



**K.R. MANGALAM UNIVERSITY**  
THE COMPLETE WORLD OF EDUCATION

**SCHOOL OF  
ARCHITECTURE AND DESIGN  
(SOAD)**

**Programme Handbook  
(Programme Study and Evaluation Scheme)**

**Bachelor of Architecture  
Programme Code: 16**

**FIVE YEAR UNDERGRADUATE PROGRAMME**

**(Approved in the 34<sup>th</sup> Meeting of Academic Council Held on 29 June 2024)**

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## **1.Preface**

K.R. Mangalam University envisions all its programs in the best interest of its students. It imbibes an outcome-based curriculum for all its programs to provide a focused, student-centric syllabus with an agenda to structure the teaching-learning experiences in a more outcome-based.

The outcome-based curriculum strengthens students' experiences and prepares the students for both, academia and employability, sustainability, and life-long learning.

Each program reflects the promise to accomplish the learning outcomes by studying the courses. The graduate attributes encompass values related to well-being, emotional stability, critical thinking, social justice, and skills for entrepreneurship.

The redesigned curriculum focuses on the multi-disciplinary nature of the field of design with an emphasis on core design subjects with skills to represent the process of design graphically. Another important part is the aspect of realizing the concept and graphical representation into a workable design. Students are exposed to research and hands-on project-based education with active studio sessions. Visiting faculty and external examiners are professionals and academicians chosen from the field of design. Students develop their design with inputs from highly driven team of faculty members and working professionals.

### **Salient features of this model curriculum are:**

1. Curriculum has been designed in such a way that it encourages innovation and research.
2. The revised curriculum has been designed where the students can understand the industry requirements and have hands-on experience.
3. The students will develop a problem-solving approach and will meet the challenges of future.
4. Emphasis on hands-on training has been promoted by including six-months Professional Training in eighth semester.
5. Bachelor of Architecture Programme will ensure the revision of the curriculum to help students to achieve better employability, start-ups, and other avenues for higher studies

The K.R. Mangalam University hopes that the outcome-based curriculum will help students realize their careers as informed, sensitive, and creative architects and designers.

K.R. Mangalam University was founded in the year 2013 by Mangalam Edu Gate, a company incorporated under Section 25 of the Companies Act, 1956.

### **Uniqueness of KRMU**

- i. Enduring legacy of providing education to high achievers who demonstrate leadership in diverse fields.
- ii. Protective and nurturing environment for teaching, research, creativity, scholarship, social and economic justice.

### **Education Objectives**

- i. To impart undergraduate, post-graduate and Doctoral education in identified areas of higher education.
- ii. To undertake research programmes with industrial interface.

- iii. To integrate its growth with the global needs and expectations of the major stake holders through teaching, research, exchange & collaborative programmes with foreign, Indian Universities/Institutions and MNCs.
- iv. To act as a nodal centre for transfer of technology to the industry.
- v. To provide job-oriented professional education to the student community with particular focus on Haryana.

## **2.University Vision and Mission**

### **2.1 Vision**

K.R. Mangalam University aspires to become an internationally recognized institution of higher learning through excellence in interdisciplinary education, research, and innovation, preparing socially responsible life-long learners and contributing to nation-building.

### **2.2 Mission**

- Foster employability and entrepreneurship through futuristic curriculum and progressive pedagogy with cutting-edge technology
- Instill notion of lifelong learning through stimulating research, Outcomes-based education, and innovative thinking
- Integrate global needs and expectations through collaborative programs with premier universities, research centres, industries, and professional bodies.
- Enhance leadership qualities among the youth having understanding of ethical values and environmental realities

## **3. About the School**

The **School of Architecture & Design (SOAD)** offers a robust, interdisciplinary education, providing students with hands-on experience through **experiential and project-based learning**. The curriculum is designed to foster innovation and technical proficiency across various design fields.

SOAD offers seven key programs:

- 1. Bachelor of Architecture (B.Arch)** – A five-year program that develops visionary architects with a strong foundation in design, construction, and environmental sustainability.
- 2. Bachelor of Design (B.Des) in Fashion Design** – A four-year program focused on fostering creativity and technical skills in fashion, preparing students for the dynamic fashion industry.
- 3. Bachelor of Design (B.Des) in Interior Design** – Prepares students to design functional and aesthetically pleasing interior spaces through a combination of creativity, technical knowledge, and practical applications.
- 4. Bachelor of Design (B.Des) in Textile Design** – Emphasizes innovative textile creation with an emphasis on sustainability and traditional craftsmanship.

5. **Bachelor of Fine Arts (B.F.A)** – Explores various visual arts disciplines such as painting, sculpture, and graphic arts.
6. **Bachelor of Design (B.Des) in Game Design & Animation** – A specialized program focused on designing interactive games and animations, merging creative storytelling with technical skills.
7. **Bachelor of Design (B.Des) in UX UI & Interaction Design** – Concentrates on creating user-centric digital solutions, emphasizing user experience (UX), user interface (UI), and interaction design.

SOAD emphasizes **experiential learning** through **project-based education**, giving students practical exposure to real-world challenges. This is further enhanced through **site visits, study tours, guest lectures, and industry integration**, ensuring students gain valuable insights and experience in their respective fields. The school maintains strong industry connections, enabling students to engage with leading professionals and firms in architecture, design, and related industries.

#### **4.School Vision and Mission**

**Vision:** To be a leading institution that develops innovative and sustainable design thinkers who shape the future of Architecture and Design globally.

**Mission:**

- Provide a comprehensive structured learning experience that develops strong cognitive thinking and skills in the field of architecture and design.
- Foster a collaborative and inclusive learning environment that encourages creativity and critical thinking.
- Promote sustainable and ethical design practices that address global and local challenges.
- Instill a strong foundation of ethical principles, ensuring graduates act with integrity and social responsibility in their professional endeavours.
- Engage with the community and industry to advance the role of architecture and design in society.

#### **5.About the Programme**

**The Bachelor of Architecture (B.Arch )** is a five-year undergraduate degree program that teaches students how to plan, design, and construct physical structures .The programs is designed to impart scientific knowledge to the students and will provide theoretical as well as practical training & knowledge. The program offered by the school is approved by Council of Architecture (COA), New Delhi. The curriculum has been specifically designed to impart latest knowledge and skills relevant to Architecture field including Industrial Visits / Training / Guest Lectures of Experts from Industry and Academia.

The programme equips students with the necessary skills and knowledge to embark on a rewarding career in architecture. Through a blend of studio-based learning, technical courses, and theoretical studies, students learn to design sustainable, functional, and aesthetically pleasing structures. It typically emphasizes creativity, problem-solving, and collaboration, preparing graduates to address the evolving challenges of the built environment.

Upon completion, graduates are equipped with the **necessary skills** to begin their careers as **architects**, with a deep understanding of both **theory** and **practice**. The curriculum's integration of hands-on experience ensures that students are well-prepared for real-world projects.

## 5.1 Definitions

### ➤ Programme Outcomes (POs)

Programme Outcomes are statements that describe what the students are expected to know and would be able to do upon the graduation. These relate to the skills, knowledge, and behaviour that students acquire through the programme.

### ➤ Programme Specific Outcomes (PSOs)

Programme Specific Outcomes are statements about the various levels of knowledge specific to the given program which the student would be acquiring during the program.

### ➤ Programme Educational Objectives (PEOs)

Programme Educational Objectives of a degree programme are the statements that describe the expected achievements of graduates in their career, and what the graduates are expected to perform and achieve during the first few years after graduation.

### ➤ Credit

Credit refers to a unit of contact hours/ tutorial hour per week or 02 hours of Lab/ Practical work per week.

### ➤ Studio Course

Studio courses are practical, hands-on classes where students engage in design projects, allowing them to apply theoretical knowledge in real-world scenarios. These courses emphasize creativity, collaboration, and iterative design processes, often culminating in tangible outcomes like models or design presentations.

## 5.2 Programme Educational Objectives (PEO)

**PEO 1: Human Values and Social Impact:** Graduates will integrate human values and social responsibility in their work, creating inclusive and sustainable spaces that enhance community well-being.

**PEO 2: Career Excellence:** Graduates will advance in their careers through continuous learning and the application of innovative design and technical skills in diverse professional settings.

**PEO 3: Professional Integrity:** Graduates will demonstrate professional competence, collaborating across disciplines to solve architectural challenges with sensitivity to cultural and environmental contexts.

**PEO 4: Ethical Practice:** Graduates will adhere to ethical standards, prioritizing sustainability, cultural sensitivity, and social welfare in their design and professional decisions.

**PEO 5: Entrepreneurial Innovation:** Graduates will foster entrepreneurial skills to create and lead successful design ventures, embracing innovation while maintaining ethical business practices.

### 5.3 Programme Outcomes (PO)

**PO1- Creative Design Solutions:** Demonstrate the ability to develop innovative, functional, and aesthetically pleasing Architectural solutions that meet client needs and enhance the user experience.

**PO2 - Technical Competence:** Apply advanced technical skills in space planning, materials selection, and construction methods to create efficient and sustainable built environments.

**PO3 - Ethical and Professional Responsibility:** Exhibit a strong commitment to ethical practices, social responsibility, and professional conduct, ensuring respect for cultural, environmental, and societal contexts.

**PO4 - Effective Communication:** Effectively communicate design ideas and solutions through visual, oral, and written means, engaging with clients, stakeholders, and multidisciplinary teams.

**PO5 - Sustainable Design Practices:** Integrate principles of sustainability into Architectural projects, promoting environmental stewardship and reducing the ecological impact of built environments.

**PO6 - Leadership and Social Skills:** lead multidisciplinary teams effectively, communicate with diverse stakeholders, and exhibit strong social skills essential for collaborative and inclusive design practices and contributing to the community through socially responsible design initiatives.

### 5.4 Programme Specific Outcomes (PSO)

**On completion of the program, students will be:**

**Program Specific Outcomes (PSO):**

On completion of the program, students will be:

**PSO1 – Understanding:** Architectural principles, theories, history, materials, processes, and technologies, enabling them to articulate complex concepts and design contexts effectively.

**PSO2 – Applying:** Knowledge of space planning, environmental context, materials, construction technology, and building bye-laws to create functional, aesthetically pleasing, and user-centered designs that meet diverse client needs.

**PSO3 – Analysing:** Architectural challenges by situations & complexities deconstructing spatial dynamics, material performance, human factors, and sustainability considerations to develop effective and efficient design solutions.

**PSO4 – Evaluating:** Architectural projects using established criteria and industry standards to ensure quality, safety, sustainability, and ethical considerations, and make informed design decisions.

**PSO5 – Creating:** Experimentation with new materials and technologies to produce original and ground-breaking architectural designs.

## 5.5 Career Avenues

Opportunities exist in both public & private sector, in the field of Architecture & Building construction industry.

Graduates can pursue careers in Architecture firms, construction companies, urban planning agencies, real estate agencies, government bodies, or even as independent consultants or entrepreneurs. The diverse knowledge gained during the program ensures that B.Arch. graduates are versatile and capable of adapting to various roles within the field.

## 5.6 Duration

1) As per Council of Architecture (COA) directives & regulations the B.Arch programme shall comprise of two stages: Stage-I (First 3 years) & Stage-II (Fourth & Fifth Year). The Minimum duration for the completion of B.Arch. Programme offered by the university is 5 academic years. or 10 semesters of 15 to 18 working weeks (90 work days) each, inclusive of six months or one semester of approximately 16 working weeks of practical training during 8<sup>th</sup> semester.

2) The Curriculum structure of the Architecture course shall follow the guidelines as outlined in Appendix-A under the Choice Based Credit System. However, the modes of periodic assessment, end semester and viva voce examinations, weightages and grading system are left to the discretion of the University or Institution.

3) A candidate shall not be permitted to enroll for the Architectural Design course in a semester unless he has completed the Architectural Design course of the previous semester.

4) A candidate shall not be permitted to enroll for the tenth semester Architectural Design Thesis or dissertation or project course unless he has successfully completed Practical Training or Internship.

(5) A candidate shall be awarded the degree in Architecture course by the University or Institution for having earned the minimum credits as specified in the curriculum.

(6) The Architecture Course shall be completed in a maximum period of 8 years. However, in special circumstances a candidate may be granted an extra 1 year by the University or Institution to complete the course. This shall be given only once to the candidate and treated as zero year.

(7) In case a candidate is not able to complete the course in the prescribed duration, the University or Institution may provide an exit option for the candidate if he has completed and earned all credits for the first three years of study

## 5.7 Eligibility Criteria

1) No candidate shall be admitted to architecture course unless he has passed an examination at the end of the 10+2 scheme of examination with at least 50 per cent. aggregate marks in Physics, Chemistry and Mathematics and also at least 50 per cent. marks in aggregate of the 10+2 level examination or passed 10+3 Diploma Examination with Mathematics as compulsory subject with at least 50 per cent. marks in aggregate.

(2) The candidate needs to qualify an Aptitude Test in Architecture conducted by the Council complying with the Admission Norms prescribed in Appendix-D.

(3) The institutions shall give weightage of 50 per cent. marks for aptitude tests and 50 per cent. marks in the qualifying examination as provided in Council of Architecture (COA) regulations in the matter of admissions.



## 5.8 Criteria for Award of Degree

A candidate shall be awarded the degree of Architecture course by the University or Institution for having earned the minimum credits as specified in the curriculum as per Council of Architecture (COA) directives & regulations.

## 6. Student's Structured Learning Experience from Entry to Exit in the Programme

### ➤ Education Philosophy and Purpose:

#### • Learn to Earn a Living:

At KRMU we believe in equipping students with the skills, knowledge, and qualifications necessary to succeed in the job market and achieve financial stability. All the programmes are tailored to meet industry demands, preparing students to enter specific careers and contributing to economic development.

#### • Learn to Live:

The University believes in learners' holistic development, fostering critical thinking, creativity, emotional intelligence, and a deeper understanding of the world. Our aim is to nurture well-rounded individuals who can contribute meaningfully to society, lead fulfilling lives, and engage with the complexities of the human experience.

### ➤ University Education Objective: Focus on Employability and Entrepreneurship through Holistic Education using Bloom's Taxonomy

By targeting all levels of Bloom's Taxonomy—remembering, understanding, applying, analysing, evaluating, and creating—students are equipped with the knowledge, skills, and attitudes necessary for the workforce and entrepreneurial success. At KRMU we emphasize on learners critical thinking, problem-solving, and innovation, ensuring application of theoretical knowledge in practical settings. This approach nurtures adaptability, creativity, and ethical decision-making, enabling graduates to excel in diverse professional environments and to innovate in entrepreneurial endeavours, contributing to economic growth and societal well-being.

### ➤ Importance of Structured Learning Experiences

A structured learning experience (SLE) is crucial for effective education as it provides a clear and organized framework for acquiring knowledge and skills. By following a well-defined curriculum, learners can build on prior knowledge systematically, ensuring that foundational concepts are understood before moving on to more complex topics. This approach not only enhances comprehension but also fosters critical thinking by allowing learners to connect ideas and apply them in various contexts. Moreover, a structured learning experience helps in setting clear goals and benchmarks, enabling both educators and students to track progress and make necessary adjustments. Ultimately, it creates a conducive environment for sustained intellectual growth, encouraging learners to achieve their full potential. At K.R. Mangalam University SLE is designed as rigorous activities that are integrated into the curriculum and provide students with opportunities in two parts:

- **Inside Classroom:** Structured learning in the classroom focuses on building cognitive outcomes through a student-centric approach. The methods used in this approach include:
  - **Cognitive Learning:** Students develop their critical thinking and problem-solving skills by engaging with fundamental concepts in design, materials, and construction. They are taught to analyse spaces, understand user needs, and design functional and aesthetic solutions.
  - **Student-Centric Learning:** The focus is on active participation, where students are encouraged to ask questions, collaborate, and engage in peer discussions. This fosters independent learning and critical reflection on design processes.
  - **Teaching Methods:** A mix of lectures, design critiques, workshops and seminars ensures that students grasp both the theoretical and practical aspects of Architecture. Visual aids, case studies, and multimedia presentations are used to enhance understanding.
  - **Tools and Techniques:** Various design software are introduced to equip students with technical skills in creating detailed plans and 3D models. The hands-on experience with these tools helps them translate concepts into tangible design outcomes.
  - **Approach:** Design thinking and research-based projects are emphasized. These allow students to identify problems, conduct research, brainstorm ideas, and prototype solutions, enhancing their creativity and technical skills.
  
- **Outside Classroom: The outside classroom experience enhances students' people skills and psychomotor skills by involving them in industry-related, community, and hands-on activities:**
  - **People Skills:** Students work on real-world projects, collaborating with professionals, peers, and communities. This helps them improve communication, teamwork, and client interaction skills. Industrial site visits, internship and participation in design workshops offer practical exposure to industry standards and practices.
  - **Psychomotor Skills:** Students engage in hands-on learning through field work, material exploration, and fabrication techniques. In workshops, they handle tools and materials, building furniture models and experimenting with construction methods, which improves their dexterity and understanding of material properties.
  - **Industry Interactions:** Regular industry visits to places of **architectural interest**, professional training/internship with Architectural firms or government organizations and collaborative projects with design firms allow students to bridge the gap between classroom learning and real-world practice. They get to apply classroom knowledge in a professional setting, gaining insights into market trends and industry requirements.
  - **Community Engagement:** Participation in community-based design projects fosters a sense of social responsibility. Students might engage in projects that aim to improve public spaces or address the needs of underserved communities, allowing them to apply design principles in meaningful ways.
  
- **Educational Planning and Execution WHAT, WHEN & HOW learning will happen**

The educational planning and execution framework for Bachelor of Architecture (B.Arch.) programme at the School of Architecture & Design (SOAD) is designed in accordance with **Council of Architecture (COA) (Minimum standards of Architectural education) Regulations, 2020 guidelines** to provide a structured and enriching learning experience. This framework aims to facilitate meaningful engagement, foster critical thinking, and encourage creativity among students. By clearly outlining “WHAT, WHEN, and HOW” learning will take place, the school ensures that all educational activities align with the program's objectives and contribute to the holistic development of our aspiring Architects.

The programme is designed around the educational philosophy OF "LEARN TO EARN LIVING" and "LEARN TO LIVE," providing a holistic learning experience from entry to exit.

### **Entry Phase**

Upon entry, students are introduced to the foundational principles of design and open electives such as environmental studies and disaster management. Orientation sessions emphasize understanding the fundamentals of Architecture field and the ethical responsibilities of architects. This initial phase emphasizes the importance of knowledge not just as a means to earn a living, but as a way to engage meaningfully with society.

### **Core Learning**

As students' progress, they delve deeper into both the theoretical and practical aspects of architecture & design. Courses on design ethics, building sciences and applied engineering practices, and user experience equip students with essential skills for their future careers. Hands-on workshops and industry collaborations emphasize the concept of learning as preparation for professional success while fostering a sense of civic responsibility and personal growth. We have a strong students' support system in terms of differential learning (slow & fast learning), mentor-mentee system and personal counselling thereby ensuring students move up on the learning curve.

### **Skill Development**

The program emphasizes developing versatile skills essential for a successful career in architecture, including research, design thinking, drafting, and project management. Through collaborative design projects, visit to industry, industry connect and networking students learn teamwork and communication, vital not just for professional success but also for fostering meaningful relationships in their personal lives.

### **Thesis and Exit Phase**

In the final phase, students undertake Thesis projects that integrate their learning and showcase their creativity and professionalism. This culminates in a portfolio that reflects their readiness to enter the workforce when they go for training in the final semester. Additionally, KRMU Career Development Cell (CDC) assist with job placements, reinforcing the "Learn to Earn" philosophy. The program maintains a strong focus on personal values and lifelong learning, encouraging students to approach their careers as opportunities to contribute positively to society.

### **Co-Curricular and Extra-Curricular Activities**

Students actively participate in 13 clubs and societies within the university, ranging from media production to cultural expression. These clubs facilitate peer interaction, teamwork, and leadership opportunities, helping students develop a well-rounded personality. Regular industry visits, guest lectures, and workshops by industry experts ensure that students remain connected to real-world design practices, bridging the gap between academic learning and professional expectations.

### **Community Connect**

Community connects programs enhance students' social awareness and responsibility, allowing them to engage with various societal issues related to design and the built environment. As interior designers, students learn to consider the impact of their work on communities and to advocate for inclusive and sustainable practices. Participation in sports and cultural activities further contributes to a balanced lifestyle, promoting teamwork and resilience.

### **Ethics and Values**

The programme places a strong emphasis on ethics, values, and a code of conduct in design practice. Students are encouraged to embody professionalism and integrity in their work, preparing them to be responsible designers and active citizens.

### **Career Counselling and Entrepreneurship**

Career counselling services provide guidance on job placements, internships, and skill development, helping students navigate their career paths. Additionally, the university's incubation centre fosters entrepreneurial and leadership qualities, encouraging students to explore innovative ideas and start their ventures.

### **➤ Components of Educational Planning**

All planned activities will be executed as scheduled, ensuring a consistent and enriching learning environment that supports the development of practical and theoretical skills in Architecture & design. The school will follow the following for conducting the semester educational, co-curricular and extracurricular activities.

#### **1. University Calendar:**

The University Calendar outlines key academic dates, including the start and end of terms, examination periods, and holidays that impact Bachelor of Architecture (B.Arch.) program.

#### **2. Timetable:**

The Timetable presents a structured overview of class sessions, lecture timings, studio hours, and project work, offering clarity on the weekly schedule for students.

#### **3. School Calendar:**

The School Calendar provides a detailed schedule of important events, workshops, design critiques, and submission deadlines specific to SOAD.

#### **4. Activity Calendar:**

The Activity Calendar highlights extracurricular events, guest lectures by industry professionals, and site visits that complement the academic curriculum, enriching students' understanding of interior design practice.

#### 5. **Class Sessions/Lectures:**

Scheduled activities include theoretical lectures, practical studio sessions for hands-on learning, and collaborative projects that foster teamwork and innovation.

#### 6. **Monitoring & Review**

Student progress is monitored through continuous assessment and feedback. Regular review meetings allow faculty to evaluate course delivery, address challenges, and refine teaching strategies. Student feedback plays a critical role in improving academic quality.

#### 7. **Correction & Continuous Improvement**

The program follows a cycle of ongoing improvement, using feedback and performance reviews to update curricula, refine teaching methods, and enhance faculty development. This ensures the program remains current and responsive to industry needs as per COA Regulations.

### ➤ **Course Registration and Scheduling**

### ➤ **Major and Minor Selection Process:**

Every student has to register at the beginning of each semester for the courses offered in the given semester. Major courses are registered centrally for the students as per B.Arch Program curriculum (as per COA Regulations **Appendix 1**). However, for other multidisciplinary courses (VAC, OE) the students have to register by themselves through ERP.

#### **Appendix 1:**

**A)** As per COA Regulations the choice-based credit system, which is a student or learner centric system, the courses of study in the Architecture Degree course shall be as under:

- (1) **Professional Core (PC) Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
- (2) **Building Sciences and Applied Engineering (BS and AE) Course:** A course which informs the Professional core and should compulsorily be studied.
- (3) **Elective Course:** Generally, a course which can be chosen from a pool of courses and are of two types:
  - (i) **Professional Elective (PE)** which may be very specific or specialised or advanced or supportive to the discipline or subject of study or which provides an extended scope
  - (ii) **Open Elective (OE)** which enables an exposure to some other discipline or subject or domain or nurtures the candidate 's proficiency or skill
- 4) **Employability Enhancement Courses (EEC)** which may be of two kinds:  
Employability Enhancement Compulsory Courses (EECC) and Skill Enhancement Courses (SEC)

**B)** The Weightage in terms of Credits for each of the above in the prescribed curriculum of the institution shall be as follows:

- |   |                |
|---|----------------|
| 1) Professional Core Courses (PC)                         | : 50 per cent. |
| (2) Building Sciences and Applied Engineering (BS and AE) | : 20 per cent. |
| (3) Elective Courses                                      |                |
| (i) Professional Electives (PE)                           | : 10 per cent. |

(ii) Open Electives (OE) : 5 per cent.

(4) Professional Ability Enhancement Courses (PAEC)

(i) Professional Ability Enhancement Compulsory Courses (PAECC) : 10 per cent.

(ii) Skill Enhancement Courses (SEC) : 5 per cent.

**Note:** - Where it is not possible to offer Open Electives, Professional Electives may have a weightage of 15 percent as per COA Regulation.

### ➤ **Value-Added Courses (VAC) and Open Electives (OE):**

Value-Added Courses (VAC) and Open Electives (OE) are offered to enhance students' skills and knowledge beyond the core curriculum. Students can select these courses based on their interests, enabling them to gain practical insights and experience in specific areas related to interior design. The choice of VAC and OE typically occurs at the beginning of each semester where students can consult with faculty and peers to make informed decisions.

### ➤ **Internships, Projects, Dissertations, and Training**

#### ➤ **Internships/Training**

Students are required to complete a professional training/Internship for one full semester in 8<sup>th</sup> semester as per COA regulation. The internship carries 18 credits and is evaluated in the following even semester. This hands-on experience is designed to provide students with practical exposure to the industry, allowing them to apply theoretical knowledge in real-world settings.

#### ➤ **Thesis and Research Project**

In the tenth semester, all the students undertake a Architectural Thesis project, where they work on real-life, live sites. This hands-on approach enables them to conduct in-depth research, critically analyse design challenges, and propose innovative solutions, bridging academic learning with real-world practice.

Students pursuing architecture course engage in research projects in ninth semester that allow them to focus on specific areas within the field, aligning with their career goals. These projects are mapped to practical courses and experiential learning activities, ensuring students gain comprehensive insights into their chosen specializations.

### ➤ **Co-Curricular Activities Credit Choices**

**Participation in Co/ Extracurricular activities is part of outside classroom learning.**

Students must earn 2 credits from co/ extracurricular activities. One credit from participation in co-curricular activities like Club/Society activities and another credit from Community Service (1 credit each) through participation in NSS/ Redcross activities or NGOs that contribute to their personal development, leadership skills, and community engagement.

- Under the category of **Club/Society**, 1 credit can be earned by registration in one of the Club/Societies of university and active participation in the events organized by the club/society **OR**
- 15 hours of active engagement in any of the recreational/sports activities

Under the category of **Community Service**, 1 credit can be earned by

- 15 hours active engagement in community service through NGO/NSS/Redcross or any other society approved/ empanelled by the university

At the end of the semester, students are required to submit a log of hours, a report, and a certificate of participation/ completion summarizing their activities followed by a presentation.

- **Academic Support (Differential learning needs):** Academic Support Systems for B. Arch students are designed to address diverse learning needs, ensuring each student excels. These systems include:
- **Personalized Tutoring:** One-on-one sessions with experienced tutors focus on areas such as design software, space planning, furniture design, lighting systems, material selection, and project management, customized to individual skill levels.
  - **Workshops and Seminars:** Regular workshops on topics like sustainable design, vernacular practices, construction techniques, and Architectural design ethics, along with industrial connections, enhance both practical and theoretical knowledge.
  - **Peer Mentoring Programs:** Advanced learners' mentor fellow students by leading project teams and offering guidance on assignments and design critiques, fostering a collaborative and supportive environment.
  - **Accessible Learning Resources:** Online platforms provide access to tutorials, design templates, articles, and interactive tools, accommodating various learning styles.
  - **Production and Outcome-Based Activities:** Students are encouraged to engage in practical, hands-on activities like design builds, mock-ups, and real-world projects. These works are showcased and recognized, boosting confidence and learning outcomes.
  - **Diversity and Inclusion Initiatives:** Programs promoting inclusivity ensure that all design ideas are valued, enriching the learning environment.
  - **Feedback and Assessment:** Continuous feedback systems allow students to receive constructive reviews of their work, facilitating growth, innovation, and skill development.

➤ **Student Career & Personal Support:**

- **Mentor-Mentee:** The Mentor-Mentee Program is an essential component for fostering successful careers as it acts as a bridge between faculty and students. Mentor-mentee relationships often go beyond academic and professional growth at KRMU.
- **Counselling and Wellness Services:** Counselling and Wellness Services for SOAD students are designed to support their mental health and overall well-being in a demanding academic environment. These services include confidential individual counselling sessions, where trained professionals provide guidance on stress management, time management and personal challenges. Group therapy sessions and workshops focus on topics such as resilience, coping strategies and mindfulness,

promoting a sense of community and shared experiences. The school conducts sessions on mental health awareness from time to time. Wellness initiatives may include fitness programs, relaxation activities and access to health resources that promote physical and mental health. By creating a supportive environment, these services help students navigate the pressures of their studies while fostering a balanced and healthy lifestyle.

- **Career Services and Training:** The Career Development Center (CDC) at KRMU provides comprehensive career services and training for SOAD students, focusing on creating ample placement opportunities. In addition to inviting corporate recruiters to campus, the Centre hosts various counselling and training programs aimed at enhancing students' academic and professional skills. These programs equip students with the essential tools needed to secure lucrative careers in their field. Each year, prominent companies visit the KRMU campus, offering attractive job packages to emerging talent. The faculty members and the mentors also ensure that students are well-prepared for the competitive job market.

### ➤ **Learning and Development Opportunities**

- **Practical Learning (Course Handouts, Session Plans):** Practical learning is supported by detailed handouts, providing structured guidance for students in areas like building material, space planning, climatology, and construction techniques, etc. Sessions are conducted in specialized environments such as Computer labs, studios, Material Museums, surveying & levelling lab and Construction Yard to enhance practical skills.
- **Experiential Learning (Learning by Doing):**
  - **Inside Classroom:** Design workshops, lighting system setups, building services and spatial planning exercises provide students with hands-on experience. Students apply theories through practical activities like model-making and digital design tool sessions.
  - **Outside Classroom:** Activities such as site visits, industrial visits, material procurement processes, and client interaction give students exposure to real-world challenges, with a focus on developing industry-relevant practical skills.
- **Case-Based Learning/Problem-Based Learning/Project-Based Learning:** Projects and case studies are carefully aligned with learning outcomes. Students are assigned tasks like design of community centre, library, adaptive reuse or working on sustainable design solutions, with detailed learning guidelines provided to map out the entire process from concept to completion.
- **Workshops, Seminars, and Guest Lectures:** Regular workshops on topics like sustainable materials, advanced lighting, building services, building construction techniques workshops and digital modelling, supplemented by guest lectures from industry professionals. A tentative schedule will ensure these activities occur throughout each semester, giving students opportunities for direct interaction with experts and hands-on learning experiences.

### ➤ **Assessment and Evaluation**

- **Grading Policies and Procedures for theory courses, practical courses, projects, Internships, Dissertation:** As per university examination policy of K R Mangalam



University, the Program Outcome assessments is done by aggregating both direct and indirect assessments, typically assigning 80% weightage to direct assessments and 20% to indirect assessments, to compute the final course attainment.

## Evaluation Scheme:

### Studio Courses

Evaluation Components	Weightage (%)
<b>Internal marks (Internal)</b>	<b>50</b>
A. Continuous Assessment	20
<b>(All the components to be evenly spaced)</b>	
Projects/ Quizzes/Presentations/ Participation/ Case Studies/Internal Jury (minimum of five components to be evaluated)	
B. Viva Voce (Internal)	30
<b>External Marks (External)</b>	<b>50</b>
A. End Term practical Exam	20
B. Viva Voce (External)	30
<b>Total</b>	<b>100</b>

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

### Practical Courses (Architectural Thesis/Dissertation/Computer Application based subjects)

Evaluation Components	Weightage (%)
<b>Internal marks (Internal)</b>	<b>50</b>
A. Continuous Assessment	20
<b>(All the components to be evenly spaced)</b>	
Projects/ Quizzes/Presentations/ Participation/ Case Studies/Internal Jury (minimum of five components to be evaluated)	
B. Viva Voce (Internal)	30
<b>External Marks (External)</b>	<b>50</b>
C. Viva Voce (External)	50
<b>Total</b>	<b>100</b>

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

## Theory Courses

Evaluation Components	Weightage
Internal Marks (Theory): - <b>I) Continuous Assessment (30 Marks)</b> <b>(All the components to be evenly spaced)</b> Projects/ Quizzes/ Assignments and Essays/ Presentations/ Participation/ Case Studies/ Reflective Journals (minimum of five components to be evaluated)	30 Marks
<b>II) Internal Marks (Theory)-Mid-Term Exam</b>	20 Marks
<b>External Marks (Theory): -</b> End Term Examination	50 Marks

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

- **Feedback and Continuous Improvement Mechanisms:** Teaching-learning is driven by outcomes. Assessment strategies and andragogy are aligned to course outcomes. Every CO is assessed using multiple components. The attainment of COs is calculated for every course to know the gaps between the desired and actual outcomes. These gaps are analysed to understand where does the student lags in terms of learning levels. Thereafter each student's learning levels are ascertained, if found below desirable level, and intervention strategy is effected in the following semester to make necessary corrections. To cater to the diverse learning needs of its student body, K.R. Mangalam University employs a comprehensive assessment framework to identify both slow and advanced learners. Students' learning levels are continually assessed based on their performance at various stages. If a student's performance in internal assessments falls below or equal to 55%, they are categorized as slow learners. Conversely, if a student's performance score in internal assessments is greater than or equal to 80%, they are identified as advanced learners. Such students are encouraged to participate in advanced learning activities. Through periodic evaluations and the utilization of modern management systems, the institution adeptly tracks students' performance across various courses, allowing for targeted interventions and support mechanisms.
- **Academic Integrity and Ethics:** The School of Architecture and Design places a strong emphasis on academic integrity and ethics, fostering a culture of honesty and responsibility among students. Clear guidelines are established to educate students about the importance of plagiarism prevention, proper citation practices, and ethical sourcing in their work. Regular workshops and seminars are conducted to discuss case studies and real-world scenarios, encouraging critical thinking about ethical dilemmas in Interior and Construction field. Faculty

members serve as role models, promoting transparency and accountability in their interactions and evaluations. By instilling these values, the school prepares students to uphold high ethical standards in their professional careers, emphasizing the critical role that integrity plays in design.

## 7. Programme Structure

### Five Year B.Arch Course at a Glance

	Courses	Credits
Semester I	9	28
Semester II	8	29
Semester III	9	29
Semester IV	8	28
Semester V	8	27
Semester VI	8	30
Semester VII	7	27
Semester VIII	1	18
Semester IX	4	22
Semester X	2	22
<b>Total</b>	<b>64</b>	<b>260</b>

<b>SEMESTER I</b>			
S.no	Course Code	Course Title	Credits
1	ADAR101	BASIC DESIGN & CREATIVE WORKSHOP	8
2	ADAR103	HISTORY OF CULTURE & CIVILISATION	2
3	ADAR105	ARCHITECTURAL DRAWING-I	4
4	ADAR107	BUILDING CONSTRUCTION & MATERIALS-I	4
5	ADAR109	STRUCTURAL DESIGN-I	2
6	VAC151	VAC-1 (EVS+DM)	2
7	ADARE1	ELECTIVE-I (THEORY OF DESIGN)	2
8	ADARE2	ELECTIVE-II (ARCHITECTURAL PHOTOGRAPHY)	2
9	SEC053	WORKSHOP	2
		<b>Total</b>	<b>28</b>

<b>SEMESTER II</b>			
S.no	Course Code	Course Title	Credits
1	ADAR102	ARCHITECTURAL DESIGN-I	8

2	ADAR104	EARLY EUROPEAN ARCHITECTURE	2
3	ADAR106	ARCHITECTURAL DRAWING-II	4
4	ADAR108	ARTS & GRAPHICS-I	3
5	ADAR110	STRUCTURAL DESIGN-II	2
6	ADAR112	BUILDING CONSTRUCTION & MATERIALS-II	4
7	SEC057	PROFESSIONAL COMMUNICATION	3
8		OPEN ELECTIVE	3
		<b>Total</b>	<b>29</b>

### SEMESTER III

S.no.	Course Code	Course Title	Credits
1	ADAR201	ARCHITECTURAL DESIGN-II	10
2	ADAR203	INDIAN ARCHITECTURAL HISTORY	2
3	ADAR205	ARTS & GRAPHICS-II	3
4	ADAR207	BUILDING CONSTRUCTION & MATERIALS-III	5
5	ADAR209	CLIMATOLOGY	3
6	ADAR211	STRUCTURAL DESIGN-III	2
7	ADAR213	SURVEYING & LEVELLING	1
8	ADAR215	SURVEYING & LEVELLING LAB	1
9	SEC054	COMPUTER APPLICATION IN ARCHITECTURE-I	2
		<b>Total</b>	<b>29</b>

### SEMESTER IV

S.no.	Course Code	Course Title	Credits
1	ADAR202	ARCHITECTURAL DESIGN-III	10
2	ADAR204	RENAISSANCE TO INDUSTRIAL REVOLUTION	2
3	ADAR206	ARTS & GRAPHICS-III	3
4	ADAR208	BUILDING CONSTRUCTION & MATERIALS-IV	5
5	ADAR210	STRUCTURAL DESIGN-IV	2
6	ADAR212	BUILDING SERVICES-I (WATER SUPPLY & SANITATION)	2
7	SEC055	COMPUTER APPLICATION IN ARCHITECTURE-II	2
8	ADARE3	ELECTIVE-III (ART & ARCHITECTURE APPRECIATION)	2
		<b>Total</b>	<b>28</b>

### SEMESTER V

S.no.	Course Code	Course Title	Credits
1	ADAR301	ARCHITECTURAL DESIGN -IV	10
2	ADAR303	MODERN WORLD ARCHITECTURE	2
3	ADAR305	ESTIMATING, COSTING & SPECIFICATIONS	2

4	ADAR307	BUILDING CONSTRUCTION & MATERIALS-V	5
5	ADAR309	STRUCTURAL DESIGN-V	2
6	ADAR311	BUILDING SERVICES-II (ELECTRICAL & LIGHTING)	2
7	SEC056	COMPUTER APPLICATION IN ARCHITECTURE-III	2
8	ADARE4	ELECTIVE-IV (HOUSING)	2
		<b>Total</b>	<b>27</b>

<b>SEMESTER VI</b>			
<b>S.no.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
1	ADAR302	ARCHITECTURAL DESIGN-V	10
2	ADAR304	WORKING DRAWING & BUILDING BYELAWS	5
3	ADAR306	BUILDING CONSTRUCTION & MATERIALS-VI	5
4	ADAR308	STRUCTURAL DESIGN-VI	2
5	ADAR310	BUILDING SERVICES-III (ACOUSTICS )	2
6	ADAR312	AIR CONDITIONING & MECHANICAL SERVICES	2
7	ADARE5	ELECTIVE-V (TOWN PLANNING)	2
8	ADARE6	ELECTIVE-VI (HUMAN SETTLEMENT)	2
		<b>Total</b>	<b>30</b>

<b>SEMESTER VII</b>			
<b>S.no.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
1	ADAR401	ARCHITECTURAL DESIGN -VI	10
2	ADAR403	BUILDING CONSTRUCTION & MATERIALS-VII	5
3	ADAR405	PROFESSIONAL PRACTICE & OFFICE MANAGEMENT	2
4	ADAR407	PROJECT CONSTRUCTION MANAGEMENT	2
5	ADARE7	ELECTIVE-VII (SITE PLANNING & LANDSCAPE DESIGN)	3
6	ADARE8	ELECTIVE-VIII (INTERIOR DESIGN)	3
7	VAC142	VAC-II (HUMAN VALUES & SOCIOLOGY)	2
		<b>Total</b>	<b>27</b>

<b>SEMESTER VIII</b>			
<b>S.no.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
1	ADAR402	PROFESSIONAL TRAINING	18
		<b>Total</b>	<b>18</b>

<b>SEMESTER IX</b>			
<b>S.no.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
1	ADAR501	DISSERTATION	6
2	ADAR503	URBAN DESIGN	10
3	ADARE9	ELECTIVE-IX (ARCHITECTURAL CONSERVATION)	3
4	ADARE10	ELECTIVE-X (SUSTAINABLE ARCHITECTURE)	3
		<b>Total</b>	<b>22</b>

<b>SEMESTER X</b>			
<b>S.no.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
1	ADAR502	ARCHITECTURAL THESIS	18
2	ADAR504	SEMINAR	4
		<b>Total</b>	<b>22</b>

<b>LIST OF ELECTIVES</b>			
<b>S.no.</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
1	ADARE1	THEORY OF DESIGN	3
2	ADARE2	ARCHITECTURAL PHOTOGRAPHY	3
3	ADARE3	ART & ARCHITECTURE APPRECIATION	2
4	ADARE4	HOUSING	3
5	ADARE5	TOWN PLANNING	3
6	ADARE6	HUMAN SETTLEMENT	3
7	ADARE7	SITE PLANNING & LANDSCAPE DESIGN	3
8	ADARE8	INTERIOR DESIGN	3
9	ADARE9	ARCHITECTURAL CONSERVATION	3
10	ADARE10	SUSTAINABLE ARCHITECTURE	3
11	ADARE11	INTELLIGENT BUILDINGS	3
12	ADARE12	VISUAL ARTS	3
13	ADARE13	LOW COST CONSTRUCTION TECHNOLOGY	3
14	ADARE14	WATER RESOURCE MANAGEMENT	3
15	ADARE15	INTEGRATED WASTE MANAGEMENT & TECHNOLOGY	3
16	ADARE16	ART MOVEMENTS & ARCHITECTURE	3
17	ADARE17	VERNACULAR ARCHITECTURE	3
18	ADARE18	STRUCTURAL SYSTEMS	3
19	ADARE19	PARAMETRIC DESIGN	3

## **DETAILED SYLLABI**

# **SEMESTER-I**



<b>ADAR101</b>	<b>BASIC DESIGN &amp; CREATIVE WORKSHOP</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>8</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>120</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Drawing Skills, Logical thinking</b>					

### Course Perspective

This course serves as an essential introduction to the principles and practices of architecture, fostering both creative and analytical skills. This course emphasizes the exploration of space, form, and function, encouraging students to develop a keen understanding of design fundamentals. Through a blend of theoretical study and practical application, learners will engage with key design concepts, such as balance, proportion, and context. Hands-on projects will facilitate the transition from abstract ideas to tangible designs, utilizing techniques in sketching, physical modeling, and basic digital tools. Students will be challenged to analyze sites critically, considering environmental, cultural, and social factors that influence design decisions. Furthermore, the course will emphasize the importance of iterative design processes, where students will learn to refine their ideas through feedback and self-reflection. Collaborative exercises and presentations will cultivate effective communication skills, vital for articulating design intentions. By the end of the semester, students will possess a foundational skill set, preparing them for more advanced architectural studies. This course aims not only to build technical proficiency but also to inspire a lifelong passion for architecture and its transformative potential within society.

### Course Outcomes

**Upon completion of the course the learner will be:**

- CO1.** Understanding the basics of design.
- CO2.** Applying ideas and develop skills to communicate them.
- CO3.** Analysing design in nature and surroundings.
- CO4.** Evaluating design based on design principles.
- CO5.** Creating basic objects of design.

### Course Content

#### **UNIT I: Introduction to design**

**No. of Hours: 30**

- **A-Meaning of design, Importance of design, Design in everyday life, Appreciation of Design in nature.** Exercises in terms of sketching of objects available in nature and surroundings.

#### **UNIT II: Elements of design**

**No. of Hours: 30**

- **A-Fundamental elements of design and their definitions**-point, line, shape, form, space, texture, value and colour. Forms (2D&3D) created through points (segments), lines (columns) and planes (volumes), and combination thereof; using various techniques & materials like Paper, Card board, Mount board, Thermocol, Styrofoam, Softwood, Acrylic sheets, wires etc

### **UNIT III: Principles of Design**

**No. of Hours: 30**

- **A-Introduction to the principles of design**-unity, balance, symmetry proportion, scale, hierarchy, rhythm, contrast, harmony, focus etc. use of grids, creating repetitive patterns. Theoretical inputs to be followed by exercises to develop the ability to translate abstract forms in 2D & 3D into compositions depicting various principles of design.

### **UNIT IV: Organic Designs**

**No. of Hours: 30**

- **A-Appreciation of design through various organic forms in nature** & various design principles they exhibit.
- **B-Introduction to Bio mimicry** to be followed by exercises to create organic forms using clay, Plaster of Paris, Metal scrap, Jute fibre etc.

### **Learning Experience:**

**Inside:** The inside classroom learning experience for first-semester Architectural Design students is dynamic and interactive, fostering a collaborative environment where creativity thrives. Students engage in lectures that introduce fundamental design principles, accompanied by visual presentations and discussions that encourage critical thinking. Hands-on activities, such as sketching and model-making, allow students to apply theoretical concepts in real-time, enhancing their understanding of spatial relationships and design aesthetics. Group critiques provide opportunities for peer feedback, cultivating a supportive community where students can refine their ideas and techniques. This interactive approach not only deepens their design knowledge but also builds essential skills in communication and collaboration, preparing them for future architectural challenges.

**Outside:** The outside classroom learning experience complements the theoretical foundation established indoors by immersing students in real-world architectural contexts. Field trips to local architectural sites and construction projects expose students to various design styles and materials, enriching their understanding of how concepts are implemented in practice. Engaging with architects and industry professionals during site visits allows students to ask questions and gain insights into the design process and project challenges. Additionally, students may participate in community design workshops, where they can apply their skills to real-life problems, fostering a sense of social responsibility. This hands-on exposure enhances their learning by bridging the gap between theory and practice, inspiring them to think critically about their future contributions to the field of architecture.

### **Textbooks**

Ching, Francis D. K., “Architecture: Form, Space, and Order”, Wiley and Sons

### **Suggested Readings**

1. Wallschlaeger, C and Snyder, S.B., “Basic Visual Concepts and Principles for Artists, Architects and Designers”, McGraw Hill.
2. Laseau, P, “Graphic Thinking For Architects and Designers”, John Wiley and Sons

### **Open Educational Resources (OER)**

1. <https://guides.lib.berkeley.edu/design>
2. <https://biomimicry.org/inspiration/what-is-biomimicry/>

## Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR107</b>	<b>BUILDING CONSTRUCTION AND MATERIALS -I</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>0</b>	<b>0</b>	<b>S</b>	<b>0</b>	<b>4</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>60</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic understanding of materials and drafting skills</b>					

### Course Perspective

The course for first-semester provides a critical foundation for understanding the essential components and processes involved in constructing buildings. This course explores various building materials, their properties, and applications, emphasizing how material choice affects structural integrity, sustainability, and aesthetic appeal. Students will gain insight into traditional and modern construction techniques, learning how to evaluate the appropriateness of materials based on factors such as climate, cost, and environmental impact. Through hands-on projects and laboratory sessions, learners will engage with materials directly, experiencing their textures, weights, and behaviours firsthand. The course will also cover key concepts in building systems, including structural frameworks, insulation, and finishing techniques, highlighting the interplay between design and functionality. By analysing case studies, students will learn to appreciate real-world applications of construction principles and the importance of adhering to safety standards and building codes. Collaborative group projects will foster teamwork and problem-solving skills, preparing students for future challenges in the field. By the end of the semester, students will have developed a robust understanding of building construction fundamentals, setting the stage for advanced studies in architecture and engineering.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding elementary building materials through site visits, reports, and presentations.

**CO 2:** Applying knowledge of building materials by performing market surveys and preparing detailed reports.

**CO 3:** Creating detailed drawings and presentation sheets.

**CO 4:** Creating detailed models of various building materials

### Course Content

**Unit I: Introduction to basic building materials and tools**

**15 Hrs.**

- **A-Types of tools used in construction.**
- **B-Clay and Clay products:** mud blocks, Earth stabilized blocks, Burnt Bricks, terracotta tiles, brick ballast and surkhi, flyash blocks, concrete blocks etc.
- **C-Types of Bricks:** Class, Properties, usage and applications. Their types physical characteristics, specifications, manufacturing, testing, etc. Specific purposes like walls, flooring, cladding, tiling, etc.

- **D-Other building materials:** such as Lime, Mud, Sand and Cement: availability, manufacturing, composition, physical and chemical properties, types, uses etc.

## **Unit II: Stone and Stone Masonry**

**15 Hrs.**

- **A-Stones for specific purposes** like walls, flooring, cladding, tiling, etc. Their physical characteristics, types, specifications, uses etc.
- **B-Types of stone** used in building construction, Rubble and Ashlar masonry

## **Unit III: Brick Masonry & masonry work techniques**

**15 Hrs.**

Walls and piers with bonding techniques of brick masonry including foundations, E.g., for brick masonry -Header and Stretcher bond, English & Flemish bonds, rat trap bond, L- junctions, T-junctions etc.

## **Unit IV: Roofing and Spanning**

**15 Hrs.**

Openings in masonry walls using spanning and load bearing techniques of corbelling, coping, arches, lintels and sills, domes, vaults etc.

## **Learning Experience**

**Inside:** The course focuses on developing knowledge about the structural strengths and physical properties of different building materials, as well as the process and techniques involved in masonry construction. Through a combination of theoretical study and hands-on learning, students will gain practical skills in working with basic materials commonly used in the construction industry.

**Outside:** Students undertake regular visits to construction sites, market surveys and case studies to supplement and update the knowledge base.

Assignments are in the form of market surveys for building materials and study of latest building materials in the building construction industry. Students are also required to do case studies of architectural and interior projects where the above-mentioned materials have been innovatively used.

## **Textbooks**

1. Rangwala, S. C., “Engineering Materials (Material Science)”, Charotar Publishing House.

## **Suggested Readings**

1. Agarwal, A., “Mud: The Potentials of Earth based Material for Third World Housing”, IIED
2. HUDCO, “All you wanted to know about Soil Stabilized Mud Blocks”,
3. Barry, R. Construction of Buildings, East West Press Pvt. Ltd., New Delhi, 1999
4. McKay, W.B.; Building Construction (Vol. I, II, III & IV), Orient Longman, London, 1988
5. Punamia B.C., Building Construction, Laxmi Publications (P) Ltd, New Delhi, 1993
6. Chudley, R.; Building Construction Handbook, Butterworth Heinemann, Oxford, 1988

## **Open Educational Resources (OER)**

1. <https://www.rgmcet.edu.in/assets/img/departments/CIVIL/materials/R19/2-2/BT/unit-2.pdf>

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR103</b>	<b>HISTORY OF CULTURE AND CIVILIZATION</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Historical study</b>					

### Course Perspective

The course offers an engaging exploration of architectural evolution, tracing the development of built environments from ancient civilizations to contemporary practices. This course examines significant architectural movements, styles, and cultural contexts, providing students with a foundational understanding of how historical, social, and technological factors have shaped architecture over time. By studying iconic structures and influential architects, students will gain insights into the principles that define various periods, such as classical, Gothic, Renaissance, and modern architecture. The course encourages critical analysis of architectural works, fostering an appreciation for the aesthetic and functional aspects of design while considering the impact of cultural identity and environmental sustainability. Through lectures, discussions, and site visits, students will develop their visual literacy, enhancing their ability to interpret and critique architectural forms. Assignments will include research projects and presentations, allowing students to explore specific topics in depth. By the end of the semester, students will have acquired a comprehensive overview of architectural history, equipping them with the contextual knowledge necessary for their future studies in design and construction. This course not only celebrates the diversity of architectural expression but also inspires students to envision their role in the ongoing narrative of architecture.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1.** Understanding the architecture of a specific period to understand how it addressed societal needs and demands.

**CO2.** Analysing the development of civilizations and assess its influence on contemporary architecture.

**CO3.** Articulate an understanding of the evolution of architecture by integrating factors such as location, climate, socio-cultural, historical, economic, and political influences.

### Course Content

#### Unit I: Primitive Beginnings:

**8 hours**

- **A-Introduction to History and Architecture** with special emphasis on Stone Age to Neolithic settlements in India, examples from Carnac, Bhibeteka & Stonehenge.
- **B-Birth of Civilizations:** In reference to the Asia-minor region with nascent cities like Jericho, Catalhayuk, and Hattasus etc.
- **C- Indus Valley Civilization:** Particularly in reference to the town planning principles exemplified with examples from Mohenjo-Daro and Harappa.

#### Unit II: The Vedic / Aryan Civilizations

**7 hours**

- **A-The Vedic / Aryan civilization:** With its emphasis on the Vedic town plan, its motifs and patterns.
- **B- Mesopotamian Civilization:** With special attention to cities of Mesopotamian like Ninveh, Khorsahbad, Marie, Babylon, and architectural constructs like Ziggurat.

### **Unit III: Egyptian Civilization:**

**8 hours**

Particularly in reference to social & political context of Tomb Architecture and Temple Architecture with examples.

### **Unit IV: Aegean civilization: Greek & Roman civilization**

**7 hours**

- **A-Aegean civilization:** Characteristic features of Aegean and Helladic architecture, with special reference to cities like Troy, Sparta and Mycenae, which formed the basis of Greek civilization.
- **B-Greek & Roman civilization:** Evolution of Greek and Roman architecture- factors affecting development. Hellenic and Hellenistic periods; Etruscan architecture and the Roman period, just the civilization and the cities of Romans & Greeks.
- **C-Brief introduction to Architecture, the classical orders & the advancements in construction techniques of the Romans** (vaults & domes & stucco) will be taken up in detail in Early European Architecture.

### **Learning Experience**

**Inside:** History of Architecture intends to form a connection between past and present in the context of architecture. The student starts to understand the evolution of forms, character, use of techniques and materials and their impact as a continuous process from the past to the present. The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc. The History of Architecture is studied over 5 semesters and is divided chronologically and regionally to understand and focus on a specific aspect in a particular semester.

**Outside:** The course shall include sketching and understanding of historical buildings, historical analysis, and visit to places of historical importance. The students understand the building types and development of architectural form and character based on tangible (materials, construction techniques) and intangible factors (belief systems, needs of different religions, dynasties and influences) through live examples and visits to historical sites.

### **Textbooks**

1. Cruickshank, D., Fletcher, B., Saint A., “Banister Fletcher's - A History of Architecture”, Architectural Press
2. Hiraskar, G.K., “The Great Ages of World Architecture (with Introduction to Landscape Architecture)”, Dhanpat Rai Publications (P) Ltd.

### **Suggested Readings**

1. Risebero, Bill, “ The Story of Western Architecture”, MIT Press
2. Ching Francis D.K., Jarzombek, Mark M., Prakash, Vikramaditya, “A Global History of Architecture”, Wiley



## Open Educational Resources (OER)

1. <https://urbandesignlab.in/timeline-of-the-history-of-architecture/>

## Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR105</b>	<b>ARCHITECTURAL DRAWING-I</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Visualization &amp; coherent thinking, Drawing Skills</b>					

### Course Perspective

The course serves as a vital introduction to the visual language of architecture. This course focuses on developing essential drawing skills, enabling students to effectively communicate design ideas through various mediums, including hand-drawing, technical drafting, and digital tools. Students will learn foundational techniques for creating accurate plans, elevations, and sections, while also exploring perspective drawing and rendering techniques that enhance their visual presentations. Emphasis will be placed on the importance of scale, proportion, and detail, fostering a keen eye for spatial relationships. Through hands-on exercises and project-based assignments, learners will engage in the iterative design process, refining their skills through critique and feedback. By the end of the semester, students will have developed a robust understanding of architectural representation, empowering them to convey their creative concepts confidently and prepare them for more advanced coursework in architectural design.

### Course Outcomes

**Upon completion of the course the learner will be:**

- CO1:** Understanding the principles of scale, proportion, and perspective in architectural drawing.
- CO2:** Analysing various architectural drawings to determine their compliance with design principles and technical standards.
- CO3:** Evaluating architectural drawings based on clarity, accuracy, and adherence to design principles.
- CO4:** Creating comprehensive architectural drawing set, including floor plans, elevations, and sections, that effectively communicates design intent.

### Course Content

#### Unit-I

- A-Brief introduction of drafting instruments & their use.
- B-Understanding freehand architectural lettering & sheet layout.

#### Unit-II

- A-Understanding about elements to drawing like. Point, line, plane, volume
- B-Fundamentals of scale: Understanding the representation of actual object in the drawing to the scale (suggestive exercise- On a sheet, an object could be drawn on various scales and can be dimensioned)

#### Unit-III

- Visualizing an object with the help of Orthographic projection with case specific as axis perpendicular to the H.P. & V.P. (Suggestive exercise -Drafting of 3D composition in Plan and elevate

#### Unit-IV

- A-Understanding geometry of solid objects.
- B-Understanding Section of solids with respect to specific case scenarios.

- C-Understanding Plan, section and Elevation with respect to the various line weight, for drafting purpose.

### Learning Experience:

**Inside:** The course gives insight about graphical representation of visualized design. It starts with understanding the basic tools, techniques of drafting and meaning of basic symbols of drawing. Also, emphasis given on development of own writing/lettering style to make it more unique and interesting.

### Textbooks

Engineering Drawing, N.D. Bhatt.

### Suggested Readings

Engineering Drawing, R.K Dhawan

### Open Educational Resources (OER)

1. <https://codesigncollaborative.org/orthographic-projection/#:~:text=An%20orthographic%20projection%20is%20a,%2C%20front%2C%20and%20right%20side.>

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR109</b>	<b>STRUCTURAL DESIGN-I</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Retain a strong grasp of basic fundamentals and critical thinking skills that enable them to consistently and successfully apply Structural Engineering principles within their chosen career path.</b>					

### Course Perspective

The course provides a foundational understanding of the principles governing the design and analysis of structural systems in architecture. This course introduces essential concepts such as load distribution, material behaviour, and structural integrity, enabling students to grasp how various forces impact buildings. Through lectures, hands-on activities, and collaborative projects, students will explore different structural types, including beams, columns, and trusses, while learning to evaluate their suitability for specific design scenarios. Emphasis will be placed on the relationship between aesthetics and functionality, encouraging students to consider how structural elements can enhance architectural expression. By engaging in practical exercises, students will develop skills in creating basic structural models and analysing their performance. By the end of the semester, students will have gained a solid understanding of the fundamentals of structural design, laying the groundwork for more advanced studies in architecture and engineering.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding the basic principles of structural mechanics as a foundation for studying structural design.

**CO2:** Analysing the composition and resolution of forces to understand their effects on structural systems.

**CO3:** Evaluating the equilibrium of forces and analyse support reactions to understand their role in maintaining structural stability.

**CO4:** Calculating concepts of centroid, centre of gravity, and moment of inertia.

### Course Content

#### UNIT I:

**8 hours**

- A-Force & its units
  - B- Laws of forces
  - C- Resultant of a force system – Analytical, Method of resolution, Triangle Law, Polygon law, Graphical (Vector) method
  - D- Moment of force – Varignon’s principle,
  - E- Couple - Moment & Arm of a couple
  - F-Equilibrium of Forces:
  - G- Principles of equilibrium

- **H-** Analytical & Graphical method for equilibrium of forces
- **I-** Free body diagram
- **J-** Conditions of equilibrium
- **K-** Types of equilibrium

**UNIT II:**

**7 hours**

- **A-** Centroid & Centre of Gravity:
- **B-** Definition, Centroid and Centre of Gravity
- **C-** Relationship between C.G., Centre of Mass and Centroid.
- **D-** Centroid of a Line
- **E-** Methods of finding out C.G. & Centroid of plane figures; Symmetrical sections, unsymmetrical sections, solids by different methods – Geometrical, By moments, & Graphical method.

**UNIT III:**

**8 hours**

- **A-** Moment of Inertia:
- **B-** Definition & important theorems – Parallel axis & perpendicular axis theorem.
- **C-** Section modulus
- **D-** Radius of Gyration
- **E-** MI of plane lamina
- **F-** MI of Composite sections.

**UNIT IV:**

**8 hours**

- **A-** Support Reactions
- **B-** Types of loading – point load, uniformly distributed load, uniformly varying load.
- **C-** Methods for reaction of beams or frames and trusses i.e Analytical, Graphical, by Space diagram & Vector diagram
- **D-** Types of end supports of beams & frames – simple supported, Hinged, Overhanging beams
- **E-** Beams subjected to Moments
- **F-** Statically Determinate Structure

**Learning Experience Inside:** In the first semester of Structural Design, students engage in a dynamic classroom environment where theoretical concepts come to life through interactive lectures and hands-on activities. The curriculum emphasizes foundational principles such as load calculations, material properties, and design codes. Through collaborative projects, students analyze real-world case studies, fostering critical thinking and problem-solving skills. Visual aids, including software simulations and 3D models, enhance understanding, while group discussions encourage peer learning and the exchange of ideas.

**Outside:** Complementing the indoor learning, outside classroom experiences play a crucial role in the Structural Design curriculum. Students participate in site visits to local construction projects, allowing them to observe structural systems in action and understand the practical implications of their studies. Workshops with industry professionals provide insights into current practices and emerging technologies. Additionally, students may engage in fieldwork, collecting data and assessing materials, which reinforces classroom concepts and encourages a hands-on approach to learning that bridges theory and practice.

## Textbooks

1. Applied Mechanics by R.S. Khurmi, S.chand Publications.
2. Structure Mechanics for Architects by Prof. Harbhajan Singh, Abhishek Publications, Chandigarh.

## Suggested Readings

1. Strength of Materials by S.Ramamrutham, Dhanpat Rai & Sons, New Delhi.Mechanics of Materials by Dr. B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, Laxmi Publications (P) Ltd., New Delhi
2. Mechanics for Engineers, Statics, Ferdinand P. Beer & E. Russell Johnston, Jr. Mc.Graw Hill, International Student Edition.

## Open Educational Resources (OER)

1. [https://www.researchgate.net/profile/Boshra-Eltaly/publication/331021482\\_Theory\\_of\\_Structure\\_1/links/61632210e7993f536cba4386/Theory-of-Structure-1.pdf](https://www.researchgate.net/profile/Boshra-Eltaly/publication/331021482_Theory_of_Structure_1/links/61632210e7993f536cba4386/Theory-of-Structure-1.pdf)

## Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>VAC151</b>	<b>VAC-I (Environment Studies &amp; Disaster Management)</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basics of Environment</b>					

### Course Perspective

The course provides a foundational understanding of the relationship between architecture, environmental sustainability, and disaster resilience. This course covers essential topics such as ecological principles, resource management, and the impact of climate change on built environments. Students will explore strategies for sustainable design and urban planning while learning how to assess and mitigate risks associated with natural disasters. Through case studies and practical exercises, they will develop critical skills in disaster preparedness and response. By the end of the semester, students will be equipped to contribute to resilient and sustainable architectural practices in an evolving environment.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding environmental issues to develop a deep understanding of how to contribute to a healthy and safe environment.

**CO2:** Applying techniques for environmental protection, recognizing that a clean, healthy, safe environment is crucial for the sustainability of all species.

**CO3:** Analysing environmental concerns at both national and international levels, focusing on the formulation of protection acts and sustainable development policies.

**CO4:** Evaluating the impacts of rapid industrialization, consumerism, and over-exploitation of natural resources on the degradation of the earth.

### Course Content

#### UNIT I-Environment and Natural Resources:

**8 Hours**

- **A-Multidisciplinary nature of environmental sciences;** Scope and importance; Need for public awareness.
- **B-Land resources;** land use change; Land degradation, soil erosion and desertification.
- **C-Deforestation:** Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- **D-Water:** Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies. Carbon Footprints

## UNIT II- Ecosystems and Biodiversity:

7 Hours

- **A-Ecosystem:** Definition and Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession.
- **B-Case studies** of the following ecosystems:
  - Forest ecosystem
  - Grassland ecosystem
  - Desert ecosystem
  - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)
- **C-Biological diversity:** genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots ; India as a mega-biodiversity nation; Endangered and endemic species of India; Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity; Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

## UNIT III- Environmental Pollution and Environmental Policies:

10 Hours

- **A-Environmental pollution:** types, causes, effects and controls; Air, water, soil and noise pollution nuclear hazards and human health risks; Solid waste management: Control measures of urban and industrial waste; Pollution case studies.
- **B-Sustainability and sustainable development;** Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture;
- **C-Environment Laws:** Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; wildlife Protection Act; Forest Conservation Act; Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context. Fundamentals and Application of ESG (Environment Social Governance).

## UNIT IV: Human Communities and the Environment and Field work:

5 Hours

- **A-Human population growth:** Impacts on environment, human health and welfare; Resettlement and rehabilitation of project affected persons; case studies; Disaster management: floods, earthquake, cyclones and landslides; Environmental movements: Chipko, Silent valley, Bishnoi's of Rajasthan; Environmental ethics: Role of Indian and other religions and cultures in environmental conservation; Environmental communication and public awareness, Recent Case studies related to earthquakes, Foods, Famine, Water Crisis/Scarcity, Smog, Water contamination at National and International Level.
- **B-Visit to an area** to document environmental assets: river/ forest/ flora/fauna, etc.
- **C-Visit to a local polluted site**-Urban/Rural/Industrial/Agricultural.
- **D-Study of common plants, insects, birds and basic principles of identification.** Study of simple ecosystems-pond, river, Delhi Ridge, etc.

## Learning Experience

**Inside:** In the first semester of Environment Studies & Disaster Management, students immerse themselves in a comprehensive exploration of environmental systems and disaster response strategies. Classroom sessions blend lectures, multimedia presentations, and interactive discussions, fostering a deep understanding of ecological principles, climate change, and risk assessment. Through case studies of past disasters, students analyze response frameworks and recovery efforts, enhancing their critical thinking and analytical skills. Collaborative group



activities encourage students to develop disaster preparedness plans and engage with environmental policies, creating a participatory learning atmosphere.

**Outside:** To enrich their understanding, students partake in outdoor learning experiences that connect theory to real-world applications. Field trips to local ecosystems and affected disaster zones allow students to observe environmental challenges first hand and assess the effectiveness of management strategies. Workshops with local disaster management agencies offer insights into emergency preparedness and community resilience. Additionally, students may engage in community service projects focused on environmental restoration or disaster readiness, fostering a sense of responsibility and active participation in addressing societal challenges.

### Textbooks

1. Kaushik and Kaushik, Environmental Studies, New Age International Publishers (P) Ltd. New Delhi.

### Suggested Readings

1. A.K. De, Environmental Chemistry, New Age International Publishers (P) Ltd. New Delhi.
2. S.E. Manahan, Environmental Chemistry, CRC Press.
3. S.S Dara and D.D. Mishra, Environmental Chemistry and Pollution Control, S.Chand & Company Ltd, New Delhi.
4. R. Gadi, S. Rattan, S. Mohapatra, Environmental Studies Kataria Publishers, New Delhi.

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADARE1</b>	<b>ELECTIVE -I(THEORY OF DESIGN)</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Interest in Basic Design and keen Observation</b>					

### Course Perspective

The course makes the students understand 2D and 3D elements conceptually as well as their usage in Architectural Design. The student will will attain a deeper understanding of spaces, the connections in terms of circulation and order that governs the arrangement of spaces. Finally this knowledge of connections of spaces is translated into drawing of plans and sections.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Analysing and designing architectural spaces effectively.

**CO2:** Applying their knowledge to deconstruct spaces into their fundamental elements and conceptualize these spaces in their simplest forms.

**CO3:** Analysing the breakdown of built forms into their functional components and understand the organization and connections that integrate them.

**CO4:** Evaluating how architectural drawings effectively communicate spatial relationships and design concepts.

### Course Content

**UNIT I:** 8 hours

The course begins with a simple understanding of 2D design elements like point, lines and planes. While all of us can easily visualize a straight line in two dimensions, the sequence of creating planes, shapes, forms, spaces, enclosures and buildings in 3D is of great significance to a student of Architecture. All these are understood conceptually as well as in the context of built form.

**UNIT II:** 8 hours

Then the understanding is developed further by studying Circulation (Horizontal and Vertical and Circulation and Spaces between Buildings) and Order (Geometrical, structural, dimensional, material, spatial).

**UNIT III:** 8 hours

Theory of Design helps develop an understanding of elements and principles of design that eventually guide the students in pursuing practical design problems. The students learn to articulate the concepts and manifest them into drawings by understanding the relationship of Plan, Section and Elevation, Architectural Scale and Programming in Architectural Design.

**UNIT IV:** 8 hours

Elements of Biomimicry, pragmatism, deconstructivism are studied to understand spaces as design beyond lines and planes. These concepts introduce students to fluid shapes and inspiration from nature.

### Learning Experience

**Inside:** Students understand the full range of design elements, principles, spaces, connections, and their interplay in human context. They explore these through a study of simple terms, their translation into form and space.

They then understand how architecture and other design integrate all these to make functional spaces and built form. This understanding can become the basis of all design fields in being able to translate colours, textures, elements and ideas into workable design manifestations.

### Textbooks

1. Francis D. K. Ching, "Architecture, Form, Space and Order".

### Suggested Readings

1. Francis D. K. Ching, "Introduction to Architecture".
2. Francis D. K. Ching, "Design Drawing".

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADARE2</b>	<b>ELECTIVE -II (ARCHITECTURAL PHOTOGRAPHY)</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Skill Enhancement Course (Practical</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Photography skills</b>					

### Course Perspective

This course introduces the fundamental techniques and concepts of capturing built environments through photography. This course emphasizes the relationship between light, composition, and architectural forms, guiding students to develop their visual storytelling skills. Through hands-on assignments and critiques, learners will explore various photography styles, including documentary, artistic, and commercial approaches, while understanding the importance of perspective and context. Students will also gain insights into post-processing techniques to enhance their images. By the end of the semester, students will have honed their ability to effectively communicate architectural ideas and emotions through compelling photographic imagery.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding the significance of perspective in photography.

**CO2:** Analysing the historical development and evolution of photography in architecture to assess its benefits.

**CO3:** Creating a chronological overview of world architecture, exploring various photographic techniques and angles to enhance their understanding.

**CO4:** Evaluating the factors influencing focus in photography and design strategies to maximize the impact of their images.

### Course Content

#### Unit I: Photographic Communication

**10 hours**

- **A-Introduction to photography, types of Cameras, equipment-** cameras & lenses,
- **B-Principles of photo composition.**
- **C-Exposure, Aperture, Speed, colour, black & white,**
- **D-Film processing, printing & developing.**

#### Unit II: Architectural Photography and Photo Journalism

**10 hours**

- **A-Architectural Photography,** Exterior and Interior photography.
- **B-Photo journalism,** Practical exercises to understand composition.

#### Unit III: Photographic Documentation

**10 hours**

Photo documentation of buildings highlighting quality of architectural spaces.

### Learning Experience

**Inside:** In the first semester of Architectural Photography, students are introduced to the fundamental principles of capturing the built environment through engaging lectures and hands-on workshops. The curriculum covers topics such as composition, lighting, and the use of various camera techniques tailored to architectural subjects. Students learn to analyse famous architectural photographs, discussing the visual elements that convey design intent and spatial relationships. Practical exercises encourage experimentation with different perspectives and settings, while critiques foster a supportive environment for peer feedback, helping students refine their unique photographic styles.

**Outside:** To complement classroom learning, students venture into the field for hands-on photographic assignments that allow them to apply their skills in real-world settings. Field trips to notable buildings and urban landscapes enable students to practice capturing architectural details and the interplay of light and shadow. Guided sessions with professional photographers provide valuable insights into techniques and challenges faced in the industry. Additionally, students participate in collaborative projects, where they document local architecture and present their work in exhibitions, promoting community engagement and enhancing their portfolios.

### Textbooks

1. Heinrich, M. (2008). Basics Architectural photography. Birkhauser Verlag AG.
2. Sounders, D. (1988). Professional Advertising Photography. London : Merchurst.

### Suggested Readings

1. Harris, M. (2001). Professional Architectural Photography. Focal Press.
2. Harris, M. (2002). Professional Interior Photography. Focal Press.

### Open Educational Resources (OER)

1. <https://www.format.com/magazine/resources/photography/architecture-photography>

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

<b>ADAR101</b>	<b>WORKSHOP</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>Category of Course</b>	<b>Skill Enhancement Course (Practical</b>					
<b>Total Contact Hours</b>	<b>60</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Logical thinking</b>					

**Course Perspective:** The Workshop course provides a hands-on environment to explore practical skills essential for architectural practice. This course emphasizes craftsmanship, encouraging students to engage with various materials and tools while developing techniques for model-making, prototyping, and fabrication. Through guided projects, students will learn to translate design ideas into tangible forms, fostering creativity and problem-solving skills. Collaborative activities will promote teamwork and communication, simulating real-world architectural workflows. By the end of the semester, students will have gained confidence in their technical abilities and a deeper understanding of the making process, laying a solid foundation for their future studies in architecture.

### **Course Outcomes**

**Upon completion of the course the learner will be:**

**CO1:** Understanding various carpentry tools, woodworking machines, and welding equipment.

**CO2:** Analysing the processes involved in woodworking and welding.

**CO3:** Applying the techniques for creating various carpentry and welding joints.

### **Course Content**

**14 Hrs**

**UNIT I:** To introduce carpentry tools, processes and wood working machines. To prepare three dimensional solids like cube, cuboids, pyramids, spheres, cone and cylinders and make a composition.

#### **UNIT II: Carpentry joints**

**16 Hrs**

**A-**Technical terms, classification of joints: lengthening, spliced or longitudinal joints; bearing joint, framing joint, angle/ corner joint, oblique/shouldered joint, widening or side joint

**B-**Fastenings, Carpentry tools and various connecting devices

**C-**To demonstrate the use of carpentry tools in making joints such as Dovetail Joint, Mortise and Tenon Joint, Lap joint, Butt Joint etc. to be used for making furniture.

#### **UNIT III**

**14 Hrs**

To prepare joints (Lap and Butt) by metal arc welding

#### **UNIT IV**

**16 Hrs**

To create complex three-dimensional forms for models using carpentry methods

### **Learning Experience**

**Inside:** The students engage in a hands-on learning environment that emphasizes the practical application of architectural concepts. The classroom is equipped with various tools and materials, allowing students to experiment with model-making, fabrication techniques, and prototyping. Through guided projects, they learn to translate their design ideas into physical models, focusing on precision and craftsmanship. Instructors facilitate skill-building sessions on using specific tools and technologies, such as 3D printing and CNC machining, while peer critiques promote collaboration and the exchange of ideas, fostering a sense of community and innovation.

**Outside:** To enrich their workshop experience, students participate in field trips to local fabrication shops and architectural studios, where they observe professional practices in action. These visits allow them to see how theoretical skills are applied in real-world contexts, providing insights into the workflow of design and construction processes. Additionally, students may collaborate on community-based projects, where they apply their workshop skills to create functional structures or installations for public use. This hands-on involvement not only reinforces their technical skills but also fosters a sense of responsibility and connection to the community they serve.

### Textbooks

1. Raghuwanshi, B.S., “A Course in Workshop Technology – ‘Vol. I and II’, Dhanpat Rai and Co.

### Open Educational Resources (OER)

1. <https://www.thesprucecrafts.com/wood-joinery-types-3536631>
2. *Introduction to carpentry tools and joints*  
Link: <https://gppanchkula.ac.in/wp-content/uploads/2020/03/INTRODUCTION-TO-CARPENTRY-TOOLS-AND-JOINTS.pdf>

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term External Jury
Weightage (%)	20	30	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

## **SEMESTER-II**



<b>ADAR102</b>	<b>ARCHITECTURAL DESIGN-I</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>8</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>120</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Drawing Skills, Understanding of spatial planning</b>					

### Course Perspective

The Architectural Design course for second-semester students builds on foundational concepts, focusing on more complex design challenges and critical thinking. This course encourages students to explore the relationship between form, function, and context, fostering a deeper understanding of user experience and site-specific solutions. Through a series of projects, students will engage in the iterative design process, incorporating feedback and refining their ideas. Emphasis will be placed on integrating sustainable practices and innovative materials. Collaborative critiques and presentations will enhance communication skills, preparing students to articulate their design intentions effectively. By the end of the semester, students will be equipped with advanced design skills and a comprehensive perspective on architectural practice.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding human dimensions and their functions through the study of anthropometrics.

**CO2:** Analyzing the sizes of spaces for specific functions based on human dimensions, utilizing case studies of dwellings.

**CO3:** Evaluating the relationship between built form design and the surrounding landscape.

**CO4:** Creating site drawings, architectural drawings, and models that respect human scale and the site context.

### Course Content

To Study Anthropometrics to understand human dimensions and their functions, space-activity, relationships, measured drawings of simple living units.

To study Scale in Architecture to increase perception and sensitivity of the students about space in terms of balance & proportions.

This can be best understood through one or two short exercises of studying and measuring the interior layout of personal space for living, eating, sleeping, cooking, toilets, laundry area, outdoor sitting spaces such as verandah, balcony etc.

Suggestive mode of work-The studio work can be divided in stages

Prototype study, Problem identification, Site analysis (if needed), Preliminary sketch etc. Models of the final design necessary for greater comprehension.

Design of mono-cellular-units/structures -Design of simple single activity units such as milk booth, tea stall, shelter in park, bus stop or designing of student's own room (as a student of architecture).

Design of multiple but simple activity spaces involving primarily horizontal circulation.

Exercise to emphasize the significance of the user in the process of design. The design of building unit to be completed in the following stages: Prototype study, Problem identification, Site analysis, Preliminary sketch etc. Models of the final design necessary for greater comprehension. Suggested exercises: Residence, Guest House, Dharamshala, etc.

### Learning Experience:

**Inside:** In the second semester of Architectural Design, students delve deeper into the principles of design theory, material selection, and spatial organization. The classroom experience is characterized by a blend of lectures, design critiques, and hands-on workshops that challenge students to create innovative design solutions. They engage in collaborative projects that encourage brainstorming and teamwork, refining their conceptual ideas into tangible designs. Through the use of modeling tools and software, students learn to visualize their concepts and develop presentation skills that effectively communicate their design intentions to peers and instructors.

**Outside:** To enhance their practical understanding of architectural design, students participate in field trips to significant architectural sites and construction projects. These excursions provide invaluable insights into real-world applications of design principles, allowing students to observe construction techniques and material usage firsthand. Additionally, workshops with industry professionals expose students to current trends and practices in architecture. Students may also engage in community design charrettes, where they work on real projects that address local needs, fostering a sense of civic responsibility and collaboration while applying their skills in a meaningful context.

### Textbooks

Ching, Francis D. K., “Architecture: Form, Space, and Order”, Wiley and Sons

### Suggested Readings

1. Watson, Donald, “Time-saver Standards for Building Materials and Systems”, Tata McGraw Hill
2. Wallschlaeger, C and Snyder, S.B., “Basic Visual Concepts and Principles for Artists, Architects and Designers”, McGraw Hill.
3. Laseau, P, “Graphic Thinking for Architects and Designers”, John Wiley and Sons

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR112</b>	<b>BUILDING CONSTRUCTION &amp; MATERIALS-II</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>4</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>60</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Observation, drawing skills, maintaining journals for construction materials.</b>					

### Course Perspective

The Building Construction and Materials course for second-semester students delves deeper into the technical aspects of construction practices and material selection. This course focuses on advanced building techniques, structural systems, and the properties of diverse materials, including wood, concrete, steel, and sustainable options. Students will analyze real-world case studies to understand how material choices impact design, cost, and environmental performance. Hands-on workshops will provide practical experience in construction methods and tools. By the end of the semester, students will have gained a comprehensive understanding of the relationship between design and construction, equipping them to make informed decisions in future architectural projects.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding the difference between the components of building substructure and superstructure.

**CO2:** Analysing building materials, including wood, timber, and bamboo, through site visits, reports, and presentations.

**CO3:** Evaluating materials through site visits, market surveys, and reports to showcase their properties and applications.

**CO4:** Creating accurate and detailed construction drawings.

### Course Content

**Unit I: Sub-structure- Shallow Foundations and plinth** **14 Hrs.**

- **A-Introduction to foundations** and plinth along with their role in supporting structures
- **B-Types of shallow foundations:** strip footings, isolated footings, raft foundations etc.

**Unit II: Superstructure** **16 Hrs.**

- **C-Brick Masonry** and cavity walls including masonry work techniques such as jointing, pointing and plastering.
- **D-Understanding** the components of an external wall section, including insulation, moisture barriers, and finishes from foundation to terrace.

### Unit III: Timber and Bamboo

16 Hrs.

Introduction to timber and bamboo as construction materials Structure, Classification, Characteristics, Seasoning, Storage, Defects, Preservation, uses etc.

- **A-Timber products:** Boards- decorative & commercial plywood and boards – types and qualities, ply board, block board, particle board, wood cement board, fiber board, compressed straw board, cement fiber board etc.
- **B-Veneers & laminates**
- **C-Joinery methods**
- **D-Finishes for simple wood work and types of adhesives used.**
- **E-Varnishes:** Natural and synthetic clear varnishes, French polish
- **F-Natural Adhesives** – Animal, Casein, Bituminous.
- **G-Thermoplastic Adhesives** – Polyvinyl Acetate.
- **H-Thermosetting Adhesives & Plastics** - Urea Formaldehyde, Phenol Formaldehyde, Melamine Formaldehyde, Resorcinol Formaldehyde,
- **I-Epoxy Resins, Rubber Adhesive.**
- **J-Details of wooden doors, windows and staircase**
- **K-Details of Ledged & Braced batten doors and windows.**
- **L-Wooden doors:** details of flush paneled & glazed doors, their fastenings, fittings & fixtures.
- **M-Wooden windows:** details of paneled and glazed windows, their fastenings, fittings & fixtures.

### Unit IV: Roof Types and Covering, and Roof Finishes

14 Hrs.

- **A-Different types of roofs:** pitched roofs, flat roofs, gable roofs, hip roofs etc.
- **B-Roof covering materials:**
  - **C-Tiles-** Clay Tiles (Country, Allahabad, Mangalore tiles etc.), Concrete Tiles,
  - **Sheets-** Metal sheets, Asbestos Cement sheets (Plain & Corrugated), Aluminium Sheets (Plain & Corrugated), Galvanised Iron Sheets (Plain & Corrugated)
- **D-Stone Slating, Shingles, Thatch.**
- **E-Waterproof membranes**

### Learning Experience

**Inside:** Building Construction & Materials-II is a course designed to provide students with a thorough understanding of the building components, construction techniques, and materials used in building substructure and superstructure. The course will cover topics such as foundation and superstructure systems used in load bearing construction systems. It will also cover roof systems, and the use of wood, timber, and bamboo in construction.

**Outside:** Through a combination of theoretical knowledge, site visits, reports, and presentations, students will develop practical skills in identifying, analyzing, and applying various building materials and construction techniques.

### Textbooks

1. Farrelly, Lorraine, “Basic Architecture 02: Construction + Materiality”, Ava Publishing
2. Agarwal, A., “Mud: The Potentials of Earth based Material for Third World Housing”, IIED,
3. HUDCO, “All you wanted to know about Soil Stabilized Mud Blocks”,

### Suggested Readings

1. Watson, Donald, “Time-saver Standards for Building Materials and Systems”, Tata McGraw Hill,
2. Rangwala, S. C., “Engineering Materials (Material Science)”, Charotar Publishing
3. House. Punamia B.C., Building Construction, Laxmi Publications (P) Ltd, New Delhi, 1993

### Open Educational Resources (OER)

1. <https://www.scientific.net/book/advanced-building-construction-and-materials-ii/978-3-03826-699-0>

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR106</b>	<b>ARCHITECTURAL DRAWING-II</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>60</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Visualization &amp; coherent thinking</b>					

### Course Perspective

The Architectural Drawing course for second-semester students expands on foundational skills, emphasizing advanced techniques in architectural representation. This course focuses on developing precision in technical drawings, including detailed plans, sections, and elevations, as well as enhancing skills in perspective and rendering. Through a series of assignments and collaborative critiques, learners will refine their ability to convey complex design ideas clearly and effectively. By the end of the semester, students will be equipped with advanced drawing skills essential for professional architectural practice.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding scale in plans, sections, and elevations.

**CO2:** Applying the knowledge gained to create isometric and axonometric projections.

**CO3:** Creating one-point and two-point perspective drawings, including sociography in plans, elevations, and views.

### Course Content

#### Unit -I

**16 Hrs**

- Study of principles and techniques of axonometric, oblique and isometric views and construct three dimensional views of basic and complex geometrical shapes.
- Basic terms, principles, types and techniques of geometrical perspective drawing.

#### Unit-II

**14 Hrs**

- Make perspective by measuring point method, Angular method and parallel perspective.
- Make perspective of simple objects, inclined planes, cylindrical objects, arches and other circular forms etc. (one point or two point)

#### Unit-III

**16 Hrs**

- Prepare drawings on the presentation of interior and exterior views in one point perspective and section perspectives.

#### Unit-IV

**14 Hrs**

- **Sciography:** Principles of shades and shadows. Drawing shades and shadows of lines, planes, solids and architectural features in plan, elevations and isometric view

### Learning Experience

**Inside:** In the previous course, emphasis was given on understanding about one dimensional and two-dimensional visualization of an object. So, taking the course forward, now the emphasis given on understanding 3-dimensional visualization of a space and a building. This will be done with the help of various types of projections, perspectives and Sciography.

### Textbooks

1. Engineering Drawing, N.D. Bhatt.
2. Engineering Drawing, R.K Dhawan

### Open Educational Resources (OER)

1. <https://www.artistsnetwork.com/art-mediums/learn-to-draw-perspective/>

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR110</b>	<b>STRUCTURAL DESIGN-II</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Hands-on design experience and skills will be gained and learned through problem sets and a comprehensive design project</b>					

### Course Perspective

This course for second-semester students builds on foundational concepts, delving deeper into the analysis and design of structural systems in architecture. This course focuses on understanding complex structural behaviours, including loads, forces, and material properties, while emphasizing the importance of safety and stability in architectural design. Students will explore advanced topics such as structural mechanics, load paths, and the integration of various materials, including concrete, steel, and timber. Through hands-on projects learners will gain practical experience in designing and analysing structural elements like beams, columns, and frames. Emphasis will be placed on real-world applications, encouraging students to consider both aesthetic and functional aspects of structures. Collaborative workshops and critiques will enhance their problem-solving skills and promote a team-oriented approach to design. By the end of the semester, students will possess a robust understanding of structural principles, preparing them for more advanced studies and professional challenges in architecture and engineering.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding the fundamental principles of structural mechanics relevant to simple design elements.

**CO2:** Analysing the concept of perfect frames in detail.

**CO3:** Designing and creating singly reinforced beams, applying relevant principles and calculations.

### Course Content

#### UNIT I:

**8 hours**

- Analysis of perfect frames
- Simple stresses in frames – Tensile & compressive
- Analysis of a perfect truss by method of joints, method of sections, graphical method & Link polygon
- Cantilever trusses
- Simply supported trusses

#### UNIT II:

**7 hours**

- Overview of R.C.C. construction
- Cement, coarse aggregate, Water and reinforcement materials.
- Abram's water-cement ratio law



- Stress-strain curves and characteristic strengths of structural steel.
- Properties of Cement concrete & their impact on the structural strength,
- Introduction to Nominal mix concrete and Design Mix Concrete.
- Characteristic compressive strength of concrete and its determination,
- Workability of concrete, Slump test, compacting factor test;
- Compaction and Curing of concrete,
- Durability of concrete, Gain of strength of concrete with time, Age factor

### **UNIT III:**

**8 hours**

- Theory of R.C.C.
- Advantages of RCC
- Assumptions in the theory of RCC – Hooke’s law
- Distribution of stress in Steel & concrete – Modulus of Elasticity
- Equivalent area of composite section
- Theory of bending of RCC beams – Elastic theory & Ultimate load theory
- Limit state method
- Stress Strain diagram & Neutral axis & its position
- Lever arm
- Classification of RCC section
- Balanced or economical
- Over & under reinforced sections
- Moment of resistance

### **UNIT IV:**

**7 hours**

- Shear stresses in Beams
- Design for shear
- Bond stress & development length
- Design of Singly Reinforced Beams

### **Learning Experience**

**Inside:** This course provides an ability to have a clear understanding of ethical issues pertaining to engineering and adopt industry standards of ethical behavior. The course is designed to arouse an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use architectural judgment to draw conclusions and an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**Outside:** Complementing the indoor learning, outside classroom experiences play a crucial role in the Structural Design curriculum. Students participate in site visits to local construction projects, allowing them to observe structural systems in action and understand the practical implications of their studies. Workshops with industry professionals provide insights into current practices and emerging technologies. Additionally, students may engage in fieldwork, collecting data and assessing materials, which reinforces classroom concepts and encourages a hands-on approach to learning that bridges theory and practice.

### **Textbooks**

1. IS: 883–1984 (reaffirmed 2005), Code of Practice for Design of Structural Timber in Buildings.
2. IS: 1905–1987 (reaffirmed 2002), Code of Practice for Structural Use of Un-reinforced Masonry.

3. Design of Masonry and Timber Structures by Singh H. Abhishek Publications, Chandigarh.
4. Design and Construction of Wood Framed Buildings by Morton Newman, McGraw Hill Inc., New York.
5. Design of Steel Structures by Dr. S.M.A. Kazimi, R.S. Jindal, Prentice Hall of India Private Ltd., New Delhi.

### Open Educational Resources (OER)

1. <https://www.tejy.com/step-by-step-process-of-structural-design-of-building/>

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR104</b>	<b>EARLY EUROPEAN ARCHITECTURE</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Historical Study</b>					

### Course Perspective

The course offers an in-depth exploration of the architectural developments from the Roman period through the Gothic era. This course examines key styles, such as Romanesque and Gothic, emphasizing their historical, cultural, and technological contexts. Students will analyze significant structures, including cathedrals, castles, and civic buildings, to understand how architectural forms evolved in response to societal needs and artistic movements. Through lectures, site visits, and case studies, learners will gain insights into the materials and construction techniques used during these periods, as well as the role of architecture in expressing power, spirituality, and community identity. Critical discussions will encourage students to reflect on the lasting impact of early European architecture on contemporary design practices. By the end of the semester, students will have developed a comprehensive understanding of the foundations of European architectural heritage, equipping them with knowledge relevant to their future studies and professional practice in architecture.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding the evolution of architecture, considering factors such as location, climate, socio-cultural, historical, economic, and political influences.

**CO2:** Analysing how the architecture of a specific period addresses the needs and demands of society.

**CO3:** Evaluating the development of civilizations and their influence on contemporary architecture.

### Course Content

#### Unit I: Greek and Roman Architecture

**8 hours**

Continuing with detailed study of Greek and Roman Architecture, the students study history of Architecture in the world with details of the classical orders & advancements in construction techniques of the Romans (vaults, domes, aqueducts and stucco).

#### Unit II: Emphasis on Byzantine and Romanesque Architecture

**7 hours**

The syllabus covers the techniques of construction and evolution of forms from Byzantine Architecture (types of domes, spanning of space with squinches, use of pendentives in important churches of Constantinople).

**Unit III: Romanesque Architecture****8 hours**

The study continues with new construction methods of Romanesque Architecture with emphasis on massiveness, verticality and ornamentation of medieval churches and integration of centralized and longitudinal plans. Churches of Italy and France are studied for articulation of external wall like arcaded interiors and combination of the five towered structures and longitudinal basilica.

**Unit IV: Gothic Architecture****7 hours**

Gothic Architecture with flying buttress, ribbed vault, use of stained glass in cathedrals and churches and its influence in Central Asian cities like Bukhara and Samarkand are covered to complete the course. The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation.

**Learning Experience**

**Inside:** History of Architecture intends to form a connection between past and present in the context of architecture. The student starts to understand the evolution of forms, character, use of techniques and materials and their impact as a continuous process from the past to the present. The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc. The History of Architecture is studied over 5 semesters and is divided chronologically and regionally to understand and focus on a specific aspect in a particular semester.

**Outside:** The course shall include sketching and understanding of historical buildings, historical analysis, and visit to places of historical importance.

**Textbooks**

Cruickshank, D., Fletcher, B., Saint A., “Banister Fletcher's - A History of Architecture”, Architectural Press

Hiraskar, G.K., “The Great Ages of World Architecture (with Introduction to Landscape Architecture)”, Dhanpat Rai Publications (P) Ltd.

**Suggested Readings**

Francis D K Ching, mark jarzombek, Vikramaditya Prakash.: A Global History of Architecture,

**Open Educational Resources (OER)**

1. <https://www.pdfdrive.com/a-global-history-of-architecture-e184758967.html>

**Evaluation Scheme**

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR108</b>	<b>ARTS AND GRAPHICS-I</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>45</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Logical thinking &amp; Basic sketching</b>					

### Course Perspective

The Arts and Graphics course for second-semester students focuses on the intersection of visual arts and architectural design, enhancing students' creative expression and technical skills. This course introduces various artistic techniques, including drawing, painting, and digital media, encouraging experimentation with different styles and materials. Emphasis will be placed on developing a strong visual language and understanding the role of graphics in architectural presentations. Through hands-on projects and collaborative critiques, students will learn to effectively communicate their design ideas and concepts. By the end of the semester, students will have refined their artistic skills and gained confidence in integrating graphics into their architectural practice.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding the principles of colour theory to draw shades and shadows.

**CO2:** Analysing various sketching techniques across different mediums.

**CO3:** Applying various rendering techniques utilized in various mediums.

**CO4:** Creating still life sketches and produce scaled graphics of foliage.

### Course Content

#### **UNIT I: Still life sketching**

**15 Hrs**

Indoor sketching, to practice still life sketching of objects and figures with shades and shadows using pencil etc. (black and white) Outdoor sketching, practice still life sketching of objects & figures with shades & shadow using pencil etc. To understand principals of drawing shades & shadows with source of light being sun

#### **UNIT -II Color theory-**

**10 Hrs**

- Color mixtures, colour systems, colour organization, application of colour schemes, national and international standards on colour.
- Use of colors and coloring techniques. Brush control exercises in water, oil, poster, crayon and mixed media.

#### **UNIT- III: Architectural Presentation & Rendering**

**10 Hrs**

**A-Representation of scaled graphics of foliage-trees, plants & shrubs, human figures & furniture etc.**

**B-Architectural Presentation & Rendering of Landscape Elements:** To practice presentation and rendering of Trees, herbs, shrubs, ground covers, contours & water bodies as a single entity, and in clusters / groups in association with built forms, both in plans & elevations, in Black & White and in color.

**UNIT- IV: Architectural presentation & Rendering**

**10 Hrs**

- **A-Architectural presentation & rendering of inanimate objects in manmade environment:** To practice presentation and rendering of both plans & elevations of cars, furniture, buildings, accessories such as telephone, desktops, etc., in Black & White and in Colour.
- **B-Architectural presentation & rendering of human figures:** To practice presentation and rendering of both plans & elevations, in Black & White and in Colour.

**Learning Experience**

**Inside and Outside:** This subject is a blend of the technique of art and architecture drawing that it teaches logics of rendering on conventional drawing format. The students of architecture learn how to render architecture forms as well as the nature around the proposed project with various drawing and painting mediums. It makes students observe nature and architecture forms through a graphic perspective. Scale, proportion, color, texture are graphically represented through their sketching and coloring practices which is a helpful practice in their whole career to graphically justify their design. Various conventional graphical mediums will be used to represent the design, for instance , graphite pencil, charcoal , pen and ink , pastel colors and water colors .Since the students follow the scientific method of three dimensional drawing on two dimensional format , they can justify the concept and formal aspect of the architectural design with various ocular perspectives. As per the conventional architectural drawing practice every nook and corner of the drawing should be detailed with specific drawing; sometimes colored.

Students must practice sketching with 5-6 sketches per week.

**Textbooks**

1. Malik, Shankar, “Perspective and Sciography”, Allied Publishers,

**Suggested Readings**

1. Robert W. Gill, “Rendering with pen and ink”
2. Leslie, Martin C., “Architectural Graphics”, Macmillan Pub Co

**Evaluation Scheme**

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

<b>SEC057</b>	<b>PROFESSIONAL COMMUNICATION</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>45</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Professional communication skills</b>					

### Course Perspective

The Professional Communication course for second-semester students focuses on developing essential communication skills tailored for the architectural field. This course emphasizes effective verbal and written communication, critical for presenting design concepts and collaborating with diverse stakeholders. Students will learn to create compelling presentations, articulate ideas clearly, and engage in constructive critiques. Additionally, the course covers professional practices such as report writing, documentation, and client interactions. Through role-playing exercises and group projects, learners will enhance their ability to communicate confidently and persuasively. By the end of the semester, students will be equipped with the skills necessary to succeed in professional architectural environments.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO1:** Understanding fundamentals of grammar to enhance their written and oral communication skills.

**CO2:** Evaluating and enhancing their personality traits to build self-confidence.

**CO3:** Applying effective strategies for professional communication.

**CO4:** Developing and refining their academic writing skills.

### Course Content

#### **UNIT I: Introduction to Communication**

**10 hours**

Importance of Communication Skills, Meaning, Forms & Types of Communication; Process of Communication; Principles of Effective Communication/7Cs, Barriers in Communication (Interpersonal, Intrapersonal and Organizational).

#### **UNIT II: Academic Writing:**

**15 hours**

Précis (Summary – Abstract – Synopsis – Paraphrase – Précis: Methods), Letter & Résumé (Letter Structure & Elements – Types of letter: Application & Cover - Acknowledgement –

Recommendation – Appreciation – Acceptance – Apology – Complaint –Inquiry).Writing a proposal and synopsis. Structure of a research paper. Citations and plagiarism.

### **UNIT III: Technology-Enabled Communication**

**10 hours**

- A-Using technology in communication tasks, E-mails, tools for constructing messages, Computer tools for gathering and collecting information; Different virtual medium of communication.
- Building Vocabulary: Word Formation (by adding suffixes and prefixes); Common Errors; Words Often Confused; One word substitution, Homonyms and Homophones; Antonyms &Synonyms, Phrasal Verbs, Idioms & Proverbs ( 25 each); Commonly used foreign words(15 in number)

### **UNIT IV: Personality Development:**

**10 hours**

Etiquettes & Manners; Attitude, Self-esteem & Self-reliance; Public Speaking; Work habits (punctuality, prioritizing work, bringing solution to problems), Body Language: Posture, Gesture, Eye Contact, Facial Expressions; Presentation Skills/ Techniques.

### **Learning Experience**

**Inside:** In the second semester of Personal Communication, students engage in a dynamic exploration of verbal and non-verbal communication skills essential for effective interpersonal interactions. The classroom environment fosters active participation through discussions, role-playing, and group activities that encourage students to practice and refine their communication techniques. Students analyze various communication models and theories, exploring topics such as active listening, emotional intelligence, and conflict resolution. Through constructive feedback from peers and instructors, they gain confidence in their ability to convey ideas clearly and build rapport with diverse audiences.

**Outside:** To complement classroom learning, students participate in experiential activities that enhance their personal communication skills in real-world settings. Workshops and networking events provide opportunities to practice public speaking and engage with professionals from various fields, allowing students to apply their skills in authentic situations. Additionally, community service projects encourage teamwork and collaboration, helping students navigate group dynamics while contributing to meaningful causes. Observational assignments, such as attending public forums or presentations, further enable students to analyze communication strategies in action, reinforcing their understanding of effective interpersonal engagement.

### **Textbooks**

1. Kumar, Sanjay and Pushplata.*Communication Skills*. Oxford University Press, 2015.

### **Suggested Readings**

1. Mitra, Barun K. *Personality Development and Soft Skills*. Oxford University Press, 2012.
2. Tickoo, M.L., A. E. Subramanian and P.R. Subramaniam. *Intermediate Grammar, Usage and Composition*. Orient Blackswan, 1976.
3. Bhaskar, W.W.S., AND Prabhu, NS., “English Through Reading”, Publisher: MacMillan,1978
4. Business Correspondence and Report Writing” -Sharma, R.C. and Mohan K. Publisher: Tata McGraw Hill1994



5. Communications in Tourism & Hospitality- Lynn Van Der Wagen, Publisher: Hospitality Press
6. Business Communication-K.K. Sinha
7. Essentials of Business Communication by Marey Ellen Guffey, Publisher: Thompson Press
8. How to win Friends and Influence People by Dale Carnegie, Publisher: Pocket Books
9. Basic Business Communication by Lesikar&Flatley, Publisher Tata McGraw Hills
10. Body Language by Allan Pease, Publisher Sheldon Press

### **Evaluation Scheme**

Components	Mid Term Exam	Class Test/ Presentation/ Assignment	Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

## **SEMESTER -III**

<b>ADAR201</b>	<b>ARCHITECTURAL DESIGN-II</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>120</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Designing Creativity</b>					

### **Course Perspective**

This course focuses on mastering the details of architectural drawings, including construction systems, materials, and services. Students will gain the skills necessary to interpret and utilize detailed drawings effectively, enabling them to incorporate fundamental solutions into their design projects. By learning to apply these skills to various types of projects, such as schools and art galleries, students will enhance their ability to achieve design goals and address practical challenges in real-world scenarios. This course is crucial for developing the proficiency needed to execute complex designs and contribute effectively to diverse architectural projects.

### **Course Outcomes**

**Upon completion of the course the learner will be able :**

**CO1:** Understanding the impact of local conditions by doing a case study embedded in vernacular traditions and methods.

**CO2:** Understanding the site and impact of context through site understanding to arrive at a conceptual design.

**CO3:** Applying the integration of built space with open spaces in a design, respecting local climatic conditions.

**CO4:** Creating the design based on form, circulation, functionality, use of local materials, and techniques of construction.

**CO5:** Creating final architectural drawings with a site plan of a simple functional building for public activity in a non-urban or semi-urban setting.

**CO6:** Evaluating and reflecting on all objectives through a detailed model of the final design.

## Course Content.

### Unit I: Building Typology and Vernacular Traditions

No. of Hours 30

- A. Overview of Building Typologies: Introduction to various building types and their functions.
- B. Vernacular Traditions in Architecture: Study of social and physical environments and traditional construction methods in vernacular architecture.
- C. Regional Characteristics: Exploring vernacular architecture in different climatic zones of India, with a focus on regional characteristics.
- D. Group Exercise: Students are divided into groups to research and present reports on vernacular architecture in specific climatic zones, including graphical presentations.

### Unit II: Analysis, Site Zoning, and Concept Development

No. of Hours 30

- A. Built Form Analysis: Examining how built forms relate to their sites, surroundings, and climatic settings.
- B. Site Zoning: Study of site zoning and its impact on spatial organization and functionality.
- C. Conceptual Exploration: Encouraging experimentation with built and open spaces to develop initial design concepts.
- D. Site and Surroundings Integration: Developing a conceptual understanding of how to integrate building design with site-specific conditions.

### Unit III: Design Development

No. of Hours 30

- A. Major Design Problem: Designing a simple building for public activity in a non-urban or semi-urban setting, such as a play school, healthcare center, or small shopping complex.
- B. Design Process: Introduction to the roles of other key players in the architectural design process, including clients and users.
- C. Contextual Considerations: Addressing design considerations relevant to non-urban settings, including the absence of formal bye-laws.
- D. Design Proposal Development: Students create design proposals that incorporate their understanding of vernacular architecture and site conditions.

### Unit IV: Final Design and Presentation

No. of Hours 30

- A. Endorsement of Vernacular Design: Encouraging students to incorporate vernacular design principles into their final design proposals.
- B. Presentation Drawings: Development of comprehensive presentation drawings to effectively communicate design concepts.
- C. Model Making: Creating physical models to support and visualize final design proposals.
- D. Final Review: Presentation and critique of final designs, with an emphasis on integrating vernacular architecture and addressing site-specific needs.

## Learning Experience

The course will integrate lectures, group exercises, and hands-on projects to deeply explore building typology, vernacular traditions, and site-specific design. Students will engage in research on vernacular architecture, analyze built forms in relation to their environments, and develop design concepts through site zoning and contextual studies. Hands-on activities will include creating design proposals, developing presentation drawings, and model making. Assessments will include group presentations, design proposals, and final critiques. The instructor will offer ongoing support and feedback, encouraging collaborative work and peer reviews for continuous improvement.

## Textbooks

1. Watson, Donald, “Time-saver Standards for Building Materials and Systems”, Tata McGraw Hill

## Suggested Readings

1. Design Dialog: Dialectics of Design in Architecture, Prof. Shireesh A. Deshpande
2. Christopher Benninger , “Letters to a Young Architect”
3. Time-Saver Standards for Building Types
4. Architectural Standard Ernst Peter Neufert Architects Data
5. Time-Saver Standards for Architectural Design Data

## Open Educational Resources (OER)

1. Building Typology and Vernacular Architecture - Coursera: This course covers various building types and vernacular architecture principles, with insights into traditional construction methods and regional characteristics.
2. Site Analysis and Zoning - edX: This course focuses on site analysis, zoning, and integrating built forms with their surroundings, providing practical tools for conceptual exploration and design.
3. Design Development for Public Buildings - FutureLearn: A course dedicated to designing public buildings in non-urban settings, including creating design proposals and incorporating vernacular architecture principles.

## Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR207</b>	<b>BUILDING CONSTRUCTION &amp; MATERIALS-III</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>5</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>75</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Detailing Observation, drawing skills, maintaining journals for construction materials.</b>					

### Course Perspective

This course emphasizes the study of various building materials and construction techniques, anchored in performance standards and codes. It provides an in-depth exploration of each material's application, considering both historical and contemporary methodologies. As the course progresses, it also addresses the latest trends and innovations in construction practices and materials, including new technologies. This comprehensive approach ensures that students are well-versed in both traditional and modern techniques, equipping them with the knowledge necessary to stay current in the field and apply cutting-edge solutions to real-world construction challenges.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding various building materials and construction techniques through presentations based on performing standards and codes.

**CO2:** Understanding the latest trends in practice and usage of new technology/materials through case studies and reports.

**CO3:** Understanding the knowledge of procuring materials to the manufacturing of products in different industries through site visits.

**CO4:** Analysing the constituents, defects, classifications, treatments, preservations, and uses of traditional building materials through drawings and detailing.

**CO5:** Applying the use of building materials in joinery details and complex constructions with higher load capacities through models and sheets.

### Course Content.

#### Unit I: Introduction to Framed Construction and Materials

**No. of Hours 00**

- A. Concepts of Framed Construction: Overview of the principles and types of framed construction.
- B. Building Materials: Study of materials used in RCC (Reinforced Cement Concrete) construction, including reinforcements, cement, and aggregates.
- C. Manufacturing and Procurement: Understanding the processes involved in sourcing and producing building materials.
- D. Selection Criteria and Quality Control: Criteria for selecting construction materials, including quality control and testing procedures.

**Unit II: Excavation, Formwork, Centering, and Scaffolding** **No. of Hours 00**

- A. Excavation Methods: Exploration of excavation techniques, machinery, and tools used in construction.
- B. Formwork Systems: Overview of formwork systems and their components in RCC construction.
- C. Centering, Shuttering, and Scaffolding: Techniques and practices for centering, shuttering, and scaffolding in RCC projects.
- D. Safety Considerations: Best practices and safety measures related to formwork and scaffolding.

**Unit III: RCC Construction** **No. of Hours 00**

- A. Principles of Framed Construction: Importance and overview of multi-storey framed structures.
- B. Substructure and Superstructure Components: Detailed study of RCC foundations (shallow and deep), basements, retaining walls, and superstructure elements.
- C. Structural Elements: Examination of beams, columns, lintels, column grids, frame construction, slabs (simply supported, cantilevered, flat), and RCC staircases.
- D. Expansion Joints: Understanding the role and implementation of expansion joints in RCC construction.

**Unit IV: Wall and Floor Surface Finishing Techniques** **No. of Hours 00**

- A. Wall Finishes: Introduction to surface finishes for both interior and exterior walls, including paints, polishing, and texturing.
- B. Market Survey: Analysis of wall surface finishing materials, their types, and market rates.
- C. Flooring Options: Study of various flooring materials including mud, brick, terracotta tiles, cement concrete, stone slabs, terrazzo, ceramic and vitrified tiles, wooden flooring, and PVC.
- D. Market Survey: Analysis of flooring materials, their types, and market rates.

**Learning Experience**

The course will involve a combination of theoretical lectures, hands-on activities, and practical applications to explore framed construction and materials. Students will study the principles of framed construction, material properties, and manufacturing processes through interactive sessions. They will engage in exercises related to excavation methods, formwork systems, and safety practices. Detailed analysis of RCC construction components will be complemented by practical projects on wall and floor finishes. Students will conduct market surveys and develop proposals based on material selection and finishing techniques. Ongoing support and feedback will be provided, with collaborative group work and peer reviews encouraged for enhanced learning.

**Textbooks**

1. Rangwala, S. C., “Engineering Materials (Material Science)”, Charotar Publishing House.
- 2.

**Suggested Readings**

1. Farrelly, Lorraine, “Basic Architecture 02: Construction + Materiality”, Ava Publishing,
2. Watson, Donald, “Time-saver Standards for Building Materials and Systems”, Tata McGraw Hill

### Open Educational Resources (OER)

1. Introduction to Framed Construction - Coursera: Provides a foundational overview of framed construction principles, including types and materials used in RCC construction.
2. Construction Methods and Safety - edX: Covers excavation, formwork systems, and scaffolding techniques, emphasizing best practices and safety measures in construction.
3. RCC Construction and Finishing Techniques - FutureLearn: Focuses on RCC construction principles, structural elements, and surface finishing techniques, including market surveys for materials.

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)



<b>ADAR203</b>	<b>INDIAN ARCHITECTURAL HISTORY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Knowledge of basic history. Logical Thinking</b>					

### Course Perspective

History of Indian Architecture intends to form a connection between past and present. The student starts to understand the evolution of forms, character, use of techniques and materials and their impact as a continuous process from the past to the present.

The course shall include sketching and understanding of historical buildings, historical analysis, and visit to places of historical importance. The students are introduced to a chronological study of Indian architecture starting with development of civilizations to contemporary times. The students understand the building types and development of architectural form and character based on tangible (materials, construction techniques) and intangible factors (belief systems, needs of different religions, dynasties and influences).

### Course Outcomes

**Upon completion of the course the learner will be able :**

**CO1:** Remembering the ways in which historical civilizations have shaped and influenced contemporary architectural practices.

**CO2:** Understanding the influences and innovations that have shaped architectural development throughout history.

**CO3:** Evaluating how contextual factors have influenced architectural styles, forms, and practices during specific periods.

### Course Content.

#### UNIT I: Overview of Indian Architecture

**No. of Hours 8**

- A. Development of Architecture: Study of architectural evolution from the Vedic period following the Indus Valley Civilization.
- B. Major Architectural Traditions: Introduction to Buddhist, Hindu, and Islamic architectural styles, with a focus on Mughal Architecture.
- C. Architectural Influences: Examination of how these traditions influenced and shaped architectural practices in the Indian subcontinent.
- D. Key Examples: Analysis of notable examples from each architectural tradition to illustrate their development and characteristics.

#### UNIT II: Buddhist Architecture

**No. of Hours 7**

- A. Origins and Influences: Exploration of the origin of Buddhist architecture and its early influences.
- B. Key Structures: Study of significant Buddhist architectural elements such as Ajivkyas, cave architecture, Sanchi Stupa, toranas, chaitya halls, and Amravati Stupa.
- C. Symbolism and Structural Functions: Understanding the symbolism and structural functions of these architectural forms.
- D. Rock-Cut Architecture: Examination of Hinayana and Mahayana phases, including early Buddhist Viharas, monasteries, and significant caves in Western Ghats (Karli, Nalanda, Sarnath, Gaya) and Ajanta Caves.

### **UNIT III: Hindu Architecture**

**No. of Hours 8**

- A. Temple Architecture: Detailed study of Hindu temple styles including Nagara, Dravidian, and Vesara.
- B. Architectural Elements: Exploration of other Hindu architectural elements such as forts, palaces, stepwells, gates, and baradaris.
- C. Regional Emphasis: Special focus on famous temples in North and South India, highlighting their unique characteristics and historical significance.
- D. Comparative Analysis: Comparing and contrasting different styles and elements of Hindu architecture across the country.

### **UNIT IV: Islamic and Mughal Architecture**

**No. of Hours 7**

- A. Rise of Islamic Architecture: Overview of the rise of Islamic architecture and its key characteristics.
- B. Architectural Elements: Study of Islamic architectural elements including mosques, tombs, domes, minarets, and arches.
- C. Historical Regimes: Examination of Islamic architecture under various regimes such as Slave, Khalji, Tughlaq, Sayyid, Lodhis, and Shershah Suri.
- D. Mughal Architecture: Focus on the evolution of Mughal architecture, with particular emphasis on contributions by Akbar (Fatehpur Sikri, Humayun's Tomb) and Shah Jahan (Shahjahanabad, Red Fort, Jama Masjid, Taj Mahal).

### **Learning Experience**

The course will integrate lectures, group discussions, and hands-on activities to explore the evolution and characteristics of Indian architecture. Students will study the development of architecture from the Vedic period and major traditions like Buddhist, Hindu, and Islamic architecture through interactive sessions and visual analyses of key examples. They will engage in detailed examinations of significant structures and architectural elements, with group exercises on comparative analyses and case studies. Practical projects will include creating presentations and models of architectural styles. Continuous support and feedback will be provided, with opportunities for peer collaboration and reviews to enhance learning.

### **Textbooks**

1. Grover, S. K., "Buddhist and Hindu Architecture in India", CBS.
2. Grover, S. K., "Islamic Architecture in India", CBS

### **Suggested Readings**

1. Brown, Percy, "Indian Architecture – Vol I and II", Apt Books.
2. Maheshwari and Garg, "Ancient Indian Architecture", CBS. .
3. Thapar, B., "Introduction to Indian Architecture", Periplus Editions.
4. Surendra S., "Indian Architecture: Hindu, Buddhist and Jain", Ajanta Offset and Packaging Ltd.

### Open Educational Resources (OER)

1. Overview of Indian Architecture - Coursera: Provides a comprehensive introduction to the evolution and major traditions of Indian architecture, including Buddhist, Hindu, and Islamic styles.
2. Buddhist Architecture and Symbolism - edX: Focuses on Buddhist architectural elements and their symbolism, including rock-cut architecture and significant structures.
3. Hindu and Islamic Architecture - FutureLearn: Offers an in-depth study of Hindu temple styles, Islamic architectural elements, and the evolution of Mughal architecture, with detailed case studies.

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR209</b>	<b>CLIMATOLOGY</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version 1.0</b>	<b>1.0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>45</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Understanding basics of environment and climate Implementation in design</b>					

### Course Perspective

This course imparts the basic concepts of environment and climate. It enables them to design and enhance a site according to the location, climate and needs of the client. The course introduces the basic concepts about human comfort, ways of achieving it, solar geometry- its implementation in designing buildings as per orientation, shading devices-designing, wind movement patterns around buildings, etc.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Remembering knowledge of environmental and climatological aspects associated with architectural design development, creative conceptualization, visualization, and the design process.

**CO2:** Remembering knowledge of solar geometry.

**CO3:** Understanding knowledge of air temperature.

**CO4:** Understanding knowledge of the relationship of wind with topography.

**CO5:** Understanding the effect of changes in various parameters of buildings with the help of simulation.

### Course Content.

#### Unit I: Introduction to Climate and Solar Geometry

**No. of Hours 10**

- A. Elements of Climate: Study of solar radiation, temperature, wind, humidity, precipitation, sky conditions, and night radiation, including their measurement.
- B. Climatic Zones: Classification of climatic zones and their characteristics, with a focus on tropical climates.
- C. Macroclimate and Microclimate: Understanding the differences and interactions between macroclimate and microclimate.
- D. Environmental Effects: Analysis of the greenhouse effect, global warming, and their impact on architecture.
- E. Human Thermal Comfort: Study of heat physics, including body heat production and loss, heat balance, thermal mass, latent heat, and comfort zones.
- F. Solar Geometry: Relationship between Earth and Sun, methods for recording the sun's position, and understanding solar radiation gains on various surfaces.

**Unit II: Daylight, Shading Devices, and Air Temperatures****No. of Hours 15**

- A. Daylight: Exploration of natural lighting, glare, daylight factor, and daylighting techniques in tropical climates.
- B. Lighting Factors: Analysis of color, light amount, and the sky as a light source, including the impact of opening size and shape on light intensity and penetration.
- C. Shading Devices: Use of shadow angle protractors and solar charts for designing shading devices and sun control mechanisms.
- D. Air Temperature: Factors influencing temperatures, such as latitude, season, land, water, wind, altitude, and atmospheric conditions. Study of temperature inversion and heat transmission through building components.

**Unit III: Wind, Ventilation, and Orientation****No. of Hours 10**

- A. Wind: Study of diurnal and seasonal variations in wind, its heating and cooling effects, and its impact on land use and road patterns.
- B. Ventilation and Air Movement: Analysis of air patterns around and within buildings, including wind eddies, and the effects of openings and architectural elements.
- C. Orientation: Optimal orientation of buildings in relation to sun and wind to enhance energy efficiency and comfort.

**Unit IV: Simulation and Analysis****No. of Hours 00**

- A. Simulation Tools: Introduction to E-Quest Software for environmental simulation.
- B. Building Orientation: Studying the effects of changes in building orientation on environmental performance.
- C. Design Analysis: Evaluating the impact of different design strategies, including building size, shape, and shading devices, on energy efficiency and comfort.

**Learning Experience**

The course will employ a combination of lectures, practical exercises, and simulation tools to explore climate, solar geometry, and their impact on architecture. Students will study elements of climate, climatic zones, and environmental effects through interactive sessions and case studies. They will analyse daylight, shading devices, and air temperatures with hands-on activities using tools like shadow angle protractors and solar charts. Practical projects will include using E-Quest Software for environmental simulation, evaluating building orientation, and analysing design strategies. Ongoing support and feedback will be provided, with collaborative group work and peer reviews encouraged for comprehensive understanding.

**Textbooks**

1. Manual of Tropical Housing and Building: Climatic design, by Otto H. Koenigsberger, Longman, – Architecture

**Suggested Readings**

1. Krishnan, A. (ed.), Baker, N., Yannas, S., Szokolay, S., Climate Responsive Architecture – A
2. Givoni, B., Man, Climate and Architecture, Elsevier Publishing Company Limited.

## Open Educational Resources (OER)

1. Introduction to Climate and Solar Geometry - Coursera: Offers a detailed exploration of climate elements, solar geometry, and their implications for architectural design.
2. Daylighting and Shading Devices - edX: Focuses on natural lighting techniques, shading devices, and their impact on building performance, including practical exercises.
3. Wind and Ventilation in Architecture - FutureLearn: Covers the effects of wind, ventilation, and building orientation on environmental performance, including the use of simulation tools for design analysis.

## Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR205</b>	<b>ARTS &amp; GRAPHICS II</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>45</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basics of Art Integration of techniques and medium of art in design.</b>					

### Course Perspective

This subject is a blend of the technique of art and architecture drawing and helps students develop their rendering on conventional drawing format. The students of architecture learn how to render architecture forms as well as the nature around the proposed project with various drawing and painting mediums.

Students observe nature and architecture forms through a graphic perspective. Scale, proportion, colour, texture is graphically represented through their sketching and colouring practices which is a helpful practice in their whole career to graphically justify and express their design. Various conventional graphical mediums will be used to represent the design, for instance, graphite pencil, charcoal, pen and ink, pastel colors and water colours. Since the students follow the scientific method of three-dimensional drawing on two-dimensional format, they can justify the concept and formal aspect of the architectural design with various ocular perspectives.

### Course Outcomes

**Upon completion of the course the learner will be able :**

**CO1:** Understanding the capability to graphically represent architectural design by developing artistic skills rather than simply arranging the space.

**CO2:** Evaluating the full range of art techniques and mediums, and using them creatively in expressing design by extracting inherent logic, construction, structural stability, and aesthetics through observation and graphical expression.

**CO3:** Creating artistic representations of architectural design by developing skills in various art techniques and mediums, and expressing design creatively.

### Course Content.

**Unit I: Exploration with Pen and Building Perspective Drawings      No. of Hours 00**

- A. Exploring Pen Techniques: Practice with pens of varying thicknesses to understand line quality and texture.
- B. Doodling and Form Rendering: Use doodling techniques to explore and render forms effectively.
- C. Building Perspective Drawings: Create detailed perspective drawings of buildings using different pen techniques.

## **Unit II: Nature and Landscape Integration**

**No. of Hours 00**

- A. Nature Exploration: Study and sketch natural elements using pens of varying thicknesses.
- B. Doodling and Rendering of Landscape Elements: Apply doodling techniques to render and understand landscape elements.
- C. Human Figures and Scale: Incorporate human figures into drawings to understand scale and proportion in relation to buildings.
- D. Integration with Nature: Combine building design with natural surroundings to create harmonious compositions.

## **Unit III: Sectional Drawings and Depth**

**No. of Hours 00**

- A. Exploring Sections: Practice creating sectional drawings with pens of different thicknesses.
- B. Depth and Perspective: Develop an understanding of depth and perspective in sections using ink and rendering techniques.
- C. Integration of Previous Elements: Combine techniques from Units I and II with sectional drawing skills to create comprehensive architectural representations.

## **Unit IV: Introduction of Color and Comprehensive Rendering**

**No. of Hours 00**

- A. Introduction of Colors: Apply colors to printed or ink-rendered drawings to enhance visual appeal and clarity.
- B. Combining Mediums: Use all mediums and techniques learned so far to enhance architectural drawings.
- C. Comprehensive Rendering: Render plans, site plans, sections, and elevations using the full range of tools and techniques acquired throughout the course.

## **Learning Experience**

The course will blend practical exercises with theoretical lessons to develop skills in architectural drawing and rendering. Students will start by exploring pen techniques and creating detailed building perspective drawings. They will then move on to sketching natural elements, rendering landscapes, and integrating human figures to understand scale. Sectional drawings will be practiced, with a focus on depth and perspective, and combining previous techniques. The course will culminate in applying color and combining all learned techniques for comprehensive rendering of architectural drawings. Support and feedback will be available, with opportunities for collaborative work and peer reviews to refine skills.

## **Textbooks**

1. Gill, Robert W.; *Rendering with Pen and Ink* (April 1984); Thames & Hudson.

## **Suggested Readings**

1. Ching, D.K Francis: *Form, Space and Order* (2015); John Wiley & Sons, New Jersey

## **Open Educational Resources (OER)**

2. *Architectural Drawing Techniques* - Coursera: Covers pen techniques, perspective drawings, and rendering methods for creating detailed architectural illustrations.
3. *Nature and Landscape Sketching* - edX: Focuses on sketching natural elements and integrating them with architectural designs, using various pen techniques and doodling methods.



4. Comprehensive Rendering for Architecture - Future Learn: Provides guidance on combining colour, pen techniques, and other mediums to enhance architectural drawings and create comprehensive renderings.

#### **Evaluation Scheme**

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>SEC054</b>	<b>COMPUTER APPLICATIONS IN ARCHITECTURE-I</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>Category of Course</b>	<b>Skill Enhancement Course (Practical)</b>					
<b>Total Contact Hours</b>	<b>60</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic knowledge of computer systems</b>					

### Course Perspective

This course empowers students to leverage computers for 2D drafting and 3D modelling, providing them with essential skills in digital design tools. By familiarizing students with realistic rendering and presentation techniques, the course ensures they can effectively visualize and communicate their design ideas. This hands-on approach equips students with the technical proficiency needed to create detailed, accurate digital representations of their projects, enhancing their ability to present and refine their designs in a professional context.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding how to use drafting software AutoCAD.

**CO2:** Applying software learning tools with the design studio project, including Adobe package and MS Office package.

**CO3:** Creating high-quality interior drawings in 3D software.

### Course Content.

#### Unit I: Word Processing and Office Applications

**No. of Hours 15**

- A. Introduction to MS Office: Overview of Microsoft Word, PowerPoint, and Excel.
- B. Microsoft Word: Basics of document creation, formatting, and text manipulation.
- C. Microsoft PowerPoint: Creating and designing presentations, using slides effectively.
- D. Microsoft Excel: Introduction to spreadsheets, data entry, and basic data analysis.

#### Unit II: Introduction to AutoCAD for 2D Drafting

**No. of Hours 15**

- A. Digital Drawing Tools: Familiarization with drawing lines and shapes in AutoCAD.
- B. Modifying Elements: Techniques for modifying lines and shapes, and drawing with accuracy and speed.
- C. Organizing Drawings: Managing plans, sections, and elevations; printing to scale.
- D. Text Styles and Hatches: Applying text styles, sizes, hatches, and dashed lines.
- E. Stencils and Blocks: Using and creating stencils and blocks for efficient drafting.
- F. Advanced Editing and Dimensioning: Advanced editing tools and techniques for dimensioning drawings.

### Unit III: Introduction to 3D Modelling and Rendering

No. of Hours 15

- A. 3D Modelling Basics: Introduction to 3D modelling techniques using software like Google SketchUp or equivalent.
- B. Basic Rendering Techniques: Techniques for rendering models to create realistic visualizations.
- C. Application and Practice: Practical exercises in 3D modelling and rendering to reinforce learning.

### Learning Experience

The course will combine hands-on practice with theoretical lessons to build proficiency in essential software tools. Students will start with an introduction to MS Office, focusing on Word, PowerPoint, and Excel, covering document creation, presentation design, and data analysis. They will then progress to AutoCAD, learning to create, modify, and organize 2D drawings, manage text styles, and use advanced editing tools. The course will culminate in 3D modelling and rendering, using software like Google SketchUp, with practical exercises to apply and reinforce 3D visualization skills. Support and feedback will be provided throughout, with opportunities for group projects and peer reviews to enhance learning.

### Textbooks

1. Gindis, E. (2014). Up and Running with AutoCAD 2015: 2D & 3D Drawing and Modelling. Oxford: Elsevier.

### Suggested Readings

1. Seidler, D. R. (2007). Digital Drawing for Designers: A Visual Guide to AutoCAD 2012. London Fairchild Publications.

### Open Educational Resources (OER)

1. Introduction to MS Office - Coursera: Covers the fundamentals of Microsoft Word, PowerPoint, and Excel, focusing on document creation, presentations, and data analysis.
2. AutoCAD for Beginners - edX: Provides an introduction to AutoCAD for 2D drafting, including drawing tools, modifying elements, and advanced editing techniques.
3. 3D Modelling and Rendering Basics - Future Learn: Focuses on 3D modelling techniques and rendering using software like Google SketchUp, with practical exercises to create realistic visualizations.

### Evaluation Scheme

Components	Mid-term Jury	End term Internal Jury	End term External Jury
Weightage (%)	20	30	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR211</b>	<b>STRUCTURAL DESIGN-III</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Observation and Interest in the subject Analysing, designing, simulating, visualizing, optimizing,</b>					

### Course Perspective

This course provides an ability to have a clear understanding of ethical issues pertaining to engineering and adopt industry standards of ethical behaviour.

The course is designed to arouse an ability to develop and conduct appropriate experimentation, analyse and interpret data, and use architectural judgment to draw conclusions and an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Remembering the elementary treatment of concrete technology.

**CO2:** Understanding the design of lintels with sunshades and slabs spanning in one direction.

**CO3:** Understanding the difference between the Working Stress Method and the Limit State Method.

**CO4:** Evaluating the detailing of reinforcement and serviceability in the limit state.

### Course Content.

#### **Unit I: Design of Lintels, Slabs, and Reinforced Brickwork** **No. of Hours 08**

- A. Lintels with Sunshade: Design principles for lintels including sunshade considerations.
- B. Load Transfer on Lintels: Various cases and methods of load transfer through lintels.
- C. One-Way Slabs: Design of slabs spanning in one direction, focusing on load distribution and reinforcement.
- D. Cantilever Chhajja: Design considerations for cantilevered chhajjas (overhangs).
- E. Reinforced Brickwork (RBW): Introduction to reinforced brickwork and its design steps.

#### **Unit II: Doubly Reinforced Beams and Flanged Beams** **No. of Hours 07**

- A. Theory of Doubly Reinforced Beams: Understanding the theory and design principles of doubly reinforced beams.
- B. Notations and Neutral Axes: Notations used in design, critical neutral axis vs. actual neutral axis.
- C. Steel Beam Theory: Basics of steel beam theory and its application.

- D. Flanged Beams and T-Beams: Theory and design of flanged beams and T-beams, including their neutral axes.
- E. Design of Continuous T-Beams: Design considerations for continuous T-beams.

### **Unit III: Reinforcement Analysis and Design**

**No. of Hours 08**

- A. Reinforcement for Torsion: Analysis and design of reinforcement for sections subjected to torsion.
- B. Shear and Torsion: Understanding shear and torsion in structural elements.
- C. Longitudinal Reinforcement: Design and placement of longitudinal reinforcement.
- D. Transverse Reinforcement: Design considerations for transverse reinforcement.
- E. Side Face Reinforcement: Analysis and design of side face reinforcement.

### **Unit IV: Design of Two-Way Slabs**

**No. of Hours 07**

- A. Two-Way Slab Design: Principles and design of two-way slabs using various methods.
- B. Grashoff Rankine's Theory: Application of Grashoff Rankine's theory in slab design.
- C. IS Code 456-1978 Method: Design methods according to IS Code 456-1978 for simply supported, fixed edges, and continuous slabs.
- D. Torsional Reinforcement: Considerations for torsional reinforcement in two-way slabs.

### **Learning Experience**

The course will combine theoretical instruction with practical exercises to deepen understanding of structural design elements. Students will begin with the design of lintels, slabs, and reinforced brickwork, covering principles, load transfer, and specific design considerations. They will then advance to doubly reinforced and flanged beams, exploring theory, design, and application. The course will further cover reinforcement analysis, focusing on torsion, shear, and various types of reinforcement. Finally, students will study two-way slab design, applying different theories and IS Code 456-1978 methods. Practical assignments, design projects, and group discussions will enhance learning, with continuous support and feedback provided.

### **Textbooks**

1. IS: 883–1984 (reaffirmed 2005), Code of Practice for Design of Structural Timber in Buildings.
2. IS: 1905–1987 (reaffirmed 2002), Code of Practice for Structural Use of Un-reinforced Masonry.

### **Suggested Readings**

1. Design of Masonry and Timber Structures by Singh H. Abhishek Publications, Chandigarh.
2. Design and Construction of Wood Framed Buildings by Morton Newman, McGraw Hill Inc., New York.
3. Design of Steel Structures by Dr. S.M.A. Kazimi, R.S. Jindal, Prentice Hall of India Private Ltd., New Delhi.

### **Open Educational Resources (OER)**

1. Structural Design Basics - Coursera: Offers a comprehensive introduction to the design of structural elements like lintels, slabs, and reinforced brickwork, including practical design principles.

2. Reinforced Concrete Design - edX: Focuses on the theory and design of reinforced beams, flanged beams, and continuous T-beams, with emphasis on practical applications and reinforcement analysis.
3. Advanced Concrete Design - FutureLearn: Provides advanced techniques for two-way slab design, including application of Grashoff Rankine's theory and IS Code 456-1978 methods, with practical design exercises.

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR213</b>	<b>SURVEYING &amp; LEVELLING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basics of math, mapping, graphing and plotting</b> <b>Understanding of different maps, scales and surveying instruments</b>					

### Course Perspective

This course will introduced the fundamentals of surveying measurements to provide a broad overview of the surveying instrumentation (Total Station, Compass, Auto Level, Theodolite, Plane Table, Chains and Tapes), procedures, measurement corrections and reductions, survey datum, and computations that are required to produce a topographical map or a site plan for engineering and design projects.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the fundamentals and principles of surveying and measurement of distance.

**CO2:** Understanding angular measurement by traversing and levelling ground points from a reference datum.

**CO3:** Understanding horizontal and vertical angle measurement and field area calculations.

**CO4:** Applying techniques for finding the location of inaccessible stations on sites and conducting aerial surveys.

### Course Content.

#### Unit I: Surveying and Land Topography

**No. of Hours 08**

- A. Introduction to Surveying: Basic concepts and importance of surveying in architecture.
- B. Understanding Land Topography: Exploration of land topography and its relevance in architectural design and planning.

#### Unit II: Survey Types and Equipment

**No. of Hours 07**

- A. Types of Surveys: Overview of different types of surveys commonly practiced.
- B. Survey Equipment Introduction: Introduction to various surveying equipment and their applications.
- C. Principles of Surveying: Fundamental principles of surveying and equipment requirements.

### **Unit III: Compass and Levelling Instruments**

**No. of Hours 07**

- A. Types of Compasses: Study of various types of compasses used in surveying.
- B. Prismatic Compass: Detailed examination of the prismatic compass, its construction, and uses.
- C. Levels and Adjustments: Overview of different types of levels, their temporary and permanent adjustments, and the use of levelling staffs.

### **Unit IV: Contouring, Tacheometric Surveying, and Photogrammetry No. of Hours 08**

- A. Contour Lines: Characteristics of contour lines and their significance in surveying.
- B. Contouring Methods: Direct and indirect methods of contouring and interpolation of contours.
- C. Marking Foundations: Techniques for marking foundations and measuring buildings under construction.
- D. Tacheometric Surveying: Introduction to general instruments, and systems of tacheometric measurements including the Stadia and Subtense methods.
- E. Photogrammetry: Definition, principles, and applications of photography in surveying.

### **Learning Experience**

The course will integrate lectures, practical exercises, and fieldwork to provide a comprehensive understanding of surveying and land topography. Students will begin with an overview of surveying principles and land topography's role in architecture. They will explore various types of surveys and surveying equipment, learning fundamental principles and applications. Practical sessions will focus on using compass and levelling instruments, including detailed work with prismatic compasses and levels. The course will culminate in contouring techniques, tacheometric surveying, and photogrammetry, with hands-on projects to apply these methods. Continuous support, feedback, and opportunities for collaborative work and peer reviews will enhance the learning experience.

### **Textbooks**

1. Rangwala, Surveying & Levelling, Charotar Publishing House.

### **Suggested Readings**

1. Subramanian, Surveying Levelling, Oxford Higher Education.

### **Open Educational Resources (OER)**

1. Introduction to Surveying - Coursera: Covers the basics of surveying, including fundamental principles and the role of surveying in architecture.
2. Surveying Equipment and Techniques - edX: Focuses on various types of surveys, surveying equipment, and their applications, with practical examples and exercises.
3. Advanced Surveying Methods - Future Learn: Provides an in-depth look at contouring, tacheometric surveying, and photogrammetry, with practical applications and techniques in modern surveying.



### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR215</b>	<b>SURVEYING &amp; LEVELLING LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>
<b>Category of Course</b>	<b>BUILDING SCIENCES AND APPLIED ENGINEERING (PRACTICAL)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basics of math, mapping, graphing and plotting  Understanding of different maps, scales and surveying instruments</b>					

### Course Perspective

Surveying is the art of determining the relative positions of different objects on the surface of the earth by measuring the horizontal distances between them and vertical angle either in elevation or depression. From the observations obtained is corrected and plotted on paper to prepare the map in the suitable scale. Thus, in discipline, the measurements are taken in the horizontal plane as well as vertical plane.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the working of different types of surveying equipment.

**CO2:** Applying surveying equipment in the field for the measurement of distance, direction, and elevation.

**CO3:** Applying adjustments to the traverse and calculation of coordinates, including latitude and departures.

**CO4:** Creating maps using surveying data.

### Course Content.

#### Unit I: Chain Surveying and Levelling

**No. of Hours 08**

- A. Chain Surveying: Choosing appropriate stations for chaining, Booking and recording field notes, addressing obstacles in chaining and errors that may occur.
- B. Levelling: Reading and Reduction: Recording and reducing levels from readings, Errors in Levelling: Identifying and correcting errors in levelling.

#### Unit II: Compass Surveying

**No. of Hours 07**

- A. Compass Surveying: Bearings: Understanding reduced and whole circle bearings. Magnetic Declination: Effects of magnetic declination and local attraction.

### Unit III: Plane Tabling and Contouring

No. of Hours 08

- A. Plane Tabling: Equipment and Methods: Overview of equipment and methods used in plane tabling, Two and Three Points Problems: Solving two-point and three-point problems in plane tabling.
- Contouring: Contour Maps: Interpretation and preparation of contour maps, Site Modelling: Site modeling using a total station.

### Unit IV: Theodolite Surveying

No. of Hours 07

- A. Theodolite: Theodolite Overview: Introduction to theodolite, including its temporary and permanent adjustments, Measuring Bearings and Angles: Measuring magnetic bearings, horizontal, and vertical angles.

### Learning Experience

The course will combine theoretical knowledge with practical exercises to cover essential surveying techniques. Students will start with chain surveying and leveling, focusing on choosing stations, recording field notes, and addressing errors. They will then explore compass surveying, learning about bearings and the effects of magnetic declination. Practical sessions will involve plane tabling, solving two- and three-point problems, and contour mapping, with an emphasis on using a total station for site modeling. The course will conclude with theodolite surveying, covering the instrument's adjustments and measurement of bearings and angles. Hands-on practice, fieldwork, and continuous feedback will support learning and skill development.

### Textbooks

1. Rangwala, Surveying & Levelling, Charotar Publishing House.

### Suggested Readings

1. R.Subramanian, Surveying & Levelling, Oxford Higher Education.

### Open Educational Resources (OER)

1. Fundamentals of Chain Surveying - Coursera: Covers the basics of chain surveying, including station selection, field note recording, and error correction techniques.
2. Compass Surveying Techniques - edX: Provides an introduction to compass surveying, including understanding bearings, magnetic declination, and their effects on survey accuracy.
3. Advanced Surveying with Theodolites - FutureLearn: Focuses on theodolite surveying, covering instrument adjustments, and measurement of bearings and angles, with practical examples and exercises.

### Evaluation Scheme

Components	Mid-term Jury	End term Internal Jury	End term External Jury
Weightage (%)	20	30	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

## **SEMESTER-IV**

<b>ADAR202</b>	<b>ARCHITECTURAL DESIGN-III</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>150</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Designing Creativity</b>					

### Course Perspective

This course aims to cultivate an appreciation for the design process and deepen students' understanding of the complexities and contradictions inherent in solving architectural design problems, particularly within institutional contexts. By engaging with these challenges, students will develop a nuanced perspective on how to address and resolve intricate design issues, equipping them with the skills needed to tackle complex projects effectively and thoughtfully.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the design process and its stages, and applying it effectively to architectural design problems.

**CO2:** Applying the concept into zoning using different elements and principles of design.

**CO3:** Analysing case studies and conducting comparative analysis to derive inferences.

**CO4:** Evaluating the design to ensure it is holistically perfect for the particular site and its surroundings.

**CO5:** Creating site synthesis and developing a justified concept.

**CO6:** Creating a complete profile of the design in the form of models and 3D views, providing insights into details as solutions to challenges on the site.

### Course Content.

#### Unit I: Built Form, Literature, and Case Studies

**No. of Hours 35**

- A. Design Projects Related to Climatic Conditions: Study of built forms and their relationship to site, surroundings, and climatic settings.
- B. Creative design of simple buildings like community halls, restaurants, college canteens, libraries, motels, wayside tourist arcades, kiosks, and artist's studios.
- C. Design of buildings with primarily horizontal circulation and repetitive units such as primary or middle schools, post offices, nursing homes, banks, and police stations.

#### Unit II: Analysis, Site Zoning, and Concept

**No. of Hours 40**

- A. Site Analysis: Detailed site analysis at the beginning of each design problem. Developing sensitivity to existing site conditions and context.

- B. Design Concept Development: Experimenting with built and open spaces. Addressing climate and physical setting issues. Sensitivity to vernacular features of the site.

### **Unit III: Design Development**

**No. of Hours 40**

- A. Functional, Geometric, and Visual Order: Focus on functional, geometric, and visual organization of repetitive units.
- B. Design Issues: Detailing: Introduction of services and detailing selected areas.
- Structural Integration: Ensuring design ideas are feasible structurally.

### **Unit IV: Final Design and Presentation**

**No. of Hours 35**

- A. Presentation: Computer-generated presentation drawings. Creation of a model to represent the final design.

### **Learning Experience**

This course integrates practical design exercises with theoretical insights to enhance students' skills in built form analysis and design. Students will begin by studying built forms in relation to climatic conditions and designing simple buildings such as community halls, restaurants, and libraries. They will engage in site analysis to develop sensitivity to existing conditions and contextual factors, followed by experimenting with design concepts that address climate and vernacular features. The course will then focus on the functional, geometric, and visual organization of designs, incorporating structural feasibility and detailing. Students will conclude by creating computer-generated presentation drawings and physical models of their final designs. Hands-on projects, peer reviews, and continuous feedback will support learning throughout the course.

### **Textbooks**

1. Watson, Donald, “Time-saver Standards for Building Materials and Systems”, Tata McGraw Hill

### **Suggested Readings**

1. Design Dialog: Dialectics of Design in Architecture, Prof. Shireesh A. Deshpande
2. The Discovery of Architecture: a contemporary treaties on ancient values and indigenous reality, M.N. Ashish ganju and Narendra Dengle
3. Agarwal, A., “Mud: The Potentials of Earth based Material for Third World Housing”, IIED
4. Christopher Benninger , “Letters to a Young Architect”

### **Open Educational Resources (OER)**

1. Design Principles for Climatic Conditions - Coursera: Covers the relationship between built forms and climatic conditions, focusing on design strategies for various building types.
2. Site Analysis and Design Concepts - edX: Provides methods for detailed site analysis and developing design concepts that respond to site conditions and context.
3. Advanced Design Development - Future Learn: Focuses on the development of functional, geometric, and visual order in design, including integration of structural considerations and detailed design.

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR208</b>	<b>BUILDING CONSTRUCTION &amp; MATERIALS-IV</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>5</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>75</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Learn Detailing Drawing skills</b>					

### Course Perspective

This course is designed to expose students to the process of building construction, the components of buildings and the materials, skills and equipment used in shaping them. The emphasis is on familiarization by direct handling and observation. Students shall be encouraged to acquire a taste for good workmanship and quality products. The course is visualized as having three essential components viz. a lecture course in materials and methods of construction, a construction studio wherein principles and practices shall be applied to the production of meaningful working details and drawings and a building workshop to be conducted either in the construction field in the school premises or at specific venues outside incorporating a first-hand experience of important stages of building construction, to complement the studio work. The construction studio will be integrated with the Architectural design studio wherever possible.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding steel, aluminium, and glass through presentations and site visit reports.

**CO2:** Applying knowledge through sketches and sheets.

**CO3:** Understanding through detailed case studies and reports, along with sheets with detailing.

**CO4:** Creating detailed architectural construction drawings of aluminium doors, windows, and partitions.

**CO5:** Creating detailed architectural construction sheets of panelling and glazing.

### Course Content.

#### **Unit I: Ferrous Metals, its Extraction and Processing**

**No. of Hours 20**

- A. Overview of ferrous metals commonly used in building construction, Techniques for extracting, Properties, and characteristics of steel.
- B. Environmental and ecological impact of metal extraction and processing.

#### **Unit II: Framed Structures Using Steel for Construction**

**No. of Hours 15**

- A. Introduction to framed structures using steel.
- B. Types of steel sections: hot rolled and cold rolled sections.
- C. Principles and techniques of structural connections in steel-framed structures using riveting, welding, and bolting.



### **Unit III: Framed Steel Structures**

**No. of Hours 20**

- Steel/Grillage foundations
- Steel floor, Mezzanine floor
- Roofing (Steel trusses- Lattice Girder and North-light truss, Tubular truss, Portal Frames, etc..) and walling assemblies in steel construction.
- Steel staircase, Metal stairs - types and construction details of steel stairs

### **Unit IV: Glazing as an Exterior Wall Finish**

**No. of Hours 10**

- Introduction to glazing as an exterior wall finish.
- Manufacturing process properties and characteristics of glass.
- Types of glazing systems: curtain walls, structural glazing, spider fittings etc. its installation techniques and best practices.
- Energy efficiency and sustainability aspects of glazed facades.

### **Learning Experience**

This course provides a comprehensive exploration of steel and glazing in construction. Students will start with an overview of ferrous metals, focusing on extraction, properties, and environmental impacts. They will then delve into framed steel structures, learning about various steel sections, structural connections, and applications in foundations, floors, roofing, and staircases. Practical sessions will involve designing and analysing steel-framed structures, including detailed construction techniques. The course will also cover glazing as an exterior wall finish, including types of glazing systems, installation techniques, and considerations for energy efficiency and sustainability. Hands-on projects, case studies, and design exercises will facilitate learning, with feedback and support provided throughout.

### **Textbooks**

1. Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.
2. BIS (2011) National Building Code, SP 7, Bureau of Indian Standards.

### **Suggested Readings**

1. Foster, Stroud (1963) Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.
2. McKay, W. B. (1972) Building Construction (Metric), Longman, London, vol. 1 to 5.
3. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
4. Punmia, B. C. (2005) Building Construction, Firewell Media, Delhi.
5. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi.

### **Open Educational Resources (OER)**

1. Introduction to Steel Structures - Coursera: Offers a detailed overview of steel framing, including types of steel sections and structural connections.
2. Glazing Systems and Techniques - edX: Provides insights into different glazing systems, their manufacturing processes, and installation techniques.

3. Sustainable Metal Construction - FutureLearn: Focuses on the environmental and ecological impacts of metal extraction and processing, along with sustainable practices in metal construction.

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR204</b>	<b>RENAISSANCE TO INDUSTRIAL REVOLUTION</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Knowledge of European and Indian history. Historical study</b>					

### Course Perspective

History of Architecture intends to form a connection between past and present in the context of architecture. The student starts to understand the evolution of forms, character, use of techniques and materials and their impact as a continuous process from the past to the present.

The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc. The History of Architecture is studied over 5 semesters and is divided chronologically and regionally to understand and focus on a specific aspect in a particular semester.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the role of intangibles, such as cultural, social, and philosophical influences, in shaping art and architecture in Europe.

**CO2:** Understanding the Renaissance period and its impact on the art and architecture of Europe.

**CO3:** Analysing the social, economic, and technological consequences of the Industrial Revolution on architectural practices and urban environments.

**CO4:** Analysing the influences of European styles and techniques on colonial architecture in India.

### Course Content.

#### **Unit I: Renaissance and Baroque Architecture** **No. of Hours 08**

- Renaissance Architecture: Overview: Architectural growth from the 18th & 19th centuries in Europe and the Indian subcontinent.
- Classical Architecture Influences: Leaning on Greek & Roman art and architecture.

#### **Unit II: Industrial Revolution and Neo-Classicism** **No. of Hours 07**

- Architectural Implications: Impact of the Industrial Revolution on architecture. 19th-century Neo-Classicism. Development of architecture in Victorian England.
- Technological Advances: Eiffel Tower, Crystal Palace. Technology of iron and steel.
- Town Planning Trends: European town planning trends and their influence on architecture.

#### **Unit III: European Influence and Architecture** **No. of Hours 07**

- Architectural Evolution: Industrial Revolution and its architectural implications. Neo-Classicism and Victorian England architecture.
- Technological and Cultural Impacts: Technology of iron and steel. Influence of European architecture in India.

#### **Unit IV: Colonial Architecture in India**

**No. of Hours 08**

- Regional Focus: Buildings in Kolkata, Goa, Delhi, Mumbai.
- Colonial Influences: Portuguese (Goa), Dutch (Coromandel, Malabar). British (Delhi, Kolkata, Mumbai). French (Pondicherry).
- Architectural Styles: Early British princely Indian architecture. Birth of Indo-Saracenic architecture. Lutyen's Delhi.

#### **Learning Experience**

This course provides an in-depth study of significant architectural movements and their impacts, spanning from Renaissance to colonial influences in India. It begins with Renaissance and Baroque architecture, exploring its growth in Europe and the Indian subcontinent, and how classical Greek and Roman art and architecture shaped these periods. The course then examines the Industrial Revolution and Neo-Classicism, focusing on the architectural implications of technological advances like iron and steel, and European town planning trends. Moving forward, students will investigate the European influence on architecture, particularly in the context of the Industrial Revolution, Neo-Classicism, and Victorian architecture. The final unit delves into Colonial architecture in India, highlighting the regional impact of Portuguese, Dutch, British, and French influences, with a focus on notable styles and buildings.

#### **Textbooks**

1. Cruickshank, D., Fletcher, B., Saint A., "Banister Fletcher's - A History of Architecture", Architectural Press

#### **Suggested Readings**

1. Hiraskar, G.K., "The Great Ages of World Architecture (with Introduction to Landscape Architecture)", Dhanpat Rai Publications (P) Ltd.

#### **Open Educational Resources (OER)**

1. Renaissance and Baroque Architecture - Khan Academy: Offers a comprehensive overview of Renaissance and Baroque architecture, including key architects, buildings, and design principles.
2. Industrial Revolution and Neo-Classicism - MIT OpenCourseWare: Provides lectures and readings on the architectural impacts of the Industrial Revolution and Neo-Classicism, including the development of new technologies and their effects on architecture.
3. European Architectural Influence in India - Coursera: Explores the influence of European architectural styles in India, including case studies of colonial buildings and town planning.
4. Colonial Architecture in India - National Institute of Design (NID) Resources: A collection of resources and case studies on colonial architecture in India, covering various regional styles and influences.

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR206</b>	<b>ARTS AND GRAPHICS-III</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>45</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Advance sketching, rendering Drawing skills</b>					

### Course Perspective

This subject offer practice of precise graphical rendering of plan, elevation, section, and landscape designing in Manuel manner, which gives core foundation to students designing capacity. The students study how to use different type of markers and drafting pens for rendering, and gain precision in architectural drawing with markers and pen. Architectural Model making and sculpting technique is one of the practices along with rendering technique that students gain the knowledge of making three dimensional forms. The basic modal making mediums such as clay, plaster of Paris, sun-board and various types of foams are used for making models which gives the experience of three-dimensional modelling in architecture to the students.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the elements of art and aesthetic approaches to recognize how the creation of architecture becomes a cultural activity rather than merely space arrangement for living.

**CO2:** Understanding the importance of manual rendering in architectural drawing and how it enhances students' creativity and precision in defining objects in drawings.

**CO3:** Applying rendering and painting mediums by practicing with various tools such as pen, charcoal, shading pencils, colour pencils, and watercolours, and introducing sociography to render light and shadow in architectural drawings, along with teaching human figure drawing, proportion, and scale scientifically.

### Course Content.

#### Unit I: Introduction to Architectural Graphics

**No. of Hours 15**

- Graphical Entities and Mediums: Introduction to the graphical aspects of architectural drawing. Application of different drawing and painting mediums. Developing drafting skills with precision and scale proportion.
- B. Rendering Techniques: Rendering three-dimensional geometric and irregular forms. Understanding natural light effects on objects. Sketching from nature and studying natural light impacts.
- C. Perspective and Views: Practice of different types of perspectives and views. Scientific approach to rendering perspectives.

#### Unit II: Art and Architecture Rendering Techniques

**No. of Hours 10**

- A. Blending Art and Architecture: Techniques of rendering on conventional drawing formats. Development of creative and aesthetic vision in design.
- B. Rendering Architectural Forms: Techniques for rendering architectural forms and the surrounding nature. Use of various drawing and painting mediums.

- C. Application to Future Projects: Applying rendering techniques to future design projects. Enhancing creative and aesthetic understanding.

### Unit III: Precision in Perspective and View

No. of Hours 10

- A. Perspective Techniques: Scientific practice of different types of perspectives and views. Understanding the logic of perspective as a fundamental tool for architects.
- B. Rendering Tools: Use of markers and drafting pens for precise rendering. Gaining precision in architectural drawings through various tools.

### Unit IV: Architectural Model Making and Sculpting

No. of Hours 10

- A. Model Making Techniques: Techniques for creating three-dimensional forms. Use of basic modelling mediums such as clay, plaster of Paris, sun-board, and various types of foams.
- B. Sculpting Techniques: Introduction to sculpting techniques for architectural models. Hands-on experience in three-dimensional modelling.

### Learning Experience

This course focuses on developing skills in architectural graphics, rendering, and model making. It starts with an introduction to architectural graphics, emphasizing precision in drafting, rendering techniques for three-dimensional forms, and various perspectives and views. Students will explore blending art and architecture, rendering architectural forms with different mediums, and applying these techniques to future design projects. The course advances to precision in perspective and view, using markers and drafting pens for accurate rendering. It culminates in architectural model making and sculpting, where students will learn techniques for creating three-dimensional forms and sculpting architectural models using various materials.

### Textbooks

1. Malik, Shankar, "Perspective and Sociography", Allied Publishers.

### Suggested Readings

1. Robert W. Gill, "Rendering with pen and ink"
2. Leslie, Martin C., "Architectural Graphics", Macmillan Pub Co.

### Open Educational Resources (OER)

1. Introduction to Architectural Graphics - OpenCourseWare (OCW): Offers a foundational overview of architectural graphics, including drafting skills, rendering techniques, and the use of different drawing mediums.
2. Rendering Techniques - SketchUp Campus: Provides tutorials and resources on rendering geometric and irregular forms, including understanding light effects and sketching from nature.
3. Blending Art and Architecture - Coursera: A course that explores techniques for integrating art and architecture, focusing on creative rendering and the development of aesthetic vision.

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>SEC059</b>	<b>COMPUTER APPLICATIONS IN ARCHITECTURE II</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version 1.0</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Skill Enhancement Course (Practical)</b>					
<b>Total Contact Hours</b>	<b>60</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Advance knowledge of computers Drawing skills</b>					

### Course Perspective

Empowering students to use computers as 3D modelling tool and to familiarize realistic rendering and presentation techniques using computers. To familiarize with software associated with making drawing, formatting, and presentation. Development of effective presentation techniques

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding how to use drafting software AutoCAD.

**CO2:** Understanding the use and application of software for making presentation drawings.

**CO3:** Creating high-quality drawings in 3D software.

### Course Content.

#### Unit I: Introduction to AutoCAD as 3D drafting tool

**No. of Hours 20**

- Need of 3d dimension, the convention of AutoCAD, plan view in AutoCAD, co-ordinate system in 3d, plan view in AutoCAD, using object snap in 3d.
- Construction of wire frame model, solid modeling using primitives, solid modeling from 2d geometry, union, subtract, region
- 3d orbit, 3d array, 3d mirror, rotate, align, slice, fillet, using lights in rendering, point light, spot light, sun properties, material.

#### Unit II: Presentations

**No. of Hours 20**

- Introduction of various software available for presentation such as Adobe package
- Photoshop,
- InDesign & Illustrator or equivalent

#### Unit III: Advanced 3D Modelling

**No. of Hours 20**

- Advanced modelling, V-Ray rendering engine, or equivalent.

### Learning Experience



The course focuses on the fundamentals of 3D drafting in AutoCAD. Students will learn about the need for 3D dimensions, AutoCAD conventions, and the coordinate system in 3D. They will practice constructing wireframe models, solid modeling using primitives, and creating complex shapes from 2D geometry. Key tools and techniques include 3D orbit, array, mirror, rotate, align, slice, and fillet, as well as using lights and materials in rendering.

### Textbooks

1. Bark, S. (2012). An Introduction to Adobe Photoshop. Ventus Publishing ApS, Sheffield.
2. Gindis, E. (2014). Up and Running with AutoCAD 2015: 2D & 3D Drawing and Modelling. Oxford: Elsevier.

### Suggested Readings

1. Seidler, D. R. (2007). Digital Drawing for Designers: A Visual Guide to AutoCAD 2012. London Fairchild Publications.
2. Bark, S. (2012). An Introduction to Adobe Photoshop. Sheffield: Ventus Publishing ApS.

### Open Educational Resources (OER)

1. AutoCAD 3D Drafting Basics - YouTube Tutorials: Comprehensive video tutorials on 3D drafting basics in AutoCAD, including coordinate systems, object snaps, and wireframe models.
2. AutoCAD Solid Modeling - LinkedIn Learning: Provides detailed courses on solid modeling, including creating shapes from 2D geometry and using advanced tools like union, subtract, and region.
3. 3D Orbit and Rendering Techniques - Autodesk Knowledge Network: Offers resources on using 3D orbit, array, mirror, and advanced rendering techniques in AutoCAD, including lighting and material properties.

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term External Jury
Weightage (%)	20	30	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR210</b>	<b>STRUCTURAL DESIGN-IV</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basics of Structural Analysis and Mechanics</b>  <b>Understanding of different structures and their behaviour under loading conditions</b>					

### Course Perspective

This course will cover flexural analysis and design of reinforced concrete structures including, shear and diagonal tension, serviceability, bond, anchorage and development length of flat slab short and slender columns and footings in reference to architecture requirements. To introduce the students to the fundamentals of reinforced concrete design with emphasis on the design of flat slabs, short and slender columns, footings and foundations. In addition, student will learn how to analyse, and design reinforced concrete structural members under bending, shear, and/or axial loads according to the IS building code requirements.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Remembering the design of flat slabs.

**CO2:** Understanding the terminology related to columns and their design concepts.

**CO3:** Understanding the design and detailing of columns subjected to direct and bending stresses.

**CO4:** Understanding the design of foundations.

**CO5:** Understanding the design of combined footings.

### Course Content.

#### Unit I: Design of Slabs and Frames

**No. of Hours 08**

- Design of flat slabs
- Continuous frame method
- Empirical design method of flat slabs

#### Unit II: Design of RCC Columns

**No. of Hours 07**

- Design of axially loaded RCC columns
- Long & short columns
- Lateral reinforcement for columns
- Permissible stresses in RCC columns
- Effective length
- Slenderness ratio
- Eccentricity
- Longitudinal & Transverse reinforcement

- Pitch & dia of ties
- Helical reinforcement
- Cover to reinforcement
- Permissible loads for compression member
- Composite columns, RCC walls

### **Unit III: Combined Stresses in Columns**

**No. of Hours 07**

- Direct & Bending stresses
- Columns subjected to tensile & compressive load & bending
- Design of columns subjected to combined bending & direct stresses
- ISI note on design of columns subjected to combined bending & direct stresses

### **Unit IV: Foundation Design**

**No. of Hours 08**

Isolated column footing & continuous footing for walls

- Square, rectangular, trapezoidal & circular footings
- Inclusive of one way and two shears
- Flexure & checks
- IS code for design of footing
- Design of continuous wall footing
- Design of isolated column footing
- Design of combined footing
- Shapes of combined slab footing
- Design steps slab footing
- Design steps slab footing with centre beam
- Strap footing
- Mat or Raft foundation

### **Learning Experience**

This unit covers the design of flat slabs, continuous frame methods, and empirical design methods for flat slabs. Students will learn the principles and techniques involved in designing these structural elements. This unit focuses on the design of Reinforced Cement Concrete (RCC) columns. Topics include: Design of axially loaded RCC columns, Long and short columns, Lateral reinforcement, permissible stresses, effective length, and slenderness ratio, Eccentricity and reinforcement details such as pitch, diameter of ties, and helical reinforcement.

### **Textbooks**

1. IS: 883–1984 (reaffirmed 2005), Code of Practice for Design of Structural Timber in Buildings.
2. IS: 1905–1987 (reaffirmed 2002), Code of Practice for Structural Use of Un-reinforced Masonry.

### **Suggested Readings**

1. Design of Masonry and Timber Structures by Singh H. Abhishek Publications, Chandigarh.
2. Design and Construction of Wood Framed Buildings by Morton Newman, McGraw Hill Inc., New York.

3. Design of Steel Structures by Dr. S.M.A. Kazimi, R.S. Jindal, Prentice Hall of India Private Ltd., New Delhi.
4. Comprehensive Design of Steel Structures by Dr. B.C. Punmia , Ashok Kumar Jain, Arun Kumar Jain, Laxmi Publications (P) Ltd., New Delhi.

### Open Educational Resources (OER)

1. Design of Flat Slabs - NPTEL Course: An online course focusing on the design principles and methods for flat slabs.
2. Design of Continuous Frames - YouTube Tutorials: Step-by-step video tutorials on continuous frame design methods.
3. RCC Columns Design - Lecture Notes and Slides: Comprehensive lecture notes and slides on the design of RCC columns, including reinforcement details and permissible stresses.
4. Combined Stresses in Columns - IS Code and Design Examples: Resources covering the IS code provisions for columns subjected to combined bending and direct stresses, with design examples.

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR212</b>	<b>BUILDING SERVICES-I (WATER SUPPLY &amp; SANITATION)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	Basics of services Implementation in design					

### Course Perspective

This course aims to provide students with a comprehensive understanding of the fundamentals of water supply and sanitation. It emphasizes integrating this knowledge into architectural design to ensure that systems are effectively incorporated into building projects. Students will develop practical skills in creating plumbing drawings for both above-ground and underground installations across different building types. Additionally, the course covers water supply, drainage, sewage, and stormwater management at the residential level, equipping students with the expertise to address these critical aspects in their designs.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Remembering the knowledge of water supply and drainage systems in buildings.

**CO2:** Understanding water supply systems from the source (municipality level) to the building level.

**CO3:** Applying the design of water supply systems for domestic and multi-storeyed buildings.

**CO4:** Creating layouts for simple plumbing, drainage, and rainwater harvesting systems for small buildings, such as residences.

### Course Content.

#### Unit I: Water Supply

**No. of Hours 08**

- Detailed studies such as Sources and Treatment of water
- Water demand & calculations
- Storage & conveyance of water at municipal level
- Water supply systems and various fittings
- Hot and Cold-water supply layouts.

#### Unit II: Water Analysis

**No. of Hours 08**

- Water supply design of a residence: Connection with water mains, design of Underground & Overhead water tanks
- Water pump capacity
- calculations for diameter of pipe
- Introduction to water supply in a multi-storeyed building.

### Unit III: Sanitation

No. of Hours 07

- Definition of Refuse, garbage, rubbish, sullage, sub soil water, storm water, night soil, sewage sanitary, domestic & industrial, sewer, sewerage & waste water
- Various drainage & sanitary fixtures & fittings, traps - role of water seal, sizes, materials and their space requirements, Water efficient and waterless fixtures
- Types of pipes and drains in different materials and their usage, diameter of pipes, slope standards • Inspection and Intercepting chambers, manholes etc.
- Sewage and Effluent treatment- Innovative and cost-effective sanitation concepts e.g., Eco SAN

### Unit IV: Sewage systems

No. of Hours 07

- Sewage systems for a small project, Wastewater recycling methods e.g., DEWATS etc.
- Introduction to STP's & ETP's, Design calculations of septic tank & soak pit
- Storm water design calculations for roof top & for surface drains rain
- Water Harvesting & Groundwater Recharge
- Zero discharge concepts

### Learning Experience

This course covers essential aspects of water supply, analysis, sanitation, and sewage systems. It begins with an introduction to water supply systems, including sources, treatment, demand calculations, and layout design for both hot and cold water. It then delves into residential water supply analysis, covering pump capacity, pipe sizing, and multi-storeyed building considerations. The course also explores sanitation, defining key terms, studying drainage fixtures, and examining water-efficient solutions. Finally, it addresses sewage systems with a focus on small project design, wastewater recycling, STP and ETP concepts, stormwater management, and zero discharge practices. Open Educational Resources include online courses, video tutorials, textbooks, research papers, and guidelines on these topics.

### Textbooks

1. Birdie, B. S. (1996). Water supply and Sanitary Engineering. Dhanpat Rai and Sons. & National Building Code of India. (2005)
2. Punmia, B. C., Jain, A. K. and Jain, A. K. (1995). Water Supply Engineering. New Delhi : Laxmi Publications.

### Suggested Readings

1. Punmia, B. C., Jain, A. K. and Jain, A.K. (1998). Waste Water Engineering. New Delhi : Laxmi Publications
2. Rangwala, S. C. (2005). Water Supply and Sanitary Engineering. Charoter Publishing

### Open Educational Resources (OER)

1. Water Supply Systems - Khan Academy: Provides resources on the basics of water supply, including sources, treatment processes, and municipal systems.
2. Residential Water Supply Design - Coursera: Offers practical guidance on designing residential water supply systems, including calculations for pipe diameters and tank design.
3. Sanitation and Waste Management - MIT OpenCourseWare: Covers sanitation definitions, drainage systems, and water-efficient fixtures, with an emphasis on innovative and cost-effective solutions.

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADARE3</b>	<b>ART &amp; ARCHITECTURAL APPRECIATION</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Historical Context and significance of Art, Architecture Integration of History, Aesthetics, Appreciation</b>					

### Course Perspective

This course will guide the student in appreciating art pieces, sculptures and buildings. The students will understand the different aspects of understanding these in terms of their social, historical context and appreciating the arrangement of colours, spaces, features as well as physical forms.

After completing this course, students will be able to interpret works of art and architecture explaining the processes involved in artistic production; identify the political, social, cultural, and aesthetic issues that artists examine in their work; and explain the role and effect of the visual arts and architecture in contemporary terms.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Encouraging a sense of curiosity and sharpening students' powers of observation.

**CO2:** Understanding the arts and architecture of India by examining works of art that combine physical attributes with subjective statements based on the viewer's reaction.

**CO3:** Understanding historical, religious, or environmental information surrounding a particular work of art to grasp its meaning.

**CO4:** Evaluating a work of art or architecture by providing a critical point of view concerning its aesthetic or cultural value.

### Course Content.

#### Unit I: Art and Architecture

**No. of Hours 08**

- The process and training of interpreting them. Study of the following Architects and Artists: Achyut Knvinde, Brinda Somaya, B.V. Doshi, Charles Correa, M.F. Hussain, Krishen Khanna, Anjolie Ela Menon, Arpana Caur.

#### Unit II: Understanding Art and Artists

**No. of Hours 07**

- Understanding art and artists. Finding the hidden meaning. – The Elements and Principles of Visual Language.
- Study of the following Architects and Artists: Hafeez Contractor, Rahul Mehrotra, Laurie Baker, Nari Gnadhi, Raj Rewal, Sheila Sri Prakash, Sheela Gowda, Anita Dube, Subodh Gupta.



### Unit III: Artistic Media and Reflection

No. of Hours 08

- Artistic Media and Architecture. Learning about how the world functions based on Nature, Body, Identity, Sexuality, Politics and powers and how to reflect them in art and how it was reflected by various artists.
- Study of the following Architects and Artists: Anant Raje, Bimal Patel, Joseph Allen Stein, Sonali Bhagwati, Sunita Kohli, S.H. Raza, Francis Newton Souza, Alicia Souza

### Unit IV: Myths, Dreams, and Spirituality

No. of Hours 07

- Learning about the other world- Myths, Dreams, Spirituality and interpretation. Learning about how art is at different places at different times (the western world).
- Comparison and Analysis between different Architects and artists according to their works

### Learning Experience

This course delves into the intersection of art and architecture, exploring how various architects and artists have contributed to and been influenced by these disciplines. Students will study the processes of interpreting art and architecture, focusing on influential figures such as Achyut Kanvinde, Brinda Somaya, B.V. Doshi, Charles Correa, and notable artists like M.F. Hussain and Krishen Khanna. The course emphasizes understanding the hidden meanings in art, including the elements and principles of visual language, through the works of artists and architects like Hafeez Contractor, Rahul Mehrotra, and Laurie Baker.

### Textbooks

1. "Architecture: Form, Space, and Order" by Francis D.K. Ching
2. "The Art of Architecture: A Study of the Process of Designing" by Robert A. M. Stern

### Suggested Readings

1. "Ways of Seeing" by John Berger
2. "The Elements of Graphic Design: Space, Unity, Page Architecture, and Type" by Alex W. White

### Open Educational Resources (OER)

1. Art and Architecture - Yale Open Courses: Provides lectures and readings on the relationship between art and architecture, including case studies of influential figures.
2. Understanding Visual Language - Khan Academy: Offers resources on the elements and principles of visual language, helping students analyse and interpret art.
3. Artistic Media and Reflection - Coursera: Includes courses on how art reflects societal themes such as nature, identity, and politics.

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/	Attendance	End Term Exam
Weightage (%)	20	20		10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

## **SEMESTER -V**

<b>ADAR301</b>	<b>ARCHITECTURAL DESIGN–IV</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>150</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Designing Creativity</b>					

### Course Perspective

To inculcate the appreciation of the design process & an understanding of the design complexities and contradictions involved in resolving architectural design problems of Institutional nature. Students to put emphasis on structure of large span structures and prepare structural models. To understand basic structure and forms in relation to space and materials & application of structural forms in design. The objectives of Arch. Design in the earlier semesters were concerned with ‘space and form’ and ‘formal transformations’; ‘space and activity’; ‘space & regional setting’ etc. The continuation of this leads to understanding of architecture as an outcome of ‘space and structure’

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding basic structures and forms in relation to space and materials and applying structural forms in design.

**CO2:** Understanding the design process in resolving the design of institutional structures.

**CO3:** Applying various developmental complexities and contradictions involved in urban structures and patterns.

**CO4:** Applying user behaviour and design guidelines pertaining to physically handicapped individuals in structures.

**CO5:** Evaluating the theoretical basis for design decisions as provided in the guidelines.

**CO6:** Creating detailed knowledge of building infrastructure and services, developing from an abstract idea to detailed design.

### Course Content

#### Unit I: Institutional Design Context

**No. of Hours 35**

- Nature of Contemporary Institutions: Examination of how contemporary institutions fit into the urban structure. Analysis of the correlation between institutional design and urban context.
- Development Control and Urban Infrastructure: Impact of development control regulations and urban infrastructure on institutional design. Review of zoning laws, land use policies, and their effects on institutional planning.
- Approaches to Urban Context: Various approaches to integrating buildings within an urban context. Consideration of scale, density, and urban fabric.

#### Unit II: Integration and Functionality

**No. of Hours 40**

- Integration of Functions: Ensuring smooth integration of various functions such as movement, climate control, acoustics, structural elements, and services within institutional buildings. Strategies for efficient design of circulation spaces and service integration.
- B. Landscaping and Site Planning: Principles of landscaping and site planning for institutional buildings. Creation of functional and aesthetically pleasing outdoor spaces.
- C. Institutional Character: Development of institutional character from abstract concepts to detailed design elements. Importance of creating a coherent identity for institutional buildings.

### **Unit III: User Requirements and Theoretical Inputs**

**No. of Hours 40**

- User behaviour and Accessibility: Analysis of user behaviour and requirements, with a focus on accessibility for physically handicapped individuals. Design considerations for inclusivity and accessibility.
- Theoretical Inputs: Provision of necessary theoretical knowledge related to institutional design norms and issues. Use of lectures and slide shows to cover topics not included in design problems.

### **Unit IV: Design Problems**

**No. of Hours 35**

- Design of Institutional Buildings: Projects related to various types of institutional buildings, including: Educational Institutions: Schools, colleges (medical, engineering, law, business, music, dance), vocational training institutions. Cultural and Socio-Cultural Centres: Museums, libraries, art galleries, cultural centres, performing arts centres. Industrial Buildings: Design of industrial spaces within institutional contexts.
- Adaptive Reuse: Design challenges related to the adaptive reuse of documented buildings. Approaches for repurposing existing structures while preserving historical and architectural value.
- Portfolio Requirements: Portfolio requirements should include detailed drawings covering construction systems, materials, and services. Emphasis on comprehensive documentation of design solutions.

### **Learning Experience**

This course on Institutional Design focuses on understanding how contemporary institutions integrate within urban environments and address various design challenges. Students will explore how institutional buildings fit into urban structures, examining the impact of development controls and urban infrastructure on design. Emphasis will be placed on different approaches to blending buildings with their urban contexts, considering scale, density, and urban fabric.

Students will learn about integrating various functions within institutional buildings, including movement, climate control, and acoustics, while ensuring efficient design of circulation spaces and services. Landscaping and site planning principles will be covered to create functional and aesthetically pleasing outdoor spaces. The course will also address how to develop a coherent institutional character from abstract concepts to detailed design elements.

### **Textbooks**

1. Watson, Donald, "Time-saver Standards for Building Materials and Systems", Tata McGraw Hill
2. Design Dialog: Dialectics of Design in Architecture, Prof. Shireesh A. Deshpande

## Suggested Readings

1. The Discovery of Architecture: a contemporary treaty on ancient values and indigenous reality, M.N. Ashish ganju and Narendra Dengle
2. Agarwal, A., “Mud: The Potentials of Earth based Material for Third World Housing”, IIED
3. Christopher Benninger, “Letters to a Young Architect”

## Open Educational Resources (OER)

1. Urban Design and Institutional Context - MIT Open Courseware: Offers insights into how institutional buildings integrate into urban environments and the impact of development regulations
2. Institutional Building Design - Coursera: Provides resources and courses on designing various types of institutional buildings, including educational, cultural, and industrial institutions.
3. Landscaping and Site Planning - edX: Covers principles of landscaping and site planning, including how to create functional and aesthetically pleasing outdoor spaces for institutional buildings.

## Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR307</b>	<b>BUILDING CONSTRUCTION AND MATERIALS -V</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>5</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>75</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Detailing/ Observation, drawing skills, maintaining journals for construction materials.</b>					

### Course Perspective

To introduce and familiarize the students with constituents, manufacturing process / availability, properties / characteristics, defects, classifications, treatments, preservation and uses of traditional building materials used in construction. To introduce and familiarize the students with constituents, manufacturing process / availability, properties / characteristics, defects, classifications, treatments, preservation and uses of traditional building materials used in construction. To understand the use of the above said building materials in simple building works.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding different types of slabs and beams in R.C.C. and preparing detailed drawings.

**CO2:** Understanding the design and execution of R.C.C. (Reinforced Cement Concrete) with different materials.

**CO3:** Creating construction detailing for industrial applications or building types, including roof and bridge designs for long and short span truss systems, and producing drawings for the same.

### Course Content

#### **Unit I: Dry Construction Building Subcomponents No. of Hours 20**

- Types of partitions: materials, construction details, and installation techniques
- Details of drywall partitions: assembly, finishing, and soundproofing considerations
- Wall panelling
- Cabinets

#### **Unit II: Implementation of Metals in Building - Steel No. of Hours 20**

- Design, fabrication, and installation techniques of steel doors (including rolling, collapsible shutters) and windows.
- Revolving and mechanical doors and windows

#### **Unit III: Implementation of Metals in Building – Aluminium No. of Hours 15**

- Techniques for extracting, Properties, characteristics, and uses of aluminium in building construction.

- Environmental and ecological impact of metal extraction and processing
- Introduction to Aluminium extruded sections
- Design, fabrication, and installation techniques of aluminium doors, windows, and partitions.

#### **Unit IV: Water Proofing and Insulating Assemblies**

**No. of Hours 20**

- Advanced treatment for waterproofing, insulation, and drainage in flooring and roofing systems
- Principles of insulating assemblies in walls, floors, and roofs. Alternate materials for energy efficiency and thermal comfort.
- Terracing and terrace gardens.

#### **Learning Experience**

This course on Dry Construction Building Subcomponents explores advanced construction techniques focusing on partitions, wall panelling, and cabinetry. Students will examine the different types of materials used for partitions and their construction and installation methods. Special emphasis will be given to drywall partitions, including assembly, finishing, and soundproofing. Additionally, the course covers the design and detailing of cabinetry and wall panelling, fostering hands-on skills in interior design and construction.

#### **Textbooks**

1. Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.
2. BIS (2013) National Building Code, SP 7, Bureau of Indian Standards.

#### **Suggested Readings**

1. Foster, Stroud (1963) Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.
2. McKay, W. B. (1972) Building Construction (Metric), Longman, London, vol. 1 to 5.
3. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
4. Punmia, B. C. (2005) Building Construction, Firewell Media, Delhi.
5. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi.
6. Relevant IS codes

#### **Open Educational Resources (OER)**

1. Drywall Construction - Coursera: Offers detailed resources on the construction and finishing of drywall partitions, including soundproofing techniques.
2. Building with Steel and Metals - MIT Open Courseware: Covers metal fabrication, design, and installation techniques in building construction, including doors, windows, and other components.
3. Aluminium in Building Construction - edX: Provides an in-depth look at the properties, extraction process, and uses of aluminium in modern construction, including environmental considerations.

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)



<b>ADAR303</b>	<b>MODERN WORLD ARCHITECTURE</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Knowledge of European and Indian Architectural history. Logical thinking</b>					

### Course Perspective

Modern World Architecture intends to form a connection between past and present in the context of architecture. The student starts to understand the evolution of forms, character, use of techniques and materials and their impact as a continuous process from the past to the present e.g the journey of the dome in the modern context. The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc.

The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation. The students will generate an understanding about the development and evolution of architecture as a culmination of various factors. The students understand the building types and development of architectural form and character based on tangible (materials, construction techniques) and intangible factors (belief systems, needs of different religions, dynasties and influences). This course will ignite creative thoughts and fuel new imaginations. After completing the course, students will be able to understand the purpose of the subject and the implementation of history in today's design.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the development of civilizations and its impact on modern architecture, while arousing curiosity and sharpening powers of observation.

**CO2:** Understanding the chronological study of world architecture, beginning with the development of civilizations in the context of location, climate, and socio-cultural, historical, economic, and political influences.

**CO3:** Understanding modern world buildings and surroundings in terms of their location, climate, and geographical, cultural, historical, economic, and political influences of the time.

**CO4:** Analysing architecture of different periods as a solution to the needs or demands of society.

### Course Content

#### Unit I: Colonial Architecture in India

**No. of Hours 08**

- Colonial Architecture in India – (late 18th to early 20th century):
- Colonial culture reflecting in the architecture of India, Emphasis on the buildings of Kolkata, Goa, Delhi & Mumbai.
- Portuguese-Goa, Dutch-Coromandel, Malabar, French-Pondicherry

- Birth of Indo Saracenic Architecture- Lutyen's Delhi

## **Unit II: Modern architecture**

**No. of Hours 07**

- Modern architecture: Various modern movements in different parts of the Western world and their role in defining Modern architecture taking examples of Architects ( Le-Corbusier, FLW, Mies van deRohe) /Artist and their works such as (Basically to learn the difference of Architecture style between all)
- Post Impressionism,
- Expressionism,
- Art Nouveau,
- Surrealism,
- Abstract Expressionism,
- Cubism
- In Indian Context: Public Works Department (PWD) and its role in the works of Indian Architects.
- Buildings of New Delhi

## **Unit III: Postmodern Architecture**

**No. of Hours 08**

- (Architecture of early 19th and late 20th century): Architects Philosophies & their works
- American architecture
- Birth of American Skyscrapers
- Introduction to Chinese Architecture style.

## **Unit IV: Brief Introduction to various styles**

**No. of Hours 07**

- Constructivism, deconstructivism (Examples of various Architects works)
- Biomimetic-Gherkin Building, London
- Parametricism

## **Learning Experience**

Students will explore the architectural evolution in India during the colonial period, focusing on how Portuguese, Dutch, French, and British colonial powers influenced local building styles, with a deep dive into the emergence of Indo-Saracenic architecture and Lutyens' Delhi. This will include analysing the architecture of key Indian cities like Kolkata, Goa, Delhi, and Mumbai. Students will further study modern architectural movements in the Western world, such as Post-Impressionism, Expressionism, and Cubism, as well as their impact on Indian architecture through the works of prominent figures like Le Corbusier and the role of the Public Works Department in shaping modern Indian cities. The course will also introduce postmodern movements and architectural philosophies, including American skyscrapers and the early developments of Chinese architecture. Finally, the students will gain an overview of architectural styles such as Constructivism, Deconstructivism, and emerging trends like Biomimetic and Parametric design.

## **Textbooks**

1. Cruickshank, D., Fletcher, B., Saint A., "Banister Fletcher's - A History of Architecture", Architectural Press.

## **Suggested Readings**

1. Snyder, J and Catanese, A, "Introduction to Architecture", McGraw-Hill,

2. Farrelly, Lorraine, "The Fundamentals of Architecture", Ava Publishing
3. Voordt and Wegen, "Architecture in Use", Architectural Press,
4. Smithies, K.W., "Principles of Design in Architecture", Van Nostrand Reinhold Co,
5. Roger H. Clark and Michael Pause, "Precedents in Architecture", Van Nostrand Reinhold Co.
6. Parmar, V. S., "Design Fundamentals in Architecture", Somaiya Publications Pvt. Ltd.

### Open Educational Resources (OER)

1. "Colonial Architecture in India: From Imperial Aesthetics to National Heritage" by RIBA Journal (Free access)
2. "Modern Architecture: A Critical History" by Kenneth Frampton (Free e-book available in select educational libraries)
3. "Postmodern Architecture: Theories and Practices" by MIT OpenCourseWare (Free lectures and notes)

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADARE4</b>	<b>Elective-IVHOUSING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Understanding basics of housing Application of Housing Policies and programmes.</b>					

### Course Perspective

This course imparts essential knowledge of housing fundamentals, including relevant policies, programs, and the housing design process. Students will gain a foundational understanding of the key concepts involved in housing, equipping them with the skills to navigate and apply housing policies and design principles effectively.

### Course Outcomes

**Upon completion of the course the learner will be able :**

- CO1:** Remembering the concept of housing.
- CO2:** Understanding housing policies and programs.
- CO3:** Understanding housing standards for design.
- CO4:** Understanding housing finance.

### Course Content

#### **Unit I: Introduction to housing**

**No. of Hours 08**

- Concepts, definition & components of housing
- Role of housing in socio-economic development of nation
- Housing Process & sequence of development
- Housing need, demand and supply
- Housing problems and inadequacy
- Formal and informal housing
- Housing characteristics and situation

#### **Unit II: Policies & Programmes**

**No. of Hours 07**

- Housing in 5-year plans
- National Housing policies
- National housing schemes and programmes
- Elements of housing policy
- Housing surveys
- Housing agencies

#### **Unit III: Housing standards and design**

**No. of Hours 08**

- Housing typology
- Residential gross and net density
- Understanding of FAR, FSI, Ground coverage and other development controls
- Housing standards, and basic principles of formulating standards
- Desirable and minimum design standards

- Form and structure of housing as shaped by socio-economic & physical parameters: location, topography, development controls, climate etc.
- Community and neighbourhood factors
- Latest trends of Market

#### **Unit IV: Housing Finance**

**No. of Hours 07**

- Finance agencies
- Obstacles in financing
- Banking and non-banking institutions for financing

#### **Learning Experience**

This unit introduces students to the multifaceted world of housing, exploring its importance in the socio-economic development of a nation. The learning will cover basic concepts, definitions, and components of housing, as well as key challenges such as housing demand, supply, and the dichotomy between formal and informal housing sectors. Students will critically examine housing policies and programs, including the role of housing in the 5-year plans and various national schemes. Understanding housing standards will be central, with a focus on key metrics like Floor Area Ratio (FAR), Floor Space Index (FSI), and development controls. Additionally, students will study the influence of socio-economic, climatic, and community factors on housing design, along with the latest market trends. Lastly, housing finance will be explored, including finance agencies, banking institutions, and common obstacles in securing housing finance.

#### **Textbooks**

1. Rangwala, Town Planning, Charotar publishing House, Anand.

#### **Suggested Readings**

1. Chiara Joseph De et al (1995). Time saver standards for housing and residential development. McGraw Hill, New York
2. Correa, C. (1999) Housing and urbanization, Urban Design Research Institute, Mumbai.
3. Mehta, M. and Mehta, D. (1989) Metropolitan housing market. Sage Publications, New Delhi
4. Housing, Compilation of housing Related Topics for AITP examination, Institute of Town Planners.

#### **Open Educational Resources (OER)**

1. "Affordable Housing and Inclusive Urban Development" by UN Habitat
2. "Housing Policies and Urban Development" from World Bank Open Knowledge Repository
3. "Housing and Community Development" by MIT Open CourseWare

## Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>SEC056</b>	<b>COMPUTER APPLICATION IN ARCHITECTURE-III</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Skill Enhancement Course (Practical)</b>					
<b>Total Contact Hours</b>	60					
<b>Pre-Requisites/ Co-Requisites</b>	Learning software's Drawing skills.					

### Course Perspective

Empowering students to use computers as 3D modelling tool and to familiarize realistic rendering and presentation techniques using computers. To develop or upgrade an understanding about Autodesk Revit Architecture, as an important tool for drafting, designing, analysing and representation of the drawings in a desired manner.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Remembering how to use drafting software Revit.

**CO2:** Understanding the use and application of software for making presentation drawings.

**CO3:** Creating good quality drawings in 3D software.

### Course Content

#### Unit I: Getting Started Revit Architecture

**No. of Hours 20**

- Introduction, Modifying the view, Common tasks, System options,
- File locations, Spelling options, Settings, Keyboard shortcuts,
- Levels and grids, Zooming, Steering wheels.

#### Unit II: Building the Model and Modify

**No. of Hours 20**

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

#### Unit III: Presentation

**No. of Hours 20**

- Dimensions, Keynotes, Tags, Symbols, adding legend views, Creating a detail callout,
- Adding filled and masking regions, using detail components, Creating sheet, Sheet properties

## Learning Experience

This unit introduces students to Revit Architecture, providing a foundational understanding of the software and its capabilities. Students will begin by learning the essentials such as navigating the interface, modifying views, using common tasks, and customizing system options, including file locations, spelling options, and keyboard shortcuts. In the second part, students will focus on building models using Revit, constructing various elements like walls, doors, windows, roofs, and architectural components. They will also delve into more advanced topics such as sloped surfaces, stairs, ramps, and curtain walls. Finally, the unit covers presentation techniques where students will learn to add dimensions, keynotes, tags, symbols, and legends, along with creating detailed views and professional-quality sheets for project documentation.

## Textbooks

1. Autodesk Revit Architecture 2012: No Experience required – Eric WinG

## Suggested Readings

1. Mastering Autodesk Revit Architecture 2012 – James Vandezande, Phil Read, Edd

## Open Educational Resources (OER)

1. "Revit Architecture Tutorials" by *Autodesk Knowledge Network*
2. "BIM for Beginners" by *The BIM*
3. "Introduction to Revit for Architectural Design" by *Coursera*

## Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Exam	Studio	End Term External Jury
Weightage (%)	20	30	20		30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)



<b>ADAR309</b>	<b>STRUCTURAL DESIGN-V</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Logical aptitude and thinking</b>					

### Course Perspective

Students will evaluate the effect of the environment on service life performance, properties and failure modes of concrete structure. Designing of different structural components with their practical application. The basic objective is to produce a structure capable of resisting all applied loads without failure and excessive deformations during its anticipated life. The course curriculum deals with the study of various design aspects of pre-stressed concrete and design of stair case. The students will learn the analysis and design of singly and doubly reinforced beam by limit state method and working stress method.

### Course Outcomes

**Upon completion of the course the learner will be able:**

- CO1.** Understanding design philosophies, basic elements of structures.
- CO2.** Understanding reinforcing details and concreting.
- CO3.** Applying Basic principles of working stress and limit state methods.
- CO4.** Analysing the Design of domes, shells and folded plates.

### Course Content

#### Unit I: Limit State Method

**No. of Hours 08**

- Concept of Limit state design
- characteristics strength of steel & concrete
- Design values,
- Loads & loading conditions
- Limit state of collapse & serviceability
- Limit state method vs working stress method, Building code.
- Theory & design by Limit state method, of
- singly reinforced,
- Doubly-reinforced
- L & T beams

#### Unit II: Prestressed Concrete

**No. of Hours 07**

- Elements, Principles and systems,
- loss of pre stress,
- analysis of pre stresses and
- design of beam, circular tanks & pipe

#### Unit III: Stairs Design and Detailing

**No. of Hours 08**

- Design & detailing of Stairs
- With stair slab spanning horizontally
- With stair slab spanning vertically
- Distribution of loading on staircase
- Design of doglegged stairs
- Design of stairs with quarter space landing

#### **Unit IV: Domes, Shells, and Folded Plates**

**No. of Hours 07**

- Theory & design
- Stresses in spherical domes
- Stresses in domes due to Universally distributed load
- Stresses in domes due to concentrated load at crown, combined UDL & concentrated loads and wind loads

#### **Learning Experience**

Students will gain a comprehensive understanding of structural design through the Limit State Method, Prestressed Concrete, and advanced structural elements like stairs, domes, shells, and folded plates. The coursework begins with an introduction to the Limit State Method, focusing on its principles compared to the Working Stress Method. Students will explore characteristics of steel and concrete, loading conditions, and design values for various structural elements including singly and doubly reinforced beams. Moving on to Prestressed Concrete, students will learn about its fundamental principles, elements, and systems, including how to account for losses of pre-stress and design for beams, circular tanks, and pipes. The unit also covers detailed design and detailing of stairs, including various types and loading distributions. Finally, students will delve into the theory and design of domes, shells, and folded plates, understanding stresses under different load conditions and practical applications in structural design.

#### **Textbooks**

1. BIS (2000) Indian Standard Code of Practice for Plain and Reinforced Concrete I.S: 456, Bureau of Indian Standards.
2. Punmia, B. C., Jain, A. K., and Jain, A. K. (1992) Reinforced concrete structures, Vol. I, Firewall Media, New Delhi.

#### **Suggested Readings**

1. Singh, H. (2008) Design of Reinforced concrete structures for Architects, Abhishek Publications, Chandigarh.
2. Mallick, S. K. and Gupta, A. P. (1980) Reinforced Concrete, Oxford & IBH publishing company Pvt. Ltd. New Delhi.
3. Shetty, M. S. (2008) Concrete Technology, S. Chand Limited.
4. Neville A. M. (2012) Properties of Concrete, Prentice Hall
5. Mehta, P. K. and Moterio, P. J. M. (2005) Concrete: Microstructure and properties, McGraw-Hill Professional
6. Dayaratnam P. (1983) Reinforced Concrete Design, M. Primlani.

#### **Open Educational Resources (OER)**

1. "Limit State Design of Reinforced Concrete" by *NPTEL*
2. "Prestressed Concrete: Theory and Design" by *Coursera*
3. "Design of Concrete Structures" by *MIT Open Courseware*

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR305</b>	<b>ESTIMATING, COSTING &amp; SPECIFICATIONS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Understanding basics Implementation in practise</b>					

### Course Perspective

This course is intended to impart students with the necessary technical knowledge for preparation of Specifications and calculating estimates and detailed costing for small to medium scale projects.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the storing and handling of different types of materials.

**CO2:** Understanding estimates for building components, interior, plumbing, and electrification installations.

**CO3:** Understanding detailed estimates and schedules of rates.

**CO4:** Understanding the process of tendering, price rise mechanisms, and the award of tenders.

**CO5:** Analysing different types of contracts and tender documents for buildings.

### Course Content

#### Unit I: Specifications (Materials)

**No. of Hours 08**

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

#### Unit II: Specification (Items of works)

**No. of Hours 08**

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

#### Unit III: Estimation

**No. of Hours 04**

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

**Unit IV: Estimation (Exercises)****No. of Hours 02**

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

**Unit V: Rate Analysis****No. of Hours 04**

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

**Unit VI: Accounting Procedures****No. of Hours 04**

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

**Learning Experience**

This unit provides an in-depth understanding of specifications and estimation in construction, crucial for ensuring the quality and accuracy of building projects. Students will start with an exploration of Specifications (Materials), learning about their importance, scope, and the correct forms and sequences for writing them. They will study standard specifications drafted by agencies like the C.P.W.D. and practice writing detailed specifications for various building materials such as bricks, aggregates, cement, reinforcement, timber, glass, and paints.

**Textbooks**

1. Dutta, B. N. (2003) Estimating and Costing, UBS Publishers
2. Birdie, G. S. Estimating and Costing

**Suggested Readings**

1. Kohli, D. D and Kohli, R.C. (2004) A Text Book of Estimating and Costing, S.Chand & Company Ltd.
2. Brook, Martin. (2004) Estimating and Tendering for Construction Work, 3rd edition, Elsevier.
3. Ashworth, A. (1999) Cost studies of buildings, Pearson Higher Education

**Open Educational Resources (OER)**

1. "Construction Specifications and Standards" by *The Open University*
2. "Introduction to Estimation and Quantity Surveying" by *NPTEL*
3. "Building Estimation and Costing" by *MIT Open Courseware*

**Evaluation Scheme**

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR311</b>	<b>BUILDING SERVICES-II (ELECTRICAL &amp; LIGHTING)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Understanding services Implementation in design</b>					

### Course Perspective

This course introduces the fundamental concepts of electrical systems in both domestic and multi-storeyed buildings. It covers essential topics such as lighting, fixtures and fittings, and cabling, providing students with a foundational understanding of how to design and implement electrical systems effectively in various building types.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding lighting solutions by assessing lighting fixtures, controls, and systems for optimal results.

**CO2:** Understanding electricity generation, transmission, and distribution sources to buildings.

**CO3:** Applying drawing and calculation techniques for electrical loads in small buildings.

**CO4:** Analysing basic room lighting measurements.

**CO5:** Creating drawing representation details for construction drawings related to electrical and lighting systems.

### Course Content

#### **Unit I: Introduction to engineering services for buildings** **No. of Hours 07**

- Electrical Services: sources of electrical energy supplied to buildings
- Electricity generation, transmission and distribution.
- Instruments for measurement, metering
- Electricity Authority, Act, rules and regulations

#### **Unit II: Rules and regulations** **No. of Hours 08**

- Rules and regulations regarding electrification of buildings as appropriate with relevant standards
- Types of electrical wiring system, earthing, scope and requirements
- Requirements of electrical materials such as conductors, insulators
- Types and requirements of electrical cables
- Control equipment's such as switch gear, safety devices to be used in electrical layouts

#### **Unit III: Electrical lighting** **No. of Hours 08**

- Electrical lighting
- Integration of Electrical lighting with day lighting, sensors

- Instruments for measurement lux meters
- Type of lamps and luminaries, lighting density and efficiency
- Outdoor lighting, Specialized lighting like art galleries etc.

#### Unit IV: Graphical symbols

No. of Hours 07

- Graphical symbols electrical systems
- Plug load calculation of a small building
- Electrical drawing of a small building

#### Learning Experience

This unit provides comprehensive coverage of engineering services related to electrical systems in buildings. Students will begin with an Introduction to Engineering Services for Buildings, focusing on the sources of electrical energy, including generation, transmission, and distribution. They will also learn about measurement instruments, metering, and relevant regulations as specified by the Electricity Authority. Finally, the Graphical Symbols section will introduce students to the graphical symbols used in electrical systems. They will practice plug load calculations for small buildings and create electrical drawings, which are crucial skills for planning and implementing electrical systems in real-world scenarios.

#### Textbooks

1. Raina K. B. & Bhattacharya S. K. (2007) Electrical Design, Estimating and Costing, New Age International Publishers, New Delhi.
2. Dagostino, F. R. (1978) Mechanical and Electrical Systems in Construction in Architecture, Reston Publishing Company, Prentice Hill Co., Virginia.

#### Suggested Readings

1. Egan, D. M. (1983) Concepts in Architectural Lighting, McGraw Hill Book Company.
2. Flynn, J. E. et. al (1992) Architectural Interior Systems: Lighting, Acoustics and Air conditioning, Van Nostrand Reinhold
3. NBO (1966) Hand book for Building Engineers, National Buildings Organisation, New Delhi.

#### Open Educational Resources (OER)

1. "Electrical Engineering: Introduction to Electrical Systems" by MIT *OpenCourseWare*
2. "Electrical Systems for Buildings" by *The University of Texas at Austin*
3. "Building Electrical Systems" by *OpenLearn*

#### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

## **SEMESTER -VI**



<b>ADAR302</b>	<b>ARCHITECTURAL DESIGN-V</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>150</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Designing Creativity</b>					

### Course Perspective

The course emphasizes designing spaces that can accommodate daily routines as well as seasonal and annual events. Students will explore relationships between space and individual needs, balancing human-scale considerations with broader urban contexts. Key societal aspirations, such as aesthetic expression and form, will be considered alongside technical requirements like climate adaptation, building services, construction methods, and adherence to codes and bye-laws (e.g., NBC).

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the design required for multiple groups of users with consideration for site, climate, services, and bylaws.

**CO2:** Analysing the role of density, mixed land use, ground coverage, and developmental control needs for housing design.

**CO3:** Applying basic structural forms in relation to space and materials.

**CO4:** Creating a design process and design solution for a public building or housing.

### Course Content

#### Unit I: Design of Mid-rise Apartments

**No. of Hours 00**

- Issues to be addressed for the design project pertaining to apartment design:
- Density, mixed land use, ground coverage, development controls.
- Type of occupancy, social strata, social status and prevalent social strata
- Urban systems, services and their integration with the project.
- User requirements (derived from surveys)
- Issues in appropriate technology and costs.
- Issues of hierarchy, identity of space, public and private scales of space. Integration of community institutions etc.
- Detailing for the disabled and the elderly.
- Indian / local architectural responses to climate, culture, traditional values, building elements, symbols motifs and special character.
- Details from the dwelling cell to immediate shared space to communal space shall be emphasized and worked out. Socio cultural layer of the occupants shall form a strong fabric in the ultimate weave of the design. Projects shall aim at developing a very sensitive attitude towards micro level human habitation and role of architecture in enhancing or curbing the quality of living.
- Examples of projects: Apartments for IT employees, Govt. servants, teaching faculty, Textile weavers, etc. luxury flats in the center of the city, group housing in the suburbs.

#### Unit II: Public buildings

**No. of Hours 00**

- The role of urban space as a public realm and the need to create such spaces as extension of private domain in a public building shall be investigated and shall become one of the architectural goals of the project. Some of the prerequisites of the project shall be;
- Multiple functions,
- Public access to majority of the spaces,
- Large gathering areas which are open and extendable to the immediate urban context.
- Examples of projects: large scale exhibition spaces, Auditorium, Cinema halls, Sports stadium, etc., Detailing of architectural features of the major project like entrance lobby, skylights and staircases has to be attempted.

### Learning Experience

In this course, students will focus on two key areas: the design of mid-rise apartments and public buildings. Students will explore the multifaceted challenges of designing mid-rise apartment buildings. Projects will involve detailed design from the dwelling cell to shared and communal spaces, aiming to enhance the quality of living and reflect the socio-cultural fabric of the occupants. Examples include apartments for various demographic groups and luxury flats. Students will investigate the role of public spaces within buildings and their interaction with the urban environment. Students will work on projects such as large exhibition spaces, auditoriums, cinema halls, and sports stadiums, focusing on how these buildings serve as public spaces and interact with their surroundings.

### Textbooks

1. Time-Saver Standards for Building Types

### Suggested Readings

1. Architectural Standard Ernst Peter Neufert Architects Data
2. Time-Saver Standards for Architectural Design Data

### Open Educational Resources (OER)

1. "Apartment Design: Creating Sustainable, Healthy, and Community-Oriented Apartments" by *OpenLearn*
2. "Public Building Design and Urban Context" by *MIT OpenCourseWare*
3. "Architectural Design of Public Buildings" by *Coursera*

### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR306</b>	<b>BUILDING CONSTRUCTION &amp; MATERIALS-VI</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>5</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>75</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Detailing &amp; Observation, drawing skills, maintaining journals for construction materials.</b>					

### Course Perspective

To introduce and familiarize the students with constituents, manufacturing process / availability, properties / characteristics, defects, classifications, treatments, preservation and uses of traditional building materials used in construction.

To acquaint the students to building materials such as glass, aluminium, etc. with construction techniques for the use of these materials in building works.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding various building materials and construction techniques based on performance standards and codes.

**CO2:** Understanding the latest trends in practice and the usage of new technologies and materials.

**CO3:** Understanding about the procurement of materials and the manufacturing of products in different industries.

**CO4:** Understanding the constituents, defects, classifications, treatments, preservation, and uses of traditional building materials.

**CO5:** Analysing the use of building materials in joinery details and complex constructions with higher load capacities.

### Course Content

#### Unit I: Plastic and Rubber as Building Materials

**No. of Hours 20**

- Introduction to plastic and rubber as building materials
- Properties and characteristics of PVC and UPVC
- Design, fabrication, and installation techniques of PVC and UPVC doors and windows

#### Unit II: False Ceiling

**No. of Hours 20**

- Understanding the purpose and benefits of false ceilings
- Types of false ceilings and their construction details
- Installation techniques and considerations for false ceilings
- Gypsum- Gypsum Board, Ceiling Board & Tiles, Gypsum Plaster, Components and Accessories. Jointing and finishing.

### **Unit III: External Wall Cladding**

**No. of Hours 15**

- Introduction to external wall cladding materials and systems
- Construction details and installation techniques of sandwich panels
- Characteristics and installation methods of aluminium composite panel (ACP) cladding
- Techniques and considerations for dry and wet stone cladding on external walls.

### **Unit IV: Alternate Roofing Techniques**

**No. of Hours 20**

- Overview of construction equipment used in advanced building construction
- Introduction to alternate roofing techniques
- Principles and construction details of domes, vaults, and shell roofs

### **Learning Experience**

In this unit, students will explore the integration of innovative building materials and techniques into architectural design. They will begin by examining the properties and applications of plastics and rubbers, particularly PVC and UPVC, focusing on their use in fabricating and installing doors and windows. The course will then cover the purpose and benefits of false ceilings, with an emphasis on different types of ceilings, including gypsum-based options, and their installation techniques. Students will learn about external wall cladding systems, including sandwich panels and aluminium composite panels (ACP), along with various stone cladding techniques. Finally, the course will introduce alternate roofing methods, exploring the principles and construction details of domes, vaults, and shell roofs, alongside an overview of construction equipment used in advanced building techniques.

### **Textbooks**

1. Foster, Stroud Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.
2. Singh, Gurucharan Building Construction Engineering, Standard Book House, New Delhi.

### **Suggested Readings**

1. McKay, W. B. Building Construction (Metric), Longman, London, vol. 1 to 5.
2. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
3. Barry, R Construction of Buildings, London, vol. 1 to 5.
4. Punmia, B. C. Building Construction, Delhi.

### **Open Educational Resources (OER)**

1. "Introduction to Building Materials and Construction" - An online textbook covering the basics of various building materials, including plastics, rubbers, and their applications in construction. Available at OpenStax.
2. "Gypsum Board and Ceiling Systems" - A comprehensive guide on gypsum board usage, including installation and finishing techniques for false ceilings. Accessible at The Constructor.

3. "External Wall Cladding: Materials and Techniques" - An educational resource detailing different cladding materials and installation methods, including ACP and stone cladding. Found at ArchDaily.

### **Evaluation Scheme**

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADARE5</b>	<b>ELECTIVE- V (TOWN PLANNING)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Knowledge of cities, basic design Logical thinking</b>					

### Course Perspective

The course intends to introduce the students to the concepts and theories of planning and the relationship between architectural development and its larger context of the town and the history and development of the global trends in planning processes as compared to Indian planning methods, its relevance & application to modern day principles of town planning.

### Course Outcomes

**Upon completion of the course the learner will be able to:**

**CO1:** Understanding the concept of town planning and relating it to architectural projects in the context of planning.

**CO2:** Understanding planning principles and their evolution.

**CO3:** Evaluating analytical skills in understanding the planning of cities through historical timelines.

**CO4:** Creating basic skills in planning surveys, analysis, and generating alternative planning strategies.

### Course Content

#### Unit I: Introduction to Principles and Techniques

**No. of Hours -07**

- Definition and vocabulary of Town Planning and Regional Planning
- Town planning and architecture, role of a town Planner, Elements and planning principal of city plan.
- Evolution of town planning in India: pre-independence and post-independence

#### Unit II: Town planning Terminology, Planning Process & Standards **No. of Hours 08**

- Land use, Concept of F.A.R. and Density, Zoning and Subdivision Regulations, Master Plan.
- Introduction about Professional Bodies in planning profession such as T.C.P.O. and I.T.P.I. etc. Various Planning authorities like D.D.A., CIDCO, HUDA/ HSVP etc. Introduction to Local and Self Government in urban as well as rural areas, introduction to 73rd and 74th amendment to the constitution.
- Planning Process & Standards Understanding of planning process. Relevance of standards in planning as per URDPFI guidelines prepared by TCPO.
- Introduction to Town Planning Schemes, Development Plan and Regional Plan.
- Town planning surveys (Physical, social and Economical, Aesthetic Surveys), Preparation of MASTER PLAN for old and new towns, Planning Standards.

### **Unit III: Planning Concepts and Evolution**

**No. of Hours 05**

- Planning concepts related to City beautiful movement (Chicago, Chandigarh), Urban Utopia (Broadacre), Garden city (Letchworth), Radburn Theory (Radburn) and Neighbourhood planning.
- Planning Theories & Models – Theories by Le Corbusier, Sir Patrick Geddes, Sir Ebenezer Howard, C. A. Doxiadis, Clarence Perry and Lewis Mumford. – their relevance to Indian conditions.

### **Unit IV: Roads and traffic studies Modern Transportation systems**      **No. of Hours 07**

- Awareness of concepts related to various traffic problems in India. Understanding of PCU, Traffic volume, Road capacities, Road types; their sections and intersections, Traffic calming as per IRC guidelines.
- Shapes of plan in accordance to road networks.
- New concepts in mass and rapid transportation systems e.g. BRT, LRT and Metro rail.

### **Unit V: Modern approach in Planning**      **No. of Hours 03**

- Modern approach in Planning Introduction, Benefits and Planning components of Green City (e.g. Vancouver), Compact City (e.g. Sky city, China) and Smart City (e.g. Malta)

### **Learning Experience**

This unit introduces students to fundamental principles and techniques in town and regional planning, emphasizing the definition, vocabulary, and role of town planners within the broader context of city planning. Students will explore the evolution of town planning in India from pre-independence to post-independence periods. The course will cover essential planning concepts such as land use, FAR, density, zoning, and subdivision regulations, alongside the roles of professional bodies and planning authorities. Students will engage with planning processes, standards, and schemes, including master plans and development plans. Key planning concepts and historical theories, such as the City Beautiful movement and Garden City concept, will be examined in relation to their application in Indian contexts. The course also includes a focus on modern transportation systems, traffic studies, and contemporary planning approaches, such as green cities and smart cities, providing a comprehensive overview of both traditional and cutting-edge urban planning strategies.

### **Textbooks**

1. Rangwala, S. C. and Others Town Planning, Charotar Pub. House, Anand.
2. G.K.Hiraskar, Town Planning

### **Suggested Readings**

1. Arthur B. Gallion and Simon Eisner, The Urban Pattern – City planning and Design, Van Nostrand Reinhold company.
2. John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
3. Kevin Lynch -Image of City.
4. Sir Ebenezer Howard- Tomorrow – Peaceful Path To Social Reforms.
5. URDPFI Guidelines for Planning by TCPO.

### **Open Educational Resources (OER)**

- 1."Introduction to Urban Planning" - A comprehensive guide on urban planning principles, including key concepts, terminology, and historical evolution. Available at MIT OpenCourseWare.

2."Urban Planning and Design" - A textbook covering the fundamentals of town and regional planning, including planning processes, standards, and various planning theories. Accessible at SAGE Open.

3."Sustainable Urban Planning" - An educational resource that explores modern approaches to urban planning, including green cities, compact cities, and smart cities. Found at [Coursera](#).

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)



<b>ADAR304</b>	<b>WORKING DRAWING &amp; BUILDING BYELAWS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>
<b>Category of Course</b>	Major (studio)					
<b>Total Contact Hours</b>	75					
<b>Pre-Requisites/ Co-Requisites</b>	Fundamental understanding of Drawing skills and its implementation in Architecture practise					

### Course Perspective

To introduce working drawings and their significance in the construction of buildings. To teach students the essential components of working drawings, notations, drawing standards, strengthen the students' knowledge about preparing g working drawings for various building elements.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding requirements for drawings at various stages of a project.

**CO2:** Applying building regulations and codes into the project.

**CO3:** Applying all services and structural systems into a working drawing project.

**CO4:** Analysing various building materials and construction techniques required for construction.

**CO5:** Creating relevant drawings for different stages, from inception to final execution of a project.

### Course Content

#### Unit I: Working Drawings

**No. of Hours 20**

- Site plan.
- Foundation layout with details of foundations and DPC.
- Ground floor Plan.
- First Floor Plan.
- Terrace Plan
- Sections
- Elevations.

#### Unit II: Services Drawings

**No. of Hours 20**

- Electrical Layout.
- Plumbing Layout.
- Sanitary Layout.
- Drainage Layout.
- Rain Water Disposal / Harvesting Layout and Details.
- Toilet details.
- Kitchen / Pantry Details.

#### Unit III: Working Details

**No. of Hours 20**

- Doors and Windows Drawings and Details.
- Staircase Details including railings.

- Details of Grills, Parapet or railings.
- Typical wall section showing foundation, DPC, skirting, sill, lintel, slab
- and terracing details.

#### Unit IV: Finishing Drawings

No. of Hours 15

- Doors and Windows Frame and Shutter details.
- Flooring & Skirting pattern and fixing details.
- Dado / Wall tile pattern and fixing details.
- Wall Cladding pattern and fixing details.
- Plaster Pattern with Colour schemes.

#### Learning Experience

This unit provides a comprehensive overview of the creation and interpretation of various types of architectural and construction drawings. It begins with site plans and progresses through detailed working drawings for different building elements. Students will learn to draft and understand foundation layouts, floor plans for different levels, and key sections and elevations of a building. The unit covers essential services drawings, including electrical, plumbing, sanitary, and drainage layouts, as well as rainwater disposal and harvesting systems. Detailed working drawings will be explored, focusing on doors, windows, staircases, and typical wall sections. The final component addresses finishing drawings, detailing frames, shutters, flooring patterns, wall tiles, cladding, and plaster patterns. This unit equips students with the skills necessary to produce and analyze detailed construction documentation, crucial for effective communication and implementation in building projects.

#### Textbooks

1. Building and Construction Authority. (2005). CONQUAS-21. Singapore: The BCA Construction
2. Quality Assessment System.

#### Suggested Readings

1. Jefferis, A. and Madsen, D.A. (2005). Architectural Drafting and Design. 5th Ed. New York Thomson Delmar Learning.
2. Jeong, K-Y. (2010) Architecture Annual. Seoul: Archiworld Co.
3. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria: The Images Publishing group.
4. Osamu, A. W., Linde, R. M. and Bakhoum, N. R. (2011). The professional practice of

#### Open Educational Resources (OER)

1. "Introduction to Architectural Drawings" by MIT Open Courseware
2. "Construction Drawings and Details for Interiors" by Virginia A. McLeod
3. "BIM for Architecture, Engineering, and Construction" by Open Learn

#### Evaluation Scheme

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.

<b>ADAR308</b>	<b>STRUCTURAL DESIGN-VI</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basics of Steel Structures and Mechanics</b> <b>Understanding of different steels structures and their connections</b>					

### Course Perspective

The course deals with design of steel structures using “Limit State Design Method”. The design methodology is based on the latest Indian Standard Code of Practice for general construction (IS 800:2007). The subject covers all the necessary components such as material specifications, connections and elementary design of structural members for designing industrial steel structures.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the properties of steel and rolled steel sections.

**CO2:** Understanding the load-carrying capacity of various connections.

**CO3:** Understanding tension members and compression members.

**CO4:** Understanding supported, unsupported, and plated beams.

### Course Content

#### Unit I: Steel

**No. of Hours 08**

- Structural Properties of steel and use of steel as a structural material.
- Classification of rolled steel sections and their properties.

#### Unit II: Connections

**No. of Hours 07**

- Riveted, Bolted & Pinned connection.
- Welded connections.

#### Unit III: Tension

**No. of Hours 08**

- Design of Tension members.
- Design of compression members, lacing & bracing

#### Unit IV: Beams

**No. of Hours 07**

- Analysis and Design of simple Beams & Plated Beams.

### Learning Experience

In the study of steel as a structural material, students will first explore the structural properties of steel, including its classification and various rolled steel sections. The course will introduce the fundamental techniques of creating and analyzing different types of connections, such as riveted, bolted, pinned, and welded connections, emphasizing their applications and properties. Students

will then delve into the design of tension members and compression members, including the design of lacing and bracing systems. Finally, the course will cover the analysis and design of simple beams and plated beams, providing a comprehensive understanding of steel structure design principles and their practical applications in construction.

### Textbooks

1. Punmia, B. C., Jain, A. K. & Jain, A. K., Comprehensive Design of Steel Structures, Laxmi Publications (P) Ltd., New Delhi.

### Suggested Readings

1. BIS (1984) Indian Standard Code of Practice for General Construction in Steel IS : 800.
2. Duggal, S. K. Design of Steel Structures, Tata McGraw Hill Publishing Company Ltd., New Delhi.
3. Singh, H. Analysis & Design of Steel Structures for Architects, Abhishek Publications, Chandigarh.
4. Arya, A. S. & Ajmani, J. L. Design of Steel Structures, Nem Chand & Bros., Roorkee.

### Open Educational Resources (OER)

1. "Steel Design" by the Open University
2. "Structural Steel Design" by NPTEL (National Programme on Technology Enhanced Learning)
3. "Introduction to Structural Engineering" by MIT Open Courseware

### Evaluation Scheme

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR310</b>	<b>BUILDING SERVICES III (ACOUSTICS)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Understanding services Implementation in design</b>					

### Course Perspective

This course will give basic understanding about the science behind building acoustics. It will also help students for applying prediction methods to assess the functional requirements of firefighting services in the buildings. To familiarize the students with fundamentals of acoustics and firefighting in building services & their integration with architectural design

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the basics of acoustics.

**CO2:** Applying the fundamentals of acoustics in building design.

**CO3:** Analysing with technical accuracy in both professional and academic environments.

### Course Content

#### Unit I: Acoustics

**No. of Hours 08**

- Introduction to the study of acoustics, basic terminology, sound and distance – inverse square law; absorption of sound, sound absorption co-efficient.
- Reverberation time, Sabines' formula, various sound absorbing materials. Behaviour of sound in enclosed spaces, Acoustical defects
- Noise and its types – outdoor and indoor noise, air born noise, structure borne noise, impact noise.
- Noise control at neighbourhood and city level.

#### Unit II: Design

**No. of Hours 07**

- Acoustical design for halls used for drama, music, speech, cinema theatres and open-air theatres.
- Acoustical materials and constructional measures of noise control, insulation of machinery, sound insulation.

#### Unit III: Fire Fighting & Fire Protection

**No. of Hours 08**

- Causes of fire, reasons for loss of life due to fire, development of fire, fire load, fire hazards
- National Building Code: grading of structural elements due to fire, classification of building types, norms for fire-exit ways and building materials, concept of fire zoning, doorways, stairways, passages and corridors, fire escapes etc.

- Rules for fire protection and firefighting requirements for high-rise buildings in India
- Brief description of characteristics of combustible and non-combustible materials in case of fire

#### Unit IV: Fire Preventive techniques

No. of Hours 07

- Fire resisting materials, fire resistant rating
- Concepts in passive fire protection and control – including design of escape routes, pressurization and compartmentation, etc.
- Active fire control using portable extinguishers. Basic concepts in fixed fire fighting installations.
- Automatic fire detection and alarm systems
- Fire preventive techniques, fire protection equipments

#### Learning Experience

In this course, students will gain a comprehensive understanding of acoustics and fire safety within building design. The acoustics segment will cover fundamental concepts such as sound behaviour, absorption, and the effects of acoustical defects, including noise types and control measures at various levels. Students will explore acoustical design for specialized spaces such as theatres and halls and learn about materials and techniques for sound control. The fire safety module will introduce the causes and development of fires, fire hazards, and the relevant regulations and codes, including the National Building Code's fire safety provisions. Students will also study fire prevention techniques, including the use of fire-resistant materials, design principles for escape routes, and both active and passive fire protection systems, including automatic detection and alarm systems.

#### Textbooks

1. Michael Ermann, Architectural Acoustics Illustrated, Wiley.
2. Koenigsberger, O.H; Manual of Tropical Housing and Building: Universities Press, 2010

#### Suggested Readings

1. Catalogues of leading Audio equipment's companies
2. Egan, Architectural Acoustics
3. Kanda swamy, Architectural Acoustics and Noise Control
4. J.E. Moore, Design for Good Acoustics and Noise Control.
5. National Building Code 2005 Templeton, D., Acoustics in the Built Environment.
6. A.B. Wood, A Text book of sound. Yarwood, T.M., Acoustics.

#### Open Educational Resources (OER)

1. "Introduction to Acoustics" by OpenStax
2. "Fundamentals of Fire Protection Engineering" by National Fire Protection Association (NFPA)
3. "Fire Safety and Protection Systems" by MIT Open Courseware

#### Evaluation Scheme

Components	Mid Term Exam	Term Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR312</b>	<b>AIR CONDITIONING &amp; MECHANICAL SERVICES</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Understanding basics Implementation in design</b>					

### Course Perspective

This course imparts the basic concepts of environment and climate. It enables them to design and enhance a site according to the location, climate and needs of the client. The course introduces the basic concepts about human comfort, ways of achieving it, solar geometry- its implementation in designing buildings as per orientation, shading devices-designing, wind movement patterns around buildings, etc.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1:** Understanding the principles and importance of artificial ventilation for enhanced building comfort.

**CO2:** Understanding the working principles of air conditioning and ventilation systems.

**CO3:** Understanding the design and operation of lifts and escalators for improved building functionality.

**CO4:** Applying knowledge of mechanical systems to optimize building comfort through the integration of ventilation, air conditioning, and mechanical systems.

### Course Content

#### Unit I: Human Comfort conditions

**No. of Hours 07**

- Need for mechanical ventilation in buildings.
- Rate of ventilation for different occupancies,
- Methods and equipment employed for mechanical ventilation in buildings.

#### Unit II: Air Conditioning

**No. of Hours 08**

- Principles of Air-conditioning, Indoor Air Quality, Carnot cycles, gas laws, refrigeration, cycles and refrigerants.
- Architectural considerations for air-conditioned buildings
- Definition, advantages and disadvantages, brief introduction to psychometric process, air-cycle and refrigeration cycle. Summer and winter air-conditioning, calculation of air-conditioning loads
- Zoning: purpose and advantages. Air-distribution systems: Ducts and duct systems. Air-outlets
- Compressors, condensers, evaporators, heat exchangers, etc.

#### Unit III: Air-conditioning methods and equipment

**No. of Hours 08**

- Window units, split units, ductable air conditioners and package system.

- Central air-conditioning systems: AC plant and room, all air systems and chilled water systems, AHU and FC units, Building ducting, diffusers and grills.
- Location of air-conditioning equipment in buildings. Architectural requirement of various equipment, Residential and commercial air-conditioning, energy conservation techniques.
- Introduction to the concept of 'Clean Room' and their architectural requirements

#### Unit IV: Lifts and Escalators

**No. of Hours 07**

- Working and operation of lifts, parts of lifts; industry standards and capacity calculations.
- Provision to be made in buildings for installation: location, systems, sizes, equipment, spatial requirement
- Introduction to working of escalator and design, escalator's location, equipment

#### Learning Experience

In this course, students will delve into essential aspects of mechanical ventilation and air conditioning systems in buildings. They will explore the principles and need for mechanical ventilation, including ventilation rates for different occupancies and the methods and equipment used. The air conditioning segment will cover fundamental principles, including indoor air quality, refrigeration cycles, and the architectural considerations required for effective air conditioning. Students will learn about different air conditioning systems, such as window units, split systems, and central air systems, along with their components like compressors and heat exchangers. They will also study zoning, air-distribution systems, and energy conservation techniques. Additionally, the course will introduce lifts and escalators, including their operation, industry standards, and spatial requirements for installation.

#### Textbooks

1. Grondzik, WT, Kwok, AG, Stein, B, Reynolds, JS Mechanical and Electrical Equipment for Buildings, Wiley.

#### Suggested Readings

1. "HVAC Fundamentals" by Samuel Sugarman
2. "Principles of Heating, Ventilation, and Air Conditioning in Buildings" by John W. Mitchell and James E. Braun
3. "Elevator and Escalator Maintenance for Building Personnel" by Richard W. Thompson

#### Open Educational Resources (OER)

1. "Introduction to Mechanical Ventilation" by National Institute of Building Sciences (NIBS)
2. "Fundamentals of Air Conditioning" by MIT OpenCourseWare
3. "Elevators and Escalators Design and Installation" by ASME

#### Evaluation Scheme

Components	TEST 1	TEST 2	Quizzes/Tutorials/Assignment 1	Quizzes/Tutorials/Assignment 2	Attendance	End term exams
Weightage (%)	10	10	10	10	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)



<b>ADARE6</b>	<b>ELECTIVE -VI (HUMAN SETTLEMENT)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Understanding basics Logical thinking</b>					

### Course Perspective

Focus shall be on learning from growth and development of traditional human settlements. Aspects affecting their evolution and socio-cultural and other related aspects. Learning through case studies and literature studies along with relevant site visits shall be preferable. Familiarization with parameters responsible for evolution of human civilization and human settlements with a view to have a better understanding of the history of architecture at later stages. Introduction to the architecture of the ancient world and understanding architecture of periods in terms of space, form and structure. To generate an understanding about the development of civilization and its architectural implications. To Critically analyse learning's from development of informal and formal Human Settlements

### Course Outcomes

**Upon completion of the course the learner will be able:**

- CO1:** Understanding civilization settlement in relation to history and white designing.
- CO2:** Understanding basic skills in planning and understanding the evolution of scope.
- CO3:** Understanding principles and criteria for settlement.
- CO4:** Analysing development and architectural characteristics.

### Course Content

#### **Unit I: Evolution and Development of Human Settlements** **No. of Hours 08**

- Origin and Growth of Human Settlements, River Banks as carriers to growth of Human Settlements;
- River valley Settlements: Greek, Roman, Medieval, Renaissance and Modern.

#### **Unit II: Human Settlements in India** **No. of Hours 07**

- Human Settlements in India since the ancient to medieval and Modern periods.
- Factor affecting their development and extinction: Socio- Cultural, Disasters and Environmental Aspects.

#### **Unit III: Study and Analysis of Informal and Formal Settlements** **No. of Hours 08**

- Detailed Analysis of selected informal and formal human settlements in the world and India for deriving learnings for contemporary usage especially in the context of efficient management of Resources,

- Solid Waste Management, Sustainability and Preservation of Cultural Practices.

**Unit IV: Criteria for contemporary Sustainable human settlements      No. of Hours 07**

- A critical evaluation and discussion of new emerging concepts methods and tools, and cases like Masdar City,
- Auroville for upcoming challenges in human settlements for developing countries.

**Learning Experience**

This course provides a comprehensive examination of human settlements from their origins to contemporary issues. Students will explore the evolution of human settlements, focusing on their growth along riverbanks and through various historical periods including Greek, Roman, Medieval, Renaissance, and Modern eras. The course will also cover human settlements in India, examining their development from ancient to modern times and the factors influencing their growth or decline, such as socio-cultural dynamics, environmental challenges, and disasters. Students will analyze both informal and formal settlements globally and within India, learning about resource management, solid waste management, and sustainability practices. Finally, the course will critically evaluate contemporary sustainable human settlement concepts and case studies, such as Masdar City and Auroville, addressing emerging challenges faced by developing countries.

**Textbooks**

1. Water Conservation Techniques in Traditional Human Settlements by Pietro Laureano.
2. Human Settlements: The Environmental Challenge. A compendium of United Nations papers prepared for the Stockholm conference on Human Environment 1972.
- 3.

**Suggested Readings**

1. The Evolution of Human Settlements from Pleistocene Origins to Anthropocene Prospects by Bowen, William M., Gleeson, Robert E.
2. History of human settlements and urban design from the early ages to the end of the 19th century (Council of Planning Librarians. Exchange bibliography) Unknown Binding – 1969 by Gideon Golany
3. Evolution of human settlements in India by S.P. Chatterjee
4. Human Settlements and Planning for Ecological Sustainability: The Case of Mexico City by Keith Pezzoli John Friedmann.

**Open Educational Resources (OER)**

1. "Human Settlements: Past, Present, and Future" by Open University
2. "Sustainable Urban Development: Analysis and Case Studies" by Coursera
3. "Informal Settlements and Sustainable Development" by UN-Habitat

**Evaluation Scheme**

Components	Mid Term Exam	Class Test/ Assignment	Presentation/	Attendance	End Term Exam
Weightage (%)	20	20		10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

## **SEMESTER -VII**

<b>ADAR401</b>	<b>ARCHITECTURAL DESIGN-VI</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>150 hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	Conceptualization and functioning of Buildings/ Integration of Services, Structural and Construction systems					

## Course Perspective

The course aims to enable students to apply the knowledge gained in previous semesters in areas such as architectural design, construction, and building services. It focuses on sensitizing students to context-specific spatial factors critical to effective design, emphasizing responsiveness to the unique characteristics of each environment. Additionally, the course seeks to raise awareness of the special needs of differently-abled individuals with various physical limitations, guiding students to create accessible and inclusive built environments.

An integrated approach is encouraged, where structural systems, construction methods, and building services are seamlessly incorporated into the design process. This holistic integration aims to produce thoughtful and functional architectural solutions that respond to both practical and social aspects of the built environment

## Course Outcomes

### Upon completion of the course the learner will be able:

- CO1. Understanding Service based Design projects like Hospitals, Hotels, Airports, Transportation Hubs and Commercial Complexes.
- CO2. Creating Portfolios which include presentation drawings, construction systems, materials and services.
- CO3. Analysing Architectural models of structural forms and important aspects of functionality.
- CO4. Applying all bye laws including fire safety norms for the building

## Course Content

**No. of Hours 150**

Projects shall be of urban scale with multiple functions and a need for imagery as one of the architectural goals.

Design issues should address the following:

- Macro and micro climate
- User behaviour and requirements Utility and space enhancement Form and function
- Circulation: horizontal and vertical. Site Planning and Landscape detailing
- Structural details such as beam framing, building services / HVAC etc.
- Use of innovations in materials and techniques of construction.
- Energy efficient design, water conservation and waste recycling
- Energy Management systems Lighting and acoustics
- Communications and security systems
- Design detailing considering the barrier free environment
- Socio-economic profile of user group
- Parking details and standards
- Application of energy rating systems viz. LEED, GRIHA

- Design of high-rise buildings/services-oriented buildings like Multiplexes; Shopping malls, commercial complexes, 5-star hotels, theme-based hotels, recreational buildings, hospitals, IT centres etc.
- Design of transport terminal like airports, bus terminals, railway station, etc.

All portfolios to include two drawings showing construction system and materials, services. Architectural models of various structural forms and important historical buildings should be preserved in the Architecture museums of the college for the use in History of Architecture classes.

## Learning Experience

The course will be delivered through a variety of engaging and interactive methods aimed at enhancing student learning. These include lecture sessions supported by ICT technology, literature-based case studies, and live case studies that focus on service-oriented buildings, such as hospitals, hotels, and commercial complexes. Site visits will be organized to align with studio-based design problems, providing practical exposure to relevant architectural contexts. Additionally, students will present their work before internal and external juries for comprehensive feedback.

Collaboration will be emphasized through group work, assignments, and topic presentations, allowing students to deepen their understanding of each subject. Hands-on learning will be facilitated through model-making activities, and industry experts will conduct sessions to bridge theory and practice. This course is designed to offer a rich experiential learning environment that fosters collaboration, encourages group discussions and peer reviews, and provides regular support and constructive feedback. Students are encouraged to seek additional assistance whenever needed to fully benefit from the course.

## Reference books

1. Hospitals - G D Kunders,
2. Time-Saver Standards for Building Types
3. Architectural Standard Ernst Peter Neufert Architects Data
4. Time-Saver Standards for Architectural Design Data

## Open Educational Resources (OER)

<https://nptel.ac.in/>

<https://swayam.gov.in/>

## Evaluation Scheme

**Quiz/Assignment/ presentation/ extempore/ Written Examination/Internal jury/External Jury**

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR403</b>	<b>BUILDING CONSTRUCTION AND MATERIALS -VII</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>5</b>
<b>Category of Course</b>	<b>Major (Studio)</b>					
<b>Total Contact Hours</b>	<b>75 hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	Understanding of basic structural design aspect & construction techniques / Observation, drawing skills, maintaining journals for construction materials.					

## Course Perspective

This course aims to equip students with practical knowledge and skills to handle contemporary construction challenges and innovate in the design and execution of complex structures.

## Course Outcomes

**Upon completion of the course the learner will be able to:**

- CO1. To Understand Prefabrication/ Precast Techniques
- CO2. To understand and analyse modern construction systems and techniques used in large scale buildings and other architectural projects.
- CO3. To understand design and use of innovative & low-cost construction techniques.

## Course Content

**No. of Hours 5**

### Unit I: Prefabrication Systems

- Introduction to Prefabrication- Definition, advantages, and challenges of prefabrication in construction
  - Open prefab system: Design principles, components, and assembly methods
  - Large panel prefab system: Types of large panels, joints, and connections
- Pre-casting Methods- Introduction to pre-casting techniques such as precast concrete, precast walls, and precast slabs
  - Materials used in pre-casting and their properties
- On-site and Off-site Prefabrication
  - Comparison between on-site and off-site prefabrication methods
  - Planning and management considerations for on-site and off-site prefabrication

### Unit II: Pre-stressed Concrete

- Design principles and construction techniques for pre-stressed concrete structures with large spans
- Pre-stressing, Pre-tensioning and post-tensioning Definition, advantages, and applications of pre-stressed concrete
  - Methods of Pre-stressing, Pre-tensioning, and post-tensioning techniques
  - Anchorage systems and their design considerations
- Application of Pre-stressed Concrete in Large Space Structures
- Case studies of notable pre-stressed concrete projects

### Unit III: Innovative, low-cost construction & Speedy Construction techniques

- Techniques Using Recycled Waste Materials
  - Utilization of PET bottles, glass bottles, wooden planks, cardboards, etc. in construction

- Design and construction considerations for structures using recycled waste materials
- Sustainable construction techniques Using Bamboo, Coir, Glass Fibre, Polymers, Fly Ash, etc.

#### **Unit IV: Intelligent Buildings**

- High Tech Building Systems: Introduction to Intelligent building systems and their areas of application in architecture; Role, Types and uses of Sensors, Actuators etc in contemporary practice

Material properties, design principles, and construction methods for innovative and low-cost structures

Speedy Construction: Mivan technology, Siporex construction etc.

#### **Learning Experience**

The course will be conducted through lecture sessions through ICT technology; Literature based case study, live case study, site visits, internal and external jury, group work, assignments or presentation on particular topics, hands on learning through models and Industry expert sessions. Students will have experiential learning, opportunities to collaborate and support each other through group discussion and peer reviews. Besides mentioning the support and feedback that shall be given, students are encouraged to seek help as needed.

#### **Reference books**

1. Foster, Stroud Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.
2. Singh, Gurucharan Building Construction Engineering, Standard Book House, New Delhi.
3. McKay, W. B. Building Construction (Metric), Longman, London, vol. 1 to 5.
4. Prabhu, Balagopal T. S. Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
5. Barry, R Construction of Buildings, London, vol. 1 to 5.
6. Punmia, B. C. Building Construction, Delhi. s

#### **Open Educational Resources (OER)**

<https://nptel.ac.in/>

<https://swayam.gov.in/>

#### **Evaluation Scheme**

**Quiz/Assignment/ presentation/ extempore/ Written Examination/Internal jury/External Jury**

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations)

<b>ADAR407</b>	<b>PROJECT CONSTRUCTION MANAGEMENT</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Understanding/ Logical thinking</b>					

### Course Perspective

This course aims to equip students with a comprehensive understanding of the construction industry and the key principles of construction project management.

### Course Outcomes

#### Upon completion of the course the learner will be able:

- CO1. Understanding the engineering properties of aggregate.
- CO2. Able to identify the grade & properties of bitumen
- CO3. Able to know various hierarchical levels of transport planning.
- CO4. Able to analyse and use standard and locally available matter for roads.
- CO-5 Learning to create and employ computer applications in construction management using MS

Projects based on project progress

### Course Content

#### UNIT I:

**No. of Hours 8**

- Introduction & definition of Project construction management
- Project functions, planning process.
- Project work breakdown, Modelling and analysing networks and work scheduling process.

#### UNIT II:

**No. of Hours 7**

- Bar charts and Mile stone charts. Network analysis fundamentals, CPM Network analysis procedure. PERT - Network, Time estimates, Probability Distribution, Critical Path, Slack and Probability of achieving completion date.

Project cost analysis - Cost versus time, Contracting the Network etc.

#### UNIT III:

**No. of Hours 8**

- Resource Allocation - Resource Smoothing and Resource Levelling.
- Updating the network based on the project progress.

#### UNIT IV:

**No. of Hours 7**

- Computer applications in construction management – using MS Projects software for project planning, scheduling and control

### Text Books

1. Col. Prof Harbhajan Singh, "Construction Project Management", Abhishek Publications, Chandigarh, 2009
2. Dr B.C Punmia, Building Construction



## Learning Experience

**Inside the Classroom:** The course will be conducted through interactive lecture sessions supported by ICT technology. Students will engage in literature-based case studies, participate in group work, and present on specific topics. Industry expert sessions will also be integrated to provide practical insights. This classroom setting is designed to promote active learning and foster a deep understanding of the subject matter.

**Outside the Classroom:** Experiential learning will be a key aspect, with students encouraged to collaborate, share ideas, and support each other through group discussions and peer reviews. Site visits will offer real-world context and hands-on learning opportunities. Regular feedback and support will be provided throughout, and students are encouraged to seek additional help whenever needed to enhance their understanding and application of the course concepts. This holistic approach aims to foster both individual and collaborative growth.

## Reference Books/Materials

1. Srinath, L.S., "PERT and CPM - Principles and Applications", Affiliated East - West Press Pvt. Ltd., New Delhi, 1989.
2. Stevens, James. D., "Techniques for Construction Network Scheduling", McGraw - Hill Publishing Company, New York, 1990.
3. Mukhopadhyay, S.P., "Project Management for Architects and Civil Engineers", Firma KLM Pvt. Ltd., Calcutta, 1981
- 4.

## Open Educational Resources (OER)

<https://nptel.ac.in/>

<https://swayam.gov.in/>

## Evaluation Scheme

### Quiz/Assignment/ presentation/ extempore/ Written Examination

Components	Mid Term Exam	Class Test/ Assignment	Presentation/	Attendance	End Term Exam
Weightage (%)	20	20		10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

<b>ADARE7</b>	<b>ELECTIVE-VII (Site Planning &amp; Landscape Design)</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Designing / Implementation in design</b>					

### Course Perspective

1. **Understanding Site Planning and Landscaping:** The course aims to provide students with a comprehensive understanding of site planning and landscaping, emphasizing their importance in creating functional and aesthetic outdoor spaces.
2. **Recognizing Landscape Elements:** Students will learn to identify and appreciate key landscape elements such as landforms, plantations, water bodies, and structures, and understand their roles in shaping the landscape design.
3. **Analysing Site Elements:** The course will help students analyse site elements as both opportunities (potentials) and limitations (constraints), guiding them in synthesizing these factors to create effective, simple landscape schemes.
4. **Exploring Models and Tools:** Students will gain knowledge of various models and tools used in landscape design, helping them apply theoretical concepts in practical settings.
5. **Insight into Landscape Architecture Profession:** The course will also offer an understanding of the profession of landscape architecture, including the various agencies and stakeholders involved in landscape planning and design.

Through these learning goals, students will gain a well-rounded understanding of landscape architecture, preparing them to integrate environmental, cultural, and functional considerations into their designs.

### Course Outcomes

#### Upon completion of the course the learner will be able:

CO1 Understanding about the background of site planning and landscape design

CO2 Understanding about the elements of site landscape in planning and design

CO3 Learning about the variety of trees and plants and the benefits we get from planning them in different conditions.

CO4 Analysing the working, models and tools of landscape graphics

CO5 Understanding typical problems and addressing those in landscape design

### Course Content

#### Unit I:

**No. of Hours 08**

Site planning & design. Site analysis with surrounds and site planning for large scale sites. The first part shall deal with an introductory of recourse so that land can be put to appropriate and efficient use. The second part shall deal at a micro level with emphasis on organization of space, site planning, visual elements etc. The exercises shall include physical design of parks, gardens, urban landscape projects, etc.

#### Unit II:

**No. of Hours 04**

- Site plan preparation, site and program analysis, conceptualization, master plan drawings and section graphics

### Unit III:

**No. of Hours 08**

- World landscape history. Development of landscape through understanding of the natural and cultural factors of the place in spatial and temporal framework.
- Studying various landscapes and garden designs from historical perspective study of English Mogul, Japanese gardens, their basic principles and historical, climatologically and social background in conjunction with the societal processes and corresponding design evolution.
- The Indian Context – Understanding attitudes to open space design in India, ancient horticultural practices, various influences in landscape and garden design like that of Mughal, British colonial and the Portuguese.

### Unit IV:

**No. of Hours 10**

- Planting design at various scales through proper understanding of the role of plant material in improvement of the environment visually and physically. This is supported by site visits, assignment and design exercises. Natural Design characteristics of Plant Materials and factors influencing choice of plant material for specific design applications;
- Plant selection from ecological, aesthetic, symbolic, functional point of view.
- planting for urban and rural roads, parks and open spaces, internal courtyards etc.
- Planting for wild life, land rehabilitation, plants growing in and around water bodies.
- Understanding and / or resolving of basic landscape design issues and elements through study of existing landscapes.
- Studying elements of landscape design, Projects dealing with simple function areas of smaller scale such as children's play area, parking areas, small plaza and similar urban situations.

### Learning Experience

**Inside the Classroom:** The course will be conducted through interactive lecture sessions supported by ICT technology. Students will engage in literature-based case studies, participate in group work, and present on specific topics. Industry expert sessions will also be integrated to provide practical insights. This classroom setting is designed to promote active learning and foster a deep understanding of the subject matter.

**Outside the Classroom:** Experiential learning will be a key aspect, with students encouraged to collaborate, share ideas, and support each other through group discussions and peer reviews. Site visits will offer real-world context and hands-on learning opportunities. Regular feedback and support will be provided throughout, and students are encouraged to seek additional help whenever needed to enhance their understanding and application of the course concepts. This holistic approach aims to foster both individual and collaborative growth.

### Text Books

1. Thomas H Russ, Site Planning and Design Handbook, 2009, McGraw Hill, New York

### Reference Books/Materials

1. Lynch Kevin, Hack Garry, Site Planning, The MIT press, 1984

2. Elizabeth Boult, Chip Sullivan, Illustrated History of Landscape Design, 2010, John Wiley & Sons, Inc.
3. James A. Lagro Jr., Site Analysis, John Wiley & Sons, Inc., 2013
4. Nancy Rottle & Ken Yocom, Basics-- Landscape Architecture 02 -- Ecological Design, Ava Publishing SA, 2010

### **Open Educational Resources (OER)**

<https://nptel.ac.in/>

<https://swayam.gov.in/>

### **Evaluation Scheme**

#### **Quiz/Assignment/ presentation/ extempore/ Written Examination**

Components	Mid Term Exam	Class Test/ Presentation/ Assignment	Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

<b>ADARE8</b>	<b>Course Title</b> <b>ELECTIVE-VIII (Interior Design)</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>30hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic knowledge of design/ Creativity</b>					

### Course Perspective

1. **Understanding Interior Design Theories:** Gain foundational knowledge of key theories that guide interior design practices.
2. **Improving Interior Design Techniques:** Explore and apply innovative techniques to enhance the quality and effectiveness of interior design.
3. **Integrating Vaastu Shastra:** Understand the principles of Vaastu Shastra and how to incorporate them into design projects for balance and harmony.
4. **Developing Design Skills:** Focus on honing design abilities by applying various interior design principles to create functional and aesthetic spaces.

### Course Outcomes

**Upon completion of the course the learner will be able:**

**CO1 Understanding Interior Design Theories:** Gain foundational knowledge of key theories that guide interior design practices.

**CO2 Improving Interior Design Techniques:** Explore and apply innovative techniques to enhance the quality and effectiveness of interior design.

**CO3 Integrating Vaastu Shastra:** Understand the principles of Vaastu Shastra and how to incorporate them into design projects for balance and harmony.

**CO4 Developing Design Skills:** Focus on honing design abilities by applying various interior design principles to create functional and aesthetic spaces.

### Course Content

#### Unit I:

**No. of Hours 08**

- Definition of Interior design, Role of an Interior designer and future prospectus.
- Understanding various spaces like living spaces, retail spaces, work spaces, public spaces, transient spaces etc. with respect to Interior design. Material exploration for space making elements like wall, floor, ceiling

#### Unit II: lectures

**No. of Hours 07**

**12**

- Interior space design with focus on furniture, day light and artificial light, indoor plants and material usage to understand overall impact of above-mentioned elements on any space.

**Unit III:****No. of Hours 08**

- Works of great masters in the field and their philosophies, modern trends of interior design focus on furniture design, color application and automation of fixtures in order to save energy.

**Unit IV:****No. of Hours 07**

- Definition of Vastu shashtra, its basic principles and its application in any interior space.

Please note: The course shall include sketching and understanding of various categories of interior spaces, their measured drawings and visit to places of different concepts of interior design

**Learning Experience**

**Inside the Classroom:** The course will be conducted through interactive lecture sessions supported by ICT technology. Students will engage in literature-based case studies, participate in group work, and present on specific topics. Industry expert sessions will also be integrated to provide practical insights. This classroom setting is designed to promote active learning and foster a deep understanding of the subject matter.

**Outside the Classroom:** Experiential learning will be a key aspect, with students encouraged to collaborate, share ideas, and support each other through group discussions and peer reviews. Site visits will offer real-world context and hands-on learning opportunities. Regular feedback and support will be provided throughout, and students are encouraged to seek additional help whenever needed to enhance their understanding and application of the course concepts. This holistic approach aims to foster both individual and collaborative growth

**Reference Books**

1. Kasu A Ahmed 2005, Inside Design ,6TH Edition, Om Publishers
2. Joseph Dechiara , Julius Panero , Martin Zelnik, Time-Saver Standards for Interior Design and Space Planning, II Edition, McGraw Hill Education
3. Francis D. K. Ching, Architectural Graphics 2009, 5th Edition ,Wiley
4. Premavathy Seethe & Raman Parveen Pannu, Interior Design & Decoration CBS Publishers & Distributors Pvt. Ltd, 2005. Francis D. K. Ching, Corky Binggeli, Interior Design Illustrated 2012 John Wiley & Sons; 3rd Revised edition edition

**Open Educational Resources (OER)**

<https://nptel.ac.in/>

<https://swayam.gov.in/>

**Evaluation Scheme****Quiz/Assignment/ Presentation/ Extempore/ Written Examination**

Components	Mid Term Exam	Class Test/ Assignment	Presentation/	Attendance	End Term Exam
Weightage (%)	20	20		10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

VAC142	VAC-II (HUMAN VALUES & SOCIOLOGY)	L	T	S	P	C
Version	1.0	2	0	0	0	2
Category of Course	Major (Theory)					
Total Contact Hours	30hrs					
Pre-Requisites/ Co-Requisites	Basic knowledge of design/ Creativity					

### Course Perspective

1. To learn about the different essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings
2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity, which forms the basis of Universal Human Values and movement towards value-based living in a natural way.
3. To understand the basic social processes of society, social institutions, and patterns of social behaviour.
4. To understand the relationship between the individual and environment or social setting, spaces and built environment.

### Course Outcomes

#### Upon completion of the course the learner will be able:

- CO1. Appreciating the essential complementarily between 'VALUES' and 'SKILLS' through.
- CO2 Understanding the relation between life and profession and living in harmony at various levels of existence.
- CO3 Understanding the relationship between human and social settings.
- CO4. Creating the relationship between architecture, spaces and built environment.

### Course Content

#### Unit-I. Value Education:

**No. of Hours 8**

- Understanding the need, basic guidelines, content and process for Value Education
- Self-Exploration–what is it? - its content and process; ‘Natural Acceptance’ and Experiential Validation- as the mechanism for self-exploration
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

#### Unit-II. Understanding harmony at various levels of existence

**No. of Hours 7**

- Understanding Harmony in the Human Being - Harmony in Myself!
  - needs of Self (‘I’) and ‘Body’ - Sukh and Suvidha
  - Understanding the harmony of I with the Body: Sanyam and Swasthya
- Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship
  - Understanding values in human-human relationship; meaning of Nyaya, Trust (Vishwas) and Respect (Samman) as the foundational values of relationship
  - Understanding the harmony in the society (society being an extension of family):Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals

- Understanding Harmony in the Nature and Existence - Whole existence as Co-existence
- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature
- Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space

### Unit-III. Sociology:

**No. of Hours 7**

- What is Sociology? Relationship between Sociology and Architecture with examples.
- Concept of society and its types- rural and urban
- Social Institutions- family, educational, religion
- Social Interaction- Verbal and non- verbal

### Unit-IV. Space and built environment

**No. of Hours 8**

- Sociology of space and built environment
- Utilisation of space for social activities in rural and urban areas.
- Social history of built environment- space and power
- 

### Learning Experience

**Inside the Classroom:** The course will be conducted through interactive lecture sessions supported by ICT technology. Students will engage in literature-based case studies, participate in group work, and present on specific topics. Industry expert sessions will also be integrated to provide practical insights. This classroom setting is designed to promote active learning and foster a deep understanding of the subject matter.

**Outside the Classroom:** Experiential learning will be a key aspect, with students encouraged to collaborate, share ideas, and support each other through group discussions and peer reviews. Site visits will offer real-world context and hands-on learning opportunities. Regular feedback and support will be provided throughout, and students are encouraged to seek additional help whenever needed to enhance their understanding and application of the course concepts. This holistic approach aims to foster both individual and collaborative growth

### Reference Books

1. Kasu A Ahmed 2005, Inside Design ,6TH Edition, Om Publishers
2. Joseph Dechiara , Julius Panero , Martin Zelnik, Time-Saver Standards for Interior Design and Space Planning, II Edition, McGraw Hill Education
3. Francis D. K. Ching , Architectural Graphics 2009, 5th Edition , Wiley
4. Premavathy Seethe & Raman Parveen Pannu , Interior Design & Decoration CBS Publishers & Distributors Pvt. Ltd, 2005. Francis D. K. Ching , Corky Binggeli, Interior Design Illustrated 2012 John Wiley & Sons; 3rd Revised edition edition

### Open Educational Resources (OER)

[https://onlinecourses.swayam2.ac.in/nou24\\_hs52/preview](https://onlinecourses.swayam2.ac.in/nou24_hs52/preview)

[https://onlinecourses.nptel.ac.in/noc23\\_hs89/preview](https://onlinecourses.nptel.ac.in/noc23_hs89/preview)



## Evaluation Scheme

### Quiz/Assignment/ Presentation/ Extempore/ Written Examination

Components	Mid Term Exam	Class Test/ Assignment	Presentation/ Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

## **SEMESTER -VIII**

<b>ADAR402</b>	<b>PROFESSIONAL TRAINING</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>
<b>Category of Course</b>	<b>Skill Enhancement Course (Practical)</b>					
<b>Total Contact Hours</b>	<b>30hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Practical learning/ Designing, site and drawing coordination</b>					

### Course Perspective

To offer students an opportunity to work in an architect's office and get acquainted with the demands of the profession. Improve communication and analytical skills for handling the assigned task. To create portfolio which include two sets of drawings showing construction system and materials, services and architectural presentation drawings. Showing construction system and materials, services and architectural presentation drawings.

### Course Outcomes

**Upon completion of the course the learner will be able:**

- CO1. Developing communication and analytical skills for handling the assigned task
- CO2. Performing duties under an architect with minimum professional experience of ten years to gauge the role of density, mixed land use, ground coverage and developmental control needs for the design of housing.
- CO3. Creating portfolio which include two sets of drawings showing construction system and materials, services and architectural presentation drawings.
- CO4. Understanding the processes and challenges of designing within constraints of time.

### Course Content

**No. of Hours 22 weeks**

The 22-week office training exposes students to the processes and challenges of designing in the real world. Students are expected to learn various aspects of the design process including design development, working drawings, presentation drawings, site visits, client and consultant meetings, and Project Management.

The Training Report shall consist of the various drawings, observations, technical graphic data, design, structure, construction methods, services, use of material etc. obtained during the process of training. The building study shall be a critical appraisal of one of the noted buildings designed and supervised by the firm in which the candidate has taken the training. The Building Material Study shall include pertinent data, characteristics and applications of a contemporary building material. The detailing study shall deal with the various aspects of an interesting detail done by the firm, where the candidate has done the training or any other project of interest

### Learning Experience

The course will be conducted through practical training under an architectural firm/govt organizations/Real estate Organization

### **Evaluation Scheme**

Components	End Term Internal Jury	End Term External Jury
Weightage (%)	50	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

## **SEMESTER -IX**

<b>ADAR503</b>	<b>URBAN DESIGN</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>
<b>Category of Course</b>	<b>Major(studio)</b>					
<b>Total Contact Hours</b>	<b>150hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Practical learning/ Designing, site and drawing coordination</b>					

### **Course Perspective**

This urban design course focuses on the design process, emphasizing problem identification, spatial standards, and the formulation of requirements. Students will explore building development within an urban context, examining relationships between structures and their environment. The course also addresses the integration of building bylaws, structural elements, site planning, landscaping, and services, ensuring cohesive urban environments. Through a blend of theory and practice, students will be prepared to create functional and harmonious spaces.

### **Course Outcomes**

**Upon Document completion of the course the learner will be:**

**CO1:** Understanding the key features of an urban area.

**CO 2:** Applying assessed community needs to propose development that integrates with the existing area.

**CO 3:** Analysing urban issues through site analysis to identify key community challenges.

**CO 4:** Evaluating these issues and formulating a vision to address them with urban design interventions.

**CO 5:** Creating solutions that implement the vision, promoting sustainable development and improving urban quality of life.

### **Course Content**

#### **Unit A: Introduction and Scope**

**No. of Hours 25**

- Relationship between Architecture, Urban Design and Urban Planning; Brief review of the evolution of the urban design as a discipline, basic principles and theories.
- Broad understanding of urban forms and spaces at various spatial scales through examples from historic cities

#### **Unit B: Typologies and Procedures**

**No. of Hours 35**

- Concepts of public and private realm; understanding different types and procedures of urban design interventions their scale relationships; constraints and challenges of urban design in democratic versus authoritarian settings

#### **Unit C: Elements of Urban Design**

**No. of Hours 35**

- Understanding the city as a three-dimensional element; Urban form as determined by interplay of masses, voids, order, scale, harmony, symmetry, colour and texture; Organization of spaces and their articulation in the form of squares, streets, vistas and focal

points; Concept of public open space; Image of the city and its components such as edges, paths, landmarks, street features

#### **Unit D: Urban Design and Sustainability**

**No. of Hours 25**

- Sustainability concept; Relationship of urban design with economic, environmental and social sustainability; Urban renewal and urban sprawl; Concepts of Transit Oriented Development, Compact City, Healthy City and Walkable City

#### **Unit E: Urban Design Implementation**

**No. of Hours 30**

- Urban design and its control; Institutional arrangements for design and planning, their roles, powers and limitations; Types of planning instruments, structure plans, master plans and local area plans and zoning guidelines; Design communication and role of public participation.

#### **Design Stages**

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

#### **Suggested Studio Exercises**

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

#### **Approach**

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

#### **Learning Experience**

The Urban Design course offers a rich learning experience both inside and outside the classroom. Inside, students engage in lectures and workshops covering key concepts in urban design,

architecture, and landscape architecture. Collaborative group discussions deepen their understanding of the public realm, while hands-on design projects allow for practical application of theoretical knowledge. Guest lectures from industry professionals provide valuable insights into current practices. Outside the classroom, students participate in site visits to analyze urban spaces, engage with local communities to gather input, and collaborate with urban planning agencies to understand relevant guidelines. Additionally, they showcase their design projects in public exhibitions, receiving feedback from peers and professionals.

**Reference Books:**

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

**Open Educational Resources (OER)**

<https://www.pmi.org/most-influential-projects-2021/top-10-by-industry/urban-development>  
<https://www.archdaily.com/tag/urban-renewal>

**Evaluation Scheme: Quiz/Assignment/ presentation/ extempore/ Written Examination**

Components	Mid Term Jury	End Term Internal Jury	End Term External Jury
Weightage (%)	20	30	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)



<b>ADAR501</b>	<b>DISSERTATION</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>
<b>Category of Course</b>	<b>Major (Practical)</b>					
<b>Total Contact Hours</b>	<b>90 hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Practical learning/ Designing, site and drawing coordination</b>					

### Course Perspective

This course aims to develop a foundational understanding of research purposes and methodologies relevant to architecture. Students will learn to apply literature reviews and case study methodologies in preparing minor research or dissertations on chosen topics related to their thesis projects. The course also emphasizes the use of scientific methods for conducting post-occupancy evaluations of buildings and built environments, enabling students to draw design guidelines for their thesis. Additionally, it covers essential presentation techniques for effectively communicating research outcomes and provides guidance on thesis writing. Ultimately, students will prepare an initial synopsis for their selected thesis project, equipping them with the skills necessary for academic and professional success in architecture

### Course Outcomes

**Upon completion of the course the learner will have:**

**CO1:** Understanding and practicing research ethics and responsible conduct

**CO 2:** Applying library and tools to analyse existing research related to their topic.

**CO 3:** Evaluating and identifying suitable research methodologies while applying problem-solving skills to overcome setbacks.

**CO 4:** Creating a clear research question and hypothesis, leading to a synopsis for an architectural thesis project.

### Course Content

The dissertation shall entail the following:

- Identification of an appropriate and focused research topic reflecting social and technological needs of the day.
- Formulate synopsis including objectives, scope of work, methodology of work, case studies to be undertaken, site selection culminating in broad functional requirements.
- An investigation of the topic using an analysis of existing literature, case studies and other data sources.
- To develop understanding of the research topic.
- Conclusions from the research

The dissertation shall be based on empirical study, field work, and textual analysis in the field of urban and rural planning. It should demonstrate candidate's capacity for analysis and judgment as also her/his ability to carry out independent viewpoint in interpretation.

The dissertation shall present an orderly & critical exposition of existing knowledge of the subject or shall embody results of original interpretation and analysis & demonstrate the capacity of the candidate to do independent research work. While writing the dissertation, the candidate shall lay out clearly the work done by her/him independently and the sources from which she/he has obtained other information.

The dissertation shall be well structured document with clear objectives, well-argued and appropriate conclusions indicating an appropriate level of expertise. The submission format for all stages shall be print and digital. Seminars in related areas to the dissertation topic (conceptual, historical, analytical, and comparative or in any other area related to Architecture & habitat) are required to be presented at all stages during the entire semester.

**Learning Experience** This course enhances students' critical thinking and prepares them for their final thesis project by focusing on formulating a comprehensive research synopsis, which includes defining research goals, scope, methodology, and relevant case studies. Throughout the semester, students will develop their research skills from initial hypothesis to final conclusions, presenting data in print and digital formats while addressing various aspects of architecture and habitat. Inside the classroom, they engage in lectures and workshops on research methodologies, participate in collaborative group discussions, and receive feedback during research seminars and individual consultations. Outside the classroom, hands-on library research and field studies provide real-world data analysis, while community engagement enriches insights. Public presentations allow students to showcase their findings and receive constructive feedback. This comprehensive approach ensures they are well-prepared for their thesis projects and develop essential skills for their future careers in architecture.

**Reference Books:**

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

**Open Educational Resources (OER)**

<https://www.grammarly.com/blog/how-to-write-a-research-paper/>

<https://www.scribbr.com/category/research-paper/>

**Evaluation Scheme: Quiz/Assignment/ presentation/ extempore/ Written Examination/ Internal Jury/ External Jury**

Components	Mid-term Jury	End term Internal Jury	End term External Jury
Weightage (%)	20	30	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

<b>ADARE9</b>	<b>ELECTIVE-IX (ARCHITECTURAL CONSERVATION)</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>45 hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Historical Context and significance of Buildings  Integration of legislation, approaches, materials to intervene in historical precincts</b>					

### Course Perspective

The course on Architectural Conservation aims to instil an awareness of the value of natural and historical heritage while sensitizing students to conservation issues. It familiarizes them with essential techniques and materials used in preservation efforts, enabling informed choices about subjects at the undergraduate level. This foundational knowledge allows students to further develop their interests in conservation, either in their professional careers or in postgraduate studies, should they choose to pursue that path. Through a comprehensive approach, the course prepares students to appreciate and engage with the critical aspects of architectural conservation.

### Course Outcomes

**Upon completion of the course the learner will have:**

**CO 1:** Understanding of sustainability and its process.

**CO 2:** Learn the process of documenting the work of sustainability.

**CO 3:** Analyse, troubleshoot, and implement sustainability related solutions with previously done works and researches

**CO 4:** Study and find better techniques of sustainability.

### Course Content

#### Unit A:

**No. of Hours 15**

- Definition of conservation and its socially accepted meanings, objectives.
- Theories, Principles and concepts of conservation and its application. –
- Legislation in conservation.

#### Unit B:

**No. of Hours 10**

- History of conservation movement in the world and Indian response to the movement.
- History of Indian conservation movement.
- Study through various examples in world on same.

#### Unit C:

**No. of Hours 10**

- Causes of Decay in Cultural property, External causes of Decay, Biological & Botanical causes, Natural disasters & Man-made causes of decay, Remedies for this decay.
- The context of inspecting historic building – Inventory – Initial inspections of buildings – continuing Documentation, norms for grading and enlisting.

#### Unit D:

**No. of Hours 10**

- Actual conservation techniques for relevant building materials. Some specifications & instruction about parts of buildings. Such as foundations walls, chhajjas, wall tops, roofs & terraces with various examples of conservation practiced globally.
- Discuss work of conservation architects - Research, analysis, presentation

**Learning Experience** In this learning experience, students will explore the critical issues of energy conservation in architectural design. Through a mix of theoretical study and practical application, they will tackle challenges related to optimizing energy efficiency in built environments. By examining sustainable materials, innovative technologies, and effective design strategies, students will gain hands-on experience in implementing energy-efficient solutions. This collaborative approach equips them with the skills to address real-world environmental challenges, fostering a deep understanding of the relationship between design and energy conservation in sustainable architecture.

**Text Books:**

1. Sir Bernard M. Feilden; Conservation of Historic Buildings, Architectural Press, London.
2. Sir Bernard M. Feilden; Guidelines for conservation; Architectural Press, London.
- 3.

**Suggested Readings:**

1. A.G. K. Menon & B. K. Thapar; Heritage Zones
2. Xavier Greffe; Managing our Cultural Property; Aryan Book International, New Delhi. Robert Pickard; Policy involved in Heritage Conservation;
3. Conservation in India: Architecture + Design; A Journal for the Indian Architect, Vol VI No 1, Nov Dec 1989.
4. William Dalrymple; City of Djinns; Bloomsbury Publishing India, New Delhi; 2017.

**Open Educational Resources (OER)**

<https://www.archdaily.com/1012700/conservation-architecture-in-india-living-buildings-and-cultures>

<http://architecturalheritage.intach.org/>

**Evaluation Scheme: Quiz/Assignment/ presentation/ extempore/ Written Examination**

Components	Mid Term Exam	Class Test/ Presentation/ Assignment	Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

<b>ADARE10</b>	<b>ELECTIVE-X (SUSTAINABLE ARCHITECTURE)</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>45</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Basic Understanding basics and logical thinking</b>					

### Course Perspective

The Sustainable Architecture course fosters an understanding of natural resources and their role in design while addressing sustainability issues through innovative solutions. Students gain hands-on experience with sustainable materials and construction techniques, equipping them with practical skills. The course encourages exploration of diverse subjects, facilitating informed choices for undergraduate studies that can be expanded in postgraduate programs or careers. By the end, students will be well-prepared to make meaningful contributions to sustainable architecture.

### Course Outcomes

Upon completion of the course the learner will be:

**CO1: Understanding sustainability and its processes to build a strong foundation in the subject.**

**CO2: Applying sustainability-related solutions by analysing and troubleshooting existing works and research.**

**CO3: Evaluating various techniques of sustainability to identify better practices.**

**CO4: Creating effective documentation processes for sustainability work to ensure clarity and impact.**

### Course Content

#### UNIT-A:

**No. of Hours 15**

- Brief introduction of Sustainable Development & Architecture
- Definitions, Principles, Challenges and responses.
- Millennium Development Goals
- Culture lifestyle and sustainability – Overview of Indian Culture and Ancient cultures of the world in context of reverence of nature and ecological systems.

#### UNIT-B:

**No. of Hours 10**

- Sustainable Architecture
- Definitions and Principles
- Environmental Impact of Buildings
- Sustainable design priorities

- Cultural and economic aspects
- Basics of Lifecycle Design
- Selected Examples of sustainable Architecture- Vernacular, Historical and Contemporary Buildings

**UNIT-C:**

**No. of Hours 10**

- Energy Conservation through design of built forms- passive design strategies for energy consumption.
- (Examples of current building projects)

**UNIT-D:**

**No. of Hours 10**

- Introduction to Low Impact Design Strategies
- Available sustainability measuring tools in World and India. (Overview)- LEED, GRIHA & IGBC, .ECBC

**Learning Experience**

**Inside Classroom:** Students will begin with an introductory lecture on energy conservation principles in sustainable architecture, followed by case studies of notable energy-efficient buildings. They will participate in a hands-on workshop where teams design a building optimized for energy conservation using tools like SketchUp or Revit. Throughout this process, expert guest speakers will provide valuable insights, and students will present their designs for peer feedback. Reflective discussions will conclude the inside experience, allowing students to articulate their understanding and plans for integrating energy conservation in their future work.

**Outside Classroom:** Students will enhance their observational skills through a field trip to local energy-efficient buildings or a virtual tour of significant sustainable structures. This experience will allow them to analyze real-world applications of energy conservation strategies and see how theory translates into practice. By engaging with actual designs, students will gain a deeper appreciation for the impact of architectural decisions on energy efficiency.

**Text Books**

1. Koenigsberger, O.H , Ingersoll, T.G. < Mayhew, A Szokolay, S.V. , 1973. Manual of Tropical Housing and BUilding Part1. Climatic Design, Orient Longman Pvt.Ltd.
2. Arvind Krishnan & Others – Climate Responsive Architecture, Tata Mcgraw –Hill New Delhi 2001

**Reference Books**

1. Mili Majunder, Teri – Energy – Efficient Bldg. in India – Thomson Press, New Delhi – 2001
2. J.K Nayak & Others , Energy Systems Energy Group,- Isa Annal Of Passive Solar Architecture.

**Open Educational Resources (OER)**

1. [https://onlinecourses.nptel.ac.in › noc20\\_ar01](https://onlinecourses.nptel.ac.in › noc20_ar01)
2. <https://www.udemy.com/topic/sustainable-architecture/>

**Evaluation Scheme: Quiz/Assignment/ presentation/ extempore/ Written Examination**

Components	Mid Term Exam	Class Test/ Presentation/ Assignment	Attendance	End Term Exam
Weightage (%)	20	20	10	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

## **SEMESTER X**



<b>ADAR502</b>	<b>ARCHITECTURAL THESIS</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>1.0</b>	<b>2</b>	<b>1</b>	<b>10</b>	<b>0</b>	<b>18</b>
<b>Category of Course</b>	<b>Major (Theory)</b>					
<b>Total Contact Hours</b>	<b>150</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Completion of All Design Studios till Semester VIII, Urban Design, Professional Practice</b>					

### Course Perspective

The Architectural Thesis course aims to help students understand the context and validate the need for their chosen thesis topic or ongoing project. It encourages independent analysis of the design brief, site conditions, bylaws, context, and limitations, enabling students to propose a coherent concept design. The course builds on knowledge acquired in previous semesters, allowing students to apply their understanding of architectural design, construction, and building services. It also sensitizes students to space-specific contextual factors that influence design decisions. Ultimately, the course prepares students to independently develop their projects, presenting all aspects of their architectural design process, from initial evolution to the final solution.

### Course Outcomes

**Upon completion of the course the learner will be:**

**CO 1:** Understanding the complete design process, including problem identification, requirement formulation, design criteria evolution, and proposal preparation.

**CO 2:** Applying intensive study and research techniques related to case studies, literature, and design standards.

**CO 3:** Analysing the incorporation of building services within the design project.

**CO 4:** Evaluating the context of design, including place, people, and time, and its impact on design solutions.

**CO 5:** Creating effective presentation skills, both verbal and visual, to demonstrate projects using software and 3D modelling techniques.

### Course Content

For reasons of maintenance of uniformity in results and standards, the thesis presentation shall be in two distinct compartments: a report comprising of all the preliminary studies required for the thesis topic, and the final design solution. The Thesis report shall consist of all relevant contextual studies: of user, place and time to enable the formulation of design criteria. The design solution shall be in the form of sheets and models of the concept and design and shall further include the presentation of at least one specific aspect relevant to the selected topic in complete detail. The

report, in triplicate, shall be submitted in bound form together with prints/photographs of all the drawings and models.

### **Learning Experience**

The course provides a rich learning experience through both inside and outside activities. Students engage in lectures and workshops focused on design theory, research methodologies, and project development, complemented by group discussions that encourage collaborative problem-solving. Individual consultations with instructors offer personalized guidance throughout the thesis process. Outside the classroom, field studies and site visits allow for real-world analysis and valuable insights, while community engagement enriches their understanding of user needs. Public presentations enable students to showcase their projects and receive constructive feedback. This comprehensive approach enhances their creative and analytical skills, fostering a deep understanding of the interplay between theory and practice, ultimately preparing them to make impactful contributions to the field of architecture.

**Evaluation Scheme: Quiz/Assignment/ presentation/ extempore/ Written Examination/ Internal Jury/External Jury**

Components	Internal Jury	External Jury
Weightage (%)	50	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)

<b>ADAR504</b>	<b>SEMINAR</b>	<b>L</b>	<b>T</b>	<b>S</b>	<b>P</b>	<b>C</b>
<b>Version</b>	<b>2.0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>5</b>
<b>Category of Course</b>	<b>Studio (Major)</b>					
<b>Total Contact Hours</b>	<b>75 Hrs</b>					
<b>Pre-Requisites/ Co-Requisites</b>	<b>Research and development</b>					

### **Course Perspective**

This aims to provide students with a comprehensive understanding of essential research terminologies and their applications. Students will learn to effectively conduct literature reviews in preparation for minor research projects and apply scientific methods, tools, and techniques throughout the research process. Additionally, the course emphasizes the importance of presentation techniques and academic writing skills. By the end of the course, students will be equipped to write a technical paper of approximately 6,000 words that showcases their original input and research findings. It ensures that students are well-prepared to engage in scholarly discourse and contribute meaningfully to their field.

### **Course Outcomes**

**Upon completion of the course the learner will be:**

**CO 1:** Understanding and articulating relevant terminology, concepts, and theories, and applying them effectively.

**CO 2:** Applying skills to articulate a clear research question and create a hypothesis.

**CO 3:** Analysing and demonstrating appropriate research methodologies.

**CO 4:** Evaluating and demonstrating effective oral presentation and structured writing skills.

**CO 5:** Creating awareness of research ethics and practicing responsible conduct in research.

### **Course Content**

#### **Unit A:** Introduction

- Learning the formulation of research question or hypothesis

#### **Unit B:** Writing a technical research paper

- Writing a paper of 6000 words in following stages:
- Formulation of an original research issue by ascertaining the gaps in research
- Synopsis with clear heads of Intent, Background, Aims and Objectives, Scope,
- Methodology.
- Structuring the body of the paper in detail
- Ascertaining Primary and Secondary Sources
- Referencing in Harvard Style
- Utilizing the sources to reach to the desired objectives

- Editing the paper.
- Students are encouraged to get their research papers published in indexed journals.

**Learning Experience** Conducting research on a chosen topic in architecture enhances critical thinking and communication skills. In the classroom, students explore philosophical frameworks and current trends, developing structured arguments supported by evidence. Presentations improve public speaking and foster collaboration through diverse idea exchanges. Outside the classroom, field studies and community interactions deepen their understanding of architectural discourse and real-world applications. This comprehensive experience bridges theory with practice and sharpens their analytical and communicative competencies, preparing them for impactful contributions in architecture.

### Reference Books:

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

### Open Educational Resources (OER)

<https://www.grammarly.com/blog/how-to-write-a-research-paper/>

<https://www.scribbr.com/category/research-paper/>

**Evaluation Scheme:** Quiz/Assignment/ presentation/ extempore/ Written Examination/ Internal Jury/External Jury

Components	Mid Term Jury	End Term Internal Jury	End Term External Jury
Weightage (%)	20	30	50

\*(It is compulsory for a student to secure 50% marks in Internal and End Term Practical Exam and Viva Voce separately to secure minimum passing grade as per COA & University regulations.)