CHOICE BASED CURRICULUM

FOR

BACHELOR

IN

ARCHITECTURE

DEPARTMENT OF ARCHITECTURE &

PLANNING

BIRLA INSTITUTE OF TECHNOLOGY

MESRA

RANCHI, INDIA

Effective from academic year 2026-27 onwards

Institute Vision

To become a Globally Recognized Academic Institution in consonance with the social, economic, and ecological environment, striving continuously for excellence in education, research, and technological service to the National needs.

Institute Mission

- To educate students at Undergraduate, Post Graduate Doctoral and Post-Doctoral levels
- to perform challenging engineering and managerial jobs in industry.
- To provide excellent research and development facilities to take up Ph.D. programmes
- and research projects.
- To develop effective teaching and learning skills and state of art research potential of the
- faculty.
- To build national capabilities in technology, education, and research in emerging areas.
- To provide excellent technological services to satisfy the requirements of the industry and
- overall academic needs of society.

Department Vision

The underlying vision for the Department of Architecture is to make the department an academic knowledge hub that will actively contribute in the contemporary domain, by

- Providing innovative professionals who will contribute wholesomely to nation building.
- Providing individuals who can make significant contribution to the advancement of the society.
- Preparing students for leadership roles in the fields of Architecture

Department Mission

The mission of the Department of Architecture is to foster a student-centered educational program in architecture and urban planning. The programmes through its pedagogy which is heuristic and responsive to technological, cultural, and social environments, seeks to offer a diverse, inter-disciplinary and rigorous curriculum that will promote personal development and
professional excellence. The Department is committed in:

- Imparting strong fundamental concepts to students and motivate them to find innovative solutions to architectural and planning problems independently
- Developing architects and planners with managerial attributes capable of applying latest technology with responsibility
- Creation of congenial atmosphere and excellent research facilities for undertaking quality research by faculty and students

Programme Educational Objective (PEO)

1. To provide high quality education that prepares students to assume professional roles in architecture by imparting sound knowledge in design theories and applications, building technologies, social cultural, environmental factors and applications of computer aided design.
2. To Prepare students to work in multi- disciplinary teams within the building industry by providing knowledge in built environment related disciplines relevant to professional ethics and obligation.
3. Prepare professionals to tackle and manage resource constraints in professional situations through appropriate project management and real estate interventions.
4. Engage in lifelong learning, additional and continual formal education, professional development, research activities and self-study to provide high quality service to the public, employees, client and other professionals.

Program Outcomes (PO)

A graduate shall

a) Be competent in applying basic knowledge of architecture, building science, and technology for the purpose of obtaining solution to a multi-disciplinary problem.
b) Gain skilful knowledge of complex architectural problems and its analysis
c) Be able to design components of the built environment by applying relevant building bye-laws and regulations.
d) Be proficient in arriving at innovative solution to a problem with due considerations to society and environment
e) Be capable of undertaking appropriate research methods to solve an architectural problem to arrive at valid solution based on appropriate interpretations of data.
f) Continually upgrade his/her understanding and become adept at modern architectural knowledge, tools and techniques to apply them relevantly.
g) To demonstrate consciousness of societal and environmental issues relevant to professional architectural practice and contribute to sustainable development.
h) Be committed to professional ethics, responsibilities, and economic, environmental, societal, and political norms.
i) Demonstrate appropriate inter-personal skills to function effectively as an individual, as a member or as a leader of a team and in a multi-disciplinary setting
j) Be able to comprehend and write effective reports and design documentations; give and receive clear instructions; make effective presentations and communicate effectively and convincingly on architectural issues with architectural community and with the interest of society at large.
k) Be conscious of financial aspects of all professional activities and shall be able to undertake projects with appropriate management control and control on cost and time.
l) Recognize the need for continuous learning and upgrade their architectural knowledge for growth in their professional career.

Graduate Attributes

1. **Engineering Knowledge**: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
2. **Problem Analysis**: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. **Design/ Development of Solutions**: Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
4. **Conduct investigations** of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
5. **Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
7. **Environment and Sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
9. **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
11. **Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change.

List of Non-Departmental Open Electives for Open Elective 1:

Semester	Subject Code	Subjects offered as Open Elective	L	T	P	Credit
Fourth						
Fifth						
Sixth						
Seventh						
Ninth						

PROPOSED NEW COURSE

STRUCTURE

OF

BACHELOR OF ARCHITECTURE

Bachelor of Architecture syllabus effective from 2026-27

FIRST YEAR [I SEMESTER]							
Subject Code	**Subject**	**L (Periods/ week)**	**T (Periods/ week)**	**P (Periods/ week)**	**Credit**	**Contact Hrs.**	**Category of Course**
PROGRAM CORE - THEORY SUBJECTS							
ARP 26101	Principles of Architecture	3	0	0	3	3	PC
ARP 26102	Introduction to Building Materials	3	0	0	3	3	PC
ARP 26103	History of Indian Architecture	3	0	0	3	3	PC
NON-DEPARTMENTAL THEORY SUBJECTS							
MA 26104	Mathematics for Architects	3	0	0	3	3	FS
PROGRAM CORE - SESSIONAL SUBJECTS							
ARP 26111	Architectural Design – I	0	0	6	9	6	PC
ARP 26112	Architectural Graphics - I	0	0	4	3	4	PC
ARP 26113	Model Making & Creative Workshop	0	0	4	3	4	PC
MANDATORY COURSE							
	Choice of NCC/NSS/PT & Games/ Creative Arts (CA)	0	0	2	1	2	MC
TOTAL CREDIT					**28**		
Total Contact hours						**28**	

COURSE INFORMATION SHEET

Course code: **ARP 26101**
Course title: **Principles of Architecture**
Pre-requisite(s): None
Co- requisite(s): None
Credits: 3 L: 3 T:0 P:0
Class schedule per week: 03
Class: B.Arch
Semester / Level: I
Branch: Architecture and Planning
Name of Teacher: Ar. Anjali Pathak

Course Objectives

This course enables the students:

A.	To identify design elements and architectural principles in the built environment and debate between forms and functions.
B.	To incorporate different grid patterns and scale functions in architecture.
C.	To develop an in-depth understanding of nature-influenced architecture, climate, and socio-cultural aspects.
D.	To analyze the role of an architect in implementing the above.

Course Outcomes

After the completion of this course, students will be:

CO1	Define the domain of an architect, analysing design elements and principles in a built environment.
CO2	Understanding of concepts of nature influenced architecture and the diversity of regions.
CO3	Incorporating the above in Architectural Design.
CO4	Understanding architectural style through ages.

Syllabus

Module 1: **Architecture as a profession and the role of an architect**
Understanding the architect's role and the architectural design process. Interaction between client and architect, how projects are built, the need for the site, financing, design approvals, and the architect's contribution to cultural and social aspects.

Module 2: Design Elements & Design Principles
Basic elements of space design and their incorporation, such as point, line, plane, volume, size, colour theory, and texture in design. Visual principles of design like balance, dominance, hierarchy, proportion, datum in architecture. Studies of the organization of spaces, type of forms, the transformation of forms, and spatial organization, Gestalt law.

Module 3: Concept of Grids and Scale
Types of Common Grids: Orthogonal and Radial, and the type of scale – Generic and Human scale; proportioning systems like Le modular, the Ken. Theory of proxemics.

Module 4: Architecture influenced by nature

A brief introduction to biophilic architecture and biomimicry concepts of architecture, including the concept of culture and space, material and climate.

Module 5: Defining and Conceptualizing Architecture
Development of Architectural style through Ages (Modern, Post-Modern, etc.), work of national and international renowned architects, their philosophy and buildings.

Textbooks:

1. Architect: A Candid Guide to the Profession, by Roger K. Lewis
2. Understanding Architecture: Its Elements, History, and Meaning by Leland M. Roth, Westview Press, Place publication.
3. Francis D.K. Ching Architecture: Form Space and Order; Van Nostrand Reinhold Co., (Canada), 1979.
4. Amjad Almusaed – Biophilic and Bioclimatic Architecture, Springer

Reference books:

Gaps in the syllabus (to meet Industry/Profession requirements): NIL

POs met through Gaps in the Syllabus: NA

Topics beyond syllabus/Advanced topics/Design: NIL

POs met through Topics beyond syllabus/Advanced topics/Design

Course Delivery methods
Lecture by use of boards/LCD projectors/OHP projectors
Tutorials/Assignments
Seminars
Industrial/guest lectures
Self- learning such as use of NPTEL materials and internets

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	**% Contribution during CO Assessment**
Quiz I	10
Quiz II	10
Mid-Semester Examination	25
End Sem Examination Marks	50
Assignment	05

Assessment Components	**CO1**	**CO2**	**CO3**	**CO4**
Quiz I	✓			
Quiz II		✓	✓	
Mid-Semester Examination	✓	✓	✓	✓
End Sem Examination	✓	✓	✓	✓

Assignment			✓	✓

Indirect Assessment –
1. Student Feedback on Faculty
2. Student Feedback on Course Outcome

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO8	PO 9	PO1 0	PO1 1	PO 12
CO1	2	1	1	1	1	1	1	1	1	1	1	1
CO2	3	3	1	1	1	1	1	1	1	1	1	1
CO3	3	2	1	1	1	1	1	1	1	1	1	1
CO4	3	2	1	3	1	2	1	1	1	1	1	1

Mapping Between COs and Course Delivery (CD) methods		
CD	**Course Delivery methods**	**Course Outcome**
CD1	Lecture by use of boards/LCD projectors/OHP projectors	CO1, CO2, CO3, CO4
CD2	Tutorials/Assignments	CO3, CO4
CD3	Seminars	CO2, CO3, CO4
CD4	Industrial/guest lectures	CO2, CO4
CD5	Self- learning such as use of NPTEL materials and internets	

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Topics to be covered	TextBook / References	COs mapped	Methodology used	Remarks by faculty
1	L1	Understanding the architect's role and the architectural design process.	T1, T3	1, 2	PPT DigiClass /chalkboard	
1	L2	Interaction between client and architect, how projects are built	T3	1, 2	PPT Digi class /chalkboard	
1	L3	the need for the site, financing, design approvals,	T3	1, 2	PPT Digi class /chalkboard	
2	L4	The architect's contribution to cultural and social aspects	T1	1, 2	PPT Digi class /chalkboard	
3	L5-L7	Basic elements of space design and their incorporation,	T1	1, 2	PPT Digi class /chalkboard	

4	L8-l10	Principles of Design	T1	1, 2	PPT Digi class /chalkboard	
5	L11 - L12	Organisation of spaces	T1	1, 2	PPT Digi class /chalkboard	
6	L13	Types of form	T1	1, 2	PPT Digi class/chalkboard	
7	L14	Spatial organisation	T1,	1	PPT Digi class/chalkboard	
8	L15	Gestalt law	T3	1	PPT Digi class/chalkboard	
9	L16	Types of grids	T1	1	PPT Digi class/chalkboard	
10	L17 - L19	Types of scale	T1	1	PPT Digi class /chalkboard	
11	L20	Ken theory	T1	1	PPT Digi class/ chalkboard	
11	L21	Theory of proxemics	T3	1	PPT Digi class/chalkboard	
12	L22 - L23	Biophilic architecture	T4	1,2	PPT Digi class/chalkboard	
13	L24	Biomimicry	T4	1,2	PPT Digi class/ chalkboard	
14	L25 -26	Culture, space, and climate aspects	T4, t2	1,2,3	PPT Digi class/ chalkboard	
15	L27 - L28	Concept and philosophy of Indian architects	T1, T2	3	PPT Digi class/ chalkboard	
15	L29 - L30	Concept and philosophy of internationally renowned architects	T1, T2	3	PPT Digi class /chalkboard	

COURSE INFORMATION SHEET

Course code: **ARP 26102**
Course title: **Introduction to Building Materials**
Pre-requisite(s): None
Co- requisite(s): None
Credits: 03 L: 3 T:0 P:0
Class schedule per week: 03
Class: B.Arch
Semester / Level: 01
Branch: Architecture and Planning
Name of Teacher: Dr. Anuj Kumar Toppo

Course Objectives

This course enables the students:

A.	To classify the different types of building materials used primarily in building construction work.
B.	To identify the types of materials and their compositions.
C.	To list, label, and define the materials.
D.	To illustrate the use of materials and ascertain their application.
E	To identify the specific use and related technique for a required material.

Course Outcomes

After the completion of this course, students will be:

CO1	Understand the different types of primary building materials used in the building Industry.
CO2	Choose proper building material and its application in the building Industry
CO3	Develop a sense of comparison between different building materials.

Syllabus

Module 1: Foundations of Building Materials

Definition and scope of building materials in architecture; Historical context of material use in construction, Categorization of materials (e.g., natural, manufactured, sustainable).

- Material Properties and Performance
- Factors Influencing Material Selection

Module 2: Natural and Traditional Materials

- **Stone:**
  Types of stone, properties, characteristics, processing and installation (igneous, sedimentary, metamorphic).
- **Wood (Timber):**
  Types of wood, properties, application, preservation and treatment (hardwoods, softwoods); Engineered wood products (plywood, glulam, OSB).
- **Earth/Soil:**
  Properties of soil relevant to construction (e.g., rammed earth, adobe, compressed earth blocks); Traditional and contemporary uses; Advantages and limitations.

Module 3: Manufactured Inorganic Materials

- **Bricks and Masonry Units:**
  Types of bricks (clay, concrete, calcium silicate), manufacturing processes, application, Mortars and their role, Concrete blocks, fly ash bricks.
- **Cement and Concrete:**
  Types of cement and their properties. Mix design principles, RCC and PCC, Concrete constituents (cement, aggregates, water, admixtures), Mix design principles.
- **Glass:**
  Types, properties and application of glass (float, tempered, laminated, insulated).
- **Finishing Materials:**
  - Paints, coatings, and sealants.
  - Flooring materials (tiles, carpets, wood, vinyl).
  - Ceiling and wall finishes.

Module 4: Metals and Polymers

- **Metals:**
  Ferrous metals (iron, steel): types, properties, and applications (structural frames, cladding, reinforcement); Nonferrous metals (aluminium, copper, stainless steel): properties; Corrosion and protection methods.
- **Polymers (Plastics):**
  Types of polymers and their characteristics (thermoplastics, thermosets) - Applications and Environmental considerations.

Module 5: Sustainable and Advanced Materials

- **Sustainable Building Materials:**
  Principles of sustainable material selection; Low-embodied energy materials.
- **Emerging and Smart Materials:**
  Introduction to advanced materials like self-healing concrete, phase-change materials, transparent wood, and aerogels.

Textbooks:

1. B. C. Punmia; Building Materials and Construction.
2. Bindra & Arora; Building Materials and Construction.
3. Rangwala: Engineering Materials
4. W.B. Mckay, 'Building Construction', Vol. 1,2,3 Longmans, U.K. 1981.
5. Sushil-Kumar, T. B. (2003). Building Construction. 19th Ed. Delhi: Standard Publishers
6. K.S. Jagadish, B.V. Venkatarama Reddy, and K.S. Nanjunda Rao; Alternative Building Materials and Technologies, 2023, Newage International publisher.
7. Aman Jain & Avinash Ojha; Sustainable Construction Materials - Innovations for a greener future, 2025, Wissenpress Innovations

Reference books:

1. Khanna: Civil Engineer's Handbook

Gaps in the syllabus (to meet Industry/Profession requirements): Addressed

POs met through Gaps in the Syllabus: Yes

Topics beyond syllabus/Advanced topics/Design: NIL

POs met through Topics beyond syllabus/Advanced topics/Design

Course Delivery methods
Lecture by use of boards/LCD projectors/OHP projectors
Tutorials/Assignments
Seminars
Mini projects/Projects
Laboratory experiments/teaching aids
Industrial/guest lectures
Industrial visits/in-plant training
Self- learning such as use of NPTEL materials and internets
Simulation

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	**% Contribution during CO Assessment**
Quiz I	10
Quiz II	10
Mid-Semester Examination	25
End Sem Examination Marks	50
Assignment	05

Assessment Components	**CO1**	**CO2**	**CO3**
Quiz I	√	√	√
Quiz II	√	√	√
Mid-Semester Examination	√	√	√
End Sem Examination	√	√	√
Assignment	√	√	√

Indirect Assessment –

1. Student Feedback on Faculty

2. Student Feedback on Course Outcome

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	**Program Outcomes**											
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO8	PO 9	PO1 0	PO1 1	PO1 2
CO1	2	1	1	1	1	1	1	1	1	1	1	1
CO2	3	3	1	1	1	1	1	1	1	1	1	1
CO3	3	2	1	1	1	1	1	1	1	1	1	1

Mapping Between COs and Course Delivery (CD) methods		
CD	**Course Delivery methods**	**Course Outcome**

CD1	Lecture by use of boards/LCD projectors/OHP projectors	CO1, CO2, CO3, CO4
CD2	Tutorials/Assignments	CO3, CO4
CD3	Seminars	CO2, CO3, CO4
CD4	Industrial/guest lectures	CO2, CO4
CD5	Self- learning such as use of NPTEL materials and internets	

Lecture-wise lesson planning Details.

Week No.	Lect No.	Topics to be covered	Textbook /References	COs mapped	Methodology used	Remarks by faculty
1	L1	Introduction and discussion about topics	T1	CO1	PPT Digi Class/Chalk -Board	
1	L2- L4	Overview of Building Materials	T3	CO1	PPPT Digi Class/Chalk -Board	
2	L5- L6	Material Properties and Performance	T2,R 1	CO3	PPT Digi Class/Chalk -Board	
3	L7- L8	Factors Influencing Material Selection:	T1	CO2	PPT Digi Class/Chalk -Board	
4	L8- L9	Natural and Traditional Materials-Stone	T2	CO1	PPT Digi Class	
4	L10- L11	Natural and Traditional Materials-Wood	T2	CO3	PPT Digi Class	
5	L12 - L13	Natural and Traditional Materials-Earth/ Soil	T5,R 1	CO2, CO3	PPT Digi Class	
6	L14 - L15	Manufactured Inorganic Materials.Bricks and Masonry	T3	CO2	PPT Digi Class/Chalk -Board	
7	L16 - L18	Manufactured Inorganic Materials.Cement and Concrete	T1,R 1	CO1	PPT Digi Class/Chalk -Boards	
8	L19 – L20	Manufactured Inorganic Materials. Glass	T3	CO3	PPT Digi Class	
8	L21 - L22	Metals and Polymers Metals	R1	CO3	PPT Digi Class	
9	L23 - L24	Metals and Polymers Polymers (Plastics)	T3	CO2	PPT Digi Class	
10	L25 - L27	Sustainable Building Materials	T3	CO3	PPT Digi Class	
11	L28 - L30	Insulation and Finishing Materials	T5	CO1, CO2	PPT Digi Class	
12	L30 - L32	Emerging and Smart Materials	T1,R 1	CO1, CO3	PPT Digi Class	

COURSE INFORMATION SHEET

Course code:	**AR 26103**
Course title:	**History of Indian Architecture**
Pre-requisite(s):	None
Co- requisite(s):	None
Credits: 03	L: 3 T:0 P:0
Class schedule per week:	03
Class:	B. Arch
Semester / Level:	I
Branch:	Architecture
Name of Teacher:	Ar. Ritu Agrawal and Ar. Apurv Ashish

Course Objectives

This course enables the students:

A.	To explore and understand the historical and architectural development in ancient India, and study the chronological evolution and impacts of geographic, climatic, geological and social backgrounds of Indian architectural styles in all ages – in relationship to materials, techniques of construction.
B.	To analyse the diversity of imperial Indian Temple Architecture, Indian Mosques, Tombs, Forts, Cities, etc. including the buildings viewed as architectural masterpieces, and their urban settings.
C.	To apply the materials and patterns of construction and building techniques in each age befitting an application in contemporary times.

Course Outcomes

After the completion of this course, students will be able:

CO1.	To define and understand the basic principles of elements of historic design elements, materials and patterns of construction and building techniques in each age employing critical thinking in ancient India.
CO2.	To utilise visual and verbal vocabularies of Indian Architecture analysing the diversity of imperial Indian Temple Architecture, Indian Mosques, Tombs, Forts, Cities, etc
CO3.	To apply the materials and patterns of construction and building techniques in historic age befitting an application in contemporary times.

Syllabus

Module 1 – Introduction to Indian Architecture

Importance of the subject in the profession of architecture. Indus Valley Civilization: the various towns, town planning principles, house construction, and drainage systems. Vedic village settlement. Buddhist architecture – Evolution and golden age. Rock-cut Architecture – Stupas, Chaitya, Vihara, Pillars, Ajanta, Ellora, Kailasanath, Rathas, etc.

Module 2 – Hindu Temple Architecture

Development of the Hindu temple form from early examples such as the Ladh Khan Temple, Temple at Deogarh, and the Bhittargaon Temple. North Indian Temple Architecture:

architectural character of Gupta Temples; Orissan temple tradition with examples; Khajuraho group of Temples. Architectural character of South Indian Temple Architecture: Pallava, Chola, Pandyas, Madura, and Vijayanagar styles with representative examples.

Module 3 – Indo-Islamic Architecture: Introduction and Typologies
Introduction and rise of Indo-Islamic Architecture in India. Special features of the Mosque with examples. Special features of the Tomb. Influences of Indo-Islamic Architecture in India. Use of arches, vaults, domes, squinches, pendentives, jaalis, minarets, etc. Special features including use of landscape, water bodies, and gardens. Ornamentation in structures with interplay of materials – stones, mosaics, and gildings. Indo Islamic architecture in India- Imperial architecture of Delhi, including - Slave dynasty, Tughlaq and Sayyed/Lodhi dynasties.

Module 4 – Provincial and Mughal Indo-Islamic Architecture
Provincial Styles of the Sultanate Period – Punjab, Bengal, Jaunpur, Gujarat, Malwa, Bijapur, and Golconda with representative examples. Mughal Style prevalent during the reigns of Babur, Humayun, Akbar, Jahangir, and Shah Jahan. Architecture during Sher Shah Sur's regime – Tomb of Sher Shah Sur.

Module 5 – Revival of Indian Architecture under British patronage/ Colonial India
Revival of Indian Architecture under British patronage: Architecture in Colonial India – Monumental buildings including St. Paul's Cathedral, Kolkata; Victoria Memorial Hall, Kolkata. Contribution of Edwin Lutyens and Herbert Baker to the layout and architecture of New Delhi – Rashtrapati Bhavan and Parliament House etc.

Emphasis should be on the use of structural techniques, stones, fine arts, special features, use of landscape, water bodies, and construction methods employed. Students are required to practise sketches, compile an album, and have it evaluated regularly.

Text books:
1. Brown, P. Indian Architecture (Buddhist Hindu) Vol. I; Taraporevala and Sons, Bombay 1983 & subsequent publications.
2. Brown Percy, Indian Architecture (Islamic Period) Vol. II; Taraporevala and Sons, Bombay, 1983; and subsequent publications.
3. Grover, S. The Architecture of India, Buddhist & Hindu, Sahibabad, 1980.
4. Grover, S. The Architecture of India (Islamic) , Sahibabad, 1980.

Reference books:
1. Asher Catherine, Architecture of Mughal India.
2. Fergusson, J.A. A history of Indian and Eastern Architecture, London 1876, revised 1891.
3. Hardy, A., “Indian Temple Architecture: Form and Transformation”, Abhinav Publication, 1995
4. Hillenbrand, Robert, Islamic Architecture, Form, Function and Meaning, Edinburgh University Press, 1994.
5. Michell, George; The Hindu Temple, London.
6. Michell, George; Architecture of the Islamic World — (its history and social meaning), Thames and Hudson, London, 1978.
7. Sir Banister Fletcher; A History of Architecture, University of London, the Antholone Press, 1986.
8. Sterlin Henry, Architecture of World, India, Germany, ISBN-38228-9658-6.

9. Sterlin Henry, Architecture of World, India (Islamic), Germany ISBN– 38228-9658-6.
10. Tadgell Christopher, The History of Architecture in India, London 1990.
11. Tillotson, G.H.R. – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.

Gaps in the syllabus (to meet Industry/Profession requirements): Nil

POs met through Gaps in the Syllabus: NA

Topics beyond syllabus/Advanced topics/Design: Nil

POs met through Topics beyond syllabus/Advanced topics/Design: Nil

	Course Delivery methods
CD1	Lecture by use of boards/LCD projectors/OHP projectors
CD2	Tutorials/Assignments
CD3	Seminars
CD4	Industrial/guest lectures
CD5	Self- learning such as use of NPTEL materials and internets

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	**% Contribution during CO Assessment**
Mid Sem Examination Marks	25
End Sem Examination Marks	50
Quiz (02 nos. of 10 marks each)	20
Assignment / Quiz (s)	05

Assessment Components	**CO1**	**CO2**	**CO3**
Mid Sem Examination Marks	√	√	√
End Sem Examination Marks	√	√	√
Quiz (02 nos. of 10 marks each)	√	√	√
Assignment / Quiz (s)	√	√	√

Indirect Assessment –
1. Student Feedback on Faculty
2. Student Feedback on Course Outcome

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	**Program Outcomes**											
	PO 1	PO 2	PO3	PO4	PO 5	PO6	PO 7	PO8	PO 9	PO1 0	PO1 1	PO1 2
CO1	3	2	1	1	1	1	1	1	1	1	1	1
CO2	3	3	1	1	1	1	1	1	1	1	1	1
CO3	3	3	1	1	1	1	1	1	1	1	1	1

CD	Course Delivery methods	Course Outcome
CD1	Lecture by use of boards/LCD projectors/OHP projectors	CO1, CO2, CO3
CD2	Tutorials/Assignments	CO1, CO2, CO3
CD3	Seminars	CO1, CO2, CO3
CD4	Mini projects/Projects	CO1, CO2, CO3
CD5	Laboratory experiments/teaching aids	CO3
CD6	Industrial/guest lectures	-
CD7	Industrial visits/in-plant training	
CD8	Self- learning such as use of NPTEL materials and internets	
CD9	Simulation	

Lecture wise Lesson planning Details

Week No.	Lect. No.	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Methodology used	Remarks by faculty
1.	L1, L2, L3	1	Indus Valley Civilization Vedic village settlement; Buddhist architecture – Evolution & golden age;	T1, R7, R9	CO1, CO2	PPT Digi Class/Chalk -Board	
2.	L4, L5, L6		Rock-cut Architecture –Stupas, Chaitya, Vihara, Pillars, Ajanta, Ellora, Rathas	T1, R7, R9	CO1, CO2	PPT Digi Class/Chalk -Board	
3.	L7, L8, L9		Hindu Architecture- Development of temple form North Indian Temple Architecture	T1, R7, R9	CO2, CO3	PPT Digi Class/Chalk -Board	
4.	L10, L11, L12		North Indian Temple Architecture	T1, R7, R9	CO2, CO3	PPT Digi Class/Chalk -Board	
5.	L13, L14, L15		South Indian Temple Architecture	T1, R7, R9		PPT Digi Class/Chalk -Board	
6.	L16, L17, L18		Rise of Indo-Islamic Architecture; Influences of Indo-Islamic Architecture; Special features – use of landscape	T2, T4 R8, R9	CO2, CO3	PPT Digi Class/Chalk -Board	
7.	L19, L20, L21		Islamic Ornamentation;	T2,T4 R8,R9	CO2, CO3	PPT Digi Class/Chalk -Board	

8.	L22, L23, L24		Imperial architecture of Delhi	T2, T4 R8, R9	CO2, CO3	PPT Digi Class/Chalk -Board	
9.	L25, L26, L27		Provincial Styles of Sultanate Period	T2,T4 R8, R9	CO2, CO3	PPT Digi Class/Chalk -Board	
10.	L28, L29, L30		Provincial Styles of Sultanate Period	T2,T4 R8,R9	CO2, CO3	PPT Digi Class/Chalk -Board	
11.	L31, L32, L33		Mughal Style	T2,T4 R8,R9	CO2, CO3	PPT Digi Class/Chalk -Board	
12.	L34, L35, L36		Marble architecture	T2,T4 R8,R9	CO2, CO3	PPT Digi Class/Chalk -Board	
13.	L37, L20, L21		Architecture during the Sher Shah Sur's regime	T2,T4 R8,R9	CO2, CO3	PPT Digi Class/Chalk -Board	
14.	L38, L39, L40		Revival of Indian Architecture under British patronage - Architecture in Colonial India	T1,T2, T4 R8, R9, R10	CO3	PPT Digi Class/Chalk -Board	

COURSE INFORMATION SHEET

Course code: **MA 26104**
Course title: **Mathematics for Architects**
Pre-requisite(s): Basic Calculus
Co- requisite(s): None
Credits: 03 L: 3 T:0 P:0
Class schedule per week: 03
Class: B.Arch.
Semester / Level: 01
Branch: Architecture and Planning
Name of Teacher: Mathematics Department

Course Objectives

This course enables the students:

1	Basics concepts of matrices, including rank, eigenvalues and eigenvectors of the matrix
2	Determination of consistency and inconsistency of system of linear equations using rank of matrices
3	Application of single variable derivatives and integrals in determining different properties of a curve
4	Introduction to multi variable functions, partial derivatives and different properties associated with them their applications of multi variable calculus in determining maxima – minima and integrals for two variable functions
5	Analysis of data using different statistical techniques

Course Outcomes

After the completion of this course, students will be:

CO1	to understand the basics of matrices, statistics, differential and integral calculus
CO2	to apply the mathematical skills to specific problems arising in architecture
CO3	to demonstrate the usage of calculus in determining shape, symmetry, pattern etc. of architectural designs
CO4	to gain an understanding to establish connectivity between mathematics and architecture.

Syllabus

Module 1: Matrices
Rank of a Matrix, Row – reduced Echelon form, Consistency and inconsistency for system of linear equations using rank method, Characteristic equation, Eigenvalues and Eigen vectors, Cayley – Hamilton Theorem.

Module 2: Single Variable Calculus
Differentiation, Leibnitz's Theorem, Indeterminate forms, Taylor and Maclaurin series for functions of one variable, Maxima and Minima for functions of one variable. Definite Integrals, Applications of definite integrals.

Module 3: Multi Variable Calculus - I
Function of several variables, Limit and Continuity for functions of two variables, Partial derivatives, Euler's Theorem for Homogeneous functions, Chain Rules, Total derivatives.

Module 4: Multi Variable Calculus -II

Change of variables, Jacobian, Maxima and Minima for function of two variables, Use of double and triple integrals, Calculation of areas using multiple integrals.

Module 5: Statistics

Measures of Central Tendency, Measures of Dispersion, Correlation, Regression, Linear and Nonlinear Regression, Curve fitting, Method of Least Squares.

Textbooks:

1. M.D. Weir, J. Hass and F. R. Giordano: Thomas' Calculus, 12th edition, Pearson Educations, 2008.
2. E. Kreyszig, Advanced Engineering Mathematics, Wiley International, 9th edition, 2006.
3. S.C. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand Publications, 11th Edition, 2014.

Reference books:

1. M.R. Spiegel and L.R. Stephens, Schaum's outline of Statistics, 5th Edition, 2010.
2. H. Anton, I Brivens, S. Davis, Calculus, 10th Edition, John Wiley and Sons, Singapore Pvt. Ltd., 2013.
3. H. Schneider and G.P. Barker, Matrices and Linear Algebra, Dover's Publications, New York, 1973.

Gaps in the syllabus (to meet Industry/Profession requirements)

1. Making students solve architectural problems using the studied concepts.
2. Experimentally visualising the analytical concepts.
3. Difficult to produce extensive proves of the state-of-the-art definitions and theorems.

POs met through Gaps in the Syllabus: NA

Topics beyond syllabus/Advanced topics/Design: NA

POs met through Topics beyond syllabus/Advanced topics/Design: NA

Course Delivery methods
Lecture by use of boards/LCD projectors/OHP projectors
Tutorials/Assignments
Seminars
Mini projects/Projects
Laboratory experiments/teaching aids
Industrial/guest lectures
Industrial visits/in-plant training
Self- learning such as use of NPTEL materials and internets
Simulation

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	**% Contribution during CO Assessment**
Quiz I	10
Quiz II	10

Mid-Semester Examination	25
End Sem Examination Marks	50
Assignment	05

Assessment Components	**CO1**	**CO2**	**CO3**	**CO4**
Quiz I	√	√	√	√
Quiz II	√	√	√	√
Mid-Semester Examination	√	√	√	√
End Sem Examination	√	√	√	√
Assignment	√	√	√	√

Indirect Assessment –

1. Student Feedback on Faculty

2. Student Feedback on Course Outcome

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	Program Outcomes (POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	1	2	2	1	1	1	1	1	2
CO2	3	3	2	1	2	2	1	1	1	1	1	2
CO3	3	2	2	2	2	2	1	1	1	1	1	2
CO4	3	2	3	3	2	2	1	1	2	2	1	3

Mapping Between COs and Course Delivery (CD) methods		
CD	**Course Delivery methods**	**Course Outcome**
CD1	Lecture by use of boards/LCD projectors/OHP projectors	CO1
CD2	Tutorials/Assignments	CO2
CD3	Seminars	CO3
CD4	Mini projects/Projects	CO4
CD5	Laboratory experiments/teaching aids	
CD6	Industrial/guest lectures	
CD7	Industrial visits/in-plant training	
CD8	Self- learning such as use of NPTEL materials and internets	
CD9	Simulation	

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Ch. No.	Topics to be covered	TextBook / References	COs mapped	Methodology used	Remarks by faculty if any
NA	NA	NA	NA	NA	NA	NA	NA

COURSE INFORMATION SHEET

Course code: **ARP 26111**
Course title: **Architectural Design I**
Pre-requisite(s): None
Co- requisite(s): None
Credits: 09 L: 0 T:0 P:6
Class schedule per week: 06
Class: B. Arch
Semester / Level: I
Branch: Architecture
Name of Teacher: Dr. Satyaki Sarkar & Ar. Ritu Agrawal

Course Objectives:

This course enables the students:

A.	To introduce the fundamentals of design as a basic creative activity, and the basics of Architectural aesthetics.
B.	To learn about the basic elements of visual aesthetics through exercises aimed at experimentation.
C.	To become familiar with visual and verbal vocabularies of architecture and appreciating them.
D.	To develop and understand the basic principles of design in the context, purpose, time and technology.
E.	To evaluate the design theory and principles of design in compositions.

Course Outcome:

After the successful completion of the course, student will be able:

CO1	To understand the basic principles of design and appreciate design criteria of objects in everyday use.
CO2	To analyse, evaluate and make informed judgment on a wide range of visual and verbal vocabularies of architecture.
CO3	To comprehend basic elements of visual aesthetics and relevance to design.
CO4	To develop and employ critical and analytical thinking skills in the context of aesthetics and compositions.
CO5	To apply the principles of design and design theory in architectural compositions.

Syllabus

The understanding the elements and principles of design as the building blocks of creative design will be facilitated through exercises that will develop originality, expression, skill and creative thinking. The grammar of design and visual composition will be explored through two-dimensional compositions and three-dimensional models using various media for representation.

Topic	**Focus**	**Key Exercises**	**Number of sheets**
Point and Line	Understanding the expressive qualities of a single mark (point)	Stipple/Dot Compositions, Freehand Line Studies	01

	and the dynamics of line (direction, weight, type, character). Exploring rhythm, movement, and tension.	(Hatching/Cross-hatching), Exploring different drawing instruments (pen, charcoal, brush).	
Plane, Shape, and Form	Defining 2D shapes (geometric vs. organic) and their transformation into 3D forms (mass, volume, void). Understanding the figure-ground relationship.	Collage and Paper-cutting for figure-ground exploration. Form Analysis: Drawing/Modeling simple objects to understand their core geometry.	01
Colour Theory	Introduction to the Colour Wheel (primary, secondary, tertiary). Concepts of hue, value (light/dark), and chroma (intensity). Basic colour psychology and harmony (analogous, complementary schemes).	Colour Swatch Studies, Abstract compositions using limited colour palettes to achieve specific mood/depth.	01
Texture and tone	Differentiation between visual texture (implied) and tactile texture (real). Understanding tone (shades of grey) for modelling form and creating depth.	Rubbings (Frottage) and Collage to explore real textures. Pencil/Charcoal shading exercises to render simple forms (sphere, cone).	01
Space	Introduction to pictorial space (flat vs. deep) through overlapping, perspective, and scale change.	2D compositions exploring illusion of depth. Layering exercises in mixed media.	01
Balance and Harmony;	Achieving visual stability (Symmetrical, Asymmetrical, Radial Balance). Exploring how elements relate to create a sense of unity (Harmony).	Abstract compositions (2D) where elements must be balanced only by visual weight (e.g., size vs. darkness).	01
Rhythm and Repetition	Creating visual movement through the recurrence and variation of elements. Understanding concepts like alternation and progression.	Modular designs and patterns explored through grid systems, emphasizing flow and continuity.	01
Proportion and scale	Introduction to universal systems like the Golden Ratio and basic anthropometry to govern the relationship between parts and the whole.	Compositional studies applying formal systems like the Golden Section or rule of thirds.	01
Datum and Axis	Understanding underlying structures (invisible lines, central points) that anchor and organize complex compositions.	Analyzing and drawing the underlying axis/datum of complex historical and natural compositions	01
Conceptual Translation	Translating non-visual concepts (e.g., *Chaos, Silence, Growth, Conflict*) into pure abstract	Mixed Media Collage, Ink/Wash, Digital tools (if applicable). Final presentation	01

	visual compositions (2D). Fostering originality in expression.	board with accompanying text explaining the conceptual translation.	
3D Modelling: Form and Space	Creating simple volumetric models that articulate specific design principles	Model Making using mounting board, wire, paper, clay. Emphasis on craftsmanship and detailing.	01
Material Expression	Designing a small, abstract 3D object where the choice of material (color, finish, texture) is the primary expression of the concept.	Model using specific material types (e.g., polished wood vs. rusted metal) to convey mood or message.	01

Importance should be given on sketching and communicating the design / study through effective two and three-dimensional drawings / sketches and models.
Viva-voce: Final Viva-vice on all the design assignments to be conducted at the end of the semester by experts from the field.

Reference Books:

1. C. D. Joseph and Callender John; Time Saver Standards for Building Types.
2. Christopher Alexander; A Pattern Language.
3. Francis D.K. Ching; – Architecture: Form Space and Order; Van Nostrand Reinhold Co., (Canaa), 1979.
4. A. George, Covington & Bruce Hannah," Access by Design", Van Nostrand Reinhold, 1996.
5. Pearce Peter; Structure in Nature – Strategy for Design.
6. Peter Fawcett A.; Architecture Design Notebook. http://www.scribd.com/doc/45018090/Architecture-Design-Notebook
7. Pickering, Ernest; Architectural Design, John Wiley and Sons Inc., Canada, 1949.
8. Marjore Elliott Bevin, "Design through Discovery", Holt Rinehart and Winton, NewYork,1977.
9. Neufert's Architect's Data.
10. Snyder, James C and Catanese, Anthony, J, Introduction to Architecture, Mc-Graw Hill, 1980. V.S. Paramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi – 1973.
11. Von MeissPieree; Elements of Architecture.
12. Francis D K Ching, A Visual Dictionary of Architecture, John Wiley & Sons, Inc.

Gaps in the syllabus (to meet Industry/Profession requirements): Nil

POs met through Gaps in the Syllabus: NA

Topics beyond syllabus/Advanced topics/Design: Nil

POs met through Topics beyond syllabus/Advanced topics/Design: Nil

Course Delivery methods
Lecture by use of boards/LCD projectors/OHP projectors
Seminars

Mini projects/Projects
Industrial/guest lectures
Site visits/ case study documentations

Gaps in the syllabus (to meet Industry/Profession requirements): Nil

POs met through Gaps in the Syllabus: NA

Topics beyond syllabus/Advanced topics/Design: Nil

POs met through Topics beyond syllabus/Advanced topics/Design: Nil

	Course Delivery methods
CD1	Seminars
CD2	Mini projects/Projects
CD3	Laboratory experiments/teaching aids
CD4	Industrial/guest lectures

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	**% Contribution during CO Assessment**
Lab Quiz-1	10
Lab Quiz-2	10
Lab Viva	20
Day-to-Day Progressive Evaluation	30
End-Sem Performance	30

Assessment Components	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Progressive Evaluation	√	√	√	√	√
End Sem Evaluation	√	√	√	√	√

Indirect Assessment –
1. Student Feedback on Faculty
2. Student Feedback on Course Outcome

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	**Program Outcomes**											
	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO8	PO 9	PO1 0	PO1 1	PO 12
CO1	2	1	1	1	1	1	1	1	1	1	1	1
CO2	3	3	1	1	1	1	1	1	1	1	1	1
CO3	3	2	1	1	1	1	1	1	1	1	1	1
CO4	3	2	1	3	1	2	1	1	1	1	1	1
CO5	3	3	2	2	1	3	1	1	1	1	1	1

Mapping Between COs and Course Delivery (CD) methods		
CD	**Course Delivery methods**	**Course Outcome**
CD1	Seminars	CO1, CO2, CO3,
CD2	Mini projects/Projects	CO2, CO3,
CD3	Laboratory experiments/teaching aids	CO3,
CD4	Industrial/guest lectures	CO2, CO3

Lecture wise Lesson planning Details

Week No.	Lect. No.	Topics to be covered	Text Book / References	COs mapped	Methodology used	Remarks by faculty
1.	L1, L2	Point and line.	R1,R2, R3	CO1	PPT DigiClass /Chalkboard	
2.	L3, L4	Plane, Shape, and Form	R1,R2, R3	CO1	PPT DigiClass /Chalkboard	
3.	L5, L6	Colour Theory	R1,R2, R3	CO1, CO2	PPT DigiClass /Chalkboard	
4.	L7, L8	Texture and tone	R1, R2, R3, R11	CO1, CO2	PPT DigiClass /Chalkboard	
5.	L9, L10	Space	R1, R2, R3, R11	CO1, CO2, CO3	PPT DigiClass /Chalkboard	
6.	L11, L12	Balance and Harmony	R1, R2, R3, R11	CO1, CO4, CO3	PPT DigiClass /Chalkboard	
7.	L13, L14	Rhythm and Repetition	R1,R2, R3, R11	CO2, CO3, CO4, CO5	PPT DigiClass /Chalkboard	
8.	L15, L16	Contrast and Hierarchy	R1,R2, R3, R11, R12,	CO2, CO4	PPT DigiClass /Chalkboard	
9.	L17, L18	Proportion and scale	R1, R2, R3, R11, R12,	CO2, CO3, CO4	PPT Digi Class /Chalkboard	
10.	L18, L20	Datum and Axis	R1, R2, R3, R12,	CO2, CO3, CO4	PPT DigiClass /Chalkboard	
11.	L21, L22	Conceptual Translation	R1, R2, R3, R12,	CO2, CO3, CO4	PPT DigiClass /Chalkboard	
12.	L21, L23	3D Modeling: Form and Space	R1, R2, R3, R12,	CO2, CO3, CO4	PPT DigiClass /Chalkboard	
13.	L24, L25	Material Expression	R1, R2, R3, R12,	CO2, CO3, CO4, CO5	PPT Digi Class /ChalkBoard	
14.	L26, L27	Lab viva & Final Synthesis Project				

COURSE INFORMATION SHEET

Course code:	**ARP 26112**
Course title:	**Architectural Graphics-I**
Pre-requisite(s):	None
Co- requisite(s):	None
Credits: 03	L: 0 T:0 P:4
Class schedule per week:	04
Class:	B. Arch
Semester / Level:	I
Branch:	Architecture
Name of Teacher:	Dr. Rajan Chandra Sinha and Dr. Prashant Prasad

Course Objectives:

This course enables the students:

A.	To develop basic understanding of 3D space and preparing analytical drawings and its application in architectural field.
B.	To cultivate student's skills of geometric drawing, develop their capability of ideation of Descriptive geometry along with drawing instrumental sketching.
C.	To analyze and solve various problems involving graphics and spatial relationship to represent the possible forms of the same object.
D.	To expose the technical understanding of views

Course Outcome:

After the successful completion of the course, student will be able:

CO1	Understand the various aspects of preparing architectural drawings
CO2	Understand the different methods of representing the same object, with the help of suitable drawing instruments
CO3	Exposure to technical understanding of preparing views, along with shades and shadows, which will be applied in all architectural projects.

Syllabus

Ch. No.	***Aspects of the assignments***	***Topics to be Covered***	***A1 size sheet***
1	Lettering	Single stroke letters, Uppercase and Lower-case letters, Times Roman Font and any other suitable architectural font.	1
2	Dimensioning	Dimensioning terms and notations, Placing of dimensions, General rules of dimensioning and dimensioning of various objects.	2
3	Scale	Introduction of scales in architecture, drawing of simple shapes, reduction and enlargement of drawings on different scales	1
4	Geometrical Construction	Bisecting a line, drawing perpendiculars, parallel lines, divide a line, divide a circle, construct equilateral triangles, squares regular polygons, polygon inscribed in a circle, draw tangents.	3

5	Involutes	Draw involute of a circle, square triangle and polygon	1
6	Orthographic Projection	Plane of projection, First angle projection, Third angle Projection. Projection of lines, planes and solids. Projection on auxiliary plane. Study of section of solids to include representation of such groups in these projections	3
7	Development of surfaces	Development of lateral surfaces of solids: cubes, prisms, cylinder, Pyramids and cones. Development of transitional pieces for a sphere.	2
8	Isometric and Axonometric views of solids	Isometric axes, lines and Planes. Isometric scale, Isometric drawing of planes and cubes, prisms, cylinder, Pyramids and cones.	3
9	Perspective Projection	Techniques of drawing 1 point, 2 point and 3-point perspective views of blocks and buildings.	3

Reference Books:

1. Agarwal, B. and Agarwal, C.M., Engineering Drawing, Tata McGraw-Hill.
2. Bhattacharya, B. and Bera, S.C., Engineering Graphics, I.K. International.
3. Bhatt, N.D. and Panchal, V.M., Engineering Drawing, Charotar Publication.
4. Venugopal, K., Engineering Drawing and Graphics, New Age International
5. Arthur L. Guptill, Watson; Rendering in Pen and Ink, - Guptill Publications, New York.

Gaps in the syllabus (to meet Industry/Profession requirements): Nil

POs met through Gaps in the Syllabus: NA

Topics beyond syllabus/Advanced topics/Design: Nil

POs met through Topics beyond syllabus/Advanced topics/Design: Nil

Course Delivery methods
Explanation by use of boards/LCD projectors
Problem solving in the class
Final presentation, with all drawing sheets at the end of semester, to assess the overall understanding

Gaps in the syllabus (to meet Industry/Profession requirements): Nil

POs met through Gaps in the Syllabus: NA

Topics beyond syllabus/Advanced topics/Design: Nil

POs met through Topics beyond syllabus/Advanced topics/Design: Nil

	Course Delivery methods
CD1	Seminars
CD2	Mini projects/Projects
CD3	Laboratory experiments/teaching aids

CD4	Industrial/guest lectures

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	% Contribution during CO Assessment
Lab Quiz-1	10
Lab Quiz-2	10
Lab Viva	20
Day-to-Day Progressive Evaluation	30
End-Sem Performance	30

Assessment Components	CO1	CO2	CO3
Progressive Evaluation	√	√	√
End Sem Evaluation	√	√	√

Indirect Assessment –

1. Student Feedback on Faculty

2. Student Feedback on Course Outcome

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO8	PO 9	PO1 0	PO1 1	PO 12
CO1	3	1	1	1	1	3	1	1	2	1	1	2
CO2	3	3	1	1	1	3	1	1	2	1	1	2
CO3	3	2	1	1	1	3	1	1	2	1	1	2

Mapping Between COs and Course Delivery (CD) methods		
CD	**Course Delivery methods**	**Course Outcome**
CD1	Seminars	CO1, CO2, CO3,
CD2	Mini projects/Projects	CO2, CO3,
CD3	Laboratory experiments/teaching aids	CO3,
CD4	Industrial/guest lectures	CO2, CO3

Lecture wise Lesson planning Details

Week No.	Lect. No.	Ch. No.	Topics to be covered	Textbook / References	COs mapped	Methodology used	Remarks by faculty
1	L1	1	Introduction to Architectural Graphics, drawing instruments, sheet layout, line types	R1	CO1		Lecture + Demonstration

1	L2	1	Architectural lettering: uppercase, lowercase, single stroke lettering	R1	CO1		Demonstration + Practice
2	L3	1	Architectural lettering and sheet presentation standards	R1	CO1		Studio Exercise
2	L4	2	Dimensioning: terms, notations, dimension lines and standards	R1, R3	CO1		Lecture + Problem Solving
3	L5	2	Dimensioning of simple geometrical and architectural objects	R1, R3	CO1		Studio Exercise
3	L6	3	Introduction to scales, representative fraction, plain scales	R1, R4	CO1		Lecture + Drawing Exercise
4	L7	3	Reduction and enlargement of drawings using scales	R1, R4	CO1		Studio Exercise
4	L8	4	Geometrical constructions: bisecting lines and angles, perpendiculars, parallels	R2	CO2		Demonstration + Practice
5	L9	4	Division of lines and circles, construction of polygons	R2	CO2		Studio Exercise
5	L10	4	Inscribed and circumscribed polygons, tangents and applications	R2	CO2		Problem Solving
6	L11	5	Involutes of circle, square, triangle, and polygon	R2, R3	CO2		Demonstration + Practice
6	L12	5	Applications of involutes in architectural and engineering drawing	R2	CO2		Studio Exercise
7	L13	6	Introduction to orthographic projection, planes of projection	R4	CO2, CO3		Lecture + Sketches
7	L14	6	First-angle and third-angle projections	R4	CO2, CO3		Demonstration + Exercise

COURSE INFORMATION SHEET

Course code:	**ARP 26113**
Course title:	**Model Making & Creative Workshop**
Pre-requisite(s):	None
Co- requisite(s):	None
Credits: 03	L:0 T:0 P:4
Class schedule per week:	04
Class:	B.Arch
Semester / Level:	I
Branch:	Architecture and Planning
Name of Teacher:	Dr. Shama Parween

Course Objectives

This course enables the students:

A.	Familiarise with different types of materials and manufacturing techniques for creating art forms/ models.
B.	Use different kinds of tools and machinery to produce design models.
C.	To learn about the basic elements of visual grammar through exercises aimed at visualizing the form in terms of physical parameters (material, colour, texture, structure).
D.	To develop and represent the forms in terms of models

Course Outcomes

After the completion of this course, students will be:

CO1.	To understand the fundamentals of construction and transformation from two dimensions to three-dimension forms through model making.
CO2.	To develop skills in the context of architectural construction and compositions
CO3.	To apply the art of model making in architectural compositions.

Syllabus

Module 1

Use of standard materials in model making- paper, boxboard, thermocol, foam core board, wood, acrylic, etc., use hand tools and hand-held power tools, innovative representational mimicry

Module 2

Model-making techniques such as surface development, paper folding, origami, hand cutting, laser cutting, and 3D printing.

Module 3

Making of block models and detail models. Simple workshop practice with machines: basic woodworking and fabrication equipment for model construction.

Module 4

Use of advanced Tools and materials; painting model surfaces with various finishes; development of topography and landscape elements; use of materials such as cork and polyurethane foam; and use of lasers for the development of building envelopes.

Module 5
Presentation modeling skills: using tools with precision and techniques for preparing presentation models. General information and practice with different finishing materials.
To be coordinated with the Architectural Design and Building Construction studios

Text books:
1. Matt Driscoll, Model Making for Architects, Publisher- Crowood
2. Nick Dunn, Architectural Modelmaking, Publisher-Thames & Hudson
3. Roark T. Congdon, Architectural Model Building: Tools, Techniques and Materials, Publisher- Fairchild Publications
4. Wolfgang Knoll & Martin Hechinger, Architectural Models: Construction Techniques, Publisher- J. Ross Publishing

Reference books:
1. Ansgar Oswald, Architectural Models, Publisher - DOM Publishers
2. David Lund, A History of Architectural Modelmaking in Britain: The Unseen Masters of Scale and Vision , Publisher - Routledge

Gaps in the syllabus (to meet Industry/Profession requirements): None

POs met through Gaps in the Syllabus: NA

Topics beyond syllabus/Advanced topics/Design: NA

POs met through Topics beyond syllabus/Advanced topics/Design: NA

Course Delivery methods
Lecture by use of boards/LCD projectors/OHP projectors
Tutorials/Assignments
Mini projects/Projects
Self- learning such as use of NPTEL materials and internets

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	**% Contribution during CO Assessment**
Lab Quiz-1	10
Lab Quiz-2	10
Lab Viva	20
Day-to-Day Progressive Evaluation	30
End-Sem Performance	30

Assessment Components	**CO1**	**CO2**	**CO3**
Lab Quiz-1	√	√	√
Lab Quiz-2	√	√	√
Lab Viva	√	√	√
Day-to-Day Progressive Evaluation	√	√	√
End-Sem Performance	√	√	√

Indirect Assessment –

1. Student Feedback on Faculty

2. Student Feedback on Course Outcome

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO 12
CO1	1	2	2	1	1	1	2	2	3	3	3	3
CO2	1	1	2	1	1	1	2	3	3	3	3	3
CO3	1	1	2	1	2	2	2	3	3	3	3	1

Mapping Between COs and Course Delivery (CD) methods		
CD	**Course Delivery methods**	**Course Outcome**
CD1	Lecture by use of boards/LCD projectors/OHP projectors	CO1,CO2,CO3
CD2	Tutorials/Assignments	CO3
CD3	Mini projects/Projects	CO2,CO3
CD4	Self- learning such as use of NPTEL materials and internets	CO1

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Methodology used	Remarks by faculty
1	1	1	Introduction to use of standard materials in model making		CO1	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning.	
2	2	1	Use of hand tools and hand-held power tools		CO1, CO2	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
3	3	2	surface development		CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
4	4	2	Paper folding, origami		CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
5	5	2	Hand cutting, laser cutting,		CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	

6	6	2	3D printing		CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
7	7	3	Making of block models		CO1, CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
8	8	3	Making of block models		CO1, CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
9	9	3	Making of detail models		CO1, CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
10	10	3	Making of detail models		CO1, CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
11	11	4	Painting model surfaces with various finishes		CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
12	12	4	Development of topography and landscape elements		CO1, CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
13	13	5	Techniques for preparing presentation models		CO1, CO2, CO3	Lectures/demonstrations/ workshops/ guided exercises/ project-based learning	
14	14	5	Techniques for preparing presentation models		CO1, CO2, CO3	Lectures/ emonstrations/ workshops/ guided exercises/ project-based learning	