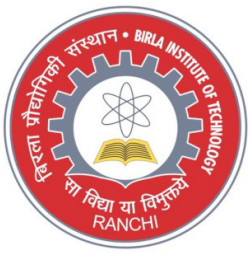

BIRLA INSTITUTE OF TECHNOLOGY
MESRA

RANCHI, INDIA

CHOICE BASED CURRICULUM

FOR

BACHELOR

IN

ARCHITECTURE

DEPARTMENT OF ARCHITECTURE

Effective from academic year 2018 – 2019 onwards

Department of Architecture
Birla Institute of Technology, Mesra, Ranchi - 835215 (India)

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 andPost-Doctorallevels 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, interdisciplinary 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 for BARCH

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 general public, employees, client and other professionals.

Program Outcomes (PO) for BARCH

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 in order 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.

STRUCTURE OF BACHELOR OF ARCHITECTURE
(BARCH UG PROGRAMME)

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							
AR 101	Principles of Architecture	3	0	0	3	3	PC
AR 102	Primary Building Materials	3	0	0	3	3	PC
AR 103	History of Indian Architecture	3	0	0	3	3	PC
NON-DEPARTMENTAL THEORY SUBJECTS							
MA109	Mathematics for Architects	3	0	0	3	3	FS
PROGRAM CORE - SESSIONAL SUBJECTS							
AR 111	Architectural Design – I	0	0	6	9	6	PC
AR 112	Descriptive Geometry	0	0	6	3	6	PC
AR 113	Construction Technique and Model Making Workshop	0	0	4	2	4	PC
MANDATORY COURSE							
MC 101/ 102/ 103/ 104	Choice of: NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1	2	MC
TOTAL CREDIT					**27**		
Total Contact hours						**30**	

FIRST YEAR [II SEMESTER]							
Subject Code	**Subject**	**L (Periods/ week)**	**T (Periods/ week)**	**P (Periods/ week)**	**Credit**	**Contact Hrs.**	**Category of Course**
PROGRAM CORE - THEORY SUBJECTS							
AR 151	Advanced Building Materials	3	0	0	3	3	PC
AR 152	History of Architecture-Western	3	0	0	3	3	PC
AR 153	Statics & Strength of Materials	3	0	0	3	3	PC
PROGRAMCORE - SESSIONAL SUBJECTS							
AR 161	Architectural Design – II	0	0	6	9	6	PC
AR 162	Building Construction – I	0	0	6	9	6	PC
AR 163	Architectural Rendering Techniques	0	0	4	2	4	PC
MANDATORY COURSE							
MC 105/ 106/ 107/ 108	Choice of: NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1	2	MC
TOTAL CREDIT					**30**		
Total Contact hours						**27**	

SEMESTER I

COURSE INFORMATION SHEET

Course code: AR 101
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
Name of Teacher: Dr.Janmejoy Gupta

Course Objectives

This course enables the students:

A.	Identify different design elements and design principles used in Architectural Building Design and built environment.
B.	Incorporate different design elements and principles in Design exercises.
C.	Developing an in-depth understanding of different factors influencing architecture of a region.
D.	Analyse the role of an architect in implementing the above.
E.	Classify architectural styles through ages.

Course Outcomes

After the completion of this course, students will be:

1.	Define the domain and variety of the functions of an architect.
2.	Analyze the design elements, principles incorporated in the built environment.
3.	Incorporating the above in Architectural Design.

Syllabus

Module 1: Architecture as a profession and role of an architect:

Contribution towards culture and the society, the Architectural Design Process & building process and the Architect's role: How projects get built, need, site, financing, design and design approvals, Architectural services rendered by an architects and disciplines needed to learn by him/her. The structure of Architectural Education-Curricular content, Design, The Design Studio, History and Theory, Technology, Structures, Materials and Methods of Construction, Environmental Controls, Computer-aided Design, Management, Electives.

Module 2: Design Elements & Design Principles:

Understanding Architectural Aesthetics - Exercises to understand the visual properties of two dimensional forms of both geometric and non-geometric surfaces. Basic design elements and their incorporation in visual art and architecture such Line and Shape, Color and Texture, Form and Size, Value, Light. Principles such as Balance, Symmetrical, Asymmetrical, Proportion and Scale, Studies of Principles of Organization of Form & Space, Principles of three-dimensional Compositions, A brief introduction to fractals in architecture and Architecture influenced by nature (Biophilic Architecture and bio-mimicry.

Module 3: Module and its application in design:

Types of Common Grids – Orthogonal and Radial, Brief Introduction to History of Modular Construction in Architecture, (Industrial Revolution and Pre-fabrication of Iron, Steel, Glass and Concrete units), "Building as Machine" concept of Corbusier and Le Modular.

Module 4: Factors influencing architecture of a region:

Climate, material, technology, and socio-cultural forces.

Module 5: Defining and Conceptualizing Architecture:

Concepts and philosophy of some leading architects (Indian and Global) and a few buildings designed by them, Development of Architecture through ages (Broad Architectural Movements starting from Gothic, Renaissance, Neo-Classical etc to Modern, Post-Modern, etc) and Critical Regionalism in Post-Independence Indian Architecture. (Notably Charles Correa and BV Doshi)

Text books:

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

Reference books: -

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

POs met through Gaps in the Syllabus: Nil

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
Tutorials/Assignments
Seminars
Mini projects/Projects
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
Mid Sem Examination Marks	25
End SemExamination Marks	60
Assignment / Quiz (s)	15

AssessmentCompoents	CO1	CO2	CO3	CO4	
Mid Sem Examination Marks					
End Sem Examination Marks					
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											
	a	b	c	d	e	f	g	h	i	j	k	l
1	H	L	M	L	M	H	L	M	L	M	-	M
2	H	H	H	L	L	H	M	L	H	L	-	L
3	H	H	-	H	H	H	H	M	M	-	L	H

CD	**Course Delivery methods**	**Course Outcome**	**Course Delivery Method**
CD1	Lecture by use of boards/LCD projectors/OHP projectors	CO1	CD1,CD2
CD2	Tutorials/Assignments	CO2	CD2, CD6
CD3	Seminars	CO3	CD2, CD 3, CD4
CD4	Mini projects/Projects		
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.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	L1,L2			Contribution towards culture and the society, the Architectural Design Process & building process and the Architect's role.	T1	1		PPT Digi Class/Chalk -Board	
2	L3,L4			How projects get built, need, site, financing, design and design approvals, Architectural services rendered by an architects and disciplines needed to learn by him/her.	T1	1		PPT Digi Class/Chalk -Board	
3	L5,L6			The structure of Architectural Education- Curricular content, Design, The Design Studio, History and Theory, Technology, Structures, Materials and Methods of Construction, Environmental Controls, Computer-aided Design, Management, Electives.	T1	1		PPT Digi Class/Chalk -Board	
4	L7,L8			Understanding Architectural Aesthetics - Exercises to understand the	T2	2		PPT Digi Class/Chalk -Board	

				visual properties of two dimensional forms of both geometric and non-geometric surfaces.					
5	L9			Basic design elements and their incorporation in visual art and architecture such Line and Shape, Color and Texture, Form and Size, Value, Light. Principles such as Balance, Symmetrical, Asymmetrical, Proportion and Scale.	T2	2		PPT Digi Class/Chalk -Board	
6	L10			Studies of Principles of Organization of Form & Space, Principles of three-dimensional Compositions.	T2	2		PPT Digi Class/Chalk -Board	
7	L11			A brief introduction to fractals in architecture and Architecture influenced by nature (Biophilic Architecture and bio-mimicry.	T2	2		PPT Digi Class/Chalk -Board	
8	L12			Types of Common Grids – Orthogonal and Radial.	T3	2,3		PPT Digi Class/Chalk -Board	
9	L13			Brief Introduction to History of Modular Construction in Architecture, (Industrial	T3	2,3		PPT Digi Class/Chalk -Board	

				Revolution and Pre-fabrication of Iron, Steel, Glass and Concrete units)					
10	L14			"Building as Machine" concept of Corbusier and Le Modular.	T2,T3	2,3		PPT Digi Class/Chalk -Board	
11	L15			Climate, and its impact on architecture.	T2,T3	3		PPT Digi Class/Chalk -Board	
12	L16			Material, and its impact on architecture.	T2,T3	3		PPT Digi Class/Chalk -Board	
13	L17			Technology, and its impact on architecture.	T2,T3	3		PPT Digi Class/Chalk -Board	
14	L18			Socio-cultural forces, and its impact on architecture.	T2,T3	3		PPT Digi Class/Chalk -Board	
15	L19,20 ,21,22.			Concepts and philosophy of some leading architects (Indian and Global) and a few buildings designed by them&and a few buildings designed by them	T2,T3	2,3		PPT Digi Class/Chalk -Board	
16	L23-L26			Development of Architecture through ages.	T2	2,3		PPT Digi Class/Chalk -Board	
17	L27-L31			Broad Architectural Movements starting from Gothic, Renaissance, Neo-Classical etc to Modern, Post-Modern, etc.	T2	2,3		PPT Digi Class/Chalk -Board	
18	L32-34			Critical Regionalism in Post-	T2	3		PPT Digi Class/Chalk -Board	

				Independence Indian Architecture. (BV DOSHI)					
19	L35-37			Critical Regionalism in Post-Independence Indian Architecture. (CHARLES CORREA)	T2	3		PPT Digi Class/Chalk -Board	

COURSE INFORMATION SHEET

Course code: AR 102
Course title: PRIMARY BUILDING MATERIALS
Pre-requisite(s): None
Co- requisite(s): None
Credits: 3 L: 3 T: 0 P: 0
Class schedule per week: 03
Class: B. Architecture
Semester / Level: I
Branch: Architecture
Name of Teacher: 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.	Toidentifythetypesofmaterialsandtheircompositions.
C.	To list, label and define thematerials.
D.	Toillustrateuseofmaterialsandascertaintheirapplication.
.E	Toidentifythespecificuseandrelatedtechniquefora required material.

Course Outcomes

After the completion of this course, students will be:

1.	Understand the different types of primary building materials used in building Industry.
2.	Choose proper building material and their application in building Industry
3.	Develop a sense of comparison between different building materials.

Syllabus

Module 1. Brick and Stone
Composition, Sizes, Properties and Classification of bricks, Tests for bricks. Introduction of Brickworks: masonry bonding & ornamental bonding.
Classification of stones. Common building stones used in India. Characteristics and use of stones.Dressing of stone.Artificial stones. Introduction of Stonework: Rubble and Ashlars masonry.

Module 2.Metals and Timber
Pig iron, cast iron, wrought iron – types, properties, steel – properties, types, market form of steel and uses of steel in construction, properties of mild steel and hard steel, defects in steel.
Qualities of timber for construction.Seasoning, Storage and Preservation of timber. Use of different types wood in various parts of building. Industrial timber: veneers, plywood, fibreboard, etc.

Module 3.Cement and Sand
Composition of ordinary cement. Function of cement ingredients. Properties of cement – Fineness, Soundness, Setting times, etc.Grades of cement and different types of cements used in construction.OPC,PPC,PSC. Storage of cement in site.
Sources of Sand, Classification, Test of Sand. Grades of sand and theiruses

Module 4.Moter and Lime
Types of mortar – lime mortar, mud mortar, lime-surkhi mortar, cement mortar. Different

grades of mortar, their compositions and properties. Preparation of cement mortar. Use and selection of mortar for different construction work.Fat and hydraulic lime – properties anduse.

Module 5. Concrete
Compositions and grades of concrete.Various steps in concrete construction – batching, mixing, transporting, compacting, curing, shuttering, jointing. Tests and quality control of concrete. Design Mix of concrete.

Text books:
1. B. C. Punmia; *Building Materials andConstruction.*
2. Bindra&Arora; *Building Materials andConstruction*.
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.

Reference books:
1. Khanna: *Civil Engineer's Hand Book*

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	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	60
Assignment / Quiz (s)	15

Assessment Compoents	**CO1**	**CO2**	**CO3**	**CO4**	
Mid Sem Examination Marks	√	√	√		
End Sem Examination Marks	√	√	√		
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											
	a	b	c	d	e	f	g	h	i	j	k	l
1	H	M	M	H	H	H	H	M	M	H	H	M
2	H	H	H	M	H	H	H	M	L	L	H	H
3	H	H	H	H	M	H	M	L	M	M	M	H

Mapping Between COs and Course Delivery (CD) methods				
CD	**Course Delivery methods**		**Course Outcome**	**Course Delivery Method**
CD 1	Lecture by use of boards/LCD projectors/OHP projectors		CO1	CD1,CD2
CD 2	Tutorials/Assignments		CO2	CD2,CD4
CD 3	Seminars		CO3	CD4, CD5 and CD8
CD 4	Mini projects/Projects			
CD 5	Laboratory experiments/teaching aids			
CD 6	Industrial/guest lectures			
CD 7	Industrial visits/in-plant training			
CD 8	Self- learning such as use of NPTEL materials and internets			
CD 9	Simulation			

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Tentative Date	Ch. No.	Topics to be covered	Text Book / Refere nces	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	L1		1	Introduction and discussion about topics	T1	CO1		PPT Digi Class/Chock -Board	
1	L2-L3			Composition, Sizes, Properties and Classification of bricks	T3	CO1		PPT Digi Class	
2	L4			Tests for bricks	T3	CO1			
2	L5-L6			Introduction of Brickworks: masonry bonding	T2,R1	CO3			

				&ornamental bonding.					
3	L7-L8			Classification of stones. Common building stones used in India.	T1	CO2		PPT Digi Class	
4	L8-L9			Characteristics and use of stones. Dressing of stone. Artificial stones.	T2	CO1		PPT Digi Class	
4	L10			Introduction of Stonework: Rubble and Ashlars masonry.	T2	CO3		PPT Digi Class	
5	L11			Pig iron, cast iron, wrought iron – types, properties	T5	CO3		PPT Digi Class	
5	L12 - L13			steel – properties, types, market form of steel and uses of steel in construction	T5,R 1	CO2, CO3		PPT Digi Class	
6	L14 - L15			properties of mild steel and hard steel, defects in steel.	T3	CO2		PPT Digi Class	
7	L16 - L18			Qualities of timber for construction. Seasoning, Storage and Preservation of timber.	T1,R 1	CO1		PPT Digi Class	
8	L19			Use of different types wood in various parts of building.	T3	CO3		PPT Digi Class	
8	L20 - L21			Industrial timber: veneers, plywood, fibreboard, etc.	R1	CO3		PPT Digi Class	
9	L21 -			Composition of ordinary	T3	CO2		PPT Digi Class	

	L24			cement. Function of cement ingredients. Properties of cement – Fineness, Soundness, Setting times, etc.					
10	L25 - L27			Grades of cement and different types of cements used in construction. OPC,PPC,PS C. Storage of cement in site.	T3	CO3		PPT Digi Class	
11	L28 - L29			Sources of Sand, Classification, Test of Sand. Grades of sand and theiruses.	T5	CO1, CO2		PPT Digi Class	
12	L30 - L31			Types of mortar – lime mortar, mud mortar, lime-surkhi mortar, cement mortar.	T1,R 1	CO1, CO3		PPT Digi Class	
12	L32 - L33			Different grades of mortar, their compositions and properties. Preparation of cement mortar.	T2	CO1, CO2		PPT Digi Class	
12	L34 - L35			Use and selection of mortar for different construction work.Fat and hydraulic lime – properties anduse.	T2	CO1		PPT Digi Class	

13	L36			Compositions and grades of concrete.	T2	CO3		PPT Digi Class	
14	L37 - L38			Various steps in concrete construction – batching, mixing, transporting, compacting, curing, shuttering, jointing.	T5,R 1	CO2		PPT Digi Class	
14	L39 - L40			Tests and quality control of concrete. Design Mix of concrete.	T3	CO3		PPT Digi Class	

COURSE INFORMATION SHEET

Course code: **AR 103**
Course title: **HISTORY OF INDIAN 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**
Name of Teacher: **RituAgrawal**

Course Objectives

This course enables the students:

A.	To acquire basic concepts regarding 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 understand the diverse artistic and architectural expressions with regard to the historical context in which they are developed.
C.	To develop a critical view towards development and expression of Indian architecture
D.	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.
E.	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:

1.	To define and understand the basic principles of elements of historic design elements, materials and patterns of construction and building techniques in each age befitting an application in contemporary times.
2.	To outline and employ critical thinking in the context of historical and architectural development in ancient India.
3.	To explain and utilise visual and verbal vocabularies of Indian Architecture
4.	To interpret and analyse the diversity of imperial Indian Temple Architecture, Indian Mosques, Tombs, Forts, Cities, etc
5.	To apply the materials and patterns of construction and building techniques in historic age befitting an application in contemporary times.

Syllabus

Module 1
Importance of the subject in the profession of architecture; Indus Valley Civilization- the various towns, town planning principles, houseconstruction, drainage systems; Vedic village settlement ;Buddhist architecture – Evolution & golden age;
Rock-cut Architecture –Stupas, Chaitya, Vihara, Pillars, Ajanta, Ellora, Kailasanath, Rathas, etc.

Module 2
Hindu Architecture –Development of temple form from examples like Ladh Khan, Temple at Deogarh, Bhittargaon Temple; North Indian Temple Architecture- Architectural character of Gupta Temples; Orissan temple with examples and Khajuraho group of Temples; Architectural character of South Indian Temple Architecture- Pallava, Chola, Pandyas, Madura and Vijayanagar style with examples.

Module 3
Introduction – Rise of Indo-Islamic Architecture in India; Special features of Mosque with examples; Special features of Tomb; Influences of Indo-Islamic Architecture in India; Use of arches, vaults, domes, squinches, pendentives, jaalis, minarets,etc.; Special features – use of landscape, water bodies and gardens; Ornamentation in structures with interplay of materials – stones, mosaics, gildings.

Module 4
Indo Islamic architecture in India- Imperial architecture of Delhi, including - Slave dynasty, Tughlaq and Sayyed/Lodhi dynasties; Provincial Styles of Sultanate Period – Punjab, Bengal, Jaunpur, Gujarat, Malwa, Bijapurand Golconda with examples.

Module 5
Mughal Style prevalent during the reign of Babur; Humayun; Akbar; Jahangir and Shah Jahan; Architecture during the Sher Shah Sur's regime – Tomb of Sher Shas Sur;
Revival of Indian Architecture under British patronage - Architecture in Colonial India - Monumental buildings of - St.Pauls Cathedral, Kolkata, Victoria Memorial Hall, Kolkata; Contribution of Edwin Lutyens & Herbert Baker to the lay-out and Architecture of New Delhi – RashtrapathiBhavan& Parliament House.

Emphasis should be on the use of structural techniques, stones, fine arts, special features, use of landscape, water bodies, and construction methods employed.
Students need to practice sketches and make an album and get 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. Sterlin Henry, Architecture of World , India, Germany, ISBN-38228-9658-6.
8. Sterlin Henry, Architecture of World, India (Islamic), Germany ISBN– 38228-9658-6.
9. Tadgell Christopher, The History of Architecture in India, London 1990.
10. Tillotson, G.H.R. – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.

Course Delivery methods
Lecture by use of boards/LCD projectors/OHP projectors
Tutorials/Assignments
Seminars
Mini projects/Projects
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**
Mid Sem Examination Marks	25
End Sem Examination Marks	60
Assignment / Quiz (s)	15

Assessment Components	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Mid Sem Examination Marks	√	√	√	√	√
End Sem Examination Marks	√	√	√	√	√
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**											
	a	b	c	d	e	f	g	h	i	j	k	l
1	H	M	L	-	-	-	M	-	-	-	-	-
2	H	L	-	-	-	_-	-	-	-	-	-	-
3	L	-	-	-	-	-	-	-	-	L	-	-
4	L	H	L	M	M	L	L	-	-	H	-	M
5	H	H	M	-	M	H	L	L	-	M	-	H

Mapping Between COs and Course Delivery (CD) methods				
CD	**Course Delivery methods**		**Course Outcome**	**Course Delivery Method**
CD1	Lecture by use of boards/LCD projectors/OHP projectors		CO1	CD1
CD2	Tutorials/Assignments		CO2	CD1
CD3	Seminars		CO3	CD1, CD2
CD4	Mini projects/Projects		CO4	CD1, CD2
CD5	Laboratory experiments/teaching aids		CO5	CD1, CD3
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.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1.	L1, L2, L3		1	Indus Valley CivilizationVedic 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, CO3		PPT Digi Class/Chalk -Board	
3.	L7, L8, L9			Hindu Architecture-Development of temple form North Indian Temple Architecture	T1, R7, R9	CO3, CO4		PPT Digi Class/Chalk -Board	
4.	L10, L11, L12			North Indian Temple Architecture	T1, R7, R9	CO3, CO4		PPT Digi Class/Chalk -Board	
5.	L13, L14, L15			South Indian Temple Architecture	T1, R7, R9	CO3, CO4		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	CO3, CO4		PPT Digi Class/Chalk -Board	
7.	L19			Islamic	T2,	CO3,		PPT Digi	

	, L20 , L21			Ornamentation;	T4 R8, R9	CO4		Class/Chalk -Board	
8.	L22 , L23 , L24			Imperial architecture of Delhi	T2, T4 R8, R9	CO3, CO4		PPT Digi Class/Chalk -Board	
9.	L25 , L26 , L27			Provincial Styles of Sultanate Period	T2,T 4 R8, R9	CO3, CO4		PPT Digi Class/Chalk -Board	
10.	L28 , L29 , L30			Provincial Styles of Sultanate Period	T2, T4 R8, R9	CO3, CO4		PPT Digi Class/Chalk -Board	
11.	L31 , L32 , L33			Mughal Style	T2, T4 R8, R9	CO3, CO4		PPT Digi Class/Chalk -Board	
12.	L34 , L35 , L36			Marble architecture	T2, T4 R8, R9	CO3, CO4		PPT Digi Class/Chalk -Board	
13.	L37 , L20 , L21			Architecture during the Sher Shah Sur's regime	T2, T4 R8, R9	CO3, CO4		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	CO5		PPT Digi Class/Chalk -Board	

COURSE INFORMATION SHEET

Course code: **MA 109**
Course title: **MATHEMATICS FOR ARCHITECTS**
Pre-requisite(s): Basic Algebra, Basic Calculus
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**
Name of Teacher: **Dr.Abhinav Tandon**

Course Objectives

This course enables the students:

A.	Basics concepts of matrices, including rank, eigenvalues and eigenvectors of the matrix
B.	Determination of consistency and inconsistency of system of linear equations using rank of matrices
C.	Application of single variable derivatives and integrals in determining different properties of a curve
D.	Introduction to multi variable functions, partial derivatives and different properties associated with them their
E.	Applications of multi variable calculus in determining maxima – minima and double integrals for two variable functions
F.	Analysis of data using different statistical techniques

Course Outcomes

After the completion of this course, students will be:

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

Syllabus

Module 1: Matrices
Real and Complex Matrices, Elementary Transformations, 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
Successive differentiation, Leibnitz's Theorem, Indeterminate forms, Concavity, Convexity, Point of Inflection, Taylor and Maclaurin series for functions of one variable, Maxima and Minima for functions of one variable.
Definite Integrals, Reduction Formula, Applications of definite integrals in finding length of curves, area between curves, area of the surfaces of revolution.

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 Differential Coefficient, Change of variables.

Module 4: Multi Variable Calculus -II
Jacobian, Properties of Jacobians, Taylors and Maclaurin series for function of two variables, Maxima - Minima for function of two variables, Lagrange's method of multipliers.

Module 5: Statistics
Measures of Central Tendency, Measures of Dispersion, Moments, Skewness, Kurtosis Correlation, Methods to find Coefficient of Correlation, Regression, Linear Regression, Lines of Regression, Regression coefficients, Nonlinear Regression, Curve fitting, Method of Least Squares.

Text Books
a. M.D. Weir, J. Hass and F. R. Giordano: Thomas' Calculus, 12th edition, Pearson Educations, 2008.
b. E. Kreyszig, Advanced Engineering Mathematics, Wiley International, 9th edition, 2006.
c. 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): NA

POs met through Gaps in the Syllabus: Nil

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
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
Mid Sem Examination Marks	25
End SemExamination Marks	60
Assignment / Quiz (s)	15

AssessmentCompoents	CO1	CO2	CO3	CO4	
Mid Sem Examination Marks					
End Sem Examination Marks					
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 Outcomes	Program Outcomes											
	a	b	c	d	e	f	g	h	i	j	k	l
1	M	H	M	L	M	M	L	L	L	L	L	M
2	H	H	M	L	M	M	L	L	L	L	L	M
3	H	M	M	M	M	M	L	L	L	L	L	M
4	H	M	H	H	M	M	L	L	M	M	L	H

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	Program Outcomes											
	a	b	c	d	e	f	g	h	i	j	k	l
1												
2												
3												

Mapping Between COs and Course Delivery (CD) methods				
CD	**Course Delivery methods**		**Course Outcome**	**Course Delivery Method**
CD1	Lecture by use of boards/LCD projectors/OHP projectors		CO1	CD1
CD2	Tutorials/Assignments		CO2	CD1
CD3	Seminars		CO3	CD1 and CD2
CD4	Mini projects/Projects			
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.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	L1		1		T1, R1	1, 2		PPT Digi Class/Chock -Board	

COURSE INFORMATION SHEET

Course code: **AR 111**
Course title: **ARCHITECTURAL DESIGN I**
Pre-requisite(s): None
Co- requisite(s): None
Credits: 9 **L: 0** **T:0** **P:6**
Class schedule per week: **06**
Class: **B. Arch**
Semester / Level: **I**
Branch: **Architecture**
Name of Teacher: **Prof. RituAgrawal**

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:

1.	To understand the basic principles of design and appreciate design criteria of objects in everyday use.
2.	To analyse, evaluate and make informed judgment on a wide range of visual and verbal vocabularies of architecture.
3.	To comprehend basic elements of visual aesthetics and relevance to design.
4.	To develop and employ critical and analytical thinking skills in the context of aesthetics and compositions.
5.	Toapply the principles of design and design theory in architectural compositions.

Syllabus

1. Introduce the factors of Design regarding elementary forms –
   By Graphical methods, comparison of designed and non-designed objects, Appreciation of design criteria.
   Critically appraise and Design of an object in everyday use like Table, Chair, Stool, Drawing Board, T-Scale, etc. — 02 sheets

2. Exercises in Points & Lines.
   Expressing a given theme in a geometric pattern. — 02 sheets

3. Family of shapes - developing various shapes from a given geometric shape –
   Working out composition with such developed shapes; — 03sheets

Organising large number of identical geometric shapes to express a given theme to obtain symmetrical and asymmetrical patterns.
Combining different geometric shapes and making a unit of bigger/larger shape and using many such units and expressing a design/pattern.
Models with linear members such as match sticks, reeds, etc. to understand geometric form and structure.

4. Introducing value and colour, to give emphasis in the expression of design. 03 sheets
   To achieve focus and center of interest in design using different textural elements.
   Development of geometric pattern by division, subtraction, and addition or overlapping to express them with the use of colours.

5. Study of lines, colour, texture, volume of objects with the sense of contrast, 02 sheets
   harmony, balance and relative proportions; the inherent visual properties of any physical object or enclosure.
   Visualize techniques of graphic expression to present the innovative design ideas.

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. AGeorge , 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.
13. R.W Gill, Manual of Rendering with Pen and Ink (The Thames and Hudson Manuals), W. W. Norton & Co Inc.
14. James C Snyder and Anthony J. Catanese, Introduction to Architecture, McGraw-Hill
    All Books, journals and magazines on Architecture

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**
Progressive Evaluation	60
End Sem Evaluation	40

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**											
	a	b	c	d	e	f	g	h	i	j	k	l
1.	M	-	-	L	-	-	-	-	-	-	-	-
2.	H	H	-	-	-	-	-	-	-	-	-	-
3.	H	M	L	-	-	-	-	-	-	-	-	-
4.	H	M	L	H	-	M	-	-	-	-	-	-
5.	H	H	M	M	L	H	-	-	-	-	-	-

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.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1.	L1, L2			Introduce the factors of Design regarding elementary forms.	R1, R2, R3	CO1		PPT Digi Class /Chalk -Board	
2.	L3, L4			By Graphical methods, comparison of designed and non-designed objects, Appreciation of design criteria.	R1, R2, R3	CO1		PPT Digi Class /Chalk -Board	
3.	L5, L6			Critically appraise and Design of an object in everyday use like Table, Chair, Stool, Drawing Board, T-Scale, etc.	R1, R2, R3	CO1, CO2		PPT Digi Class /Chalk -Board	
4.	L7, L8			Exercises in Points & Lines. .	R1, R2, R3, R11	CO1, CO2		PPT Digi Class /Chalk -Board	
5.	L9, L10			Expressing a given theme in a geometric pattern.	R1, R2, R3, R11	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	
6.	L11, L12			Family of shapes - developing various shapes from a given geometric shape.	R1, R2, R3, R11	CO1, CO4, CO3		PPT Digi Class /Chalk -Board	
7.	L13, L14			Working out composition with such developed shapes.	R1, R2, R3, R11	CO2, CO3, CO4, CO5			
8.	L15, L16			Organising large number of identical geometric shapes to express a given theme to obtain symmetrical and asymmetrical patterns.	R1, R2, R3, R11, R12, R14.	CO2, CO4		PPT Digi Class /Chalk -Board	
9.	L17,			Combining different	R1,R2,	CO2,		PPT Digi	

	L18			geometric shapes and making a unit of bigger/larger shape and using many such units and expressing a design/pattern.	R3, R11, R12, R14.	CO3, CO4		Class /Chalk -Board	
10.	L18, L20			Models with linear members such as match sticks, reeds, etc. to understand geometric form and structure.	R1,R2, R3, R12, R13, R14.	CO2, CO3, CO4		PPT Digi Class /Chalk -Board	
11.	L21, L22			Introducing value and colour, to give emphasis in the expression of design.	R1,R2, R3, R12, R13, R14.	CO2, CO3, CO4		PPT Digi Class /Chalk -Board	
12.	L21, L23			Development of geometric pattern by division, subtraction, and addition or overlapping to express them with the use of colours.	R1,R2, R3, R12, R13, R14.	CO2, CO3, CO4		PPT Digi Class /Chalk -Board	
13.	L24, L25			Study of lines, colour, texture, volume of objects with the sense of contrast, harmony, balance and relative proportions; the inherent visual properties of any physical object or enclosure.	R1,R2, R3, R12, R13, R14.	CO2, CO3, CO4, CO5		PPT Digi Class /Chalk -Board	
14.	L26, L27			Study of lines, colour, texture, volume of objects with the sense of contrast, harmony, balance and relative proportions; the inherent visual properties of any physical object or enclosure.	R1,R2, R3, R12, R13,R14.	CO2, CO3, CO4, CO5		PPT Digi Class /Chalk -Board	

COURSE INFORMATION SHEET

Course code: **AR 112**
Course title: **DESCRIPTIVE GEOMETRY**
Pre-requisite(s): None
Co- requisite(s): None
Credits: 3 **L: 0 T:0 P:6**
Class schedule per week: **06**
Class: **B. Arch**
Semester / Level: **I**
Branch: **Architecture**
Name of Teacher: **Dr. D. J. Biswas**

Course Objectives
This course enables the students:

A	To develop basic understanding of preparing architectural 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, along with shades and shadows to represent in graphical presentation

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

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

Syllabus / Course Content:

Aspects of the assignments	***A1 size drg. sheet***
Lines & Lettering	1
Dimensioning of different 2D objects	1
Scale drawing of simple shapes, reduction and enlargement of drawings on different scales	1
Projection of planes and solids	2
Study of section of solids to include representation of such groups in these projections	1
Study of development of surfaces, drawing of unfolded surface of 3d objects	1
Techniques of drawing Isometric and Axonometric views of solids	2
Techniques of drawing 1 point, 2 point and multi-point perspective views of blocks and buildings	2
Concept of shade and shadow of objects	1

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

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	60
Assignment / Quiz (s)	15

Assessment Components	CO1	CO2	CO3	CO4	
Mid Sem Examination Marks					
End Sem Examination Marks					
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											
	a	b	c	d	e	f	g	h	i	j	k	l
1	H	L		L		H	L		M	M	L	M
2	H	L		L	L	H		L	M	M		M
3	H		L			H			M			M

Mapping Between COs and Course Delivery (CD) methods				
CD	**Course Delivery methods**		**Course Outcome**	**Course Delivery Method**
CD1	Lecture by use of boards/LCD projectors/OHP projectors		CO1	CD1, CD2, CD5

CD2	Tutorials/Assignments		CO2	CD1, CD2, CD5
CD3	Seminars		CO3	CD1, CD2, CD5
CD4	Mini projects/Projects			
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.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	L1, to L6			Lines & Lettering	R1,R2, R3	CO1		PPT Digi Class/Chalk -Board	
2	L7 to L12,			Dimensioning of different 2D objects	-do-	-do-		-do-	
3	L13 to L18			Scale drawing of simple shapes, reduction and enlargement of drawings on different scales	-do-	-do-		-do-	
4	L19 to L30			Projection of planes and solids.	-do-	CO1, CO2		-do-	
5	L31 to L36			Section of solids to include representation of such groups in these projections	T3,T5	CO1, CO2, CO3		-do-	
6	L37, L42			Development of surfaces, drawing of unfolded surface of 3d objects	T1, T5	CO1, CO4		-do-	
7	L43 to L54			Techniques of drawing Isometric and Axonometric views of solids	T2,T5	CO2, CO3, CO4		-do-	
8	L55 to L66			Techniques of drawing 1 point, 2 point and multi-point perspective views of blocks and buildings	T1, T4, T5	CO2, CO4		-do-	
9	L67 to L72			Concept of shade and shadow of objects	T5	CO2, CO3, CO4		-do-	

COURSE INFORMATION SHEET

Course code: **AR 113**
Course title: **CONSTRUCTION TECHNIQUE and MODEL MAKING WORKSHOP**
Pre-requisite(s): None
Co- requisite(s): None
Credits: 2 **L: 0 T:0 P:4**
Class schedule per week: **04**
Class: **B. Arch**
Semester / Level: **I**
Branch: **Architecture**
Name of Teacher: **Prof. RituAgrawal**

Course Objectives: This course enables the students:

A.	To introduce the fundamentals of construction and the essentials of Architectural model making.
B.	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).
C.	To become familiar with visual vocabularies of architecture and appreciating them.
D.	To develop and represent the forms in terms of models.
E.	To apply the theory of model making in compositions.

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

1.	To understand the fundamentals of construction and transformation from two dimensions to three dimension forms through model making.
2.	To develop skills in the context of architectural construction and compositions.
3.	To apply the art of model making in architectural compositions.

Syllabus

1. Construction Techniques - Preliminary construction principles -
   Hands-on feel of materials and their applications – soil, cement, brick, wood, etc.
   Laying of brick courses & various bonds of brick with & without mortar.
   Mortar mixing & Mortar preparations of cement mortar for masonry and plaster.
   Timber Joinery details – T-junction, Cross-junction, Tenon &Mortise Joints, Dove-tail Joint, etc.
   (Site visits and 3-D models to understand the topic).

2. Skills to represent ideas and forms through study model -
   Models with linear members such as match sticks, reeds, etc. to understand geometric form and structure.

3. Architectural Model Making with variety of materials such as card board, ivory sheets, plastic & acrylic sheets, glass, timber & plywood.

4. Study of Development of surfaces, drawing of unfolded surfaces of 3-D objects.

5. Site visit report

Text books: Nil

Reference Books:

1. Ching, Francis D K, A Visual Dictionary of Architecture, John Wiley & Sons, Inc.
2. Ching, Francis D K, Barry, S. and Zuberbuhler, D., Building Structures Illustrated – Patterns, Systems and Design, John Wiley & Sons, Inc.
3. Snyder, James C. and Anthony J. Catanese, Introduction to Architecture, McGraw-Hill.

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**
Progressive Evaluation	30
End Sem Evaluation	20

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											
	a	b	c	d	e	f	g	h	i	j	k	l
1.	H	L	-	-	-	H	-	-	-	-	-	-
2.	L	H	-	-	-	H	-	-	-	-	-	-
3.	M	L	-	-	-	M	-	-	-	-	-	-

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.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
15.	L1			Introduction to Construction Techniques- Hands-on feel of materials and their applications – soil, cement, brick, wood, etc.	R1, R2, R3	CO1		PPT Digi Class /Chalk -Board	
16.	L2			Site visit to study Mortar mixing & Mortar preparations of cement mortar for masonry and plaster.	R1, R2, R3	CO1		PPT Digi Class /Chalk -Board	
17.	L3			Site visit forLaying of brick courses & various bonds of brick with & without mortar.	R1, R2, R3	CO1, CO2		PPT Digi Class /Chalk -Board	
18.	L4			Skills to represent ideas and forms through study model - Models with linear members such as match sticks, reeds, etc. to understand geometric form and structure.	R1, R2, R3,	CO1, CO2		PPT Digi Class /Chalk -Board	
19.	L5			Creative models with match sticks, reeds, etc. to understand geometric form and structure.	R1, R2, R3,	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	

20.	L6			Creative models with match sticks, reeds, etc. to understand geometric form and structure.	R1, R2, R3,	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	
21.	L7			Theme based models, sculptures, mural design, tile design, pattern making, etc.	R1, R2, R3	CO2, CO3			
22.	L8			Architectural Model Making with variety of materials such as card board, ivory sheets, plastic & acrylic sheets, glass, timber & plywood.	R1, R2, R3.	CO2		PPT Digi Class /Chalk -Board	
23.	L9			Architectural Model Making with variety of materials such as card board, ivory sheets, plastic & acrylic sheets, glass, timber & plywood.	R1, R2, R3	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	
24.	L10			Architectural Model Making with variety of materials such as card board, ivory sheets, plastic & acrylic sheets, glass, timber & plywood.	R1, R2, R3	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	
25.	L11			Architectural Model Making with variety of materials such as card board, ivory sheets, plastic & acrylic sheets, glass, timber & plywood.	R1, R2, R3	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	
26.	L12			Development of surfaces,	R1, R2, R3	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	
27.	L13			Model of unfolded surfaces of 3-D objects.	R1, R2, R3	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	
28.	L14			Site visit report	R1, R2, R3	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	

SEMESTER II

COURSE INFORMATION SHEET

Course code: AR 151
Course title: ADVANCED BUILDING MATERIALS
Pre-requisite(s): None
Co- requisite(s): None
Credits: 3 L:3 T:0 P:0
Class schedule per week: 03
Class: B. Architecture
Semester / Level: II
Branch: Architecture
Name of Teacher: Anuj Kumar Toppo

Course Objectives

This course enables the students:

A.	To list the various properties of non-ferrous alloys used as building material
B.	To classify the types of corrosion of ferrous and non-ferrous metals and respective preventive measures.
C.	To outline the use of various admixtures in concrete
D.	To compare the use of traditional concrete and RMC
.E	To analyse and prepare the specification of various clay and ceramic tiles for building application.
F	To outline the application of different painting system in building exterior and interior

Course Outcomes

After the completion of this course, students will be:

1.	Understand the different types of Advanced building materials used in building Industry.
2.	Choose proper alternative of building material and their application in building Industry
3.	Develop a sense of organization of appropriate building material

Syllabus

Module 1: Non Ferrous Metal

Aluminum & important alloys and brief description of uses, Copper & important alloys and brief description of uses, Corrosion of both ferrous and non- ferrous metals – types and preventive measures.

Module 2: Clay Products, Wall & Floor Tiles

Roofing Tiles their properties and use, terra-cotta, earthenware, stoneware, porcelain, vitreous.
General character and construction process of traditional flooring like:
IPS flooring, Terrazzo flooring, Vitrified tiles, planks , Stone Sizes, Classification & Properties of tiles used in wall and flooring, Selection criteria & Methods of fixing various types of tiles.

Module 3: Special Concrete

Water repellent, Waterproofing compounds, Accelerators, Air entraining agents, Hardeners, plasticizer, Fly ash Their availability and uses, Light weight concrete, ready-mix concrete, precast concrete.

Module 4: Varnishes, Paints Distempers

Characteristics and process of varnishing, Type and Compositions of Paints.
Types of painting system: Aluminum paints, Cement-based paints, oil emulsion paints, Enamel paints and Their selection criteria.Texture Paints.

Module 5: Plastics and Polymers
Types and Use of Plastic in building construction, Properties of Plastic. Use of various Polymer Materials in building industry
Use of Nano-paints.
Miscellaneous Materials
Glass, Fibre glass, Cork, rubber, Gypsum, sealants, Asbestos, Cement Board, WPC
Heat and sound insulative materials, Their trade name anduses.

Text books:
1. B. C. Punmia; *Building Materials and Construction* .Laxmi Publications Pvt Ltd, NewDelhi,1993
2. Bindra&Arora; *Building Materials andConstruction.*
3. W.B. Mckay, '*Building Construction'*, Vol. 1,2,3 Longmans, U.K.1981.
4. Rangwala: *Engineering Materials*
5. Sushil-Kumar, T. B. (2003).*Building Construction.* 19th Ed. Delhi : Standard Publishers.

Reference books:
1. Khanna: *Civil Engineer's Hand Book*
2. Arthur Lyons; Materials for Architects and Builders- An Introduction; Arnold, London1997

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
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**
Mid Sem Examination Marks	25
End SemExamination Marks	60
Assignment / Quiz (s)	15

AssessmentCompoents	**CO1**	**CO2**	**CO3**	**CO4**	
Mid Sem Examination Marks					
End Sem Examination Marks					
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											
	a	b	c	d	e	f	g	h	i	j	k	l
1	H	M	M	H	L	H	H	H	M	L	H	H
2	H	H	H	M	H	M	H	H	M	L	H	H
3	H	H	H	H	M	H	M	L	M	M	M	H

Mapping Between COs and Course Delivery (CD) methods				
CD	**Course Delivery methods**		**Course Outcome**	**Course Delivery Method**
CD 1	Lecture by use of boards/LCD projectors/OHP projectors		CO1	CD1, CD2
CD 2	Tutorials/Assignments		CO2	CD1, CD4
CD 3	Seminars		CO3	CD1 ,CD2and CD4
CD 4	Mini projects/Projects			
CD 5	Laboratory experiments/teaching aids			
CD 6	Industrial/guest lectures			
CD 7	Industrial visits/in-plant training			
CD 8	Self- learning such as use of NPTEL materials and internets			
CD 9	Simulation			

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	L1-L2		1	Aluminum & important alloys and brief description of uses	T5, R1	CO1		PPT Digi Class/Chock -Board	
2	L3-L4			Copper & important alloys and brief description of uses	T1	CO1		PPT Digi Class/Chock -Board	

3	L4-L6			Corrosion of both ferrous and non-ferrous metals – types and preventive measures.	T1	CO1		PPT Digi Class/Chock -Board	
4	L7-L8			Roofing Tiles their properties and use, terra-cotta, earthenware, stoneware, porcelain, vitreous.	T1	CO2		PPT Digi Class/Chock -Board	
5	L9-L11			IPS flooring, Terrazzo flooring, Vitrified tiles, planks , Stone Sizes, Classification & Properties of tiles used in wall and flooring, Selection criteria & Methods of fixing various types of tiles.	T3,R1	CO2, CO3		PPT Digi Class/Chock -Board	
6	L12 - L15			Water repellent, Waterproofing compounds, Accelerators, Air entraining agents, Hardeners, plasticizer, Fly ash Their availability and uses,	T2,R2	CO1 CO2 CO3		PPT Digi Class/Chock -Board	
7	L16 - L18			Light weight concrete, ready-mix concrete, precast concrete.	T4,R1	CO2		PPT Digi Class/Chock -Board	
8	L19 - L21			Characteristics and process of varnishing, Type and	T3,R1	CO2		PPT Digi Class/Chock -Board	

				Compositions of Paints.					
9	L22 - L24			Types of painting system: Aluminum paints, Cement-based paints, oil emulsion paints, Enamel paints and Their selection criteria.Texture Paints.	T3,R1	CO3		PPT Digi Class/Chock -Board	
10	L25 - L26			Types and Use of Plastic in building construction, Properties of Plastic.	T2,R1	CO2 CO3		PPT Digi Class/Chock -Board	
11	L27 - L29			Use of various Polymer Materials in building industry	T4,R2	CO1		PPT Digi Class/Chock -Board	
12	L30			Use of Nano-paints.	R1			PPT Digi Class/Chock -Board	
12	L31 - L32			Glass, Fibre glass	T1,T3,R1	CO1		PPT Digi Class/Chock -Board	
13	L33 - L34			Cork, rubber, Gypsum, sealants	T1,T3,R1	CO1		PPT Digi Class/Chock -Board	
14	L35 - L38			Heat and sound insulative materials, Their trade name anduses.	T3,R2	CO3		PPT Digi Class/Chock -Board	

COURSE INFORMATION SHEET

Course code: AR 1052
Course title: HISTORY OF ARCHITECTURE -WESTERN
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: II
Branch: Architecture
Name of Teacher: Apurv Ashish

Course Objectives

Grossly divided, architecture of the World are of two type – Oriental (eastern) and Occidental (western). Students of Architecture in this course have been exposed to the former in the previous semester, where they have studied the more spiritual approach towards buildings and their design. In this subject, they would be taught about the more materialistic and philosophical approach of the occidental school of thought. This course enables the students:

A.	To teach the development of occidental, henceforth mentioned as Western architecture along time scale, with the help of chronological development of civilizations across the globe.
B.	To impart knowledge about the art & architecture of the European, Egyptian & Middle eastern cultures, which have served as the cradle of human civilization during the ancient and the classical periods.
C.	To explain the relationship between culture, building art and construction techniques of space and time.
D	To teach the student the analysis of social, political, religious, climatological and financial factors and how they have influenced architecture.

Course Outcomes

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

1.	Develop an appreciation of varied cultures and the resulting architectural productions which are unique in time and place.
2.	Improve their knowledge about place and culture by studying the planning, construction, and aesthetics of important historical buildings ie. Western Architecture.
3.	Build basic concepts for subjects like Principles of Human Settlements, Model Making Workshop, Contemporary Architecture etc.
4.	Improve their knowledge about the historical context and explore their contemporary design implications.

Syllabus-

Module 1: Primitive, Mesopotamian and Egyptian Architecture.

A. Development of forms of shelters and megalithic structures.
B. Salient building types :Ziggurats, Temples, Palaces, Housing and Town Planning Aspects (Mesopotamian)
   - Sumerians- City of Ur, White temple at Uruk, Great Ziggurat, Ur, Oval Temple at Khafaje.
   - Assyrians- Palace of Sargon, City of Khorsabad, Nineveh.

- Babylonians- City of Babylon, Nebuchadnezzar's Palace.
- Persians- Palace of Persepolis.

C. Salient building types: Development of Pyramids, Cult and Mortuary Temples, Housing and Town Planning Aspects (Egyptian)

- Ancient Egyptian Period- Mastabas, Bent Pyramid, Pyramids of Giza (Parts of Pyramid).
- Middle Egyptian Period- City of Hotepsenusret.
- New Empire- Temple at Abu Simbel, Great Temple at Karnak..

Module 2: Classical Architecture: Greek and Roman Architecture.

A. Greek Architecture -

I. Early Greek Period (Minoan Period)- Barrow Tombs, Minoan Palace at Knossos, Crete and Lion Gate, Mycenae.

II. Ancient Greek Period (Hellenic period)-

- Development of Classical Order – Doric, Ionic, Corinthian.
- City planning aspects of Athens, Priene.
- Relevance of open spaces
- Salient building types: Salient features of Greek Houses, Development of Temple types and Temples at Acropolis eg. Pantheon, Stoas, Theatre of Epidarus.
- Technology of Optical Correction (Entasis).

B. Roman Architecture

- Contribution in new materials and new construction/structural systems, eg, Pozzolana, Cement, Stone Blocks, Stone Masonry, Arch, Barrel and Groin Vault, Dome.
- Development of Tuscan and Composite order.
- Salient building Types: Parthenon, Forums, Colosseum, Circus Maximus, Thermaeof Caracalla, Basilica of Trajan.

Module 3: Early Christian, Romanesque and Byzantine Architecture.

A. Early Christian Architecture: Development of Early Christian Church from Roman Basilica. Example – St. Peter's Basilica

B. Romanesque Architecture: Development of Romanesque architecture from Early Christian architecture. Example- Pisa Complex.

C. Byzantine Architecture:

- Contribution of Byzantine architecture in the development of structural system – dome construction over square plan,
- Adoption of Greek cross in church layout.
- Use of mosaic and mural in interior.
- Case example – Saint Hagia Sophia, Istanbul; St. Mark's Cathedral, Venice.

Module 4:Gothic Architecture

A. Development of Gothic church and its new elements:

- Pointed Arch window
- Different arch types – lancet, equilateral, depressed
- Trefoil arch
- Cluster column and intersecting vault roof
- Clerestory window and triforium
- Flying buttress
- Glazed window, stone and metal trellis, flamboyant window, rose window
- Entrance of church

Case example – Cathedrals of Chartres, St. Dennis, Notre Dame (Paris), Reims.

Module 5: Renaissance Architecture

A. Division of Renaissance architecture into Early, Mature and Late periods.
B. Contribution in structural system, eg, Ribbed dome, Lantern dome.
Case example–St. Peter's Cathedral (Rome), Louvre Palace (Paris).

Text Books:

1. Sir Banister Fletcher, A History of Architecture, University of London, the Antholone Press, 1986.
2. G.K.Hiraskar, Great Ages of World Architecture, DhanpatRai& Sons, Delhi.
3. Moffet, M., Fazio, M. and Wodehouse, L., "A World History of Architecture", McGraw-Hill. 2008.

Reference Books:

1. Watkin, D., "A History of Western Architecture", Thames and Hudson. 1986.
2. S. Lloyd and H.W. Muller, History of World Architecture – Series, Faber and Faber Ltd. London, 1986.

POs met through Gaps in the Syllabus: Nil

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	Self- learning such as use of NPTEL materials and internet.

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	60
Assignment	15

Assessment Components	**CO1**	**CO2**	**CO3**	**CO4**
Mid Sem Examination Marks	√	√	√	√
End Sem Examination Marks	√	√	√	√
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											
	a	b	c	d	e	f	g	h	i	j	k	l
1	M	L		M		M	M	L		M		M
2	H	L		M	L	H	M	M		H	L	M
3	H	M		M	L	H	M	L	L	L		H
4	H	M		M	L	M	H	M	L	M		M

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, CO4
CD2	Tutorials/Assignments	CO1, CO2, CO4
CD3	Seminars	CO2, CO3
CD4	Self- learning such as use of NPTEL materials and internet	CO1, CO2, CO3, CO4

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	L1			Development of Shelters and Megalithic structures.	T1, T3	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	
1	L2-L3			**Sumerians**- City of Ur, White temple at Uruk, Great Ziggurat, Ur, Oval Temple at Khafaje.	T1, T3, R2	CO1, CO2, CO4		PPT Digi Class/Chalk -Board	
2	L4			**Assyrians**- Palace of Sargon, City of Khorsabad, City of Nineveh.	T1, T3, R1	CO1, CO3		PPT Digi Class/Chalk -Board	
2	L5-L6			**Babylonians**- City of Babylon, Nebuchadnezzar's Palace.	T3, R1	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	

				Persians- Palace of Persepolis.					
3	L7-L8			**Ancient Egyptian Period**- Mastabas, Bent Pyramid, Pyramids of Giza (Parts of Pyramid). **Middle Egyptian Period**- City of Hotepsen-usret.	T2, T3	CO2, CO3, CO4		PPT Digi Class/Chalk -Board	
3	L9			**New Egyptian Empire**- Temple at Abu Simbel, Great Temple at Karnak..	T2, T3, R2	CO1, CO2		PPT Digi Class/Chalk -Board	
4	L10-L11			**Early Greek Period**- Barrow Tombs, Minoan Palace at Knossos, Crete and Lion Gate, Mycenae.	T1, T3, R1	CO1, CO2, CO4		PPT Digi Class/Chalk -Board	
4	L12			**Ancient Greek Period** (**Hellenic period**)- Development of Classical Order – Doric, Ionic, Corinthian.	T1, T2	CO1, CO2		PPT Digi Class/Chalk -Board	
5	L13-L14			**Greek Period- City planning** aspects of Athens, Priene. Relevance of open spaces during Greek Period.Sal-	T1, T3, R2	CO2, CO3, CO4		PPT Digi Class/Chalk -Board	

				ient building types: Salient features of Greek Houses.					
6	L15-L16			**Greek Period-** Development of Temple types and Temples at Acropolis eg. Pantheon	T1, T3, R1	CO1, CO2, CO4		PPT Digi Class/Chalk -Board	
7	L17-L18			**Greek Period-** Development of Temple types and Temples at Acropolis eg. Pantheon, Stoas, Theatre of Epidarus. Technology of Optical Correction (Entasis).	T1, T3 R2	CO1, CO3, CO4		PPT Digi Class/Chalk -Board	
8	L19-L20			**Roman Architecture-** Contribution through new materials and new construction/structural systems, eg, Pozzolana, Cement, Stone Blocks, Stone Masonry, Arch, Barrel and Groin Vault, Dome.	T2, T3 R2, R3	CO1, CO2		PPT Digi Class/Chalk -Board	
8	L21-L22			**Roman Architecture-** Development of Tuscan and Composite order. Salient building Types: Parthenon, Forums, Colosseum.	T1, T3	CO1, CO2		PPT Digi Class/Chalk -Board	
9	L23-L24			**Roman Architecture-**	T1, T2,	CO1, CO2,		PPT Digi Class/Chalk	

				Salient building Types: Parthenon, Forums, Colosseum, Circus Maximus, Thermae of Caracalla, Basilica of Trajan.	T3, R1	CO4		-Board	
10	L25-L27			**Early Christian Architecture**- Development of Early Christian Church from Roman Basilica. Example – St. Peter's Basilica	T1, T3, R2	CO1, CO2		PPT Digi Class/Chalk -Board	
11	L28-L29			**Romanesque Architecture**- Development of Romanesque architecture from Early Christian architecture. Example- Pisa Complex.	T1, T3	CO1, CO2, CO4		PPT Digi Class/Chalk -Board	
12	L30-L31			**Byzantine Architecture**- Contribution of Byzantine architecture in the development of structural system – dome construction over square plan, Adoption of Greek cross in church layout.	T1, T2, T3	CO1, CO2, CO4		PPT Digi Class/Chalk -Board	
12	L32-L33			**Byzantine Architecture**- Use of mosaic and mural in interior.	T1, R3	CO1, CO2		PPT Digi Class/Chalk -Board	

				Case example – Saint Hagia Sophia, Istanbul;					
12	L34-L35			**Byzantine Architecture**-Case example: St. Mark's Cathedral, Venice.	T1, T2, R2	CO1, CO2, CO4		PPT Digi Class/Chalk -Board	
13	L36			**Gothic Architecture**-Development of Gothic church and its new elements: Pointed Arch window Different arch types – lancet, equilateral, depressed Trefoil arch	T1, T3	CO1, CO2, CO4		PPT Digi Class/Chalk -Board	
13	L37-L38			**Gothic Architecture**-Cluster column and intersecting vault roof Clerestory window and triforium Flying buttress Glazed window, stone and metal trellis, flamboyant window, rose window Entrance of church Case example – Cathedrals of Chartres	T1, T3, R1, R2	CO1, CO2, CO4		PPT Digi Class/Chalk -Board	
14	L39-L40			**Gothic Architecture**-Case example –St. Dennis, Notre Dame	T1, T3, R3	CO1, CO2		PPT Digi Class/Chalk -Board	

				(Paris), Reims.					
14	L41-L42			**Renaissance Architecture**-Division of Renaissance architecture into Early, Mature and Late periods. Contribution in structural system, eg, Ribbed dome, Lantern dome.	T1, T2, T3	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	
15	L43-L44			**Renaissance Architecture**-Case example –St. Peter's Cathedral (Rome), Louvre Palace (Paris).	T1, T3, R2	CO2, CO3, CO4		PPT Digi Class/Chalk -Board	

COURSE INFORMATION SHEET

Course code: AR 1053
Course title: STATICS AND STRENGTH OF MATERIALS
Pre-requisite(s): Mathematics course with ordinary differential equations
Co- requisite(s): None
Credits:3 L:3 T: 0 P:0
Class schedule per week: 3 Classes/Week
Class: B. Arch
Semester / Level: II
Branch: Architecture
Name of Teacher:

Course Objectives

This course enables the students:

A.	To understand the equilibrium conditions of different force systems in two-dimensional plane
B	To understand stress-strain behaviour of ductile and brittle materials in their elastic limit.
C	To draw shear force and bending moment diagram of statically determinate beams subjected to different types of loads.

Course Outcomes

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

1.	Understand the basic principle of statics and strength of materials theorems and to apply the concept in structural problems.
2.	Analyse force applied to the truss members in simple and plane truss.
3.	Evaluate centre of gravity and centroid of solid objects and plane figures, respectively
4.	Analyse elastic behaviour of ductile and brittle materials
5.	Evaluate shear force and bending moment of the beams subjected to different types of loads

Syllabus

Module 1: Introduction to Statics

Basic principle of statics, coplanar and concurrent system of forces,Principle of Transmissibility, two-dimensional force systems, free body diagrams, moment and couple,Force-Couple Systems, Varignon's theorem of moment, resultant of force systems, and conditions of equilibrium.

(8 Lectures)

Module 2: Truss and Structures

Plane truss, simple truss**,** redundant, analysis of simple plane truss using method of sections and method of joints, and graphical solutions for force analysis of trusses.

(8 Lectures)

Module 3:Center of Gravity and Centroid

Center of gravity of solid objects, determination of centroid of plane and curve areas, Moment of Inertia of plane figures, Polar moment of inertia, parallel axis theorem, and radius of gyration.

(8 Lectures)

Module 4: Simple Stress and Strain

Concept of stress and strain – normal and shear,Poisson'sratio,stress-strain diagrams for ductile and brittle materials,elasticity and plasticity, linear elasticity and Hooke's Law, Young's modulus, modulus of rigidity, volumetric strain and bulk modulus, relations between Young's modulus, modulus of rigidity, and bulk modulus, allowable loads and factor of safety for ductile and brittle materials.

(9 Lectures)

Module 5: Shear Force and Bending Moment

Types of supports, beams, and loads, statically determinate and indeterminate beams, degree of statical indeterminacy, equilibrium of a beam, shear force and bending moment, relationship between shear force, bending moment and load intensity, shear force and bending moment diagrams for statically determinate beams subjected to different types of loads, point of contraflexure.

(9 Lectures)

Text books:

1. J.L. Meriam and L. G. Kraige, *Engineering Mechanics: Statics*, John Wiley & Sons, Inc.
2. J. M. Gere and S. P. Timoshenko, *Mechanics of Materials*, Springer-Science+Business Media, B.V.

Reference books:

1. I. H. Shames, *Engineering Mechanics: Statics and Dynamics*, Prentice Hall,New Jersey
2. I.B. Prasad, *A text book of Applied Mechanics: Dynamics and Statics*, Khanna Publishers
3. S. Ramamurtham, *Strength of Materials*, DhanpatRai Publications
4. S. S. Rattan, *Strength of Materials,* Tata McGraw-Hill Publishers.

Gaps in the syllabus (to meet Industry/Profession requirements):
Analysis of torsion and combined stresses

POs met through Gaps in the Syllabus:
PO1, PO2, and PO4

Topics beyond syllabus/Advanced topics/Design:
Stress-strain behaviour of materials using tensorial approach

POs met through Topics beyond syllabus/Advanced topics/Design
PO1, PO2, and PO4

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
Mid Sem Examination Marks	25
End Sem Examination Marks	60
Assignment / Quiz (s)	15

AssessmentCompoents	CO1	CO2	CO3	CO4	CO5
Mid Sem Examination Marks					
End Sem Examination Marks					
Assignment					

Indirect Assessment –

1.Student Feedback on Faculty
2. Student Feedback on Course Outcome

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	Program Outcomes			
	1	2	3	4
1	H	M	-	H
2	H	M	-	L
3	L	-	-	L
4	H	M	L	M
5	M	L	-	L

Mapping Between COs and Course Delivery (CD) methods				
CD	**Course Delivery methods**		**Course Outcome**	**Course Delivery Method**
CD 1	Lecture by use of boards/LCD projectors/OHP projectors		CO1-5	CD1
CD 2	Tutorials/Assignments		CO1-5	CD2
CD 3	Seminars			
CD 4	Mini projects/Projects			
CD 5	Laboratory experiments/teaching aids			
CD 6	Industrial/guest lectures			
CD	Industrial visits/in-plant training			

7				
CD 8	Self- learning such as use of NPTEL materials and internets			
CD 9	Simulation			

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	L1		1	Basic principle of statics, coplanar and concurrent system of forces	T1, R1, R2	1		PPT Digi Class/Chalk-Board	
1	L2		1	Basic principle of statics, coplanar and concurrent system of forces	T1, R1, R2	1		PPT Digi Class/Chalk-Board	
1	L3		1	Principle of Transmissibility, two-dimensional force systems	T1, R1, R2	1		PPT Digi Class/Chalk-Board	
2	L4		1	Principle of Transmissibility, two-dimensional force systems	T1, R1, R2	1		PPT Digi Class/Chalk-Board	
2	L5		1	free body diagrams, moment and couple,Force-Couple Systems	T1, R1, R2	1		PPT Digi Class/Chalk-Board	
2	L6		1	Varignon's theorem of moment	T1, R1, R2	1		PPT Digi Class/Chalk-Board	
3	L7		1	resultant of force systems, and conditions of equilibrium	T1, R1, R2	1		PPT Digi Class/Chalk-Board	
3	L8		1	resultant of force systems, and conditions of equilibrium	T1, R1, R2	1		PPT Digi Class/Chalk-Board	
4	L9		2	Plane truss, simple truss,	T1, R1,	2		PPT Digi Class/Chalk	

				redundant	R2			-Board	
4	L10		2	Plane truss, simple truss**,** redundant	T1, R1, R2	2		PPT Digi Class/Chalk -Board	
4	L11		2	analysis of simple plane truss using method of sections and method of joints	T1, R1, R2	2		PPT Digi Class/Chalk -Board	
5	L12		2	analysis of simple plane truss using method of sections and method of joints	T1, R1, R2	2		PPT Digi Class/Chalk -Board	
5	L13		2	analysis of simple plane truss using method of sections and method of joints	T1, R1, R2	2		PPT Digi Class/Chalk -Board	
5	L14		2	analysis of simple plane truss using method of sections and method of joints	T1, R1, R2	2		PPT Digi Class/Chalk -Board	
6	L15		2	graphical solutions for force analysis of trusses	T1, R1, R2	2		PPT Digi Class/Chalk -Board	
6	L16		2	graphical solutions for force analysis of trusses	T1, R1, R2	2		PPT Digi Class/Chalk -Board	
6	L17		3	Center of gravity of solid objects	T1, R1, R2	3		PPT Digi Class/Chalk -Board	
7	L18		3	determination of centroid of plane and curve areas	T1, R1, R2	3		PPT Digi Class/Chalk -Board	
7	L19		3	determination of centroid of plane and curve areas	T1, R1, R2	3		PPT Digi Class/Chalk -Board	
7	L20		3	Moment of Inertia of plane figures	T1, R1, R2	3		PPT Digi Class/Chalk -Board	

8	L21		3	Moment of Inertia of plane figures	T1, R1, R2	3		PPT Digi Class/Chalk -Board	
8	L22		3	Polar moment of inertia, parallel axis theorem	T1, R1, R2	3		PPT Digi Class/Chalk -Board	
8	L23		3	Polar moment of inertia, parallel axis theorem	T1, R1, R2	3		PPT Digi Class/Chalk -Board	
9	L24		3	radius of gyration	T1, R1, R2	3		PPT Digi Class/Chalk -Board	
9	L25			Concept of stress and strain – normal and shear	T2, R3, R4	4		PPT Digi Class/Chalk -Board	
9	L26			Concept of stress and strain – normal and shear	T2, R3, R4	4		PPT Digi Class/Chalk -Board	
10	L27			Concept of stress and strain – normal and shear	T2, R3, R4	4		PPT Digi Class/Chalk -Board	
10	L28			stress-strain diagrams for ductile and brittle materials	T2, R3, R4	4		PPT Digi Class/Chalk -Board	
10	L29			elasticity and plasticity, linear elasticity and Hooke's Law	T2, R3, R4	4		PPT Digi Class/Chalk -Board	
11	L30			elasticity and plasticity, linear elasticity and Hooke's Law	T2, R3, R4	4		PPT Digi Class/Chalk -Board	
11	L31			Young's modulus, modulus of rigidity, volumetric strain and bulk modulus	T2, R3, R4	4		PPT Digi Class/Chalk -Board	
11	L32			relations between Young's modulus, modulus of rigidity, and bulk modulus	T2, R3, R4	4		PPT Digi Class/Chalk -Board	

12	L33			allowable loads and factor of safety for ductile and brittle materials	T2, R3, R4	4		PPT Digi Class/Chalk -Board	
12	L34			Types of supports, beams, and loads	T2, R3, R4	5		PPT Digi Class/Chalk -Board	
12	L35			Types of supports, beams, and loads	T2, R3, R4	5		PPT Digi Class/Chalk -Board	
13	L36			statically determinate and indeterminate beams	T2, R3, R4	5		PPT Digi Class/Chalk -Board	
13	L37			statically determinate and indeterminate beams	T2, R3, R4	5		PPT Digi Class/Chalk -Board	
13	L38			degree of statical indeterminacy, equilibrium of a beam	T2, R3, R4	5		PPT Digi Class/Chalk -Board	
14	L39			shear force and bending moment, relationship between shear force, bending moment and load intensity	T2, R3, R4	5		PPT Digi Class/Chalk -Board	
14	L40			shear force and bending moment diagrams for statically determinate beams subjected to different types of loads, point of contraflexure	T2, R3, R4	5		PPT Digi Class/Chalk -Board	
14	L41			shear force and bending moment diagrams for statically determinate	T2, R3, R4	5		PPT Digi Class/Chalk -Board	

				beams subjected to different types of loads, point of contraflexure					
15	L42			shear force and bending moment diagrams for statically determinate beams subjected to different types of loads, point of contraflexure	T2, R3, R4	5		PPT Digi Class/Chalk -Board	

COURSE INFORMATION SHEET

Course code: **AR 1061**
Course title: **ARCHITECTURAL DESIGN II**
Pre-requisite(s): The students should have registered for AR 111 Architectural Design-I
Co- requisite(s): None
Credits: 9 **L: 0 T: 0 P:6**
Class schedule per week: **06**
Class: **B. Arch**
Semester / Level: **II**
Branch: **Architecture**
Name of Teacher: **Prof. Ritu Agrawal**

Course Objectives:

This course enables the students:

A.	To introduce the process of architectural design - from inception to representation.
B.	To identify, analyse and relate the concepts of space, form and order in the context of three-dimensional designed space. To design objects based on the concept of space and form.
C.	To identify and classify different functional spaces, their relationships and analyse their space requirements.
D.	To identify the human standards of design based on ergonomics, and relate activities to spatial data (dimensions, space-defining/establishing elements).
E.	To understand and apply the design theory and principles of design for small buildings.

Course Outcome:

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

1.	To develop critical and analytical thinking skills in the context of the concepts of space, form and order.
2.	To understand, distinguish and analyse three dimensional designed spaces, wide range of functions and their relationships.
3.	To comprehend human standards of design based on ergonomics.
4.	To represent the forms in terms of drawings and 3D models.
5.	To design various components of different functional spaces with an integration of the principles of composition and design.

Syllabus

1. Relationship between Basic Design and Architectural Design: comprehensive understanding of space, form, function and design.
   Study of 3D forms/shades and shadow study and composition.

2. Application of elements of design to achieve design principles in creative work.
   Design of small objects (parts of building, like, window grill, boundary wall, floor tiles and similar projects) with respect to function structure aesthetics.

3. Introduction to external and internal form concept, their quality, concept of space, relation of space and volume.
   Approach to design as a continuous process through aesthetics, function and technology; study of basic components of a building and their functions.
   Study of basic human needs, standard measurements of human activities and allocation of spaces: Examples of Dimensions of different rooms.

4. Principle of design with reference to function, various activities and related spaces; Data collection, environments, climate, orientation, site conditions, circulation flow diagrams.
   Concepts of Anthropometrics and ergonomics.
   Study and concept of measured drawings of small buildings.
   Study and design of single units like living spaces, sleeping and cooking spaces, stalls, bus-stops, telephone booths, Rest pavilion, Picnic shelter, Small Florist's shop, Hostel room, Public Toilet, Internet Booth, Kids' Toy shop, Coffee shop, Fast-food restaurant, Yoga centre, Lodge in forest /hill etc. Detailed design of single room for simple function showing relationship with adjoining areas for other activities not more than 25 sq.mts.

5. Design assignments should gradually build up in complexity, starting from single spatial unit, through multiple attached units, to clustering of several units.

   Design problems dealing with planning for activities such as individual living units shops, stalls, snack bars, unilevel activities with three to four functions of total area up to 80 sq.mts; Residence design for single family - (site to be given & shown to students for better understanding and sensitivity towards site analysis).

Sessional Work: Assignments based on the above topics. Total – 10-12 sheets.

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. C. D. Joseph and Callender John; Time Saver Standards for Architectural Design Data.
3. Christopher Alexander; A Pattern Language.
4. Francis D.K. Ching; – Architecture: Form Space and Order; Van Nostrand Reinhold Co., (Canaa), 1979.
5. A George and Bruce Hannah," Access by Design", Van Nostrand Reinhold, 1996.

6. Pearce Peter; Structure in Nature – Strategy for Design.
7. Peter Fawcett A.; Architecture Design Notebook. http://www.scribd.com/doc/45018090/Architecture-Design-Notebook
8. Pickering, Ernest; Architectural Design, John Wiley and Sons Inc., Canada, 1949.
9. Marjore Elliott Bevin, "Design through Discovery", Holt Rinehart and Winton,NewYork,1977.
10. Neufert's Architect's Data.3rd Ed., Blackwell Science. 2000.
11. V.S. Paramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi – 1973.
12. Von MeissPieree; Elements of Architecture.
13. Francis D K Ching, A Visual Dictionary of Architecture, John Wiley & Sons, Inc.
14. James C Snyder and Anthony J. Catanese, Introduction to Architecture, McGraw-Hill, 1980.
All Books, journals and magazines on Architecture

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

	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
Progressive Evaluation	60
End Sem Evaluation	40

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											
	a	b	c	d	e	f	g	h	i	j	k	l
1.	H	L	-	L	L	-	-	-	-	-	-	-
2.	H	H	L	L	L	-	-	-	-	-	-	-
3.	H	L	-	M	L	-	-	-	-	-	-	-
4.	M	H	M	M	L	-	-	-	-	-	-	-
5.	H	H	H	H	M	-	-	-	-	L		

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.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
29.	L1, L2			Relationship between Basic Design and Architectural Design: comprehensive understanding of space, form, function and design.	R1, R2, R3, R4	CO1		PPT Digi Class /Chalk -Board	
30.	L3, L4			Relationship between Basic Design and Architectural Design: comprehensive understanding of space, form, function and design.	R1, R2, R3	CO1		PPT Digi Class /Chalk -Board	
31.	L5, L6			Study of 3D forms/shades and shadow study and composition.	R1, R2, R3	CO1, CO2		PPT Digi Class /Chalk -Board	
32.	L7, L8			Application of elements of design to achieve design principles in creative work.	R1, R2, R3, R11	CO1, CO2		PPT Digi Class /Chalk -Board	
33.	L9, L10			Design of small objects (parts of building, like, window grill, boundary wall, floor tiles and similar projects) with respect to function structure aesthetics.	R1, R2, R3, R11	CO1, CO2, CO3		PPT Digi Class /Chalk -Board	
34.	L11, L12			Concepts of Anthropometrics and ergonomics.	R1, R2, R3, R10	CO1, CO4, CO3		PPT Digi Class /Chalk -Board	
35.	L13, L14			Study of basic human needs, standard measurements of human activities and allocation of spaces: Examples of Dimensions of different rooms.	R1, R2, R3, R11	CO2, CO3, CO4, CO5			
36.	L15, L16			Study and concept of measured drawings of small buildings.	R1, R2, R3,	CO2, CO4		PPT Digi Class /Chalk	

					R11, R12, R14.			-Board	
37.	L17, L18			Study and concept of measured drawings of small buildings. Study and design of single units like living spaces, sleeping and cooking spaces, stalls, bus-stops, telephone booths, Rest pavilion, Picnic shelter, Small Florist's shop, Hostel room, Public Toilet, Internet Booth, Kids' Toy shop, Coffee shop, Fast-food restaurant, Yoga centre, Lodge in forest /hill etc. Detailed design of single room for simple function showing relationship with adjoining areas for other activities not more than 25 sq.mts. Discussion and review	R1, R2, R3, R11, R12, R14.	CO2, CO3, CO4		PPT Digi Class /Chalk -Board	
38.	L18, L20			Principle of design with reference to function, various activities and related spaces; Data collection, environments, climate, orientation, site conditions, circulation flow diagrams. Concepts of Anthropometrics and ergonomics.	R1, R2, R3, R12, R13, R14.	CO2, CO3, CO4		PPT Digi Class /Chalk -Board	
39.	L21, L22			Design problems dealing with planning for activities such as individual living units shops, stalls, snack bars, unilevel activities with three to four functions of total area up to 80 sq.mts.	R1, R2, R3, R12, R13, R14.	CO2, CO3, CO4		PPT Digi Class /Chalk -Board	
40.	L21,			Design problems dealing with planning for activities such as individual living units shops, stalls, snack bars, unilevel activities with three to four functions of total area up to 80 sq.mts.	R1, R2, R3, R12, R13, R14.	CO2, CO3, CO4		PPT Digi Class /Chalk -Board	

	L23			Discussion and review					
41.	L24, L25			Detailed design of single room for simple function showing relationship with adjoining areas for other activities not more than 25 sq.mts.	R1, R2, R3, R12, R13, R14.	CO2, CO3, CO4, CO5		PPT Digi Class /Chalk -Board	
42.	L26, L27			Detailed design of single room for simple function showing relationship with adjoining areas for other activities not more than 25 sq.mts. Discussion and review	R1, R2, R3, R12, R13, R14.	CO2, CO3, CO4, CO5		PPT Digi Class /Chalk -Board	

COURSE INFORMATION SHEET

Course code: AR 1062
Course title: BUILDING CONSTRUCTION I
Pre-requisite(s): None
Co- requisite(s): None
Credits: 9 L:0 T:0 P:6
Class schedule per week: 06
Class: B. Arch
Semester / Level: II
Branch: Architecture
Name of Teacher:Rajan Chandra Sinha

Course Objectives

This course enables the students:

A.	To label the various parts of building
B.	To develop the brick bond for different types of wall junction
C.	To compare the material consumption in various brick bonds
D.	To apply the different types of Door Window detailing in building application
E.	**To classify the requirement of DPC in various levels in building**

Course Outcomes

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

1.	To **define** basic building elements
2.	To **recognize** the various types of masonry, arches and foundation made up of suitable materials.
3.	To **recognize** the various types of doors and windows and **explain** the suitability of given doors and windows based on functional requirement and spatial context.
4.	To **recognize** the importance and constituents waterproofing requirement at different levels and **apply** waterproofing treatment at different levels

Syllabus

BASIC BUILDING COMPONENTS:
Development of Plan & Section of a small building to understand foundation, plinth, flooring, sill, lintel, roof slab and parapet. Typical Building Skin Section for a Two Storied House.

No. of sheets: 1

SHALLOW FOUNDATION:
Types, Isolated, combined and raft foundations and their construction techniques.

No. of sheets: 1

BRICK MASONRY AND ARCHES:
Types of Brick bonds: English, Flemish & Rat-trap bond**.** Detail brick layout at corners, junctions and brick columns.
Classification of Arches on the basis of geometrical shape, materials, construction techniques, viz. flat, segmental, semi-circular, Tudor, circular, elliptical, semi-elliptical, venetian, Florentine arches, etc. Illustration of terminology for arches, construction detailing and methods of centering.

No. of sheets: 3

DOORS & WINDOWS:

Details of door and ventilator. Battened /ledged/Braced door, Flush/Panelled door. Venetian door. Details of window, glazed, pivoted, louvered window, corner and bay window.

No. of sheets: 3

D.P.C. DETAILS:

Waterproofing details in different levels: Details of simple foundation, wall, roof, Details of sill, lintel and roof in RCC, RB and steel, Damp proof details of basement, plinth, sill, lintel, and roof level.

No. of sheets: 2

SITE STUDY & REPORT: different types of brick bonds in wall & Paving with sketches and some photographs, Traditional building component and Wood works

Text books:

1.Building Construction Illustrated by Francis D. K. Ching
2.Building Construction by W B Mackay (Volume 1 and Volume 2)
3.Building Construction by B C Punmia, Ashok K. Jain and Arun K. Jain
4.Building Construction Handbook by R. Chudely

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: 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**
Progressive Evaluation	60
End Sem Evaluation	40

Assessment Components	**CO1**	**CO2**	**CO3**	**CO4**
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											
	a	b	c	d	e	f	g	h	i	j	k	l
1	L	-	L	L	-	-	L	-	-	L	-	-
2	L	-	L	L	-	L	L	L	-	L	-	L
3	L	-	L	L	-	L	M	L	-	L	-	L
4	M	-	L	L	-	L	L	L	-	L	-	L

Mapping Between COs and Course Delivery (CD) methods		
CD	**Course Delivery methods**	**Course Outcome**
CD1	Seminars	CO1, CO2, CO3, CO4
CD2	Mini projects/Projects	CO2, CO3, CO4
CD3	Laboratory experiments/teaching aids	CO2, CO3, CO4
CD4	Industrial/guest lectures	CO2, CO3, CO4

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Tentative Date	Ch. No.	Topics to be covered	Text Book / References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	1-6			Development of Plan & Section of a small building	1,2,3,4	CO1		PPT, Chalk & talk, Illustrations	
2	7-9			Internal evaluation	NA	CO1		Drawing on sheets	
2-3	10-15			Types, Isolated, combined and raft foundations and their construction techniques.	1,2,3,4	CO2		PPT, Chalk & talk, Illustrations	
3	16-18			Internal evaluation	NA	CO2		Drawing on sheets	
4	19-24			Types of Brick bonds: English, Flemish & Rat-trap bond.	1,2,3,4	CO2		PPT, Chalk & talk, Illustrations	
5	25-27			Internal evaluation	NA	CO2		Drawing on sheets	

5	27-30			Detail brick layout at corners, junctions and brick columns.	1,2,3,4	CO2		PPT, Chalk & talk, Illustrations	
6	31-33			Internal evaluation	NA	CO2		Drawing on sheets	
6-7	34-39			Classificati on of Arches	1,2,3,4	CO2		PPT, Chalk & talk, Illustrations	
7	40-42			Internal evaluation	NA	CO2		Drawing on sheets	
`8-	43-48			Details of door and ventilator	1,2,3,4	CO3		PPT, Chalk & talk, Illustrations	
9	49-51			Internal evaluation	NA	CO3		Drawing on sheets	
9-10	52-60			Waterproofi ng details in different levels	1,2,3,4	CO4		PPT, Chalk & talk, Illustrations	
11	61-63			Internal evaluation	NA	CO4		Drawing on sheets	
11	63-66			Site Visit	NA	CO1, CO2, CO3, CO4		Mini projects/Proj ects	
12-13	67-75			Report of site visit	NA	CO3		Mini projects/Proj ects	
13	75-78			Internal evaluation	NA			Mini projects/Proj ects	

COURSE INFORMATION SHEET

Course code: AR 1064
Course title: ARCHITECTURAL RENDERING TECHNIQUES
Pre-requisite(s): None
Co- requisite(s): None
Credits:2 L:0 T:0 P: 4
Class schedule per week: 04
Class: B. Architecture
Semester / Level: II
Branch: Architecture
Name of Teacher: Anuj Kumar Toppo

Course Objectives

This course enables the students:

A.	To introduce to the students the fundamentals of drawing
B.	The studio also introduces drawings and sketching skill
C.	This studio teaches the students to learn the basics of graphic design and three-dimensional composition
D.	The studio also has a direct interface with the drafting skill.

Course Outcomes

After the completion of this course, students will be:

1.	Sketch buildings and building component.
2.	Understand the shading pattern of the object.
3.	Control over the pencil and technical pens strokes.

Syllabus

Assignment 1: Techniques for rendering of various materials/textures — No. of Sheets

Brickwork, stone, plastering, timber, tiles, flooring types, floor rugs, water, rock. Drawing and rendering of miscellaneous objects. Techniques of rendering the effects of lighting, shades, shadows on primary 3D objects like cubes, spheres, cones, cylinders, pyramids in different media. — 03

NB: All the above Rendering techniques will be done with the Pencil and Pen & Ink on Opaque paper Using variant, Line (hatch) technique, dot rendering.

Assignment 2:Techniques for rendering an architectural plan — No. of Sheets

Rendering of trees, shrubs, hedges in a plan
Rendering of different earths capes (natural and manmade) in a plan. — 03
Rendering of a building plan using different materials

NB: All the above Rendering techniques will be done on Opaque and Transparent paper Using Pencil color, Oil Crayons, and their intermixing.

Assignment 3: Techniques of rendering an architectural elevation: — No. of Sheets

Human figures- proportions and styles
Landscaping- Trees, plants, hedges used in elevations
Different hard landscape materials (street furniture, automobiles) — 03
Rendering of a building elevation.

NB: All the above Rendering techniques will be done on Opaque and Transparent paper Using variant

Pencil, Pen & Ink, Pencil color, Oil Crayons, and their intermixing.

Assignment 4:Techniques of rendering perspective views. No. of Sheets

Perspective human figures, Trees and plants, Rendering of perspective views- indoor and outdoor. (One point and Two Point), Concept of Computer Aided rendering techniques. 03

NB: All the above Rendering techniques will be done on Opaque and Transparent paper Using variant Pencil, Pen & Ink, Pencil color, Oil Crayons, and their intermixing.

Text books:

Reference books:

1. Sherley W, MORGAN; *Architectural Drawing, McGraw Hill*
2. Arthur L. Guptill, Watson ;*Rendering in Pen and Ink,– Guptill Publications, New York*
3. Gill Robert, "*Rendering with pen and ink*".
4. Gordon Griece; *The Art of Architectural Illustration.*
5. John Chen *; Architecture in Pen and Ink.*
6. Ching, F. D. K. (1997).*DesignDrawing.Hoboken : John Wiley & Sons*

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	Mini projects/Projects
CD2	Industrial/guest lectures

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	**% Contribution during CO Assessment**
Progressive Evaluation	30
End Sem Evaluation	20

AssessmentCompoents	**CO1**	**CO2**	**CO3**	**CO4**	
Mid Sem Examination Marks					
End Sem Examination Marks					
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											
	a	b	c	d	e	f	g	h	i	j	k	l
1	L				M		L	L	H	M	L	M
2	L	L	L	L	M	L	L		L		L	L
3	L		L	L	M	L	L		L		L	L

Mapping Between COs and Course Delivery (CD) methods		
CD	**Course Delivery methods**	**Course Outcome**
CD1	Seminars	CO1, CO2
CD2	Mini projects/Projects	CO1, CO2, CO3

Lecture wise Lesson planning Details.

Week No.	Lect. No.	Tentative Date	Ch. No.	Topics to be covered	Text Book / Refer e nces	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	L1-L3			Drawing and rendering of miscellaneous objects	R3,	CO1,CO3		PPT, Chalk & talk,	
2-3	L4-L6			Techniques of rendering the effects of lighting, shades, shadows on primary 3D objects	R3	CO1,CO3		PPT, Chalk & talk,	
4	L7-L10			Rendering of trees, shrubs, hedges in a plan	R2	CO1CO3		PPT, Chalk & talk,	
5	L11-L14			Rendering of different earths capes (natural and manmade) in a plan. Rendering of a building	R2	CO1,CO2		PPT, Chalk & talk,	

				plan using different materials					
6	L15 - L18			Human figures- proportions and styles	R1	CO1, CO2, CO3		PPT, Chalk & talk,	
7	L19 - L21			Landscaping- Trees, plants, hedges used in elevations	R5	CO2		PPT, Chalk & talk,	
8-9	L22 - L28			Different hard landscape materials (street furniture, automobiles)	R5	CO1, CO3		PPT, Chalk & talk,	
10	L29 - L31			Rendering of a building elevation.	R6	CO2		PPT, Chalk & talk,	
11-12	L32 - L38			Perspective human figuresTrees and plants	R5	CO1		PPT, Chalk & talk,	
13	L39 - L41			Rendering of perspective views- indoor and outdoor	R2	CO1, CO2, CO3		PPT, Chalk & talk,	
`14	L42 - L44			Concept of Computer Aided rendering techniques.	R4	CO1, CO2		PPT, Chalk & talk,	