



Integral University, Lucknow

Effective from Session: 2019-2020							
Course Code	AR201	Title of the Course	Architectural Design-III	L	T	P	C
Year	II	Semester	III	3	-	6	12
Pre-Requisite	AR109	Co-requisite	None				
Course Objectives	<ol style="list-style-type: none"> 1. To explore the interrelationship between human behavior and space in a small unit environment, including, volume of space, shape, form, function and materials. 2. Optimum space planning in the buildings 3. Focus on studying patterns with circulation and layout in design of a building. 						

Course Outcomes	
CO1	To apply the learning of the previous semesters
CO2	To map gathered information of visited physical setting
CO3	To transform the human behavioral needs into architectural program requirements
CO4	To compose the architectural spaces in a design project
CO5	To develop sensitivity towards informal settings and elements of built space.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	LIMITED DESIGN UNDER STRICT CONSTRAINTS	<ol style="list-style-type: none"> a) Limited design under strict constraints (specified area, shape, region) for single user. b) Introduction to design processes (Formulation of requirements, literature study, standards, circulation charts, etc.) Suggested Exercises <ul style="list-style-type: none"> • Basic residence design • Studio Design • Students own room Design 	44	1, 2, 3, 4 & 5
2	MEDIUM SIZE BUILDINGS WITH REPETITIVE UNITS.	<ol style="list-style-type: none"> a) Medium size buildings with repetitive units. Suggested Exercises Design exercises such as Hostels, Primary school, Exhibition pavilions, and Way-side tourist's Shopping Arcades, Haats etc.	60	1, 2, 3, 4 & 5
3	TIME PROBLEM	<ol style="list-style-type: none"> a) Design of any small scale shall be carried out in design week from introduction to final Submission, b) Design week problem should be introduced on Saturday/ two days before the commencement of the design week for enabling the students to collect literature and relevant data for the exercise. c) The problem introduced in design week to be judged by external experts. 	40	1, 2, 3, 4 & 5

Reference Books:

Design in Architecture - Architecture and Human Science by G. Broadbent.

Learning Basic Design. Mumbai: Rizvi College of Architecture. by P. Chauhan

Design Drawing. Hoboken: John Wiley & Sons by F.D. K. Ching.



Architecture: Form, Space and Order by F. D. K. Ching,

Architect? A Candid Guide to the Profession. Cambridge by K. L. Roger.

Advance Architecture. 2nd Rev. Ed. Cambridge: MIT Press

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	1	1	2	1					3	2	3	2		
CO2	3	3	2	3	2	2	2	2					3	2	3	2		
CO3	3	3	2	3	3	3	2	3					3	2	3	2		
CO4	3	3	2	3	2	2	2	3					3	2	3	2		
CO5	3	3	2	3	3	1	2	3					3	2	3	2		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

 Ar. Shweta Verma Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2019 -2020							
Course Code	AR202	Title of the Course	Building Construction and Material-III	L	T	P	C
Year	II	Semester	III	1	2	2	5
Pre-Requisite	AR110	Co-requisite	Nil				
Course Objectives	<ol style="list-style-type: none"> To develop understanding about construction principles. To understand the use of temporary construction on the site and to generate awareness about new materials and methods of construction being employed in the construction industry. Construction technology and appropriate materials for other building elements, interior finishes shall be considered under this subject from simple examples to complex. The subjects should also focus on developing design abilities by applying basic principles of construction and choosing appropriate materials and techniques as per market trends. To present the possibilities of applying diversified solutions related to materials, construction technology, finishes, decorations and aesthetics 						

Course Outcomes	
CO1	To equip the students with the knowledge of various materials and techniques used for opening in a building and also about the temporary structures that aid the construction process.
CO2	To describe building systems, and how these systems assist in the expression of a design concept.
CO3	To grasp the relation between construction materials and their applicability to different types of structures (based on function, form and use).
CO4	Develop a fundamental understanding of material in construction systems and techniques, dimensions and intrinsic qualities that influence the design process.
CO5	Sound Graphical representation of construction techniques through drawing and different rendering medium; develop details and specifications for the design projects.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Timber construction-temporary	Timbering of shallow trenches, Shoring: Raking, flying and needle; Centering, shuttering and scaffolding; Hutments for construction labour; Roof Trusses in Timber: Terminology, Single, double, triple, purlin, trussed rafter and framed roofs.	24	1,2 & 3
2	Doors & windows (wooden)	Door & Window Frames (Chaukhats): Wooden Door Shutters: Wooden- Flush, Paneled and glazed with mouldings, mosquito-proof shutters and doors with fanlight, Sliding, sliding-folding doors and revolving doors. Window Shutters: Wooden- Fixed & operable shutters and mosquito-proof shutters.	20	1, 2, 3, 4 & 5
3	Doors & windows (Metals and other Materials etc.)	Door & Window Frames (Chaukhats): Pressed Steel, Ferrocement etc. Door Shutters: Metals - Flush, Paneled and glazed with mouldings, mosquito-proof shutters and doors with fanlight, Sliding, sliding-folding doors and revolving doors. Window Shutters: Metals - Fixed & operable shutters and mosquito-proof shutters. Rolling and Collapsible Shutter: Steel and Aluminum, Window grill.	20	1, 2, 3, 4 & 5
4	Doors & windows (pvc & glass)	Door & Window Frames: PVC, Fiberglass, and other compatible materials suitable for glass and PVC door shutters. Door Shutters- PVC, Glass: Flush, Paneled and mosquito-proof shutters, Sliding doors, and revolving doors. Introduction to advancement in Door & Window material, Techniques as per latest available resources & market trends.	16	1, 2, 3, 4 & 5
5				

Reference Books:

Building Construction of Buildings, Vol. I & II by R. Barry
 Building Materials by S. K. Duggal
 Materials of Construction by D. N. Ghosh
 Building Construction by S. C. Rangwala
 Building Construction – Vol. I, II & III by W. B. Mackay
 Reinforced Concrete Constructions for 21st C. by K. K. Meghashyam

e-Learning Source:

https://cpwd.gov.in/publication/manualdw.pdfdrive.google.com/drive/folders/1Kf6c6UbCRJB5h9K2r-1bLoSIAMRldmtu?usp=share_link
<https://www.civilengineeringweb.com/2020/07/what-is-timbering.html>

PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO6	PSO7
CO1	3	1	2	3		2	3						1	3	2	3		
CO2	2		2	3	1	2	3	1					2	2	3	2		
CO3	3	2	1	3		3		2					1	3	2	3		
CO4	2		3	1	3		3	2					2	2	2	3		
CO5	2	2	3	2		2	3	2					1	2	2	2		

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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR203	Title of the Course	ARCHITECTURAL DRAWING AND GRAPHICS-II	L	T	P	C
Year	II	Semester	III	-	-	4	4
Pre-Requisite	AR111	Co-requisite	Nil				
Course Objectives	<div>1. The course aims at developing the requisite level of proficiency in drawing, which is seen as a primary communication tool in the practice of architecture just like language.</div> <div>2. Students shall be familiarized with a range of techniques of expression beginning with manual drawing.</div> <div>3. To introduce the students to graphic treatment of three-dimensional drawings.</div> <div>4. To develop perception and presentation of architectural forms and buildings.</div> <div>5. To familiarize the students with preparation of perspectives by innovative methods.</div> <div>6. To introduce the students with perspectives of interiors.</div>						

Course Outcomes	
CO1	Understanding the proficiency in drawing, which is seen as a primary communication tool in the practice of architecture just like language?
CO2	Understanding the perspective of the buildings.
CO3	Demonstrate an understanding of furniture, people and accessories in one and two point projected perspective drawing.
CO4	Articulate an understanding of volumetric drawings used in interior design.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	INTRODUCTION TO PERSPECTIVE	Difference between perspective and metric projections; Anatomy of perspective: Station point, Eye level, Cone of Vision, Picture plane, Horizon line, Ground line, Vanishing point; Type of perspectives: One point, Two point, Three point etc.	20	4
2	ONE POINT PERSPECTIVE	Perspectives of simplex and complex blocks; Perspectives of simple household furniture items; Interior views; etc.	15	3 & 4
3	TWO POINT PERSPECTIVE	Perspectives of simple and complex blocks, curved surfaces; Perspectives of residences; etc.	15	1 & 5
4	PERSPECTIVE DRAWING BY INNOVATIVE METHODS	Preparation of perspective by approximate method, diagonal method, grid method etc; Introduction to three point perspective: Perspective of cityscape, streetscape, etc; Freehand perspective drawing; Preparation of presentation drawings of small building using various rendering techniques and media, incorporating sciography creating three dimensional effects.	14	2, 3 & 4

Reference Books:

Architectural Graphics By Francis D. K., Ching

Rendering with Pen & Ink by Robert W. Gill

Reekie's Architectural Drawing by Reekie, Fraser

Engineering Drawing by N. D. Bhatt



e-Learning Source:

<https://issuu.com/michellecheve/docs/260228849-perspective-sketching-fre>

https://issuu.com/beshlaa/docs/perspective_drawing_handbook

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO6	PSO7
CO1	2	1	3	1	1	1	3	1					3	3	2	1		
CO2	2	1	2	2	1	1	2	2					3	3	1	1		
CO3	2	1	2	2	1	1	2	1					2	3	2	1		
CO4	3	2	2	2	1	1	2	2					3	2	1	1		
CO5													3	3	1	1		

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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR204	Title of the Course	ARCHITECTURAL STRUCTURES - II	L	T	P	C
Year	II	Semester	III	2	0	0	2
Pre-Requisite	AR113	Co-requisite	Nil				
Course Objectives	1. To understand the basic principles of structural mechanics, so that it can help in building a strong basis to understand study of structural design. 2. Developing in students, material skills to analyze and understand fundamentals and working of various parts of different structural systems. 3. Analysis and design of indeterminate structures and their use. 4. Understanding structural design in RCC.						

Course Outcomes	
CO1	Three-moment theorem. Slope deflection method: introduction; analysis; yielding of supports.
CO2	Study of Geo-tech. engineering and Soil Mechanics
CO3	Overview of construction materials: cement; aggregate; water; reinforcement. Grades of concrete; workability and durability, design and nominal mix.
CO4	Earthquake resistant architecture: need for study, importance for learning earthquake design and construction, scope of study.
CO5	Seismic Zones of India: Seismic effects on Architectural Structures: Inertia forces in structures, effects of deformation in structures

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Fixed and continuous beams	Three-moment theorem. Slope deflection method: introduction; analysis; yielding of supports. Moment distribution method: introduction; analysis of indeterminate beams and simple frames. Approximate methods of analysis: substitute frame method.	4	CO1
2	Elements of soil mechanics and foundation engineering	Types; safe bearing capacity; field identification and soil exploration. Selection criteria: minimum depth criteria. Design of masonry wall and column footings.	4	CO2
3	Reinforced concrete design	Overview of construction materials: cement; aggregate; water; reinforcement. Grades of concrete; workability and durability, design and nominal mix. Design philosophies: Introduction; working stress, ultimate load and limit state method. Introduction of shear stress, diagonal tension, shear reinforcement and development length. Design of beam: design of singly and doubly reinforced section, T and L sections, introduction and use of design aids (SP: 16 –IS 456-2000) and updated. Slab: Introduction, design of one way, two way and reinforced brick slab; introduction to flat, grid or coffered slabs.	12	CO3
4	Earthquake resistant architecture: preliminaries	Earthquake resistant architecture: need for study, importance for learning earthquake design and construction, scope of study. Causes of earthquakes: convention currents, tectonic plates, faults. Types of earthquakes: Inter-plate and Intra-plate earthquakes. Earthquake magnitude and Intensity: Richter scale, Body Wave magnitude, Wave energy magnitude, Modified Mercalli Intensity, MSK scale, Earthquake Measuring Instruments: seismograph.	8	CO4
5	Analysis of structures according to different seismic zones	Seismic Zones of India: Seismic effects on Architectural Structures: Inertia forces in structures, effects of deformation in structures, horizontal and vertical shaking and Flow of Inertia forces to Foundations.	4	CO5

Reference Books:



Reinforced concrete design (Limit State) by A. K. Jain
 Introduction to Structural Analysis by B. D. Nautiyal
 Theory of Structure by B. C. Punamia
 Earthquakes Geography and Management by H. N. Srivastava
 Guide to Soil Mechanics by Malcom D Bolton

e-Learning Source:

Structure Analysis: <https://nptel.ac.in/courses/105105166>
Soil Mechanics: <https://nptel.ac.in/courses/105104147>

PO- PSO CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	-	1	3	2	-	3	1	1					3	2	3	1		
CO2	-	2	3	2	1	3	1	1					2	3	3	1		
CO3	-	3	3	2	2	2	2	1					2	3	2	2		
CO4	1	2	3	2	-	3	2	1					2	3	3	3		
CO5	-	2	3	2	1	3	2	-					2	3	3	1		

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Effective from Session: 2019 - 2020							
Course Code	AR205	Title of the Course	Society, Culture & Built Environment	L	T	P	C
Year	II	Semester	IV	2	-	-	2
Pre-Requisite	AR108	Co-requisite	Nil				
Course Objectives	1.	Knowledge about the relationship between humans and the environment.					
	2.	Knowledge about different types of communities and their classification with respect to income, religion.					
	3.	Know about different types of human settlements in urban and rural areas.					
	4.	Knowledge about growth and development both in terms of income and values.					
	5.	Knowledge about the role of architects and town planners to seek a balanced living condition.					

Course Outcomes	
CO1	Know the basics of Ecological and Environmental systems and their Importance and interdependence
CO2	To understand the importance of environmental systems and its relation with human development.
CO3	Know about environmental sciences and the natural resources available for sustainable human life.
CO4	To know about legal rights and produces awareness in public and private professional conducts and ethics.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction	Definition, scope and uses of sociology Sociological concepts, relationship between human and environment Socio-cultural profile of Indian society Importance of Sociology in planning and designing of habitat and buildings Understanding terms such as rural sociology, industrial sociology, urban sociology, etc.	6	1,2,3,
2	Community and Settlement	Population explosion and its effects in the society and habitat Individual life, formation of communities, rural community, urban community, the urban-rural contrast Proliferation of poverty, growth of slums and squatters communities Social transformation and their impact on life, safety, security	8	2,3,
3	Growth and Development	Development economics Lessons from Indian experiences Advent of technology, economic growth and development influencing quality of life HDI, poverty, income distribution, employment and livelihood	6	1,2,3,
4	Demography and Social Structure	Definition, Causes, effects and control measures of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution and Nuclear Hazards. Solid waste management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution Case Studies. Disaster management: floods, earthquake, cyclone and landslides.	6	2,3,4
5	Application of Sociological Knowledge	Rapid increase in population, advent of science and technology and growth in economy changed the living conditions especially in the urban areas; Dynamics of rural migration: from rural to urban, causes, problems and possible solutions. High-rise housing and its impact in family and society Role of Architects and Planners to seek a balanced living condition Sociological studies of communities with their habitats and built environment.	6	2,3,4


Reference Books:
An Introduction to Sociology by Vidya Bhushan
Sociology a Systematic Introduction by Harry M. Johnson
Principles of Sociology by G.K. Agarwal & D.R. Sachdeva,
Indian Social Problems by G. R. Madan
Sociology: Primary Principles by C. N. Shankar Rao,

e-Learning Source:
http://www.kdietrich.com/thesis/d9a-research/section%204%20social/section%204-social.pdf
http://www.ide.go.jp/English/Publish/Download/Apec/pdf/1997_20.pdf
http://wgbis.ces.iisc.ernet.in/energy/lake2006/programme/programme/proceedings/Presentations

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C01	2	3	3	1	2	1	3	2					2	3	2	2		
C02	2	3	3	1	3	2	3	2					3	3	3	2		
C03	3	3	3	2	2	2	2	2					3	2	1	3		
C04	3	3	2	2	2	3	3	2					2	3	2	2		
C05																		

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Effective from Session: 2019 - 2020						
Course Code	AR206	Title of the Course	History of Architecture, Art & Culture-I	L	T	P
Year	II	Semester	III	2	-	-
Pre-Requisite	AR116	Co-requisite	Nil			
Course Objectives	1. Familiarization with parameters responsible for evolution of human civilization and human settlements with a view to have a better understanding of history of architecture at later stages. 2. Introduction to the architecture of the ancient world and understanding architecture of periods in terms of space, form and structure. 3. To generate an understanding about the development of civilization and its architectural implications.					


Course Outcomes	
CO1	Understand the reasons of emergence, growth and termination of prevailing architectural periods.
CO2	Analytical understandings on theories of design prevalent in ancient period (Greek and roman) and also to understand the evolution of form and spaces.
CO3	To understand the importance of historical, geographical, religious, social, building materials and construction techniques, climatic conditions in molding architecture spaces and structures.
CO4	To understand the evolution of Churches as a new structure and also the factors responsible for establishment of Christianity as religion and its architectural impacts.
CO5	To understand the morphological development of Architecture in India from post Vedic period and confined till Hindu Architecture.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Classical Architecture: Greek and Roman	Study of principles of design, proportion, Optical corrections and Classical Orders Building types viz., Temples, Sanctuaries, Thermae, Amphitheatres, Circus, Aqueducts etc. Study of planning principles adopted, Agora, Forum and their effect on settlement planning. Greek examples: Troy, Sparta, Mycenae. Parthenon, Erechtheion. Dionysos. Stoa. Cities of Miletus, Priene. Roman examples: The Pantheon, Colosseum, Forum of Augustus, Basilica of Trajan, Trajan's Column, Basilica of Constantine, Thermae of Caracalla, Circus of Marcellus	6	1
2	Early Christian Architecture	Study of Architectural character, evolution of Church form, building typologies, and building elements, polymath architecture, Baptisteries, early Basilican churches Settlement planning and fortification systems Representative Example: St. Peters Basilica of Rome	5	2
3	Buddhist Architecture in India	Study of religious philosophy, resultant evolution of building typologies, building elements and associated forms during Hinayana and Mahayana phases Types of structures and elements developed eg: Stupas, Viharas, Chaityas, Stambhas, Toranas, sacred railing etc. in India. Study of form variations across various countries, Jain temples Representative Examples: Sarnath Pillar, Lauriya Nandan Garh Pillar, Rajaprasada, Sanchi Stupa, Hinayana Buddhist Viharas, Rock Cut Caves of Orissa, Monasteries of Gandhara, Brick Architecture: Bodhgaya, Dhamekh Stupa.	6	3
4	Indo Aryan Architecture	Development of fortification, walled towns, settlement patterns and the causative factors Role of Shilpa Shastra and Arthashastra in settlement planning Study of worshiping places in Indo Aryan / Nagara style: evolution and development of temple form, development of Shikhara, Corbelled Arch, Squinch and rock-cut temples Representative examples: Orissan Temples: Vaital Deul Temple, Mukteswara Temple, Lingaraja Temple, Jagannath Temple, RajaRani Temple, Sun Temple The Khajuraho Group: Kandariya Mahadeva Temple Temples of Gujarat: Sun Temple, Modhera, Dilwara, Ranakpur, Temple cities of Palitana and Girnar	7	4
5	Dravidian Architecture	Development of fortification, walled towns, settlement patterns and the causative factors Role of Shilpa Shastras in settlement planning. Study of worshiping places in Dravidian style (Chola, Chalukya, Pallava, Satavahana, Hoysala, Vijayanagara etc.), design of Gopuram and Shikhara	8	5

		Representative Examples Chalukyan Temples: Durga temple, Aihole, Ladh Khan Temple, Aihole Architecture at Badami: Architecture at Pattadakal Pallava Temples: Temples of Mahabalipuram Chola Temples: Vradeshwara Temple Pandyas Temples: Kailashanath Temple, Temples of Madura		
Reference Books:				
A History of Architecture by Sir Banister Fletcher,				
Great Ages of World Architecture by G.K.Hiraskar,				
History of World Architecture by Pier Luigi Nervi,				
World Civilizations- Their History and their culture by E. M. Burns, P. L. Ralph				
Indian Architecture (Buddhist and Hindu Periods) by Percy Brown				
Buddhist and Hindu Architecture in India by Satish Grover				
Ancient Indian Architecture by Sanjeev Maheshwari & Rajeev Garg				
e-Learning Source:				
http://library.advanced.org/10098				
http://www.encyclopedia.com/articles/05371.html				
http://www.cup.org/Titles/09/0521094526.html				
http://www.clr.tornoto.edu - virtual lib.				
http://www.lib.virginia.edu/-Renaissance and baroque				
http://indianculture.tqn.com/msub19.htm				
http://web1.arch.hawaii.edu/courses/courses/300/arch371/09_04/9-4htm				
http://www.hindunet.org/alt_hindu/1995_Apt_1/msg00069.html				

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3			3	1	3	1	2					3	2	2	2		
CO2	3		2	3		2	1	3					3	3	3	3		
CO3	2	3		3		3	1	1					3	2	2	3		
CO4	3		2	2		3	3	1					2	1	3	1		
CO5	3	2			3	2	3	1					3	2	3	2		

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Effective from Session: 2019 - 2020							
Course Code	AR207	Title of the Course	Computer Applications-III	L	T	P	C
Year	II	Semester	III	-	4	-	2
Pre-Requisite	AR115	Co-requisite	Nil				
Course Objectives	1.	To initiate students into theory and practice of Computer Applications in Architecture.					
	2.	Advanced learning of software available for architectural applications.					
	3.	To familiarize the students with the concepts of 3D modeling. To enable them to experiment with forms, mapping, rendering and presentation techniques.					
	4.	To make students create integrated design documents by taking full advantage of the building model.					
	5.	Integration of practical exercises along with the design studio project.					

Course Outcomes	
CO1	How to Introduce students to initiate students into theory and practice of Computer Applications in Architecture.
CO2	How to familiarize Advanced learning of software available for architectural applications and familiarize the students with the concepts of 3D modeling
CO3	To enable them to experiment with forms, mapping, rendering and presentation techniques
CO4	To make students create integrated design documents by taking full advantage of the building model. Integration of practical exercises along with the design studio projects.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Advance Computer Aided 2d and 3d Drafting	Concept of blocks and object grouping; styles; organizing objects in layers; hatching techniques; introduction to symbol libraries.	14	1,2,3,
2	Specific Plug-Ins and Interface	Understanding complex commands like Pline, spline, x-refs, Attributes, Model space & Paper space etc. At least one working plan, elevation and section should be completed. Recommended softwares: Google Sketchup, AutoCAD	14	2,3,
3	Computer Aided 3d Integrated Modeling	Understanding complex commands like Pline, spline, x-refs, Attributes, Model space & Paper space etc. At least one working plan, elevation and section should be completed. Recommended software's: Google Sketch-up, AutoCAD	14	1,2,3,
4	Computer Aided Mapping and Rendering	Integrated Project Modeling- Bidirectional Associativity (simultaneous work on 2D and 3D), Building Information Modeling (BIM), Mapping and Rendering. Recommended softwares: Revit, V-ray	12	2,3,4
5	Computer Aided Mapping and Rendering	Concept of shading; Rendering; Material mapping; Environment attributes Using material editor, material browser.	10	2,3,4

Reference Books:

Building Information Management by M. Keneck Karen

Photoshop 7 by Steve Romaniello

Rendering in Sketchup: from modeling to presentation for architecture. by Daniel Tal -

AutoCAD 13 by Omura, George

Mastering AutoCAD 14 by Omura, George

Rendering in Sketchup: from modeling to presentation for architecture, landscape architecture and interior design by Daniel Tal

Autodesk Revit 2021 for Architecture No experience Required by Eric Wing

Mastering Autodesk Revit 2021 for Architecture by Marcus Kim

e-Learning Source:

<http://www.focusnet.co.uk/cib/library/physdishous94.htm>



<http://www.ourvirtualmall.com/cloth.htm>

<http://www.ddimagazine.com/>

<http://www.atlasmagazine.com/photo/lande6/>

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	1	1	1	3	3					2	3	2	2		
CO2	3	3	3	2	2	2	3	3					3	3	3	2		
CO3	3	3	3	2	1	2	2	3					3	2	1	3		
CO4	3	3	3	2	2	3	3	3					2	3	2	2		
CO5																		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

 Ar. Shweta Verma Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2019-2020						
Course Code	AR 208	Title of the Course	Building Services-Water Supply & Sanitation	L	T	P
Year	II	Semester	III	2	-	-
Pre-Requisite	Nil	Co-requisite	Nil			
Course Objectives	Introduction to elementary building services of water supply and Sanitation.					

Course Outcomes	
CO1	Knowledge of sources, treatment and conveyance of water.
CO2	Knowledge of pipes, fittings & water supply system.
CO3	Introduction to sanitation, sanitary fittings, fixtures and joints.
CO4	Knowledge of drainage systems and rain water harvesting.
CO5	Implementation of building services water supply & sanitation in design.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Sources, Treatment And Conveyance Of Water	Sources of water supply, Quality and Quantity, Treatment, Conveyance, Distribution and Storage, size of overhead tank and underground tank based on the occupancy in different type of buildings as per NBC.	06	CO 1
2	Pipes And Fittings & Water Supply System	Pipes-types, sizes and materials along with their joining details and market survey. Fittings like ferrule, stopcocks, bib cocks, meters, pressure pumps etc. Domestic hot and cold water supply systems, solar water heating supply systems and market survey	09	CO 2
3	Introduction To Sanitation, Sanitary Fittings, Fixtures And Joints	Basic principles of sanitation, collection and conveyance of waste matter from buildings, Quantity and quality of refuse, working and installation of sewers and sewer appurtenances. Fixtures like washbasins, WC's, bathtubs, sink, urinals, flushing cistern. Various types of joints, manholes and septic tanks, proper location, Sizes and ventilation of intercepting chambers and inspection chambers.	09	CO 3
4	Drainage Systems And Rain Water Harvesting	Drainage systems: Separate, combined and partially combined systems, single stack system, dry and wet carriage systems. One pipe and two pipe systems, testing of house drains, gradients used in laying drains and sewers, self-cleansing and non-scouring velocities for drain pipes., size of drainpipes and materials used. Rain water harvesting: Introduction, types and methods and its calculation.	09	CO 4
5	Application In Design	Introduction and calculation of shaft size as per NBC norms Application of above studies in current design problems and preparing design layout and details as per the NBC Standards	03	CO 5

Reference Books:

Water Supply & Sanitary Engineering by S. C. Rangwala,

Water Supply & Sanitation by Charanjeet S. Shah

Water Supply, waste Disposal and Environmental Engineering by A K Chatterjee

Elements of Water Resource Engineering by KN Duggal

Water and Wastewater Technology by Mark J Hammer

e-Learning Source:

<http://www.britannica.com/EBchecked/topic/637296/water-supply-system>



<http://www.sswm.info/category/implementation-tools/water-distribution/hardware/distribution-pipes-and-channels/pipes>

<http://www.homeownersnetwork.com/building-codes/sanitary-drainage-system-installation-requirements/>

<http://www.slideshare.net/12345plp/rain-water-harvesting-17263799>

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	-	1	2	2	-	3	3	1					1	2	1	1		
CO2	1	3	3	2	-	2	2	1					2	3	2	1		
CO3	2	2	3	3	1	2	3	1					3	3	2	2		
CO4	2	3	3	2	-	3	3	2					2	3	2	1		
CO5	2	2	2	1	-	1	3	2					2	3	3	1		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

 Ar. Shweta Verma Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow



Effective from Session: 2019-2020							
Course Code	AR209	Title of the Course	Non-Teaching Credit Course (Summer Assignment)	L	T	P	C
Year	II	Semester	III	-	-	-	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Making student learn the art of collecting data and to carry out analysis for the process of evolving design and individuality of approach.						
	To inculcate the habit of reading books related to architecture and allied subjects in a structured manner.						
	To equip the students with the art of paper presentations and preparation of report.						

Course Outcomes	
CO1	Student learned the art of collecting data for the process of evolving design.
CO2	Student learn the art to carry out analysis for the process of evolving design and individuality of approach
CO3	Developed the habit of reading books related to architecture.
CO4	Developed the habit of reading books related to allied subjects of subjects in a structured manner.
CO5	Students equipped with the art of paper presentations and preparation of report.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	COURSE OUTLINE	<p>Audit Course is to be undertaken before the commencement of III semester classes. This assignment could be a</p> <p>Measured drawing and documentation of a noted building or library based study and report writing. The choice of the building to be documented or the book to be studied is left to the choice of concerned faculty. The assignment may be given as group work (2 to 4 students per group). In case of book reading they are expected to write critical essays, book reviews or a research report based on their readings. The students have to submit a report on the work done within 15 days from the beginning of the III Semester. The reports are to be assessed by the concerned faculty for progressive marks.</p> <p>SUGGESTIVE EXERCISES</p> <p>Report Writing</p> <p>PowerPoint Presentations</p> <p>Measure drawing etc.</p>	-	1,2,3,4,5

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	3	2	1	2	3	2	1					3	2	2	3		
CO2	1	3	3	2	1	3	3	2					3	3	3	1		
CO3	3	3	2	1	2	3	2	1					3	2	2	3		
CO4	2	2	2	1	2	2	2	3					3	1	3	1		
CO5	2	2	2	1	2	2	2	3					1	2	3	2		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

 Ar. Shweta Verma Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR210	Title of the Course	Architectural Design-IV	L	T	P	C
Year	II	Semester	IV	3	-	6	12
Pre-Requisite	AR201	Co-requisite	Nil				
Course Objectives	<ol style="list-style-type: none"> 1. Making student learn the art of collecting data and to carry out analysis for the process of evolving design and individuality of approach. 2. Understanding elementary site planning: organization, scale, hierarchy, orientation and climate. 3. Understanding design as a function of specific agenda. 4. Producing creative designs for medium size and large span buildings of limited functions. 5. Understanding the layout and services of large public buildings with specialized services. 6. Implication of knowledge of design fundamentals and knowledge gained in other subjects to develop better design solutions. 7. Developing appropriate graphic skills and presentation techniques (models, rendering) to explain the contents of a design. 8. To explore the interrelationship between human behavior and space in a small and large unit environment, including, volume of space, shape, form, function and materials. 9. Focus on studying patterns in horizontal circulation in built areas. 						

Course Outcomes	
CO1	To apply the learning of the previous semesters
CO2	To teach students to create design for medium size and large span buildings of limited functions.
CO3	To transform the layout and services of large public buildings with specialized services.
CO4	To compose the architectural spaces in a design project
CO5	To develop sensitivity towards informal settings and elements of built space.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Exercise - I	a) Specific need of user and Climate consideration b) Through site visits and studio exercises, students are encouraged to understand the interrelationship between human behavior and space in a residential building. c) The projects investigate the study of built form, function, activity, and its relationship to the site and surroundings. Suggested Exercises The students are expected to design a residential building in a specific site, for an Architect / Artist / Doctor's family in urban, semi-urban or rural setting.	60	1, 2, 3, 4 & 5
2	Exercise - II	a) Buildings for large occupancy focusing on site development, landscape design and incorporation of services. Suggested Exercises Community centre, campus design Auditoriums, Cinema halls, Indoor stadiums, etc.	54	1, 2, 3, 4 & 5
3	Time Problem	a) Design of any small scale shall be carried out in design week from introduction to final Submission, b) Design week problem should be introduced on Saturday/ two days before the commencement of the design week for enabling the students to collect literature and relevant data for the exercise. c) The problem introduced in design week to be judged by external experts.	30	3, 4 & 5

Reference Books:

A Comparative analysis of 20th C. houses. London: Academy Editions. by H. Hareguchi

Design Process: A Primer for Architectural and Interior Design. New York : Van Nostrand Reinhold. by S. F. Miller

Geoffrey Bawa: The Complete Works. New York : Thames & Hudson. by D. Robson

The concept of dwelling. New York : Rizzoli International Publications by N C Schulz,

Twenty Buildings every Architect should understand. New York : Routledge. by S. Unwin



e-Learning Source:

CPWD Publications: https://cpwd.gov.in/Documents/cpwd_publication.aspx

Auditorium Design Standards: https://issuu.com/nayanikadeyn/docs/final_auditorium_ppt

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO6	PSO7
CO																		
CO 1	3	3	2	3	1	1	2	1					3	1	3	1		
CO 2	3	3	2	3	2	2	2	2					3	2	3	2		
CO 3	3	3	2	3	3	3	2	3					3	2	3	1		
CO 4	3	3	2	3	2	2	2	3					3	2	3	1		
CO 5	3	3	2	3	3	1	2	3					3	1	3	2		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

 Ar. Shweta Verma Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR211	Title of the Course	Building Construction and Material-IV	L	T	P	C
Year	II	Semester	IV	1	2	2	5
Pre-Requisite	AR202	Co-requisite	Nil				
Course Objectives	<ol style="list-style-type: none"> To develop understanding about construction principles. Construction technology and appropriate materials for structural systems, roofing, enveloping and interior finishes shall be considered under this subject from simple examples to complex. The subjects should also focus on developing design abilities by applying basic principles of construction and choosing appropriate materials and techniques as per market trends. 						

Course Outcomes	
CO1	To equip the students with the knowledge of various materials and techniques used in finishes, partition, and roof covering of a building and staircase that facilitate the vertical circulation.
CO2	To describe building systems, and how these systems assist in the expression of a design concept.
CO3	To grasp the relation between construction materials and their applicability to different types of structures (based on function, form and use).
CO4	Develop a fundamental understanding of material in construction systems and techniques, dimensions and intrinsic qualities that influence the design process.
CO5	Sound Graphical representation of concepts and ideas using drawing techniques and rendering medium and format; develop details and specifications for their design studio projects.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Floor and surface finishings	Floor finish: Types of flooring: Brick on edge, IPC, Marble, Stone, Terrazzo, Ceramic & Vitrified Tiles, Wooden flooring, PVC flooring etc. Surface finish: Cement Plaster, White Washing, Painting, Stone Crete Plaster / Exposed Aggregate Plaster / Grit Wash Plaster, Exposed Concrete Finish, Granite Finish texture, clay Brick Finish, stone Grace, Pebble stone finish, etc.	18	1, 2, & 3
2	Partitions, panelling, suspended (false) ceiling	Wooden, Plywoods, Block boards, Aluminum, Glass, PVC: Fixed partitions, sliding/folding partitions, wall paneling, false ceiling etc.	18	4 & 5
3	Roof coverings	Clay and Concrete Tiles, Asbestos Cement, Aluminum and Galvanized Iron Sheets (Plain & Corrugated), Slating, Shingles and Thatch roof as roof covering material, their properties, uses, advantages and disadvantages.	12	1, 3 & 5
4	Staircase	Stair cases: Basic design principles for different forms of staircases viz. Straight, Quarter Landing, Half Landing (Dog-legged), Winding, Arched, and Spiral etc.; Staircases in reference to their construction type viz-a-viz plain slab type, folded plate type, Staircases of materials like Timber, Steel and RCC; details of Handrail, Baluster etc., Staircase finishes, Anti-skid techniques and their details.	20	1, 3 & 4
5	Architectural design exercise for a rcc staircase	The exercise would be for the hunt of a staircase which should look beyond staircases and balustrades as functional components of architecture, but instead combine practicality and artistic imagination to create truly outstanding designs, based on basic principles of staircase theory.	12	1, 3 & 4

Reference Books:

Building Construction of Buildings, Vol. I & II by R Barry

Building Materials by S. K. Duggal

Materials of Construction by D. N. Ghosh

Building Construction – Vol. I, II & III by W. B. Mackey

Building Construction by S. C. Rangwala

e-Learning Source:



<https://sjce.ac.in/wp-content/uploads/2018/01/Staircase.pdf>

https://uiic.co.in/sites/default/files/uploads/tender/FALSECEILING_DRG-04.pdf

https://www.academia.edu/9449468/FLOORS_AND_ROOFS

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO6	PSO7
CO1	3	1	2	3		2	3						2	2	2	3		
CO2	2		2	3	1	2	3	1					2	2	3	2		
CO3	3	2	1	3		3		2					3	3	2	2		
CO4	2		3	1	3		3	2					2	2	2	1		
CO5	2	2	3	2		2	3	2					2	2	1	2		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

 Ar. Shweta Verma Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR212	Title of the Course	Climatology	L	T	P	C
Year	II	Semester	IV	1	-	2	2
Pre-Requisite	Nil	Co-requisite	AR214				
Course Objectives	1. To familiarize students with various environmental issues and relate them in context of Architecture						
	2. This subject area also known by the term building science in earlier times enlightens the students to the processes by which building and entire habitats can be designed to respond to nature, with climate as the basic parameter of design.						
	3. Introduction to elementary principles of bioclimatic studies with respect to buildings and human comfort.						
	4. Introduce principle of thermal comfort and its implication in design.						
	5. Enable student to understand design strategies for different climatic regions.						
	6. Familiarizing students with modern techniques to analyze climatic parameters and design buildings accordingly.						

Course Outcomes	
CO1	Theoretically understand design with climate as the basic parameter of design.
CO2	Prepare design strategies for different climatic regions.
CO3	Analyze, troubleshoot, and implement solutions with climate as the basic parameter of design.
CO4	Utilize modern as well as traditional techniques to derive a climate responsive design,

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	FUNDAMENTALS AND CLIMATIC ZONES	<p><i>Fundamentals</i> Introduction to climatology and its importance in architecture Elements of climate, Global climate factors, Interrelationship of climatic elements and psychometric chart</p> <p><i>Climatic Zones</i> Types of climates, Macro and Micro Climate Role of climate with respect to shelter: effects of temperature, precipitation, humidity, gases/wind, topography on life and built forms Considerations for climate-responsive design in different climatic zones - orientation, fenestration, materials, form and greeneries, Case Studies of various Indigenous shelters in response to various climate zones in the tropical belt in general and of India in particular</p>	10	1 & 3
2	THERMAL COMFORT AND SOLAR CONTROL FOR HUMAN COMFORT	<p><i>Thermal Comfort</i> Definition and explanation of thermal comfort, Human heat balance, physiological comfort, Relationship of climatic elements with thermal comfort, Thermal Comfort indices: Thermal stress index, Bio-climatic chart, effective temperature and corrected effective temperature histogram and their uses</p> <p><i>Solar Control</i> Apparent movement of the sun, sun path diagrams (solar chart), solar angles, Shadow angles, solar shading masks etc . Exercises on plotting isopleths, transfer of isopleths to solar chart, fitting a shading mask over the overheated period & design of sun shading devices for different orientations.</p>	12	2 & 3
3	PRINCIPLES OF THERMAL DESIGN IN BUILDINGS	<p>Thermal quantities – heat flow rate, conductivity (k-value) & resistivity, conductance through a multi-layered body, surface conductance, transmittance calculation of U- value – convection , radiation , concept of sol-air temperature & solar gain factor exercises in heat loss & heat gain in building assuming steady state assumption (thermal balance equation).</p> <p>Periodic heat flow in building – time lag & decrement factor & its application in selection of appropriate materials for walls & roof Effect of Insulation & cavity on time lag & its practical use Exercises on achieving the required indoor temperature by varying the components of composite materials according to the U values</p>	8	1, 3 & 4
4	DAYLIGHT, VENTILATION AND CLIMATE RESPONSIVE	<p><i>Daylight</i> Nature of light and its properties, sources of light, daylight factor and glare; effect of size and shape of openings in different planes in buildings; design for daylight;</p>	10	2 & 4

	ARCHITECTURAL DESIGN	<i>Ventilation and Air Movement</i> Requirement and function of ventilation; stack effect; airflow pattern inside and outside buildings Importance of understanding there optimum orientation of building its form with respect to wind		
5	CLIMATE RESPONSIVE ARCHITECTURAL DESIGN	Building design and layout planning consideration for different climate types Analysis of climatic data sets- climate graph, the mahoney tables etc. Exercises on design of small buildings for various climates Use of computer software such as eQuest, Ecotect 2012, REVIT etc. for climate focused architectural design	8	2 & 4

Reference Books:

The Climatic Data – Handbook by Ishwar Chand

Manual of Tropical Housing and building by O. I. Koenigsberger

Climate Responsive Architecture by Arvind Krishnan

Elements of Environmental Engineering by K. M. Duggal

Environmental Science by V.K. Ahluwalia

Environmental Engineering by Arcadio. P. Sincer

A Text book on Environmental Pollution and Control by D. S. Bhatra

Energy Environment and Sustainable Development by Pradeep Chaturvedi

Energy Technologies for Sustainable Development by Dr. Upendra Pandel

e-Learning Source:

http://erg.ucd.ie/UCDERG/pdfs/mb_shading_systems.pdf http://mhathwar.tripod.com/thesis/climaticarch/climatic_architecture.html

<http://solstice.crest.org/efficiency/index.shtml>

<http://www.pge.com/pec/archives/w98passi.html>

www.terin.org/

<http://www.envinst.conu.edu/~envinst/research/built.html>

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO6	PSO7
CO1	3	2	1	2	2	1	3	1					3	3	2	1		
CO2	2	2	1	2	3	2	2	3					2	3	2	2		
CO3	3	2	3	3	2	3	2	3					2	3	3	1		
CO4	3	3	3	1	1	2	1	3					3	2	3	2		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

 Ar. Shweta Verma Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR213	Title of the Course	ARCHITECTURAL STRUCTURES - III	L	T	P	C
Year	II	Semester	IV	2	0	0	2
Pre-Requisite	AR204	Co-requisite	Nil				
Course Objectives	1. To understand the basic principles of structural mechanics, so that it can help in building a strong basis to understand study of structural design. 2. Developing in students, material skills to analyze and understand fundamentals and working of various parts of different structural systems. 3. Understanding structural design in RCC						

Course Outcomes	
CO1	Column: Design of axially and eccentrically loaded short and long columns by working stress and the limit state methods, use of design aids.
CO2	Retaining Wall: Types, stability criteria, design of cantilever retaining wall. Staircase: effective span of staircase, distribution of loading on staircase, design of various types of staircase.
CO3	Types, theory and design of isolated and combined column footings; raft and pile foundations.
CO4	Requirement or good detailing, cover to reinforcement, spacing of reinforcement, reinforcement requirements, reinforcement splicing, curtailment and bar bending schedule
CO5	Construction joints, expansion and contraction joints.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Reinforced concrete design of structural elements (column and beam)	Column: Design of axially and eccentrically loaded short and long columns by working stress and the limit state methods, use of design aids. Continuous beam: Introduction, effective span, span/depth ratio.	12	1
2	Reinforced concrete design of structural elements (retaining wall and staircase)	Retaining Wall: Types, stability criteria, design of cantilever retaining wall. Staircase: effective span of staircase, distribution of loading on staircase, design of various types of staircase.	8	2
3	Foundation engineering in r.c.c	Types, theory and design of isolated and combined column footings; raft and pile foundations.	4	3
4	Detailing of reinforcement	Introduction, requirement or good detailing, cover to reinforcement, spacing of reinforcement, reinforcement requirements, reinforcement splicing, curtailment and bar bending schedule.	4	4
5	Requirement of joints in rcc construction	Construction joints, expansion and contraction joints.	4	5

Reference Books:



Reinforced concrete design (Limit State) by A. K. Jain
 Introduction to Structural Analysis by B. D. Nautiyal
 Theory of Structure by B. C. Punamia
 Earthquakes Geography and Management by H. N. Srivastava
 Guide to Soil Mechanics by Malcom D Bolton

e-Learning Source:

Structure Analysis: <https://nptel.ac.in/courses/105105166>
 Soil Mechanics: <https://nptel.ac.in/courses/105104147>
 Concrete Technology: <https://nptel.ac.in/courses/105102012>
 Earthquake Reasistant Design for Foundation: <https://nptel.ac.in/courses/105107204>

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	3	2	-	3	2	1					3	3	3	2		
CO2	1	2	3	1	2	-	2	2					3	3	3	1		
CO3	3	2	3	2	-	3	2	1					2	3	2	2		
CO4	1	3	2	1	2	3	2	2					3	3	2	2		
CO5	1	2	3	1	2	-	2	2					3	3	2	1		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

 Ar. Shweta Verma Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR214	Title of the Course	Site Planning and Sustainable Architecture	L	T	P	C
Year	II	Semester	IV	1	2	-	2
Pre-Requisite	Nil	Co-requisite	AR212				
Course Objectives	<ol style="list-style-type: none"> To teach the importance of a site and its content in architectural creations. To orient the students towards several influencing factors which governs the siting of a building or group of buildings in a given site To teach various techniques of site analysis through exercises and case studies. To teach the students the methodology of preparing a site analysis diagram. This will serve as a prelude to any architectural creation. To understand the concept of sustainability and sustainable development. To inform the various issues like climate change, ecological footprint, etc. To understand low impact construction practices, life cycle costs and alternative energy resources. Familiarize the students with the various rating systems for building practices with cases. 						



Course Outcomes	
CO1	Students will learn the methodology of preparing the site analysis diagram.
CO2	To understand the concept of sustainability and sustainable development.
CO3	To inform the various issues like climate change, ecological footprint, etc.
CO4	To understand low impact construction practices, life cycle costs and alternative energy resources.
CO5	Familiarize the students with the various rating systems of building practices with case.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to site planning	Definition of plot, site, land and region, units of measurements. Importance of site analysis; On site and off site factors; Analysis of natural, cultural and aesthetic factors: topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects; Preparation of site analysis diagram. Study of microclimate: vegetation, landforms and water as modifiers of microclimate. Study of land form: contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations – Case studies and exercises on the above.	10	1, 2 & 3
2	Site planning and site layout principles	Context of the site. Introduction to existing master plans land use for cities, development control Rules. Site selection criteria for housing development, commercial and institutional projects - Case studies. Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, road widths and parking, regulations. Turning radii & street intersections	10	4 & 5
3	Introducing sustainable architecture and climate change	Defining sustainability, sustainable architecture and overview on definitions proposed by other intellectuals; Eco systems, food chain and natural cycles or cradle to cradle concept; Objectives of Sustainable development; Sustainable economy and Use; Sustainability aspect of Habitat Design and Integrated Building Design Overview of climate change and its impact on global and regional scale. Principles of energy systems. Energy crisis and global environment. Study on Vernacular techniques and technological advancements in climate control in various climatic zones.	10	1, 3 & 5
4	Design areas in sustainable development and its indices	Need for Sustainable Building Design, Elements of Sustainability; Principles and methods of Sustainable Building Development; Design Areas in Sustainable Development- Site Planning, water management, solid waste management; Climate responsive design; Energy efficiency and energy systems Sustainable site selection and development. Introduction to Green building concepts. Teri, LEED, GIRHA and BREEAM etc. Ecology and sustainability. Various sources of energy, recyclable products and embodied energy. Measures of Sustainable Design; Checklist for sustainability	9	1, 3 & 4
5	Sustainable materials and cities	Sustainable Materials: Selection of materials Eco building materials and construction. Low impact construction – Bio mimicry, Zero energy buildings, Nano technology and smart materials. Sustainable cities: Dimensions of sustainable, sustainable community, Social, cultural and economic factors, urban ecology, urban heat island effects, smog etc.	9	3 & 4

		Various case studies of eco city or communities.		
Reference Books:				
Building Construction of Buildings, Vol. I & II by R Barry				
Building Materials by S. K. Duggal				
Materials of Construction by D. N. Ghosh				
Building Construction – Vol. I, II & III by W. B. Mackey				
Building Construction by S. C. Rangwala				
e-Learning Source:				
https://www.slideteam.net/powerpoint/Sustainability-Presentation				
https://www.academia.edu/9449468/FLOORS_AND_ROOFS				

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	3	2	3	1	1	2	1					3	3	3	2		
CO2	3	3	2	3	2	2	2	2					3	2	2	3		
CO3	3	3	2	3	3	3	2	3					2	2	2	2		
CO4	3	3	2	3	2	2	2	3					3	1	3	2		
CO5	3	3	2	3	3	1	2	3					2	3	2	3		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR215	Title of the Course	HISTORY OF INDIAN ARCHITECTURE, ART & CULTURE-III	L	T	P	C
Year	II	Semester	IV	2	-	-	2
Pre-Requisite	AR206	Co-requisite	Nil				
Course Objectives	<div><div>1.</div><div>Understanding of period in terms of contexts of location, climate and other parameters.</div><div>2.</div><div>Introduction to the architecture of the ancient world and understanding architecture of periods in terms of space, form and structure.</div><div>3.</div><div>Familiarizing with typical examples of building type.</div><div>4.</div><div>To generate an understanding about the development of civilization and its architectural implications.</div></div>						

Course Outcomes	
CO1	Understand the reasons for emergence, growth and termination of prevailing architectural trends.
CO2	Analytical understandings on theories of design to be able to translate creative thinking of space.
CO3	Develop understanding on problem identification related to design, space and thereby solving it.
CO4	Assess the merits of an architectural design in terms of key social, aesthetic and functional aspects.
CO5	Learn various ideologies and context of designs thereby developing their own theories and applying the same knowledge in their own design skills.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	BYZANTINE AND ROMANESQUE ARCHITECTURE	Structural and construction system of Byzantine architecture, development of pendentives <i>Byzantine examples:</i> St. Sophia, Constantinople, St Clemente. Historical background and other influences, Evolution and Development of early church, Ecclesiastical architecture of France, Structural utility of towers and flying buttress, Development of vaulting system <i>Romanesque examples:</i> Pisa Cathedral, S. Michele, Pavia. Church of Apostles, Cologne	4	1, 2 & 3
2	GOTHIC ARCHITECTURE	Dark ages and its effect on architecture – development of higher clergy. General characteristics of Gothic architecture evolution and development of pointed arch and ribs. <i>Representative Examples:</i> Cathedral of Notre Dame, Paris. Abbey Church at Reims. Beauvais Cathedral. Salisbury Cathedral. Study of Comparative Plans of English Cathedrals.	4	2 & 3
3	ISLAMIC ARCHITECTURE IN INDIA	Origin and philosophy of Islam and its interpretation in building types Advent of Islam into the Indian subcontinent its inspirations from the Arab world and locally available resources <i>Architecture of the Delhi Sultanate</i> Establishment of the Delhi Sultanate Imperial style of Delhi: Slave, Khalji, Tughlaq, Sayyid & Lodhi dynasties; Development of basic mosque and tomb prototypes. <i>Representative Examples:</i> Slave Dynasty, Khiljis, Tughlaqs, Sayyid & Lodhis, Shershah Suri's periods	10	3, 4 & 5
4	EUROPEAN RENAISSANCE, BAROQUE AND ROCOCO	Renaissance in art and architecture in Italy and elsewhere; Changing relationship between Church and State; Rebirth of Graeco-Roman classicisms, building typologies and building elements, Public Squares, Plazas and ornamentation. Landscape architecture formal gardens Dynamism and systemization of Baroque architecture <i>Representative examples:</i> Pazzi Chapel, S.Lorenzo, S. Spirito of Florence, St. Andrea, St. Pietro, Montorio, St. Peters of Rome, Piazza of St. Peters of Rome, Scala Regia, Vatican, Chateau De Chambord, Louvre.	6	3, 4 & 5
5	PROVINCIAL AND MUGHAL ARCHITECTURE	Evolution and development of Provincial architecture based on geographic, cultural, political and other influences. Establishment of the Mughal Empire and evolution of Indo-Islamic architecture under the Mughal emperors through synthesis of Rajput architectural styles as a	6	1, 2, 4 & 5

		<p>corollary of political accommodation Mughal garden architecture Later Mughals- The architecture of the provincial kingdoms with special reference to Awadh <i>Representative Examples:</i> <i>Jaunpur:</i> Atala masjid; <i>Malwa:</i> Twin cities of Dhar and Mandu; <i>Gujarat:</i> Minars of Gujarat, Teen Darwaza, Ahmedabad, stepped wells, Rauza of Sayyid Usman, Tomb of Mubarak Sayyid; <i>Bengal:</i> Adina Masjid, Eklakhi tomb, Dakhil Darwaza, Qadam Rasul mosque; <i>Southern provinces:</i> Jama Masjid, Gawan Madarsa, Charminar, Ibrahim Rauza, Mehtar Mahal, Gol Gumbaz; <i>Awadh:</i> Hussainabad Complex</p>		
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Reference Books:

A History of Architecture by Sir Banister Fletcher

Great Ages of World Architecture by G.K.Hiraskar

History of World Architecture by Pier Luigi Nervi,

World Civilizations- Their History and their culture by Burns, E. M., Ralph, P.L

Indian Architecture (Islamic) by Brown, Percy,

Islamic Architecture in India by Grover, Satish

Indian Architecture (Islamic Period). by P. Brown

e-Learning Source:

<http://library.advanced.org/10098>

<http://www.encylopedia.com/articles/05371.html>

<http://www.cup.org/Titles/09/0521094526.html>



<http://www.clr.toronto.edu - virtual lib.>

<http://www.lib.virginia.edu/-Renaissance and baroque>

<http://indianculture.tqn.com/msub19.htm>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO6	PSO7
CO1	3			3	1	3	1	2					1	2	2	3		
CO2	3		2	3		2	1	3					1	3	2	3		
CO3	2	3		3		3	1	1					1	2	3	3		
CO4	3		2	2		3	3	1					1	3	2	2		
CO5	3	2			3	2	3	1					3	2	1	2		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR216	Title of the Course	Computer Applications-IV (Advance Modeling & Simulation)	L	T	P	C
Year	II	Semester	IV	-	4	-	2
Pre-Requisite	AR207	Co-requisite	Nil				
Course Objectives	1.	To initiate students into theory and practice of Computer Applications in Architecture.					
	2.	Advanced learning of software available for architectural applications					
	3.	To familiarize the students with the concepts of 3D modeling. To enable them to experiment with forms, mapping, rendering and presentation techniques.					
	4.	To make students create integrated design documents by taking full advantage of the building model.					
	5.	Integration of practical exercises along with the design studio project.					

Course Outcomes	
CO1	To Introduce students into theory and practice of Computer Applications in Architecture.
CO2	To familiarize Advanced learning of software available for architectural applications and familiarize the students with the concepts of 3D modeling.
CO3	To enable them to experiment with forms, mapping, rendering and presentation techniques.
CO4	To make students create integrated design documents by taking full advantage of the building model. Integration of practical exercises along with the design studio projects.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	BASIC MODELLING STRUCTURAL & ENVIRONMENTAL SIMULATION	Environment mapping, fogs and atmospheres. Building information modelling mapping textures, lighting, cameras and render effects.	12	1, 2, 3
2	POST MODELING WITH VIEW PORTS	Introduction, Views Modeling Constraints and Dimensions Visibility Controls Introduction to Families Recommended softwares: Revit, V-Ray.	16	2, 3
3	RENDERING AND POST RENDERING EFFECTS	Massing Groups Rendering Working with Other Files Rooms and Areas Tags Schedules and Keynotes Recommended softwares: Revit, Lumien3D.	14	2, 3
4	RENDERING AND POST RENDERING EFFECTS	Adobe after effect- Video Editor (Project Presentation) LumiOn 3D details.	12	1, 2, 3
5	PRESENTATION	Introduction to vector and raster image, creating and saving images, image editing, using layers, special effects etc. Architectural drawing image rendering Recommended softwares: Photoshop(CS5), Corel Draw.	10	4

Reference Books:

Building Information Management by Karen M.Keneck

AutoCAD 13 by Omura, George

Mastering AutoCad 14 by Omura, George

Autodesk Revit 2017 for Architecture No Experience Required by Eric Wing

Mastering Autodesk Revit 2017 for Architecture by Marcus Kim

Adobe Photoshop Element 4.0 by Adobe

e-Learning Source:

<http://www.focusnet.co.uk/cib/library/physdshous94.htm>



<http://www.ourvirtualmall.com/cloth.htm>

<http://www.ddimagazine.com/>

<http://www.atlasmagazine.com/photo/lande6/>

	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	1	1	1	3	3					2	3	2	2		
CO2	3	3	3	2	2	2	3	3					3	3	3	2		
CO3	3	3	3	2	1	2	2	3					3	2	1	3		
CO4	3	3	3	2	2	3	3	3					2	1	3	3		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

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Integral University, Lucknow

Effective from Session: 2019 - 2020						
Course Code	AR217	Title of the Course	BUILDING SERVICES-ELECTRICAL AND LIGHTNING	L	T	P C
Year	II	Semester	IV	2	-	- 2
Pre-Requisite	Nil	Co-requisite	Nil			
Course Objectives	<ol style="list-style-type: none"> 1. The course aims at developing the elementary building services of electrical services. 2. Students shall be familiarized with a range of electrical accessories and its design consideration. Introduction to illumination schemes. 3. Students shall be familiarized with wiring systems and design consideration of lighting schemes. 4. Application of electrical services in Design. 					

Course Outcomes	
CO1	Learn elementary building services of electrical services
CO2	Familiarize with a range of electrical accessories and its design consideration.
CO3	Learn illumination schemes.
CO4	Familiarize with wiring systems and design consideration of lighting schemes.
CO5	Implicate electrical services in Design.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	WIRING SYSTEMS	Basic principles of electric circuitry, symbols, definitions and units. Introduction to generation of Electricity, System of supply & distribution at domestic level, methods of wiring: joint box system and looping in, systems of wiring: batten, capping and casing, open conduits and concealed. Circuits: series and parallel, simple circuit, load calculation, wiring diagram.	6	1,2
2	WIRING MATERIALS AND ELECTRICAL ACCESSORIES AND ITS DESIGN CONSIDERATION IN INSTALLATION	Wires and Cables: materials, types, sizes, specifications, and main switch, M.C.B., distribution boards, meters, electrical fixtures and accessories, market survey and calculation of wire length, number & positioning of MCB's and Distribution Boards as per NBC Norms. Protection against overloading, short-circuit, earth fault, lightning protection, Earthing- Methods of earthing, Fuse and types of fuses. Guidelines for installation of lighting in domestic building as per NBC, Introduction to ECBC	6	1,2
3	INTRODUCTION AND TYPES OF ILLUMINATION SCHEMES	Introduction: Terminology in illumination, definition and units, light and its characteristics: propagation, reflection, radiation, transmission, and absorption: light and vision: colors. Types of illumination schemes: Direct, semi-direct, semi-indirect, indirect, and diffused lighting.,	6	3,4
4	DESIGN CONSIDERATION OF LIGHTING SCHEMES	Methods of lighting calculation: light flux method and point to point method. Sources of Light, types and characteristics: Incandescent, fluorescent, mercury vapour, sodium, neon and LED. Interior and exterior lighting: Residential, commercial, industrial, flood, streetlighting, etc. and its cost, Lighting pollution.	6	3,4
5	APPLICATION IN DESIGN	Introduction and calculation of shaft sizes, electrical room and distribution of electricity in basement and upper floor as per NBC Application of above studies in current design problems and preparing design layout and details as per the NBC Standards.	8	5

Reference Books:

Abnws, F. and Others.: Electrical Engineering Hand Book
Bovay, H. E. Handbook of Mechanical & Electrical systems for Buildings
Bureau of Indian Standards: Code of Practice for Electrical Wiring Installations IS-732
Sawhney, G. S.: Fundamentals of Mechanical Engineering: Thermodynamics, Mechanics and Strength of Materials
Taylor, E. O. and Rao, V. V. L.: Utilisation of Electric Energy in SI units
Willim, J. McG.: Mechanical & Electrical Equipment for Buildings
K B Raina, S K Bhattacharya : Electrical Design Estimating and Costing
Handbook on Functional Requirements of Industrial Buildings (Lighting and Ventilation)
Bureau of Indian Standard : Code for Practice for DayLighting of Educational Buildings
Jankowski, Wanda : Lighting Exteriors & Landscapes
Saxena B K : Fenestrations for Daylighting of Side-Lit Rooms - A simplified
Helmut Koster : Dynamic Daylighting Architecture: basics, systems, projects Approach

Robert Bean: Lighting Interior and Exterior

e-Learning Source:

<http://www.kele.com/electrical-wiring-materials.aspx>

PO- PSO CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	1	3	3	2	1	2	2	1					2	2	2	1		
CO2	2	-	3	3		2	3	2					1	2	1	3		
CO3	-	2	-	3	1	2		3					3	2	1	2		
CO4	3	-	3	3	2	2	2	3					3	1	1	2		
CO5	-	3	2	3	1	1	1	3					2	1	2	2		

Ar. Shweta Verma
Name & Sign of Program Coordinator

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Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR218	Title of the Course	Educational Tour and Documentation	L	T	P	C
Year	II	Semester	IV	-	-	-	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	1. To develop understanding and get student familiarize about the well-known places, buildings, and architects work in India studied earlier. 2. Understanding of basic theories and principles of structural system. 3. Development of various styles with reference to the influencing factors such as geographical, geological, climatic, religious social and political conditions.						

Course Outcomes	
CO1	Student familiarize about the well-known places, buildings, and architects work in India
CO2	Understand about the basic theories and principles of structural system.
CO3	Understand about the various architectural styles.
CO4	Developed various styles with reference to the influencing factors such as geographical, geological, climatic, religious social and political conditions
CO5	Developed the skill of visualization or transferring the visual image in to the sketches on sheets.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<i>Suggestive places to visit</i>	Place to visit in this tour will be decided by a committee chair by HoD; and members as, tour coordinator, course coordinator, design teachers etc. The destination will be in complete compliance with the prescribed syllabus of design, history, vernacular, settlement pattern etc. Case study - Resort, Club House and Landscaped Gardens etc. Documentation and presentation of complete tour work. An abroad tour could be arranged depending on the student willingness with proper consent from their parents/ guardians.	-	1,2,3,4,5

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	1	2	3	2	1	2	2	1					2	2	2	2		
CO2	3	3	2	1	3	3	2	2					3	3	3	1		
CO3	1	3	3	2	1	3	3	2					3	2	2	3		
CO4	3	3	2	1	2	3	2	1					2	3	3	2		
CO5	2	2	2	1	2	2	2	3					1	2	3	2		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Ar. Shweta Verma Name & Sign of Program Coordinator	Sign & Seal of HoD
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