



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

Department Vision

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

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

Department Mission

The mission of the Department of Architecture is to foster a student-centered educational program in architecture and urban planning. The programmes through its pedagogy which is heuristic and responsive to technological, cultural, and social environments, seeks to offer a diverse, 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							
MA104	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
PROGRAM CORE - SESSIONAL SUBJECTS							
AR 161	Architectural Design – II	0	0	6	9	6	PC
AR 162	Building Construction – I	0	0	4	6	4	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					27		
Total Contact hours						25	

SECOND YEAR [III SEMESTER]							
Subject Code	Subject	L (Periods/ week)	T (Periods/ week)	P (Periods/ week)	Credit	Contact Hrs.	Category of Course
PROGRAM CORE - THEORY SUBJECTS							
AR 201	Climatology	3	0	0	3	3	PC
AR 202	Building Construction and Codes	3	0	0	3	3	PC
AR 203	Contemporary Architecture	3	0	0	3	3	PC
AR 204	Structural Mechanics	3	0	0	3	3	PC
NON-DEPARTMENTAL THEORY SUBJECTS							
CE 101	Environmental Sciences	2	0	0	2	2	FS
PROGRAM CORE - SESSIONAL SUBJECTS							
AR 211	Architectural Design - III	0	0	6	9	6	PC
AR 212	Building Construction – II	0	0	4	6	4	PC
AR 213	Computer Application in Architecture	0	0	4	2	4	PC
MANDATORY COURSE							
MC 201/ 202/ 203/ 204	Choice of: NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1	2	MC
TOTAL CREDIT					32		
Total Contact hours						30	

SECOND YEAR [IV SEMESTER]							
Subject Code	Subject	L (Periods/ week)	T (Periods/ week)	P (Periods/ week)	Credit	Contact Hrs.	Category of Course
PROGRAM CORE - THEORY SUBJECTS							
AR 251	Building Services – I (Water Supply and Sanitation)	3	0	0	3	3	PC
AR 252	Building Services – II (Electrical & Lighting)	3	0	0	3	3	PC
AR 253	Site Planning and Landscape Architecture	3	0	0	3	3	PC
OPEN ELECTIVE							
	OPEN ELECTIVE I	3	0	0	3	3	OE
PROGRAM CORE - SESSIONAL SUBJECTS							
AR 261	Architectural Design - IV and Academic Field Trip	0	0	6	9	6	PC
AR 262	Building Construction – III	0	0	4	6	4	PC
NON-DEPARTMENTAL SESSIONAL SUBJECTS							
CE 212	Surveying Field Work	0	0	4	2	4	Other Dept L/S
MANDATORY COURSE							
MC 205/206/207/ 208	Choice of: NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1	2	MC
TOTAL CREDIT					30		
Total Contact hours						28	
Note 1: Open Elective to be offered by the Department: AR 251 Building Services – I (Water Supply and Sanitation)							

THIRD YEAR [V SEMESTER]							
Subject Code	Subject	L (Periods/ week)	T (Periods/ week)	P (Periods/ week)	Credit	Contact Hrs.	Category of Course
PROGRAM CORE - THEORY SUBJECTS							
AR 301	Acoustics	3	0	0	3	3	PC
AR 302	Building Services – III (Mech. & Fire Safety)	3	0	0	3	3	PC
NON-DEPARTMENTAL THEORY SUBJECTS							
MT 204	Constitution of India	3	0	0	Nil Credit	3	HSS
CE 301	Structural Design - I	4	0	0	4	4	Civil
OPEN ELECTIVES							
	OPEN ELECTIVE II	3	0	0	3	3	OE
PROGRAM CORE - SESSIONAL SUBJECTS							
AR 311	Architectural Design - V	0	0	9	13.5	9	PC
AR 312	Working Drawing-I	0	0	4	2	4	PC
AR 313	Building Information Modelling	0	0	3	1.5	3	PC
TOTAL CREDIT					30		
Total Contact hours						32	
Note 2: Open Elective to be offered by the Department: AR 302 Building Services – III (Mech. & Fire Safety)							

THIRD YEAR [VI SEMESTER]							
Subject Code	Subject	L (Periods/ week)	T (Periods/ week)	P (Periods/ week)	Credit	Contact Hrs.	Category of Course
PROGRAM CORE - THEORY SUBJECTS							
AR 351	Specification, Estimation and Costing	3	0	0	3	3	DC
NON-DEPARTMENTAL THEORY SUBJECTS							
CE 308	Structural Design II	4	0	0	4	4	Civil
MT 123	Business Communications	3	0	0	3	3	HSS
PROGRAM ELECTIVES- Theory (02 offered; any one to be opted)							
AR 352	Vernacular Architecture	3	0	0	3	3	PE
AR 353	Architectural Conservation and Heritage Management						
OPEN ELECTIVES							
	OPEN ELECTIVE III	3	0	0	3	3	OE
PROGRAM CORE - SESSIONAL SUBJECTS							
AR 361	Architectural Design - VI and Academic Field Trip	0	0	9	13.5	9	Dept L/S
AR 362	Working Drawing II	0	0	4	2	4	Dept L/S
TOTAL CREDIT					31.5		
Total Contact hours						29	
Note 3: All Architectural Design Sessional Subjects up till V semester must be cleared before registering for VII Semester Architectural Design Sessional.							
Note 4: Departmental/ Program Elective to be offered as Open Elective to students of other departments: AR 351 Specification, Estimation and Costing							

FOURTH YEAR [VII SEMESTER]							
Subject Code	Subject	L (Periods/ week)	T (Periods/ week)	P (Periods/ week)	Credit	Contact Hrs.	Category of Course
PROGRAM CORE THEORY SUBJECTS							
AR 401	Housing and Settlement System	3	0	0	3	3	DC
AR 402	Structural Design and Systems	3	0	0	3	3	DC
AR 403	Energy Efficient Architecture	3	0	0	3	3	DC
PROGRAM ELECTIVES - Theory (02 offered; any one to be opted)							
AR 404	Disaster Management and Resilient Structures	3	0	0	3	3	PE
AR 703	Sustainable City Planning (PG Subject)						
OPEN ELECTIVES							
	OPEN ELECTIVE IV	3	0	0	3	3	OE
PROGRAM CORE SESSIONAL SUBJECTS							
AR 411	Architectural Design - VII	0	0	9	13.5	9	Dept L/S
AR 412	Interior Design	0	0	4	2	4	Dept L/S
TOTAL CREDIT					30.5		
Contact hours						28	
Note 5: Departmental/ Program Elective to be offered as Open Elective to students of other departments: AR 403 Energy Efficient Architecture							

FOURTH YEAR [VIII SEMESTER] [Architectural Apprenticeship/ Internship]							
Subject Code	Subject	L (Periods/ week)	T (Periods/ week)	P (Periods/ week)	Credit	Contact Hrs.	Category of Course
SESSIONAL SUBJECTS							
AR 461	Architectural Apprenticeship	0	0	0	6	0	Office Training
AR 462	Field Studies	0	0	0	3	0	Office Training
AR 463	Comprehensive Viva & Time Test	0	0	3	3	3	
TOTAL CREDIT					12		
Total Contact Hours						3	

FIFTH YEAR [IX SEMESTER]							
Subject Code	Subject	L (Periods/ week)	T (Periods/ week)	P (Periods/ week)	Credit	Contact Hrs.	Category of Course
PROGRAM CORE - THEORY SUBJECTS							
AR 501	Urban Design	3	0	0	3	3	DC
AR 502	Human Settlements Planning	3	0	0	3	3	DC
PROGRAM ELECTIVES- Theory (02 offered; any one to be opted)							
AR 503	Theory of Design	3	0	0	3	3	PE
AR 605	Urban Ecology and Environmental Planning (PG Subject)						
OPEN ELECTIVE OR MOOC COURSES							
	MOOC COURSES	0	0	0	2	0	MOOC
PROGRAM CORE - SESSIONAL SUBJECTS							
AR 511	Architectural Design - VIII	0	0	12	18	12	Dept L/S
AR 512	Introduction to Thesis Project & Research Methodology (Dissertation)	0	0	4	2	4	Dept L/S
TOTAL CREDIT					31		
Total Contact hours						25	
Note 6: Departmental/ Program Elective to be offered as Open Elective to students of other departments: AR 502 Human Settlements Planning							

FIFTH YEAR [X SEMESTER]							
Subject Code	Subject	L (Periods/week)	T (Periods/week)	P (Periods/week)	Credit	Contact Hrs.	Category of Course
PROGRAM CORE - THEORY SUBJECTS							
AR 551	Professional Practice and Tendering Process	3	0	0	3	3	DC
AR 552	Construction Project Management	3	0	0	3	3	DC
MOOC COURSES							
	MOOC COURSES	0	0	0	2	0	MOOC
PROGRAM CORE - SESSIONAL SUBJECTS							
AR 561	Architectural Design Thesis/ Project	0	0	12	18	12	Dept L/S
TOTAL CREDIT					26		
Total Contact Hours						18	
Note 7: All sessional subjects and Architectural Apprenticeship/ Internship must be cleared before registering for the AR 561 Architectural Design Thesis/ Project in the X Semester.							

FRAME WORK / CHOICE BASED CURRICULUM SYSTEM (CBCS)

S. No	Category	Credits	Broad Category
1	Programme Core (PC)	69	Department Courses
1.1	Labs/ Departmental Sessional	144	
2	Programme Electives (PE)	09	
3	Research project (RP)	22	
4	Open Electives (OE)	12	Other Department Courses - Interdisciplinary
5	Non-Dept. Subjects (Theory + Lab)	18	
6	MOOC	04	UGC Mandate
7	Architectural Apprenticeship + Field Studies + Comprehensive Viva & Test	12	Professional Training/ Internship
8	NCC/NSS/Creative Arts/ PT & Games	04	Mandatory
	TOTAL	277	

BARCH PROGRAMME SCHEME - SEMESTER WISE DISTRIBUTION

Recommended scheme of study				
S. No	Semester	Course Category	Credits	Total
1	FIRST	03 Programme Core (PC)	9	27
		Programme Elective (PE)	-	
		Open Elective (OE)	-	
		3 Labs/ Departmental Sessional	14	
		01 Compulsory Non-dept theory subjects	3	
		NCC/NSS/Creative Arts/ PT & Games	1	
2	SECOND	3 Programme Core (PC)	9	27
		Programme Elective (PE)	-	
		Open Elective (OE)	-	
		3 Labs/ Departmental Sessional	17	
		NCC/NSS/Creative Arts/ PT & Games	1	

3	THIRD	4 Programme Core (PC)	12	32
		Programme Elective (PE)	-	
		Open Elective (OE)	-	
		3 Labs/ Departmental Sessional	17	
		01 Compulsory Non-dept theory subjects	2	
		NCC/NSS/Creative Arts/ PT & Games	1	
4	FOURTH	3 Programme Core (PC)	9	30
		Programme Elective (PE)	-	
		1 Open Elective (OE)	3	
		2 Labs/ Departmental Sessional	15	
		1 Non-Departmental Lab	2	
		NCC/NSS/Creative Arts/ PT & Games	1	
5	FIFTH	2 Programme Core (PC)	6	30
		Programme Elective (PE)	-	
		1 Open Elective (OE)	3	
		4 Labs/ Departmental Sessional	17	
		1 Non-Departmental Theory	4	
		1 Non-Departmental Non-credit Theory	-	
6	SIXTH	1 Programme Core (PC)	3	31.5
		1 Programme Elective (PE)	3	
		1 Open Elective (OE)	3	
		2 Labs/ Departmental Sessional	15.5	
		2 Non-Departmental Theory	7	
7	SEVENTH	3 Programme Core (PC)	9	30.5
		1 Programme Elective (PE)	3	
		1 Open Elective (OE)	3	
		2 Labs/ Departmental Sessional	15.5	
8	EIGHTH	Architectural Apprenticeship	6	12
		Field Studies	3	
		Comprehensive Viva & Test	3	
9	NINTH	2 Programme Core (PC)	6	31
		1 Programme Elective (PE)	3	

		1 MOOC Course	2	
		1 Labs/ Departmental Sessional	18	
		Dissertation/ Research Project (Introduction to Thesis Project & Research Methodology)	2	
10	TENTH	2 Programme Core (PC)	6	26
		Programme Elective (PE)	-	
		1 MOOC Course	2	
		Architectural Design Thesis Project	18	
TOTAL				277

BACHELOR OF ARCHITECTURE

PROGRAMME CORE (PC) (offered in MO session only)

S. No	Course Code	Course Title	Pre requisites / Co requisites	Credits
1	AR 101	Principles of Architecture	None	3
2	AR 102	Primary Building Materials	None	3
3	AR 103	History of Indian Architecture	None	3
4	AR 111	Architectural Design – I	None	9
5	AR 112	Descriptive Geometry	None	3
6	AR 113	Construction Technique and Model Making Workshop	None	2
7	AR 201	Climatology	None	3
8	AR 202	Building Construction and Codes	None	3
9	AR 203	Contemporary Architecture	None	3
10	AR 204	Structural Mechanics	None	3
11	AR 211	Architectural Design - III	None	9
12	AR 212	Building Construction – II	None	6
13	AR 213	Computer Application in Architecture	None	2
14	AR 301	Acoustics	None	3
15	AR 302	Building Services – III (Mech. & Fire Safety)	None	3

16	AR 311	Architectural Design - V	Pre requisites: Candidate should have cleared AR 211 Architectural Design III; Co requisites: Should have registered for AR 501 Urban Design	13.5
17	AR 312	Working Drawing-I	Should have cleared Architectural Design Sessionals	2
18	AR 313	Building Information Modelling	Pre requisites: AR 214 Computer Application in Architecture	1.5
19	AR 401	Housing and Settlement System	None	3
20	AR 402	Structural Design and Systems	None	3
21	AR 403	Energy Efficient Architecture	None	3
22	AR 411	Architectural Design - VII	None	13.5
23	AR 412	Interior Design	None	2
24	AR 501	Urban Design	None	3
25	AR 502	Human Settlements Planning	None	3
26	AR 511	Architectural Design - VIII	None	18
27	AR 512	Introduction to Thesis Project & Research Methodology (Dissertation)	Should have cleared all Architecture Laboratories up to VI Semester.	2

PROGRAMME CORE (PC) (offered in SP session only)

S. No	Course Code	Course Title	Pre requisites / Co requisites	Credits
1	AR 151	Advanced Building Materials	None	3
2	AR 152	History of Architecture- Western	None	3
3	AR 153	Statics & Strength of Materials	None	3
4	AR 161	Architectural Design – II	None	9
5	AR 162	Building Construction – I	None	6
6	AR 163	Architectural Rendering Techniques	None	2

7	AR 251	Building Services – I (Water Supply and Sanitation)	None	3
8	AR 252	Building Services – II (Electrical & Lighting)	None	3
9	AR 253	Site Planning and Landscape Architecture	None	3
10	AR 261	Architectural Design - IV and Academic Field Trip	None	9
11	AR 262	Building Construction – III	None	6
12	AR 351	Specification, Estimation and Costing	None	3
13	AR 361	Architectural Design - VI and Academic Field Trip	None	13.5
14	AR 362	Working Drawing II	None	2
15	AR 551	Professional Practice and Tendering Process	None	3
16	AR 552	Construction Project Management	None	3
17	AR 561	Architectural Design Thesis/ Project	None	18

ELECTIVES

Students pursuing Bachelor of Architecture program should complete at least three (09 credits) courses each from the Programme Electives and at least 2 Open electives (06 credits) listed below.

PROGRAMME ELECTIVE (PE)

S. No	Course Code	Course Title	Pre requisites / Co requisites	Credits
1	AR 352	Vernacular Architecture	None	3
2	AR 353	Architectural Conservation and Heritage Management	None	3
3	AR 404	Disaster Management and Resilient Structures	None	3
4	AR 703	Sustainable City Planning (PG Subject)	None	3
5	AR 503	Theory of Design	None	3
6	AR 605	Urban Ecology and Environmental Planning (PG Subject)	None	3

OPEN ELECTIVE (OE): As offered by other departments

S. No	Course Code	Course Title	Pre requisites / Co requisites	Credits
1				
2				
3				
xxx				

SUBJECTS TO BE OFFERED BY ARCHITECTURE DEPARTMENT AS OPEN ELECTIVE (OE) FOR OTHER DEPARTMENTS

S. No	Course Code	Course Title	Session	Credits
1	AR 251	Building Services – I (Water Supply and Sanitation)	SP	3
2	AR 302	Building Services – III (Mech. & Fire Safety)	MO	3
3	AR 351	Specification, Estimation and Costing	SP	3
4	AR 403	Energy Efficient Architecture	MO	3
5	AR 502	Human Settlements Planning	MO	3

MINOR PROGRAMME: The Department for Bachelor of Architecture Programme will not offer any MINOR programme or Honours Programme

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 Sem Examination Marks	50
Quiz (2 nos. 10 marks each)	20
Assignment / Quiz (s)	05

Assessment Components	CO1	CO2	CO3
Mid Sem Examination Marks	√	√	√
End Sem Examination Marks	√	√	√
Quiz (2 nos. 10 marks each)	√	√	√
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 -	T2	2		PPT Digi Class/Chalk-Board	

				Exercises to understand the 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	T3	2,3		PPT Digi Class/Chalk -Board

				Architecture, (Industrial 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	T2	3		PPT Digi

				Regionalism in Post-Independence Indian Architecture. (BV DOSHI)				Class/Chalk-Board	
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.	To identify the types of materials and their compositions.
C.	To list, label and define the materials.
D.	To illustrate use of materials and ascertain their application.
.E	To identify the specific use and related technique for a required material.

Course Outcomes

After the completion of this course, students will be:

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 their uses

Module 4. Mortar 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 and use.

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 and Construction*.
2. Bindra & Arora; *Building Materials and Construction*.
3. Rangwala; *Engineering Materials*
4. W.B. McKay, ‘*Building Construction*’, Vol. 1,2,3 Longmans, U.K. 1981.
5. Sushil-Kumar, T. B. (2003). *Building Construction*. 19th Ed. Delhi : Standard Publishers.

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	50
Quiz (2 nos 10 marks each)	20
Assignment / Quiz (s)	05

Assessment Components	CO1	CO2	CO3
Mid Sem Examination Marks	√	√	√
End Sem Examination Marks	√	√	√
Quiz (2 nos 10 marks each)	√	√	√
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 / References	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/Choc k -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,R 1	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,R1	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,R1	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 their uses.	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 and use.	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:	Ritu Agrawal

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, Bhattargaon 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 Sayyid/Lodhi dynasties; Provincial Styles of Sultanate Period – Punjab, Bengal, Jaunpur, Gujarat, Malwa, Bijapur and 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 Shah Sur; Revival of Indian Architecture under British patronage - Architecture in Colonial India - Monumental buildings of - St. Paul's Cathedral, Kolkata, Victoria Memorial Hall, Kolkata; Contribution of Edwin Lutyens & Herbert Baker to the lay-out and Architecture of New Delhi – Rashtrapathi Bhavan & 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	50
Quiz (02 nos. of 10 marks each)	20
Assignment / Quiz (s)	05

Assessment Components	CO1	CO2	CO3	CO4	CO5
Mid Sem Examination Marks	√	√	√	√	√
End Sem Examination Marks	√	√	√	√	√
Quiz (02 nos. of 10 marks each)	√	√	√	√	√
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 / Refer ences	COs mapped	Actual Conte nt covere d	Methodolo gy used	Remar ks 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	T2, T4 R8, R9	CO3, CO4		PPT Digi Class/Chalk -Board	

				features – use of landscape				
7.	L19 , L20 , L21			Islamic Ornamentation;	T2, T4 R8, R9	CO3, CO4		PPT Digi 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 Sem Examination Marks	50
Quiz (02 nos. of 10 marks each)	20
Assignment / Quiz (s)	05

AssessmentCompoents	CO1	CO2	CO3	CO4
Mid Sem Examination Marks	√	√	√	√
End Sem Examination Marks	√	√	√	√
Quiz (02 nos. of 10 marks each)	√	√	√	√
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			
C			
D	Course Delivery methods	Course Outcome	Course Delivery Method
CD 1	Lecture by use of boards/LCD projectors/OHP projectors	CO1	CD1
CD 2	Tutorials/Assignments	CO2	CD1
CD 3	Seminars	CO3	CD1 and CD2
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		1		T1, R1	1, 2		PPT Digi Class/Chock-Board	

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, harmony, balance and relative proportions; the inherent visual properties of any physical object or enclosure. 02 sheets
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, New York, 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	50
End Sem Evaluation	50

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

Wee k No.	Lect . No.	Tent ative Date	C h. No.	Topics to be covered	Text Book / Refere nces	COs mapp ed	Actual Conte nt cover ed	Methodolo gy used	Remar ks 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:

<i>Aspects of the assignments</i>	<i>A1 size drg. sheet</i>
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. Gupthill, Watson; Rendering in Pen and Ink,- Gupthill 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
Progressive Evaluation	50
End Sem Evaluation	50

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		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. Ritu Agrawal

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	50
End Sem Evaluation	50

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 for Laying 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	R1, R2, R3,	CO1, CO2, CO3		PPT Digi Class /Chalk	

				and structure.				-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 Tiles, 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 and uses.

Text books:

1. B. C. Punmia; *Building Materials and Construction* .Laxmi Publications Pvt Ltd, NewDelhi,1993
2. Bindra&Arora; *Building Materials and Construction*.
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 Sem Examination Marks	50
Quiz (2 nos 10 marks each)	20
Assignment	05

Assessment Components	CO1	CO2	CO3
Mid Sem Examination Marks	√	√	√
End Sem Examination Marks	√	√	√
Quiz (2 nos 10 marks each)	√	√	√
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.

Wee k No.	Lect . No.	Tentativ e Date	Ch . No .	Topics to be covered	Text Book / Referen ces	COs mappe d	Actual Conte nt covere d	Methodolo gy used	Remark s by faculty if any
1	L1- L2		1	Aluminum & important alloys and brief description of uses	T5, R1	CO1		PPT Digi Class/Choc k -Board	
2	L3- L4			Copper & important alloys and brief description of uses	T1	CO1		PPT Digi Class/Choc k -Board	

3	L4- L6			Corrosion of both ferrous and non-ferrous metals – types and preventive measures.	T1	CO1		PPT Digi Class/Choc k -Board	
4	L7- L8			Roofing Tiles their properties and use, terra-cotta, earthenware, stoneware, porcelain, vitreous.	T1	CO2		PPT Digi Class/Choc k -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/Choc k -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/Choc k -Board	
7	L16 - L18			Light weight concrete, ready-mix concrete, precast concrete.	T4,R1	CO2		PPT Digi Class/Choc k -Board	
8	L19 - L21			Characteristics and process of varnishing, Type and	T3,R1	CO2		PPT Digi Class/Choc k -Board	

				Composition s of Paints.					
9	L22 - L24			Types of painting system: Aluminum paints, Cement- based paints, oil emulsion paints, Enamel paints and Their selection criteria. Textu re Paints.	T3,R1	CO3		PPT Digi Class/Choc k -Board	
10	L25 - L26			Types and Use of Plastic in building construction, Properties of Plastic.	T2,R1	CO2 CO3		PPT Digi Class/Choc k -Board	
11	L27 - L29			Use of various Polymer Materials in building industry	T4,R2	CO1		PPT Digi Class/Choc k -Board	
12	L30			Use of Nano- paints.	R1			PPT Digi Class/Choc k -Board	
12	L31 - L32			Glass, Fibre glass	T1,T3,R 1	CO1		PPT Digi Class/Choc k -Board	
13	L33 - L34			Cork, rubber, Gypsum, sealants	T1,T3,R 1	CO1		PPT Digi Class/Choc k -Board	
14	L35 - L38			Heat and sound insulative materials, Their trade name and uses.	T3,R2	CO3		PPT Digi Class/Choc k -Board	

COURSE INFORMATION SHEET

Course code: AR 152

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, Stoa, Theatre of Epidaurus.
 - 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	50
Quiz (2nos. of 10 marks each)	20
Assignment	15

Assessment Components	CO1	CO2	CO3	CO4
Mid Sem Examination Marks	√	√	√	√
End Sem Examination Marks	√	√	√	√
Quiz (2nos. of 10 marks each)	√	√	√	√
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.

Wee k No.	Lect . No.	Tentativ e Date	Ch. No .	Topics to be covered	Tex t Boo k / Ref erence s	COs mapped	Actual Conte nt covere d	Methodolog y used	Remark s 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, Nebuchadnezz	T3, R1	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	

				ar's Palace. 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	T1, T3, R2	CO2, CO3, CO4		PPT Digi Class/Chalk -Board	

				Period.Salient 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-			Roman	T1,	CO1,		PPT Digi

	L24			Architecture- Salient building Types: Parthenon, Forums, Colosseum, Circus Maximus, Thermae of Caracalla, Basilica of Trajan.	T2, T3, R1	CO2, CO4		Class/Chalk -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	T1, R3	CO1, CO2		PPT Digi Class/Chalk -Board	

				interior. 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,	T1, T3, R3	CO1, CO2		PPT Digi Class/Chalk -Board

				Notre Dame (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 153

Course title: STATICS AND STRENGTH OF MATERIALS

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:

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's ratio, 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*, Dhanpat Rai 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	50
Quiz (2nos. of 10 marks each)	20
Assignment	15

Assessment Compoents	CO1	CO2	CO3	CO4	CO5
Mid Sem Examination Marks	√	√	√	√	√
End Sem Examination Marks	√	√	√	√	√
Quiz (2nos. of 10 marks each)	√	√	√	√	√
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			
C			
D	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 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.

Wee k No.	Lect . No.	Tentativ e Date	Ch . No .	Topics to be covered	Text Book / Refer ences	COs mappe d	Actual Conten t covere d	Methodolog y used	Remark s 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 Transmissibilit y, two-dimensional force systems	T1, R1, R2	1		PPT Digi Class/Chalk -Board	
2	L4		1	Principle of Transmissibilit y, 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	T1, R1, R2	1		PPT Digi Class/Chalk -Board	

				of equilibrium					
4	L9		2	Plane truss, simple truss, redundant	T1, R1, R2	2		PPT Digi Class/Chalk-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,	T2, R3, R4	4		PPT Digi Class/Chalk -Board	

				modulus of rigidity, and bulk modulus					
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	T2, R3, R4	5		PPT Digi Class/Chalk -Board	

				diagrams for statically determinate 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 161
Course title:	ARCHITECTURAL DESIGN II
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:	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, New York, 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	50
End Sem Evaluation	50

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

Indirect Assessment –

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

Mapping between Objectives and Outcomes

Mapping of Course Outcomes onto Program Outcomes

Course Outcome #	Program Outcomes											
	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

Wee k No.	Lect. No.	Te nta tiv e Dat e	C h. N o.	Topics to be covered	Text Book / Refere nces	COs mappe d	Actual Conten t covere d	Methodolo gy used	Remar ks 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, R11, R12,	CO2, CO4		PPT Digi Class /Chalk -Board	

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 162
Course title: BUILDING CONSTRUCTION I
Pre-requisite(s): None
Co- requisite(s): None
Credits: 6 **L:**0 **T:**0 **P:**4
Class schedule per week: 04
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	1-4			Development of Plan & Section of a small building	1,2,3,4	CO1		PPT, Chalk & talk, Illustrations	
2	5-6			Internal evaluation	NA	CO1		Drawing on sheets	
2-3	7-10			Types, Isolated, combined and raft foundations and their construction techniques.	1,2,3,4	CO2		PPT, Chalk & talk, Illustrations	
3	11-12			Internal evaluation	NA	CO2		Drawing on sheets	
4	13-16			Types of Brick bonds: English, Flemish & Rat-trap bond.	1,2,3,4	CO2		PPT, Chalk & talk, Illustrations	
5	17-18			Internal evaluation	NA	CO2		Drawing on sheets	

5	19-20			Detail brick layout at corners, junctions and brick columns.	1,2,3,4	CO2		PPT, Chalk & talk, Illustrations	
6	21-22			Internal evaluation	NA	CO2		Drawing on sheets	
6-7	23-24			Classification of Arches	1,2,3,4	CO2		PPT, Chalk & talk, Illustrations	
7	25-26			Internal evaluation	NA	CO2		Drawing on sheets	
8	27-30			Details of door and ventilator	1,2,3,4	CO3		PPT, Chalk & talk, Illustrations	
9	31-32			Internal evaluation	NA	CO3		Drawing on sheets	
9-10	33-38			Waterproofing details in different levels	1,2,3,4	CO4		PPT, Chalk & talk, Illustrations	
11	39-40			Internal evaluation	NA	CO4		Drawing on sheets	
11	41-42			Site Visit	NA	CO1, CO2, CO3, CO4		Mini projects/Projects	
12-13	43-48			Report of site visit	NA	CO3		Mini projects/Projects	
13	49-50			Internal evaluation	NA			Mini projects/Projects	

COURSE INFORMATION SHEET

Course code: AR 163
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). *Design Drawing. 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	50
End Sem Evaluation	50

Assessment Components	CO1	CO2	CO3
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 / References	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 figures Trees 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,

SEMESTER III

COURSE INFORMATION SHEET

Course code: AR 201

Course title: CLIMATOLOGY

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: III

Branch: Architecture

Name of Teacher: Dr. Manjari Chakraborty

Course Objectives

This course enables the students:

A.	To acquire clear knowledge of the various climatic zones , climate factors and elements
B.	well equipped with scientific background required to design climate responsive architecture
C.	To acquire basic concepts of impact of different climate elements on human comfort
D.	To analyse and cultivate the interrelationship between natural and built environment

Course Outcomes

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

1.	Understand of relevance of climate consideration in built environment
2.	To apply relevant technologies to bring comfort in built environment
3.	Designing Climate responsive Architecture
4.	Understand tools & instruments utilized for measurement of climatic elements to relate with human comfort level

Syllabus

Module 1 : INTRODUCTION TO CLIMATOLOGY

Climate and Weather , Global Climate, Tropical Climate, Site Climate, Elements of Climate, Factors Effecting Climate, Effect of Climates on Habitat, Shelter and Environment

Module 2 : BIO-CLIMATIC APPROACH

Human Comfort Conditions, Thermal Comfort Factors, Bioclimatic Requirements, Relation of climatic elements to comfort. Comfort Zone & Bio-Climatic Chart

Module 3 : SUN & BUILDING DESIGN

Basic Principles of Heat Transfer, Thermal Insulation, Sunpath Diagram, Daylight Assessment, Visual Comfort, Solar Control & Sun Shading Device, Building Orientation and Placement

Module 4 : WIND & BUILDING DESIGN

Wind effect and Air Flow Pattern, Wind break and Wind Rose Diagram, Air movement around the buildings, Ventilation Technique-Stack Effect & induced air currents, Wind Effect on sitting of buildings

Module 5: CLIMATE RESPONSIVE ARCHITECTURE

Site Selection, Site Planning, Climate Responsive Landscaping, Shelter for warm-humid climates, Shelter for hot-dry climates, Shelter for composite climate

Reference books:

1. Narashimhan; An Introduction to Building Physics.
2. O.H. Koenigsberger and others, Manual of Tropical Housing and Building – Part I – Climatic Design, Longmans , 1980.
3. M.Evans- Housing Climate & Comfort – Architectural Press, London, 1980.
4. B. Givoni, Man, Climate and Architecture, Applied Science, Banking Essex, 1992.

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 (Select whichever is required)
Lecture by use of boards/LCD projectors
Tutorials/Assignments
Seminars
Mini projects/Projects
Laboratory experiments/teaching aids
guest lectures

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	% Contribution during CO Assessment
Mid Sem Examination Marks	25
End Sem Examination Marks	50
Quiz (2 nos 10 marks each)	20
Assignment	05

Assessment Components	CO1	CO2	CO3	CO4
Mid Sem Examination Marks	√	√	√	√
End Sem Examination Marks	√	√	√	√
Quiz (2 nos 10 marks each)	√	√	√	√
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				
2	H											
3				M			M					
4	H							L				

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			Climate and Weather, Global Climate, Tropical Climate, Site Climate	T2, T4	1		PPT Digi Class/Chalk-Board	
2	L3,L4			Elements of Climate, Factors Effecting Climate,	T1	1		PPT Digi Class/Chalk-Board	
3	L5,L6			Effect of Climates on Habitat, Shelter and Environment	T1	1		PPT Digi Class/Chalk-Board	
4	L7,L8			Human Comfort Conditions, Thermal Comfort Factors,	T2	2		PPT Digi Class/Chalk-Board	
5	L9			Bioclimatic Requirements, Relation of climatic elements to comfort.	T2	2		PPT Digi Class/Chalk-Board	

6	L10			Comfort Zone & Bio-Climatic Chart	T2	2		PPT Digi Class/Chalk-Board	
7	L11			Basic Principles of Heat Transfer, Thermal Insulation,	T2	2		PPT Digi Class/Chalk-Board	
8	L12, L13			Sunpath Diagram, Daylight Assessment,	T3	2,3		PPT Digi Class/Chalk-Board	
9	L14-L17			Visual Comfort, Solar Control & Sun Shading Device,	T3	2,3		PPT Digi Class/Chalk-Board	
10	L18-19			Building Orientation and Placement	T2,T3	2,3		PPT Digi Class/Chalk-Board	
11	L20,21			Wind effect and Air Flow Pattern,	T2,T3	3		PPT Digi Class/Chalk-Board	
12	L22, L23			Wind break and Wind Rose Diagram	T2,T3	3		PPT Digi Class/Chalk-Board	
13	L24-25			Air movement around the buildings,	T2,T3	3		PPT Digi Class/Chalk-Board	
14	L26-L28			Ventilation Technique-Stack Effect & induced air currents, Wind Effect on siting of buildings	T2,T3	3		PPT Digi Class/Chalk-Board	
15	L29, L30			Site Selection, Site Planning	T2,T3	2,4		PPT Digi Class/Chalk-Board	
16	L31-L33			Climate Responsive Landscaping	T2	2,4		PPT Digi Class/Chalk-Board	
17	L34-			Shelter for	T2	2,3		PPT Digi	

	L36			warm-humid climates,				Class/Chalk-Board	
18	L37-38			Shelter for hot-dry climates	T2	4		PPT Digi Class/Chalk-Board	
19	L39-40			Shelter for composite climate	T2	4		PPT Digi Class/Chalk-Board	

COURSE INFORMATION SHEET

Course code: AR 202

Course title: BUILDING CONSTRUCTION AND CODES

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: III

Branch: Architecture

Name of Teacher: Dr. Satyaki Sarkar

Course Objectives

This course enables the students:

A.	To understand the relationship between soil and application of different types of foundations.
B.	To understand the techniques of construction and repair for RCC construction in multistoried building.
C.	To develop knowledge on the current materials available and their applications.
D	To apply the various building bylaws and codal provisions in design of built environment.

Course Outcomes

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

1.	Explain safety practices and procedures in construction practices;
2.	Describe commonly used construction materials and techniques for sub and super structure;
3.	Identify current construction practices and various methods of construction;
4.	Understand the application of building byelaws and codes in design and implementation;

Syllabus

Module 1: Soil and foundation:

Soil properties and Bearing Capacity of Different soil, Foundation: Types of foundation, different types of shallow and deep foundation including high-rise constructions, Raft foundation, foundation detail for RCC column, grillage foundation, Pile foundation – Different component and use of pile foundation. Causes of foundation failure and remedies,

Module 2: Techniques for constructing superstructures

Temporary supporting structures: Form work and shuttering for different types of RCC elements. Different types of materials for shuttering and their specifications. Scaffolding, shoring and underpinning: Different types, uses and their specifications, Techniques adopted in construction of foundation, and superstructure for high rise constructions.

Module 3: Smart construction material and techniques:

Super-performing material like High performance concrete, aerated concrete, light transmitting concrete, floating concrete, foamed aluminum, Aerogel, Thermoplastics, Super-performing materials, Hollow and Panel wall: different types of partition wall. Reinforced brick work.

Module 4: Building byelaws application:

Building byelaws, submission plan, methods of municipal approval, NBC, fire prevention and safety measures, other regulatory aspects such as master plan and zonal plan

Module 5: Codal provision:

Codal provisions with respect to Landuse classifications and use permitted, Means of Access, Community open spaces and amenities, Requirement of Plots. Codal provisions with respect to classification of buildings, Open spaces within a plot, Off-street parking spaces.

Text books:

1. Roy Chudley, Roger Greeno, Building Construction Handbook, Routledge.
2. P.N. Khanna; Indian Practical Civil Engineer’s Handbook, Engineer’s Publishers New Delhi
3. W.B. MacKay, ‘Building Construction’, Vol. 1,2,3longmans, U.K. 1981.
4. Andrea Deplzes (Ed) Constructing Architecture: Materials, Process, Structures - A Handbook - BIRKHÄUSER, Berlin.

Reference books:

National Building Code of India 2016.

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

POs met through Gaps in the Syllabus :NA

Topics beyond syllabus/Advanced topics/Design: Nil

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

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

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	% Contribution during CO Assessment
Mid Sem Examination Marks	25
End Sem Examination Marks	50
Quiz (2 nos 10 marks each)	20
Assignment	05

Assessment Components	CO1	CO2	CO3	CO4
Mid Sem Examination Marks	√	√	√	√
End Sem Examination Marks	√	√	√	√

Quiz (2 nos 10 marks each)	√	√	√	√
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		H						
2	H	H	L	M	H	M	L	M				
3	L	H	L	L							L	L
4	H	M	H	H				L	M	M	L	H

Mapping Between COs and Course Delivery (CD) methods

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

Lecture wise Lesson planning Details.

Wee k No.	Lect . No.	Tentativ e Date	Ch . No .	Topi cs to be covered	Text Book / Refer ences	COs mapp ed	Actual Content covered	Methodolog y used	Remark s by faculty if any
1	1-2			Soil properties and Bearing Capacity of Different soil	T-1,2	CO1	Varieties of soil available	Chalk - board, PPT	
1-2	3-4			Foundation	T-1,2	CO1	Types of foundation,	Chalk - board,, PPT	
2-3	5-8			Foundation	T-1,2	CO1	Components and their failure	Chalk - board,, PPT	
3	9			Supporting structures	T-2,3	CO2, CO3	Introduction	Chalk - board,, PPT	
4-5	10-15			Supporting structures	T-2,3	CO2, CO3	Different formwork, techniques, uses and specification	Chalk - board, PPT	

							s		
6-7	16-23			Smart construction material and techniques	T-2,3	CO2, CO3	Super-performing material, their application	Chalk – board, PPT	
8	24-27			Building byelaws application	R -1	CO3, CO4	Submission plan, methods of municipal approval	Chalk – board, PPT	
9	28-30			Building byelaws application	R -1	CO3, CO4	NBC & Fire safety	Chalk – board, PPT	
10	31-32			Building byelaws application	R-1	CO3, CO4	Regulatory plans	Chalk – board, PPT	
11	33-36			Codal provision	R-1	CO3, CO4	Landuse and building classifications	Chalk – board, PPT	
12	37-38			Codal provision	R-1	CO3, CO4	Parking, amenities and open spaces	Chalk – board, PPT	
13	39-40			Assignments & Guest lecture		CO1			

COURSE INFORMATION SHEET

Course code: AR 203
Course title: CONTEMPORARY 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: III
Branch: Architecture
Name of Teacher: Apurv Ashish

Course Objectives

This course enables the students:

A.	To identify different styles and schools of Modernist, Post- Modernist, Contemporary architecture.
B.	To analyze the contributing factors for the design development of different styles.
C.	Introducing the students to various Design philosophies of post independence and contemporary architecture in Indian context.
D..	To evaluate the works of modern architecture that the student is coming across in everyday's life.
E.	To Design buildings in accordance with various Architectural Styles.

Course Outcomes

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

1.	Understand modern design philosophies in the evolution of innovative architectural forms and designs.
2.	Build their perspective towards various Architectural Styles and Product Design.
3.	Improve their appreciation towards historical sources, precursors of Modernism and evolution of Contemporary Architecture.

Syllabus-

Module 1: Introduction, Advent of Steel, glass and Ferro-concrete

- Industrial Revolution: Cast Iron and Glass Construction
- Henry Labrouste and Cast Iron Construction.
- Joseph Paxton and Great English Exhibition of 1851.
- Gustave Eiffel and French Exhibition of 1889.
- Development of Ferro concrete: Tony Garnier, Auguste Perret.

Module 2: Development of Ornamentation, Neo- Classicist Revival and Sky Scrapers

- Le Art Nouveau movement and Victor Horta, Antoni Gaudi
- H.P. Berlage, H. H. Richardson and 'True Construction'
- Chicago School: Louis Sullivan
- Organic, Usonian and Prairie Style: Frank Lloyd Wright.

Module 3: Programmatic Functionalism and Development of International Style

- Walter Gropius and Bauhaus.
- Le Corbusier
- Mies van der Rohe

Module 4: 20th Century World Architecture

- **Early Modern Architecture** (Cubism, Constructivism)- Philip Johnson, Louis I Kahn, , Oscar Niemeyer
- **Late Modern Architecture** (Post modernism and International Style, Neo- Futuristic)- ZahaHadid, Norman Foster, Frank O. Gehry, I. M. Pei, Santiago Calatrava.

Module 5: Indian Architecture since Independence

- B. V. Doshi
- Charles Correa
- Raj Rewal
- Laurie Baker

Text Books:

1. SigfriedGiedion ; Space, time and Architecture.
2. Vincent Scully Jr; Modern Architecture.
3. Vikram Bhatt and Peter Sciver; After the masters (Contemporary Architecture of India).
4. Kenneth Frampton; Modern Architecture.

Reference Books:

1. Gossel. P., “Architecture in the 20th Century”, Vol.1 & 2, Taschen. 2005.
2. Ballard B. and Rank, V.P., “Materials for Architectural Design”, Laurance King. 2006.
3. The Phaidon Atlas of Contemporary Architecture, Phaidon Press 2004.

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	50
Quiz (2 nos 10 marks each)	20
Assignment	05

Assessment Components	CO1	CO2	CO3
Mid Sem Examination Marks	√	√	√
End Sem Examination Marks	√	√	√
Quiz (2 nos 10 marks each)	√	√	√
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	M	H	L			H	L	H
2	M	H		H	M	H	M	M	M	M	L	H
3	L	M		L	H	M	L			H	L	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, CO3
CD2	Tutorials/Assignments	CO1, CO2
CD3	Seminars	CO2, CO3
CD4	Self- learning such as use of NPTEL materials and internet	CO1, CO2, CO3

Lecture wise Lesson planning Details.

Wee k No.	Lect . No.	Tentativ e Date	Ch . No .	Topics to be covered	Text Book / Reference	COs mapped	Actual Content covered	Methodolog y used	Remarks by faculty if any
1	L1			Industrial Revolution: Cast Iron and Glass Construction	T1, T4	CO2, CO3		PPT Digi Class/Chalk -Board	
1	L2- L3			Cast Iron Construction- Henry Labrouste.	T1, T4	CO1, CO3		PPT Digi Class/Chalk -Board	
2	L4			English Exhibition of 1851-	T1, T2, T4	CO1, CO3		PPT Digi Class/Chalk -Board	

				Joseph Paxton and Great.					
2	L5- L6			French Exhibition of 1889- Gustave Eiffel	T1, T2, T4, R3	CO1, CO3		PPT Digi Class/Chalk -Board	
3	L7- L8			Development of Ferro concrete: Tony Garnier.	T1, T4, R3	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	
4	L9- L10			Development of Ferro concrete- Auguste Perret.	T1, T4	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	
4	L11			Le Art Nouveau movement- Victor Horta, Antoni Gaudi	T2, T4	CO2, CO3		PPT Digi Class/Chalk -Board	
5	L12			True Construction- H.P. Berlage, H. H. Richardson	T1	CO1, CO3		PPT Digi Class/Chalk -Board	
5	L13 - L14			Introduction to Chicago School	T2, T4	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	
6	L15 - L16			Chicago School: Works of Louis Sullivan	T1, T4, R1, R3	CO2, CO3		PPT Digi Class/Chalk -Board	
7	L17 - L18			Frank Lloyd Wright- Organic, Usonian Style	T2, T4, R2	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	
7	L19			Frank Lloyd Wright- Prairie Style	T2, T4, R2	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	
8	L20 - L21			Bauhaus- Walter Gropius	T1, T4	CO2, CO3		PPT Digi Class/Chalk -Board	
9	L22 - L23			Works of Le Corbusier	T1, T4	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	
10	L24 -			Works of Mies van der Rohe	T4, R2,	CO1, CO2,		PPT Digi Class/Chalk	

	L25				R3	CO3		-Board	
11	L26 - L27			Early Modern Architecture (Cubism, Constructivism)- Philip Johnson	T2, T4, R3	CO1, CO3		PPT Digi Class/Chalk -Board	
12	L28 - L29			Early Modern Architecture (Cubism, Constructivism)- Louis I Kahn, , Oscar Niemeyer	T2, T4, R3	CO1, CO3		PPT Digi Class/Chalk -Board	
12	L30 - L31			Works of ZahaHadid, Norman Foster	T1, T4, R1	CO1, CO3		PPT Digi Class/Chalk -Board	
13	L32 - L33			Frank O. Gehry, I. M. Pei, Santiago Calatrava	T1, T4, R1	CO2, CO3		PPT Digi Class/Chalk -Board	
14	L34 - L36			Works of B. V. Doshi, Charles Correa,	T3, R3	CO1, CO3		PPT Digi Class/Chalk -Board	
14	L37 - L38			Works of Raj Rewal, A. P. Kanvinde	T3, R3	CO2, CO3		PPT Digi Class/Chalk -Board	
15	L39 - L40			Works of Laurie Baker	T3, R3	CO2, CO3		PPT Digi Class/Chalk -Board	

COURSE INFORMATION SHEET

Course code: AR 204
Course title: STRUCTURAL MECHANICS
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: III
Branch: Architecture
Name of Teacher:
Course Objectives

This course enables the students:

A.	To understand the nature of stresses developed in beams for various types of simple loads.
B	To calculate the elastic deformation and deflection occurring in various simple geometries for different types of loading.

Course Outcomes

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

1.	Understand the basic Strength of Materials theorems and to apply the concept in structural problems.
2.	Analyse different structural bodies viz.beam, frame, and column.
3.	Evaluate the influence of various geometric and loading parameters of structural bodies.
4.	Compare the results obtained from bending theory of beam and strain energy method of structural problems.
5.	Create new ideas in the field of structural mechanics.

Syllabus

Module 1: Two-dimensional stress and strain

Plane stress, Bi-axial state of stress at a point, Complementary shear, Principal stresses, Graphical representation of stresses (Mohr's Circle), Plane strain, principal strains, Graphical representation of state of strain, Strain rosettes. (9

Lectures)

Module 2: Stresses in Beams

Pure Bending, Theory, assumptions and equation of bending, Concept of Sectional modulus, Distribution of bending stress in beam cross-section, Assumptions and equation of shear in beam section, Distribution of shear stress in beam cross-section. (9

Lectures)

Module 3: Deflection of Beams

Differential equation of elastic curve of beams, Deflection of beams (due to bending only) by double integration, Macaulay's, and moment-area method – applications to simply supported, cantilever and overhanging beams. (10

Lectures)

Module 4:Energy Methods

Strain energy due to axial and bending load, Castigliano's First theorem - applications to find the deflection of beams and statically determinate trusses. (8

Lectures)

Module 5:Columns

Buckling and stability of columns, Euler's theory of column for different support conditions, Effective lengths, slenderness ratio, Rankine's formula. (6

Lectures)

Text books:

3. J. M. Gere and S. P. Timoshenko, *Mechanics of Materials*, Springer-Science+Business Media, B.V.
4. S. S. Rattan, *Strength of Materials*, Tata McGraw-Hill Publishers.

Reference books:

5. S. Ramamurtham, *Strength of Materials*, DhanpatRai Publications
6. S. S. Rattan, *Strength of Materials*, Tata McGraw-Hill Publishers.
7. G. H. Ryder, *Strength of Materials*, Macmillan Publishers India Limited

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

Torsion of circular shafts

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/Desi

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	50
Quiz (2 nos 10 marks each)	20
Assignment	05

Assessment Components	CO1	CO2	CO3	CO4	CO5
Mid Sem Examination Marks	√	√	√	√	√
End Sem Examination Marks	√	√	√	√	√
Quiz (2 nos 10 marks each)	√	√	√	√	√
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
CD1	Lecture by use of boards/LCD projectors/OHP projectors	CO1-5	CD1
CD2	Tutorials/Assignments	CO1-5	CD2
CD3	Seminars		
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.	Lecture 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	Plane stress, Bi-axial state of stress at a point	T1, T2, R1, R2, R3	1		PPT Digi Class/Chalk-Board	
1	L2			Plane stress, Bi-axial state of stress at a point	T1, T2, R1, R2, R3	1		PPT Digi Class/Chalk-Board	
1	L3			Complementary shear	T1, T2, R1, R2, R3	1		PPT Digi Class/Chalk-Board	
2	L4			Principal stresses	T1, T2, R1, R2, R3	1		PPT Digi Class/Chalk-Board	
2	L5			Principal stresses	T1, T2, R1, R2, R3	1		PPT Digi Class/Chalk-Board	
2	L6			Graphical representation of stresses (Mohr's Circle)	T1, T2, R1, R2, R3	1		PPT Digi Class/Chalk-Board	
3	L7			Plane strain, principal strains, Graphical representation of state of strain	T1, T2, R1, R2, R3	1		PPT Digi Class/Chalk-Board	
3	L8			Plane strain, principal strains, Graphical representation of state of strain	T1, T2, R1, R2, R3	1		PPT Digi Class/Chalk-Board	
3	L9			Strain rosettes	T1, T2, R1,	1		PPT Digi Class/Chalk-Board	

					R2, R3				
4	L10			Pure Bending, Theory, assumptions and equation of bending	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
4	L11			Pure Bending, Theory, assumptions and equation of bending	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
4	L12			Concept of Sectional modulus	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
5	L13			Distribution of bending stress in beam cross-section	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
5	L14			Distribution of bending stress in beam cross-section	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
5	L15			Assumptions and equation of shear in beam section	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
6	L16			Assumptions and equation of shear in beam section	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
6	L17			Distribution of shear stress in beam cross-section	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
6	L18			Distribution of shear stress in beam cross-section	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
7	L19			Differential equation of elastic curve of beams	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
7	L20			Differential equation of	T1, T2,	1,2,3		PPT Digi Class/Chalk	

				elastic curve of beams	R1, R2, R3			-Board	
7	L21			Deflection of beams (due to bending only) by double integration method	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
8	L22			Deflection of beams (due to bending only) by double integration - applications to simply supported beam	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
8	L23			Deflection of beams (due to bending only) by double integration - applications to cantilever beam	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
8	L24			Deflection of beams (due to bending only) by double integration - applications to overhanging beam	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
9	L25			Deflection of beams (due to bending only) by Macaulay's, and moment-area method	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
9	L26			Deflection of beams (due to bending only) by Macaulay's, and moment-area method - applications to simply supported beam	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
9	L27			Deflection of beams (due to	T1, T2,	1,2,3		PPT Digi Class/Chalk	

				bending only) by Macaulay's, and moment-area method - applications to cantilever beam	R1, R2, R3			-Board	
10	L28			Deflection of beams (due to bending only) by Macaulay's, and moment-area method - applications to overhanging beam	T1, T2, R1, R2, R3	1,2,3		PPT Digi Class/Chalk -Board	
10	L29			Strain energy due to axial and bending load	T1, T2, R1, R2, R3	1,2,3,4, 5		PPT Digi Class/Chalk -Board	
10	L30			Strain energy due to axial and bending load	T1, T2, R1, R2, R3	1,2,3,4, 5		PPT Digi Class/Chalk -Board	
11	L31			Castigliano's First theorem	T1, T2, R1, R2, R3	1,2,3,4, 5		PPT Digi Class/Chalk -Board	
11	L32			Castigliano's First theorem	T1, T2, R1, R2, R3	1,2,3,4, 5		PPT Digi Class/Chalk -Board	
11	L33			Castigliano's First theorem - applications to find the deflection of beams	T1, T2, R1, R2, R3	1,2,3,4, 5		PPT Digi Class/Chalk -Board	
12	L34			Castigliano's First theorem - applications to find the deflection of beams	T1, T2, R1, R2, R3	1,2,3,4, 5		PPT Digi Class/Chalk -Board	
12	L35			Castigliano's First theorem - applications to find the	T1, T2, R1, R2,	1,2,3,4, 5		PPT Digi Class/Chalk -Board	

				deflection of statically determinate trusses	R3				
12	L36			Castigliano's First theorem - applications to find the deflection of statically determinate trusses	T1, T2, R1, R2, R3	1,2,3,4, 5		PPT Digi Class/Chalk -Board	
13	L37			Buckling and stability of columns	T1, T2, R1, R2, R3	1,2,3,4,		PPT Digi Class/Chalk -Board	
13	L38			Euler's theory of column for different support conditions	T1, T2, R1, R2, R3	1,2,3,4		PPT Digi Class/Chalk -Board	
13	L39			Euler's theory of column for different support conditions	T1, T2, R1, R2, R3	1,2,3,4		PPT Digi Class/Chalk -Board	
14	L40			Euler's theory of column for different support conditions	T1, T2, R1, R2, R3	1,2,3,4		PPT Digi Class/Chalk -Board	
14	L41			Effective lengths, slenderness ratio, Rankine's formula	T1, T2, R1, R2, R3	1,2,3,4		PPT Digi Class/Chalk -Board	
14	L42			Effective lengths, slenderness ratio, Rankine's formula	T1, T2, R1, R2, R3	1,2,3,4		PPT Digi Class/Chalk -Board	

COURSE INFORMATION SHEET

OFFERED BY DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Course code: CE 101

Course title: ENVIRONMENTAL SCIENCES

Pre-requisite(s): None

Co-requisite(s): None

Credits: 2 L:2 T:0 P:0

Class schedule per week: 02

Class: B.Arch

Semester / Level: III

Branch: Architecture

Name of Teacher:

Course Objectives

This course enables the students:

A.	To impart basic knowledge of ecological principles and their applications in environment
B.	To help the students get exposed to the structure composition of the spheres of the earth, the only planet sustaining life
C.	To make students competent to analyse, how the environment is getting contaminated and probable control mechanisms for them
D.	To train students to generate awareness and become a sensitive citizen towards the changing environment

Course Outcomes

After completing this course, a student:

1	Would get introduced to the structure and function of ecosystems and their importance in the holistic environment
2	Would be able to know the sources, causes, impacts and control of air pollution
3	Would get exposed to various types of water pollution happening in the environment and learn about their effects and potential control mechanisms
4	Would get to know about the importance of soil, its contamination and basics of solid waste management
5	Is expected to have knowledge about radiation hazards and pros and cons of noise pollution

Syllabus

Module I: Ecosystem and Environment

Environmental status and reports on climate change, Concepts of ecology, and Environmental science, ecosystem: structure, function and services, Biogeochemical cycle, energy and nutrient flow, fate of environmental pollutants. Ecosystem management.

Module II: Air Pollution

Structure and composition of unpolluted atmosphere, classification of air pollution sources, types of air pollutants, effects of air pollution, monitoring of air pollution, control methods and equipment for

air pollution control, vehicular emissions and control, indoor air pollution, air pollution episodes and case studies.

Module III: Water Pollution

Water Resource; Water Pollution: types and Sources of Pollutants; effects of water pollution; Water quality monitoring, various water quality indices, water and waste water treatment: primary, secondary and tertiary treatment, advanced treatments (nitrate and phosphate removal); Sludge treatment and disposal.

Module IV: Soil Pollution and Solid Waste Management

Lithosphere – composition, soil properties, soil pollution, ecological & health effects, biogeochemical cycles; Municipal solid waste management – classification of solid wastes, MSW characteristics, collection, storage, transport and disposal methods, sanitary landfills, technologies for processing of MSW: incineration, composting, pyrolysis.

Module V: Noise pollution & Radioactive pollution

Noise pollution: introduction, sources: Point, line and area sources; outdoor and indoor noise propagation, Effects of noise on health, criteria noise standards and limit values, Noise measurement techniques and analysis, prevention of noise pollution; Radioactive pollution: introduction, sources, classification, health and safety aspects, Hazards associated with nuclear reactors and disposal of spent fuel rods-safe guards from exposure to radiations, international regulation, Management of radioactive wastes.

Text books:

1. A, K. De. (3rd Ed). 2008 Environmental Chemistry. New Age Publications India Ltd.
2. C. N. Sawyer, P. L. McCarty and G. F. Parkin. 2002. Chemistry for Environmental Engineering and Science. John Henry Press.
3. S.C. Santra. 2011. Environmental Science. New Central Book Agency.
4. Connell, D. W., Basic Concepts of Environmental Chemistry
5. Introduction to Environmental Engineering and Science, G.M. Masters & Wendell Ela, PHI Publishers
6. Environmental Chemistry – A global perspective, Gary W. Van Loon and Stephen J. Duffy, Oxford University Press

Reference books:

1. Basic Concepts of Environmental Chemistry, DW Conell, CRC Press
2. Environmental Engineering, Peavy, H., Rowe, D.R, Tchobanoglous, G. Mc-Graw - Hill International

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

POs met through Gaps in the Syllabus

Topics beyond syllabus/Advanced topics/Design

POs met through Topics beyond syllabus/Advanced topics/Design

Course Delivery methods	
Lecture by use of boards/LCD projectors/OHP projectors	√
Tutorials/Assignments	√
Seminars	√
Mini projects/Projects	√

Laboratory experiments/teaching aids	√
Industrial/guest lectures	√
Industrial visits/in-plant training	√
Self- learning such as use of NPTEL materials and internets	√
Simulation	√

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	% Contribution during CO Assessment
Mid Sem Examination Marks	25
End Sem Examination Marks	50
Quiz (2 nos 10 marks each)	20
Assignment	05

Assessment Components	CO1	CO2	CO3	CO4	CO5
Mid Sem Examination Marks	√	√	√	√	√
End Sem Examination Marks	√	√	√	√	√
Quiz (2 nos 10 marks each)	√	√	√	√	√
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	M	M	M	L	H	H	M	M	M	M	H
2	M	H	M	H	M	H	H	M	M	M	M	H
3	M	H	M	H	M	H	H	M	M	M	M	H
4	M	H	M	H	M	H	H	M	M	M	M	H
5	M	H	M	H	M	H	H	M	M	M	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
CD2	Tutorials/Assignments	CO2	CD1, CD2
CD3	Seminars	CO3	CD1, CD2

CD4	Mini projects/Projects		CO4	CD1, CD2
CD5	Laboratory experiments/teaching aids		CO5	CD1, CD2
CD6	Industrial/guest lectures			
CD7	Industrial visits/in-plant training			
CD8	Self- learning such as use of NPTEL materials and internets			
CD9	Simulation			

COURSE INFORMATION SHEET

Course code: AR 211
Course title: ARCHITECTURAL DESIGN-III
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: III
Branch: Architecture
Name of Teacher: Dr. Manjari Chakraborty

Course Objectives

This course enables the students:

A.	To familiarize students with organization of spaces with simple design problems
B.	Use of Bubble diagrams and Flow charts to start the design process
C.	To comprehend relationship between design, visual arts, building construction, building materials, structure etc and evolve a design solution.
D.	Interpretation of climatic data to formulate design approaches

Course Outcomes

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

1.	To understand the basic functional aspect of designing simple building type and its relevant spatial organization and accordingly design the unit
2.	The students shall learn to reciprocate and sensitize the design/concept to the environment with respect to specific site climate.

Syllabus

Assignment I : Small residential building – Approx duration : 6 weeks

The students are expected to design a residential building in a specific site for a small Indian joint family in urban, semi-urban or rural setting. The projects investigate the study of built form, function, activity, ergonomics & anthropometrics and its relationship to the site and surroundings.

Case Study : Students need to do a detailed case study of similar type small residence before starting actual design.

Assignment II : Multi-functional, Multi-cellular built environments- Approx duration : 4 weeks

Design projects to focus on multi-functional, multi-cellular built environments such as canteen, health club, small resort, crèche, community hall, health club, hobby centre for children etc.

Design Exercise as Time Problem

Small design exercise from various sources for inspiration for

Duration

8 hrs.

architectural design such as nature, history, geometry, culture etc. Example : children park, Monument, War Memorial, Dhaba.

Viva voce

Final Viva-vice on all the design assignments to be conducted at the end of the semester

Reference books:

1. National Building Code of India, Vol.1-5,2005.
2. Joseph De Chiara, Michael J.Crosbie, "Time Savers Standards for Building Types", McGraw-Hill Professional 2001.
3. Ernst Neuferts, "Architects Data", Blackwell, 2002.
4. Daniel Williams, "Sustainable Design: Ecology, Architecture & Planning", John Wiley & sons Inc, NJ, 2007.
5. The American Institute of Architects , Architectural Graphic Standards
6. Local building byelaws corresponding to the site.

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 (Select whichever is required)
Lecture by use of boards/LCD projectors/OHP projectors
Tutorials/Assignments
Seminars
Projects
Laboratory experiments/teaching aids
Industrial/guest lectures
Site visit

Course Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

Assessment Tool	% Contribution during CO Assessment
Progressive Evaluation	50
End Sem Evaluation	50

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

Indirect Assessment –

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

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

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				L		L	
2	M			H					L		L	

Lecture wise Lesson planning Details :

We ek No.	Lect. No.	Tentative Date	Ch . No.	Topics to be covered	Text Books/References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	1,2,3			Introduction to the problem and site	1,2,3,4/1,2,3,4,5,6	CO1, CO2	Details of Planning and services for Main design	PPT, Chalk & talk, Illustrations	
1	4			Internal evaluation of case studies / Literature studies	1,2,3,4/1,2	CO1, CO2		PPT	
2	5,6,7,8			Site study, Conceptual Design, Layout planning	1,2,3,4,5,6	CO2	Design of building and site planning	Computerised drawing tool	
3	9,10,11			Design, Layout planning	1,2,3,4,5,6	CO2	Design of building and site planning	Computerised drawing tool	
4	13,14,15			Design, Layout planning	1,2,3,4,5,6	CO1, CO2.	Design of building and site planning	Computerised drawing tool	
4	16			Internal	NA	CO1,		PPT,	

				evaluation of design development		CO2		Computerised drawing tool, paper	
5-7	16-24			Design, Layout planning	1,2,3,4,5,6	CO2	Design of building and site planning	Computerised drawing tool	
7	25-26			Internal evaluation of design development	NA	CO1, CO2.		PPT, Computerised drawing tool, paper	
8-9	27-35			Preparation of elevation, section & view	1,2,3,4,5,6	CO1, CO2.	Design of building and site planning	Computerised drawing tool	
9	36			Submission of Final design					
10	37			Starting of new problem on urban design	1,2,3,4,5,6	CO2	Introduction to problems and describing various methods of approach	PPT, Chalk & talk, Illustrations	
10	38-40			Introduction to the problem and site	1,2,3,4,5,6	CO1, CO2.	Details of Planning and services for Main design	PPT, Chalk & talk, Illustrations	
11	41			Internal evaluation of case studies / Literature studies	NA	CO1, CO2.		PPT	
11	42-45			Conceptual Design, Layout planning	1,2,3,4,5,6	CO2	Design of building and site planning	Computerised drawing tool	
12	46-48			Design, Layout planning	1,2,3,4,5,6	CO2.	Design of building and site	Computerised drawing	

							planning	tool	
13	39			Internal evaluation	NA	CO1, CO2.		PPT	
14	40-42			Preparation of elevation, section & view	1,2,3,4,5,6	CO1, CO2.	Design of building and site planning	Computerised drawing tool	
14	43			Final submission					

COURSE INFORMATION SHEET

Course code: AR 212

Course title: BUILDING CONSTRUCTION – II

Pre-requisite(s): None

Co- requisite(s): None

Credits: 6 L: 0 T: 0 P: 4

Class schedule per week: 04

Class: B. Arch

Semester / Level: III

Branch: Architecture

Name of Teacher: Rajan Chandra Sinha

Course Objectives

This course enables the students:

A.	Develop and understand the different types of deep foundation and elements of basement
B.	Identify the various elements of flooring and roofing
C.	Understand the layout and construction details of different types of staircase
D.	Apply the special types of Door Window detailing in building application
E.	Site visits to be organized to make the students aware of various technical aspects, practical difficulties, onsite decisions which will strengthen the knowledge for handling and executing a project

Course Outcomes

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

1.	To recognize the various types of deep foundations, basement construction, flooring, roofing, special doors and windows and staircase.
2.	To explain the context and suitability of above elements under a given situation.

Syllabus

DEEP FOUNDATION & BASEMENT:

Grillage foundations, Piles foundations and Caisson foundations

Construction detail of basement wall, Retaining wall, floor and foundation with particular emphasis to their damp proofing protection against rain water and provision for natural lighting and ventilation.

No. of sheets: 3

FLOORING:

Types of flooring, methods of laying, furnishing of floors with different floor finishes like cement, colored cement, mosaic, terrazzo, tiles etc.

Timber floors: construction techniques, types of timber floors: single, double and triple joist timber floors.

Special consideration for rubber, Linoleum and PVC flooring, Flag Stone Flooring, parquet flooring. Different type of resilient and vibration resistive floor.

Floorings for special functional space viz. auditorium stage, Operation theatre in hospitals etc.,

No. of sheets: 3

ROOFING:

Types of roof, Parts of roof and Types of Roof trusses.
Flat roof with wood and RCC, simple jack arch, Waterproofing, Rainwater gutter details.
Inclined Roof - Common roof covering and its arrangement: tiles, metal sheets etc. with fixing and rainwater gutter

No. of sheets: 2

SPECIAL DOOR & WINDOW:

Special doors and windows: One way and both way-swinging door, sliding door (manual and automatic), folding, revolving, collapsible and rolling door with hardware details.
Window and Ventilator with Aluminum frame.

No. of sheets: 2

STAIRCASE

Different elements of staircase, Relation between Tread and Riser, Types of staircase, Construction Details of a concrete staircase, balustrade and handrail detail

No. of sheets: 2

SITE VISIT:

At least one visit to be paid to the construction site covering various sequences of construction and a report to be submitted by individual students as a part of the sessional work.

Text books:

1. Building Construction - W.B. Mc. Kay Vol. 1- 4
2. Building Construction Illustrated - Francis D.K. Ching
3. Construction Technology - R. Chudly Vol. 1- 4
4. Building Materials and Construction - B. C. Punmia
5. Building Materials and Construction - Bindra & Arora

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
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	-	-	-	-	L	L
2	M	M	M	L	L	M	L	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
CD3	Laboratory experiments/teaching aids	CO1, CO2
CD4	Industrial/guest lectures	CO1, CO2

Lecture wise Lesson planning Details.

Wee k No.	Lect. No.	Tent ative Date	Ch . No .	Topics to be covered	Text Book / Refere nces	COs mapp ed	Actual Content covered	Methodolog y used	Remark s by faculty if any
1	1-4			Deep Foundation and basement	1,2,3,4, 5	CO1, CO2		PPT, Chalk & talk, Illustrations	
2	5-6			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
2-3	7-10			Flooring with various materials	1,2,3,4, 5	CO1, CO2		PPT, Chalk & talk, Illustrations	
3	11-12			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
4	13-16			Flooring for special functional spaces	1,2,3,4, 5	CO1, CO2		PPT, Chalk & talk, Illustrations	
5	17-18			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
5	19-20			Types of roof, Parts of roof and Types of	1,2,3,4, 5	CO1, CO2		PPT, Chalk & talk, Illustrations	

				Roof trusses.					
6	21-22			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
6-7	23-26			Inclined Roof	1,2,3,4, 5	CO1, CO2		PPT, Chalk & talk, Illustrations	
7	27-28			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
8	29-32			Special doors and windows	1,2,3,4,5	CO1, CO2		PPT, Chalk & talk, Illustrations	
9	33-34			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
9-10	35-40			Staircase design elements	1,2,3,4, 5	CO1, CO2		PPT, Chalk & talk, Illustrations	
11	41-42			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
11	43-44			Site Visit	NA	CO1, CO2		Mini projects/Projects	
12-13	45-50			Report of site visit	NA	CO1, CO2		Mini projects/Projects	
13	51-52			Internal evaluation	NA	CO1, CO2		Mini projects/Projects	

COURSE INFORMATION SHEET

Course code: AR 213

Course title: COMPUTER APPLICATION IN ARCHITECTURE

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: III

Branch: Architecture

Name of Teacher: Apurv Ashish

Course Objectives

This course enables the students:

A.	To learn various commands in 2D operation.
B.	To learn Development of 3D objects and Surfaces
C.	To learn various commands in 3D operation and drawing of 3D objects
D	To learn 3D in higher(current) versions of AutoCAD, material attachment and Rendering in AutoCAD 2011 & 2012.
E	To get an introduction to Google Sketch up.

Course Outcomes

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

1.	Handle the software to explore innovative forms and geometry.
2.	Develop the concepts to produce 2D Architectural drawings.
3.	Apply the concepts in Architectural Design, Working Drawing and Landscape Design (Sessional).
4,	Explore concepts about 3D modelling and Walkthroughs.

Syllabus

Activities -	No. of Weeks
<p>A. AutoCAD 2D</p> <ul style="list-style-type: none"> • Drawing and modifying operations in AutoCAD, Coloring and Hatching in AutoCad, Block making, writing Text and doing Dimensioning in AutoCAD. • Formatting in AutoCad, Working in Layers in AutoCAD and Use of Viewport in AutoCad <ul style="list-style-type: none"> ▪ Color and hatch, Object properties • Making of Blocks, Text and Dimensioning, Formatting operation: dimensions, text, line type etc 	<p>7 Weeks</p>

<p>B. AutoCAD 3D</p> <ul style="list-style-type: none"> ▪ Basic operations of 3-D ▪ Development of regions, polylines, Generation of surfaces and solids ▪ 3-D operation: Union, Subtraction and Intersection; 3-D operation: Rotate, Mirror and Array; ▪ Material Attachment and Rendering. ▪ Final rendering in Photoshop. ▪ Operations in 3-D ▪ Solids editing; ▪ UCS operation; ▪ Working with 3-D Viewports and 3-D Pan/Zoom to generate different views. ▪ Implications and advantage of 3-D wireframe, Hide, Shade etc. in generating 3-D views • Making of perspective views, adjustment of camera. 	<p>3 Weeks</p>
<p>C. Sketchup (3D)</p> <ul style="list-style-type: none"> • Introduction to Sketchup, Material application, Different views, Rendering with Background and Foreground, Architectural Walkthrough. 	<p>5 Weeks</p>

Design Assignments

To be conducted at the end of each lecture.

Viva voce

Final Viva-vice on the design assignments to be conducted at the end of the semester.

Text books:

1. AutoCAD Manual
2. AutoCAD Command Reference
3. Learning SketchUp: A 3D Modeling Guide for Beginners by Allan Hanson.

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	Seminars
CD2	Mini projects/Projects
CD3	Industrial/guest lectures
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
Progressive Evaluation	50
End Sem Evaluation	50

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	H	L	H		M			M	H	L	H
2	L		L		L				M		L	M
3	H	M		M		H			M	H	L	M
4	M	M		H		H		L	H	H	L	H

Mapping Between COs and Course Delivery (CD) methods		
CD	Course Delivery methods	Course Outcome
CD1	Seminars	CO1, CO2, CO4
CD2	Mini projects/Projects	CO1, CO3
CD3	Industrial/guest lectures	CO1, CO2, CO3
CD4	Self- learning such as use of NPTEL materials and internet.	CO1, CO2, 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-L3			Introduction to AutoCAD 2D	T1, T2	CO1, CO2, CO3		PPT, Chalk-talk, Software Illustrations, Assignments	
2	L4-L6			Introduction to AutoCAD	T1, T2	CO1, CO2, CO3		PPT, Chalk-talk, Software	

				2D				Illustrations, Assignments	
3	L7- L9			Introduction to AutoCAD 2D	T1, T2	CO1, CO2, CO3		PPT, Chalk- talk, Software Illustrations, Assignments	
4	L10- L12			Introduction to AutoCAD 2D	T1, T2	CO1, CO2, CO3		PPT, Chalk- talk, Software Illustrations, Assignments	
5	L13- L15			Introduction to AutoCAD 2D	T1, T2	CO1, CO2, CO3		PPT, Chalk- talk, Software Illustrations, Assignments	
6	L16- L18			Introduction to AutoCAD 2D	T1, T2	CO1, CO2, CO3		PPT, Chalk- talk, Software Illustrations, Assignments	
7	L19- L21			Introduction to AutoCAD 2D	T1, T2	CO1, CO2, CO3		PPT, Chalk- talk, Software Illustrations, Assignments	
8	L22- L-24			Introduction to AutoCAD 3D	T1, T2	CO1, CO3, CO4		PPT, Chalk- talk, Software Illustrations, Assignments	
9	L25- L27			Introduction to AutoCAD 3D	T1, T2	CO1, CO3, CO4		PPT, Chalk- talk, Software Illustrations, Assignments	
10	L28- L30			Introduction to AutoCAD 3D	T1, T2	CO1, CO3, CO4		PPT, Chalk- talk, Software Illustrations, Assignments	
11	L31- L33			Introduction to Sketchup (3D)	T3	CO1, CO3, CO4		PPT, Chalk- talk, Software Illustrations, Assignments	
12	L34- L36			Introduction to Sketchup (3D)	T3	CO1, CO3, CO4		PPT, Chalk- talk, Software	

								Illustrations, Assignments	
13	L37- L39			Introduction to Sketchup (3D)	T3	CO1, CO3, CO4		PPT, Chalk- talk, Software Illustrations, Assignments	
14	L40- L42			Introduction to Sketchup (3D)	T3	CO1, CO3, CO4		PPT, Chalk- talk, Software Illustrations, Assignments	
15	L43- L45			Introduction to Sketchup (3D)	T3	CO1, CO3, CO4		PPT, Chalk- talk, Software Illustrations, Assignments	

SEMESTER IV

COURSE INFORMATION SHEET

Course code: AR 251

Course title: BUILDING SERVICES I- Water Supply and Sanitation

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: IV

Branch: Architecture

Name of Teacher: Dr. Bimal Chandra Roy

Course Objectives

This course enables the students:

A.	To identify the different sources of water, list them and describe the method of intake.
B.	To identify the various methods of water purification and water distribution networks.
C.	To explain the various water supply appurtenances required for the distribution networks
D.	To explain the various sanitation system in Indian context and their functioning process
E.	To design water storage tank, septic tank and soak pit
F.	To prepare plumbing layout drawings for water supply and sanitation for buildings

Course Outcomes

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

1.	Identification of the various sources of water supply and the intake methods
2.	Understand the water treatment processes for different types of water
3.	Understand the waste water treatment processes and the functioning of various sewer appurtenances
4.	Designing the water reservoir, septic tanks and soak pits
5.	Preparing plumbing layout drawings for water supply and sanitation for buildings

Syllabus

Module 1: Water Supply System

Introduction, various sources of water supply, standards of purity and treatment of water, qualities of potable water. Domestic water demand, calculation of capacity of overhead/underground water tank and distribution system. water distribution networks, pipe appurtenances, pumps, pumping plants. Building service connection, ferrules, water meters. Layout of domestic water piping systems, joints, fittings and valves. Cold & hot water lines in buildings, Water supply to high rise buildings: problems encountered & systems adopted.

Module 2: Building Sanitation

Principles of sanitation, collection and disposal of various kinds of refuse from buildings. Methods of carrying refuse, systems of refuse disposal, their principles. Plumbing definitions and related terms, plumbing systems (one pipe, two pipe etc), House drainage system, Drainage of sub-soil water. Inspection chambers, Manholes, Sub-drains, culverts, ditches and gutters, drop inlets and catch basins, roads and pavements, storm overflow/regulators.

Module 3: Plumbing and Sanitary Appliances

Basic principles of Plumbing, need, scope, terminology. Specifications and installation of sanitary fittings like wash basins, water closets, urinals, bidets, sinks, etc in buildings. Uses of gate valve, float valve, flap valve, ball valve, flush valve, etc, different types of taps, faucets, stop cocks, bib cocks, 'P', 'Q', 'S', floor/bottle traps used in buildings.

Module 4: Design of Plumbing Systems

Design considerations on drainage scheme. Planning of bathrooms, lavatory blocks and kitchen in domestic and multi-storeyed buildings. Preparation of plumbing drawings, symbols commonly used in these drawings.

Module 5: Sewerage System

Indian standards and byelaws for sanitary conveyance. Disposal of sewage from isolated building, Gradients used in laying of drains and sewers for various sizes. Septic tank details & capacity calculation. Sewage treatment. Use of pumps in sanitation, biogas, soil disposal without water carriage, rural sanitation.

Text books:

1. AFE Wise, JA Swaffield Water, Sanitary & Waste Services in buildings, V Edition, Mitchell Publishing, Co. Ltd., 2002.
2. B.C Punmia., "Waste Water Engineering", Laxmi Publications, 2009.
3. S.J Arceivala., "Waste Water Treatment for Pollution Control", Tata McGraw Hill, 2008.
4. S.C. Rangwala, "Water supply and sanitary engineering", Chartar publishing house, Anand, 2016.

Reference books:

1. National Building Code of India, 2016.
2. Manual of water supply and treatment, Second edition, CPHEEO, Ministry of works and housing, New Delhi, 1977

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 Outcome (CO) Attainment Assessment tools & Evaluation procedure

Direct Assessment

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

Assessment Components	CO1	CO2	CO3	CO4	CO5
Mid Sem Examination Marks	√	√	√	√	√
End Sem Examination Marks	√	√	√	√	√
Quiz (02 nos. of 10 marks each)	√	√	√	√	√
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	H	H	L	M							
2	H	H	H	M	L		H	H			L	
3	H	H	H	M	L		H	H			L	
4	H	H	H	H	M	H	H	H			L	
5	H	H	H	H	H	H				M	L	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
CD2	Tutorials/Assignments	CO2	CD3, CD4
CD3	Seminars	CO3	CD2, CD3, CD5
CD4	Mini projects/Projects	CO4	CD1, CD2, CD3
CD5	Laboratory experiments/teaching aids	CO5	CD2, CD5
CD6	Industrial/guest lectures	CO5	CD5
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			Introduction, various sources of water supply, standards of purity and treatment of water, qualities of potable water.	T1,T4, R1,R2	CO1		PPT Digi Class	

1	L2, L3			Domestic water demand, calculation of capacity of overhead/underground water tank and distribution system	T1,T4, R1	CO1, CO2		PPT Digi Class	
2	L4, L5			water distribution networks, pipe appurtenances, pumps, pumping plants, various water treatment methods	T1,T4, R1,R2	CO2		PPT Digi Class	
2	L6			Building service connection, ferrules, water meters	T1, T4, R1	CO2		PPT Digi Class	
3	L7, L8			Layout of domestic water piping systems, joints, fittings and valves. Cold & hot water lines in buildings, Water supply to high rise buildings: problems encountered & systems adopted.	T1,T4, R1	CO2		PPT Digi Class	
3	L9			Principles of sanitation, collection and disposal of various kinds of refuse from buildings.	T1, T2, T3, R1	CO3		PPT Digi Class/Chalk -Board	
4	L10, L11			Methods of carrying refuse, systems of refuse disposal, their principles	T1,T2, T3,R1	CO3		PPT Digi Class/Chalk -Board	
4	L12			Plumbing definitions and related terms, plumbing systems (one pipe, two pipe etc), House drainage system, Drainage of sub-soil water	T1,T2, T3, R1	CO3		PPT Digi Class/Chalk -Board	
5	L13, L14			Inspection chambers, Manholes, Sub-drains, culverts, ditches and gutters, drop inlets and catch basins, roads and pavements, storm overflow/regulators.	T1, T2, T3, R1	CO3		PPT Digi Class	
5	L15			House drainage system, Drainage of sub-soil water	T1,T2, T3,R1	CO4		PPT Digi Class	
6	L16			Basic principles of Plumbing, need,	T1,T2, T3,T4,	CO3, CO4		PPT Digi Class/Chalk	

			scope, terminology	R1			k -Board	
6	L17, L18		Specifications and installation of sanitary fittings like wash basins, water closets, urinals, bidets, sinks, etc in buildings	T1,T2, T3,T4, R1,R2	CO3, CO4, CO5		PPT Digi Class	
7	L19, L20		Uses of gate valve, float valve, flap valve, ball valve, flush valve, etc	T2,T4, R1	CO4, CO5		PPT Digi Class/Chal k -Board	
7	L21		different types of taps, faucets, stop cocks, bib cocks, 'P', 'Q', 'S', floor/bottle traps used in buildings.	T2,T4, R1	CO4, CO5		PPT Digi Class	
8	L22		Design considerations on drainage scheme	T2,T4, R1	CO4, CO5		PPT Digi Class	
8	L23, L24		Planning of bathrooms, lavatory blocks in domestic and multi-storeyed buildings	T2,T4, R1	CO4, CO5		PPT Digi Class	
9	L25		Planning of kitchen in domestic and multi-storeyed buildings	T2,T4, R1	CO4, CO5		PPT Digi Class	
9	L26, L27		Symbols commonly used in plumbing drawings.	T2,T4, R1	CO4, CO5		PPT Digi Class	
10	L28, L29		Preparation of plumbing drawings for individual buildings, multi-storeyed apartment buildings	T2,T4, R1	CO5		PPT Digi Class	
10	L30		Indian standards and byelaws for sanitary conveyance	T2,T3, T4,R1, R2	CO3, CO5		PPT Digi Class/Chal k -Board	
11	L31, L32		Methods of disposal of sewage from isolated building	T1,T2, T3,T4, R1,R2	CO3, CO5		PPT Digi Class	
11	L33,		Gradients used in laying of drains and sewers for various sizes	T1,T2, T3,T4, R1,	CO3, CO5		PPT Digi Class	
12	L34, L35		Septic tank details & capacity calculation, design of soak pits	T1,T2, T3,T4, R1,R2	CO4		PPT Digi Class	
12	L36		Need of sewage treatment, various environmental acts	T1,T2, T3,T4, R1,R2	CO4		PPT Digi Class	

13	L37, L38			Various sewage treatment processes	T1,T2, T3,T4, R1	CO4		PPT Digi Class/Chalk -Board	
13	L39			Various sewage treatment processes	T1,T2, T3,R1	CO3, CO5		PPT Digi Class/Chalk -Board	
14	L40			Use of pumps in sanitation	T2,T3, T4,R1	CO3, CO4		PPT Digi Class/Chalk -Board	
14	L41, L42			Biogas, soil disposal without carriage, rural sanitation.	T1,T2, T3,T4, R1,R2	CO3, CO5		PPT Digi Class	

COURSE INFORMATION SHEET

Course code: AR 252

Course title: BUILDING SERVICES - II (Electrical & Lighting)

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: IV

Branch: Architecture

Name of Teacher: Anuj Kumar Toppo

Course Objectives

This course enables the students:

A.	To list the various components required in electricity distribution system
B.	To explain the electrical distribution in campus
C.	To develop the electrical layout diagram for building for the estimation and installation purpose
D.	To identify the various types of light requirement for different purpose
.E	To apply the fundamental of laws of illumination for analyse the light requirements of any space (both exterior and interior)
F	To design the lighting scheme for interiors spaces

Course Outcomes

After the completion of this course, students will be:

1.	Understand about the basic services and their generation
2.	Apply their knowledge in Professional life
3.	Develop a sense of organization of appropriate solution in their design

Syllabus

Module 1: Basic Concept of Electricity

Sources of Electricity, Electricity generation, Basic Electrical Distribution System – Substation, transformer, over head line, underground line. Three phase supply. Electrical distribution in campus

Module 2: Techniques for Electrical Services

Domestic wiring system, Material, classification, merits and demerits, Electrical accessories, Symbols and representation in architectural layout drawings, Single line- wiring diagram, Safety aspects, protection of buildings against lightning, NBC Recommendations, Earthing, Short circuit and overloading, Preliminary Estimation of Electrical & illumination works

Module 3: Fundamental of Illumination

Fundamentals of light. General definition of terms related to optical sensitivity, visual performance & vision, Visual field, Application of lighting and illumination in Architecture. Artificial sources of light; Lamps and their characteristics: Incandescent lamp, Fluorescent lamp, Gas filled lamp, HID lamp. Neon lamp and LED lamp. Polar Curves Luminaries and their applications

Module 4: Basic Lighting Design

Definition of Light power, light flux Light intensity, Laws of Illumination: inverse square law and Lambert's Cosine law. Application of law of illumination. General formula for illumination calculation of distributed source. Coefficient of utilization. Standard level of illuminations for various tasks, Basic lighting design, Direct, Indirect and semi-direct lighting. General and local

lighting, Glare and glare control.

Module 5: Application of Lighting

Lighting design of: Residential units, Shops & Restaurants, general office, conference hall, Art – gallery and Museum Parks & playgrounds Road/area lighting and Landscape Lighting.

Text books:

1. Derek Philips; Lighting in Architectural Design.
2. G.K.Lal, Elements of Lighting, 3-D Publishers.
3. R.G. Hopkinson and J.D.Kay, The lighting of buildings, Faber and Faber, London, 1969.
4. Philips Lighting in Architectural Design, McGraw Hill, New York, 1964.

Reference books:

1. I.E.S. Handbook.

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
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	50
Quiz (02 nos. of 10 marks each)	20
Assignment / Quiz (s)	05

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

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	H	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
CD 2	Tutorials/Assignments	CO2	CD1
CD 3	Seminars	CO3	CD1 and CD2
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.

Wee k No.	Lect . No.	Tentativ e Date	Ch . No .	Topics to be covered	Text Book / Refer ences	COs mapp ed	Actual Conten t cover ed	Methodolog y used	Remark s by faculty if any
1	L1		1	Sources of Electricity,	T1, R1	CO1		PPT Digi Class/Choc k -Board	
1	L2			Electricity generation	T2	CO1		PPT Digi Class/Choc k	
2	L3- L4			Basic Electrical Distribution System – Substation, transformer	T2- R1	CO2		PPT Digi Class/Choc k	
2	L5			over head line, underground line	T4	CO1		PPT Digi Class/Choc k	

2	L6			Three phase supply	T4	CO1		PPT Digi Class/Choc k	
3	L7			Electrical distribution in campus	T3,R1	CO1		PPT Digi Class/Choc k	
3	L8-L9			Domestic wiring system Material, classification, merits and demerits, Electrical accessories,	T4	CO3		PPT Digi Class/Choc k	
3	L10			Symbols and representation in architectural layout drawings,	T3	CO3		PPT Digi Class/Choc k	
4	L11 - L12			Single line-wiring diagram, Safety aspects, protection of buildings against lightning,	T2, R1	CO3		PPT Digi Class/Choc k	
4	L13 - L14			NBC Recommendations, Earthing, Short circuit and overloading,	T2	CO2		PPT Digi Class/Choc k	
5	L15 - L16			Preliminary Estimation of Electrical & illumination works	T1	CO1		PPT Digi Class/Choc k	
5	L17			Fundamentals of light.	T2	CO3		PPT Digi Class/Choc k	
6	L18 - L20			General definition of terms related to optical sensitivity, visual performance & vision, Visual field, Application of lighting and illumination in Architecture	T4	CO3		PPT Digi Class/Choc k	
7	L21 - L22			Artificial sources of light; Lamps and their characteristics	T1,R1	CO2		PPT Digi Class/Choc k	
7	L23			Incandescent	T2	CO2		PPT Digi	

	- L25			lamp, Fluorescent lamp, Gas filled lamp, HID lamp. Neon lamp and LED lamp. Polar Curves Luminaries and their applications				Class/Choc k	
7-8	L26 - L27			Definition of Light power, light flux Light intensity, Laws of Illumination: inverse square law and Lambert's Cosine law	T2	CO1		PPT Digi Class/Choc k	
8	L28			Application of law of illumination	T3	CO3		PPT Digi Class/Choc k	
9	L29			General formula for illumination calculation of distributed source.	T3	CO3		PPT Digi Class/Choc k	
9	L30			Coefficient of utilization. Standard level of illuminations for various tasks,	T4	CO1		PPT Digi Class/Choc k	
10	L31			Coefficient of utilization	T1	CO1		PPT Digi Class/Choc k	
10	L31 - L32			Standard level of illuminations for various tasks, Basic lighting design,	T3	CO3		PPT Digi Class/Choc k	
11-12	L33 - L34			Direct, Indirect and semi-direct lighting. General and local lighting, Glare and glare control	T3	CO2		PPT Digi Class/Choc k	
12	L35			Lighting design of: Residential units, Shops & Restaurants,	T3	CO1		PPT Digi Class/Choc k	
13	L36 - L37			Lighting design of: general office, conference hall, Art – gallery and Museum	T3	CO2		PPT Digi Class/Choc k	

14	L38 - L39			Lighting design of: Parks & playgrounds Road/area lighting and Landscape Lighting	T4	CO3		PPT Digi Class/Choc k	
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COURSE INFORMATION SHEET

Course code: AR 253

Course title: SITE PLANNING AND LANDSCAPE 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: IV

Branch: Architecture

Name of Teacher: Apurv Ashish

Course Objectives

This course enables the students:

A	To explain relationship between environment, human interventions and the impacts on it and knowledge about various measures of protecting it.
B.	To define site planning process and identify basic principles and list them.
C.	To classify historical gardens and identify their characteristics.
D.	To illustrate the different processes of site study and its application
E.	To classify natural and man-made elements, list them, identify their use and infer their application.

Course Outcomes

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

1.	Improve their concepts, ideas and techniques prevalent in landscape architecture.
2.	Develop knowledge about various techniques of site analysis and planning, which will help in Architectural Design and Landscape Design (Sessional).
3.	Build their understanding about the design process used in landscape architectural practice.

Module 1: Natural Elements of Landscape:

Landforms- soil dynamics, rock, water, vegetation. Plant types, characteristics, structure and colour. Climate and their role in landscape design, Environmental Degradation.

Module 2: Manmade Elements of Landscape:

Hard and soft landscaping, garden furniture, lighting fixtures, signage and sign boards, fences, garden hardware and surface treatment, paving materials, surface drainage, artworks, planters, garden shelters, artificial rocks, plants and waterfalls.

Module 3: Introduction to Site Analysis and Site Planning Process:

Site Analysis: Site study and analysis of all natural and man-made factors of site like site-topography and slope, soil, hydrology and drainage, vegetation, climate and visual analysis

Site Planning Process: Need, Definition, scope and relationship in between Site planning & Landscape Arch. Basic principles of landscape design.

Module 4: Evolution of Garden Design and Modern Gardens:

Origin of the concept of garden. A brief study of different garden types: Egyptian, Mesopotamian, Persian, Mughal gardens, Indian Vedic Gardens, Japanese gardens, Chinese Gardens, French Gardens, Renaissance Gardens, English Gardens.

Modern gardens: Rock garden, terrace garden, Indoor garden and other Contemporary thoughts of landscape.

Module 5: Guidelines for different landscape situations, safety and security features of Neighbourhoods:

Passive and Active Recreation spaces and Safety, Circulation and Aesthetics in Residential parks and Tot lots.

Text Books:

1. Charles W. Harris & Nicholas T. Dines; Time Saver Standards for Landscape Architecture
2. Kevin Lynch ;Site planning ;MIT Press, Cambridge, MA – 1967
3. J. O. Simonds; Landscape Architecture; McGraw Hill.
4. J. E. Ingels; Landscaping – Principles and Practice.
5. P. Walker, Theodore D; Planting Design.

Reference Books:

1. Bose, T.K. and Chowdhury, B., “Tropical Garden Plants in Colour”, Allied Publishers.
2. Black & Decker, “Landscape Design & Construction”, Creative Publishing International.
3. Thompson, W. and Sorvig, K., “Sustainable Landscape Construction: A Guide to Green”, Island Press.

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	50
Quiz (02 nos. of 10 marks each)	20
Assignment / Quiz (s)	05

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

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	M	M	H	H		M	L	H
2	M	H	M	M	L	M	M	L	M	M	M	M
3	M	L	M	M	L	M	H	M	L	M	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, CO3
CD2	Tutorials/Assignments	CO2, CO3
CD3	Seminars	CO1, CO3
CD4	Self- learning such as use of NPTEL materials and internet	CO1, CO3

Lecture wise Lesson planning Details.

Wee k No.	Lect . No.	Tentativ e Date	Ch . No .	Topics to be covered	Text Book / Refer ences	COs mapp ed	Actual Conten t cover ed	Methodolog y used	Remark s by faculty if any
1	L1			Landforms -soil dynamics, rock, water, vegetation.	T3, R2, R3	CO1, CO3		PPT Digi Class/Chalk -Board	
1	L2- L3			Plant types, characteristics, structure and colour.	T4, R1	CO1		PPT Digi Class/Chalk -Board	
2	L4			Climate and their role in landscape design	T2, T3, R3	CO1, CO2		PPT Digi Class/Chalk -Board	
2	L5- L6			Environmental Degradation.	T4, R3	CO1		PPT Digi Class/Chalk -Board	
3	L7- L8			Hard and soft landscaping, garden furniture, lighting fixtures,	T1, T3, T4, T5, R1	CO2, CO3		PPT Digi Class/Chalk -Board	
4	L9			Signage and sign boards, fences, garden hardware and surface treatment,	T1, T3, T4, T5, R1	CO2, CO3		PPT Digi Class/Chalk -Board	
4	L10			Paving materials, surface drainage, artworks,	T1, T3, T4, R1	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	

				planters, garden shelters,				
5	L11			Artificial rocks, plants and waterfalls.	T1, T3, T4, R1	CO3		PPT Digi Class/Chalk -Board
5	L12 - L13			Site Analysis: Site study and analysis of all natural and man-made factors of site like site- topography and slope	T2, T4, R3	CO2, CO3		PPT Digi Class/Chalk -Board
6	L14 - L15			Site Analysis: soil, hydrology and drainage, vegetation, climate and visual analysis	T2, T4, R3	CO1, CO2, CO3		PPT Digi Class/Chalk -Board
7	L16 - L18			Site Planning Process: Need, Definition, scope	T2, T4, R3	CO1, CO2, CO3		PPT Digi Class/Chalk -Board
8	L19			Site Planning Process: relationship in between Site planning & Landscape Arch. Basic principles of landscape design.	T2, T4, R3	CO1, CO2, CO3		PPT Digi Class/Chalk -Board
8	L20 - L21			Origin of the concept of garden. A brief study of different garden types: Egyptian, Mesopotamian	T3, T4, T5, R2	CO1, CO2		PPT Digi Class/Chalk -Board
9	L21 - L24			Mughal gardens, Indian Vedic Gardens	T3, T4, T5, R2	CO2, CO3		PPT Digi Class/Chalk -Board
10	L25 - L27			Japanese gardens	T3, T4, T5, R2	CO1, CO3		PPT Digi Class/Chalk -Board
11	L28			Chinese	T3,	CO1,		PPT Digi

	- L29			Gardens	T4, T5, R2	CO3		Class/Chalk -Board	
12	L30 - L31			French Gardens, Renaissance Gardens	T3, T4	CO1, CO3		PPT Digi Class/Chalk -Board	
12	L32 - L33			English Gardens	T3, T4	CO1, CO3		PPT Digi Class/Chalk -Board	
12	L34 - L35			Rock garden, terrace garden	T3, T4	CO1, CO2		PPT Digi Class/Chalk -Board	
13	L36			Indoor garden and other Contemporary thoughts of landscape.	T3, T4, T5, R2, R3	CO1, CO2		PPT Digi Class/Chalk -Board	
14	L37 - L38			Passive and Active Recreation spaces	T1, T4, R3	CO1, CO3		PPT Digi Class/Chalk -Board	
14	L39 - L40			Circulation and Aesthetics in Residential parks and Tot lots.	T1, T4, R3	CO1, CO2, CO3		PPT Digi Class/Chalk -Board	

COURSE INFORMATION SHEET

OPEN ELECTIVE I

Course code: MT 417/ MT 418

Course title: FRENCH/ GERMAN)

Pre-requisite(s):

Co- requisite(s):

Credits: 3 L:3 T:0 P:0

Class schedule per week: 03

Class: B. Arch

Semester / Level: IV

Branch: ARCHITECTURE

Name of Teacher:

AS OFFERED BY MANAGEMENT DEPARTMENT

COURSE INFORMATION SHEET

Course code: AR 261

Course title: ARCHITECTURAL DESIGN – IV & ACADEMIC FIELD TRIP

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: IV

Branch: Architecture

Name of Teacher: Dr. Janmejy Gupta

Course Objectives

This course enables the students:

A.	Understand how to interpret terms like Allowable FAR, Ground Coverage, Setbacks, Required Parking to be provided, etc as per Municipal Corporation bye-laws and National Building Code.
B.	Learn how to do Area-Calculations of spaces depending on number of users and nature of use to prepare Area-Statement and based on area-statement do functional space-zoning.
C.	Learn to make proper architectural space layout ensuring adequate natural light and ventilation, using either column-beam system or load-bearing walls. Also understand how to have large span structures using waffle-slab, etc.
D	Learn to integrate building aesthetics with functionality for designed building along with application of issues taught in all architectural subjects taught in first three semesters.

Course Outcomes

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

1.	Design of Low rise / Medium rise buildings with issues of moderate complexity to be tackled covering zoning regulations, byelaws, functional relationship, climatic condition, and social aspects along with basic-level structural considerations.
2.	To produce architectural design presentation drawings with site-plan, floor-plans, elevations, sections, views (exterior as well as internal) and model.

Syllabus

Main Design (Two Designs Mandatory)

Exercise Duration (approx.)

- | | |
|---|----------|
| 1. Primary school / Hostel.
OR | 14 weeks |
| 2. Nursing Home / Tourist-Lodge / Country Club-house. | 5 weeks |
| 3.Measured Drawing (based on architectural field trip) | 2 weeks |
| 4. Design (Time) Exercise Duration Any one of the above, not covered in the class | 8 hrs. |

Viva voce:Final Viva-vice on all the design assignments to be conducted at the end of the semester by experts from the field.

Text books:

1. Educational Facilities 1995-96 Review, Wiley.
2. School Building Design in Asia, Allied Publishers.
3. Educational Facilities Design, Princeton Review.
4. Architecture school Building Manual, Boston Press.

Reference books:

1. National Building Code of India, Vol.1-5,2005.
2. Joseph DeChiara, Michael J. Crosbie, "Time Savers Standards for Building Types", McGraw-Hill Professional 2001.
3. Ernst Neuferts, "Architects Data", Blackwell, 2002.
4. Daniel Williams, "Sustainable Design: Ecology, Architecture & Planning", John Wiley & sons Inc, NJ, 2007.
5. The American Institute of Architects, Architectural Graphic Standards
6. Local building byelaws corresponding to the site.

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	50
End Sem Evaluation	50

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	M	H	M	M	M	L	L			L	L
2	H		H	M	M			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	CO2.
CD3	Laboratory experiments/teaching aids	CO1,CO2.
CD4	Industrial/guest lectures	CO2.

Lecture wise Lesson planning Details.

Wee k No.	Lect. No.	Tentative Date	Ch . No.	Topics to be covered	Text Books/References	COs mapped	Actual Content covered	Methodology used	Remarks by faculty if any
1	1,2,3			Introduction to the problem and site	1,2,3,4/1,2,3,4,5,6	CO1, CO2	Details of Planning and services for Main design	PPT, Chalk & talk, Illustrations	
1	4			Internal evaluation of case studies / Literature studies	1,2,3,4/1,2	CO1, CO2		PPT	
2	5,6,7,8			Site study, Conceptual Design, Layout planning	1,2,3,4,5,6	CO2	Design of building and site planning	Computerised drawing tool	
3	9,10,11			Design, Layout planning	1,2,3,4,5,6	CO2	Design of building and site planning	Computerised drawing tool	
4	13,14,15			Design, Layout planning	1,2,3,4,5,6	CO1, CO2.	Design of building and site planning	Computerised drawing tool	
4	16			Internal evaluation of	NA	CO1, CO2		PPT, Computerised	

				design development				drawing tool, paper	
5-7	16-24			Design, Layout planning	1,2,3,4,5,6	CO2	Design of building and site planning	Computerised drawing tool	
7	25-26			Internal evaluation of design development	NA	CO1, CO2.		PPT, Computerised drawing tool, paper	
8-9	27-35			Preparation of elevation, section & view	1,2,3,4,5,6	CO1, CO2.	Design of building and site planning	Computerised drawing tool	
9	36			Submission of Final design					
10	37			Starting of new problem on urban design	1,2,3,4,5,6	CO2	Introduction to problems and describing various methods of approach	PPT, Chalk & talk, Illustrations	
10	38-40			Introduction to the problem and site	1,2,3,4,5,6	CO1, CO2.	Details of Planning and services for Main design	PPT, Chalk & talk, Illustrations	
11	41			Internal evaluation of case studies / Literature studies	NA	CO1, CO2.		PPT	
11	42-45			Conceptual Design, Layout planning	1,2,3,4,5,6	CO2	Design of building and site planning	Computerised drawing tool	
12	46-48			Design, Layout planning	1,2,3,4,5,6	CO2.	Design of building and site planning	Computerised drawing tool	
13	39			Internal evaluation	NA	CO1, CO2.		PPT	

14	40-42			Preparation of elevation, section & view	1,2,3,4,5,6	CO1, CO2.	Design of building and site planning	Computerised drawing tool	
14	43			Final submission					

COURSE INFORMATION SHEET

Course code: AR 262
Course title: BUILDING CONSTRUCTION-III
Pre-requisite(s): None
Co- requisite(s): None
Credits: 6 L: 0 T: 0 P: 4
Class schedule per week: 04
Class: B. Arch
Semester / Level: IV
Branch: Architecture
Name of Teacher: Rajan Chandra Sinha

Course Objectives

This course enables the students:

A.	To understand the layout and construction details of different types of Partitions, Cladding and suspended ceiling
B.	To understand the need for providing expansion joints and its construction details
C.	To know the construction details of ramps, elevators and escalators
D.	To know the different types and forms of large spans structures
E.	Site visits to be organized to make the students aware of various technical aspects, practical difficulties, onsite decisions which will strengthen the knowledge for handling and executing a project

Course Outcomes

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

1.	To recognize the various types of partitions, cladding, suspended ceiling, expansion joints, vertical transportation and large span structures.
2.	To explain the context and suitability of above elements under a given situation

Syllabus

PARTITIONS:

Details of Timber Panelled and Soft Board Partitions, Glazed Partitions using Aluminium and Timber sections, Glass Block Partitions, Partition with timber, metal, stone, PVC / plastic etc.

No. of sheets: 2

CLADDING AND SUSPENDED CEILING

Details of cladding of walls with stone, tiles, timber and steel framing.

Methods of suspended framing materials like timber, pressed steel, aluminium, different covering materials such as acoustical board gypsum board, PVC tiles etc.

No. of sheets: 2

EXPANSION JOINTS:

Construction details at foundation, walls, floors and roof level for both concrete and brick work.

No. of sheets: 1

ESCALATORS, RAMPS AND ELEVATORS:

Construction Details of Ramps and Elevators, Details of Escalators

No. of sheets: 2

LARGE SPAN STRUCTURES:

Types and forms of roofing in steel and RCC, their applications to factories sheds, halls, Hangers, canopies, North light roofing in steel and RCC, Patent Glazing. Coffered Slab, Flat Slab.

No. of sheets: 2

SITE VISIT:

At least two visits to be paid to the construction site covering various sequences of construction and a report to be submitted by individual students as a part of the sessional work.

Text books:

1. Building Construction - W.B. Mc. Kay Vol. 1- 4
2. Building Materials and Construction - B. C. Punmia
3. Building Materials and Construction - Bindra & Arora

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
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	-	-	-	-	L	L
2	M	M	M	L	L	M	L	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
CD3	Laboratory experiments/teaching aids	CO1, CO2
CD4	Industrial/guest lectures	CO1, CO2

Lecture wise Lesson planning Details.

Wee k No.	Lect. No.	Tent ative Date	Ch . No .	Topics to be covered	Text Book / Refere nces	COs mappe d	Actual Content covered	Methodolog y used	Remark s by faculty if any
1	1-4			Details of Timber Panelled and Soft Board Partitions, Glazed Partitions using Aluminium and Timber sections	1,2,3	CO1, CO2		PPT, Chalk & talk, Illustrations	
2	5-6			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
2-3	7-10			Glass Block Partitions, Partition with timber, metal, stone, PVC / plastic	1,2,3	CO1, CO2		PPT, Chalk & talk, Illustrations	
3	11-12			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
4	13-16			Details of cladding of walls with stone, tiles, timber and steel framing	1,2,3	CO1, CO2		PPT, Chalk & talk, Illustrations	
5	17-18			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
5	19-20			Expansion joints: Constructio n details at foundation, walls,	1,2,3	CO1, CO2		PPT, Chalk & talk, Illustrations	

				floors and roof level for both concrete and brick work.					
6	21-22			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
6-7	23-26			Construction details of Ramps and Elevators, Escalators	1,2,3	CO1, CO2		PPT, Chalk & talk, Illustrations	
7	27-28			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
8-	29-32			Types and forms of roofing in steel and RCC, their applications to factories sheds, halls, Hangers, canopies	1,2,3	CO1, CO2		PPT, Chalk & talk, Illustrations	
9	33-34			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
9-10	35-40			North light roofing in steel and RCC, Patent Glazing, Coffered Slab, Flat Slab	1,2,3	CO1, CO2		PPT, Chalk & talk, Illustrations	
11	41-42			Internal evaluation	NA	CO1, CO2		Drawing on sheets	
11	43-44			Site Visit	NA	CO1, CO2		Mini projects/Projects	
12-13	45-50			Report of site visit	NA	CO1, CO2		Mini projects/Projects	
13	51-52			Internal evaluation	NA	CO1, CO2		Mini projects/Projects	

COURSE INFORMATION SHEET

OFFERED BY DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Course code: CE 212
Course title: SURVEYING FIELD WORK
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: IV
Branch: Architecture
Name of Teacher: