Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR101	**Title of the Course**	Architecture Design-I	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	1	-	8	13
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. To introduce the student, the fundamentals of design and development of design vocabulary, to nurture design thinking and to enable them to apply the same thought process in development of design. 2. Implementation of design through conceptualization and organization. 3. To hone the creative skill by introducing creative exercises. 4. To sensitize students to be more observant to their surroundings and promote it as a basic creative instinct in them.						

Course Outcomes	
CO1	Know about the fundamentals of design and development of design vocabulary and to apply the same thought process in development of design.
CO2	Implement the design through conceptualization and organization.
CO3	Enhance creative skills through creative exercises.
CO4	Understand their surroundings and promote it as a basic creative instinct.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Unit- I**	**Introduction to Architecture and architectural profession.** **Understanding elements and principles of Architecture and visual arts.** Suggested Exercises: Using elements and principles of design in making of two and three dimensional compositions completed with different tones, textures, colours and hues.	36	1
		Understanding different types of Form and Transformations Suggested Exercises: Understanding and composing pure (platonic) solids in physical forms with use of different materials.	27	3
		Introduction to basic understanding of form order and space in architecture. Suggested Exercises: Analyzing and selecting examples of architectural compositions in terms of their inherent order. Developing a predetermined order and its transformation in architectural compositions.	15	3
		Understanding simple and complex addition and subtractive transformations in platonic solids. Suggested Exercises Compositions with geometric and non-geometric forms retaining and destroying the original form.	10	3
2	**Unit- II**	**Introduction to human activity and space required for activities**. Suggested Exercises Exercises on Anthropometrics and space standards for different uses through simple sketches and drawings. Exercises to increase perception and sensitivity of the students about space.	10	2
		Studying different objects and modifying them to their necessity. Suggested Exercises Study of common use furniture, equipment and building components. Making presentable sheets on modification of analyzed object.	10	4
3	**Unit- III**	**TIME PROBLEM** a) Design of any small scale shall be carried out in design week from introduction to final Submission b) Design week problems 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	36	1,2,3&4

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.
1962 Experiencing Architecture. 2nd Rev. Ed. Cambridge: MIT Press. by S. Rasmussen
e-Learning Source:
https://design.tutsplus.com/articles/the-basic-elements-of-design--cms-33922
https://www.invisionapp.com/defined/principles-of-design
https://issuu.com/shreyatripathi/docs/form_and_space_though_contemporary_architecture_by/s/14404894
https://www.strate.education/gallery/news/design-definition

	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**	**1**	**-**	**3**	**-**	**-**	**3**	**2**					**2**	**3**	**1**	**1**		
CO2	**3**	**1**	**-**	**2**	**-**	**1**	**2**	**3**					**2**	**1**	**3**	**2**		
CO3	**3**	**1**	**1**	**3**	**-**	**-**	**3**	**2**					**3**	**1**	**2**	**3**		
CO4	**3**	**-**	**-**	**2**	**-**	**1**	**2**	**3**					**3**	**1**	**1**	**1**		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR102	**Title of the Course**	Building Construction and Materials-I	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	**3**	**-**	**2**	**6**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. Introduction to elementary building construction materials and techniques. 2. To understand the basic physical and chemical properties of the materials.						

Course Outcomes	
CO1	Understanding of Binding materials, their classification, Manufacturing, properties and uses viz. soil, lime and cement.
CO2	Knowledge of basic construction materials, their characteristics, occurrences or production, classification, properties and uses viz. stone, bricks and other clay products.
CO3	Demonstrate fundamental knowledge of the systems and processes used to construct the building, including an understanding of industry terminology.
CO4	Market surveying and case studies so a student acquainted with the latest construction technology & materials.
CO5	Analyze, troubleshoot, and implement solutions in the field based on knowledge and experience.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Soil, Lime & Cement	Soil: Fundamentals of Soil Science, Types of soils, Principles of Soil Stabilization, Types of Stabilizers, Requirements and Types of mud wall building and surface protection; Lime: Types of lime, Classification of lime and their comparison, Manufacturing process slaking, Hardening – Testing and Storage, Lime putty etc. Cement: Manufacturing, its types, properties and uses.	18	1, 2, 4
2	Rocks, Stones & Clay Products	Rocks: Classification of rocks and its sources, quarrying of stones, Seasoning, Dressing, Stones: Characteristics and testing of stones, Common building stones and their uses, artificial stones, Aggregates for concrete work. Clay Products: Type of bricks, properties and Usage, Sun dried and Burnt clay bricks, classification of various grades of bricks, Compressed mud blocks, Hollow blocks, Terracotta, Stoneware, Earthenware, Vitreous China etc.	15	1, 2, 4
3	Brick Bonding	Brick Bonding: Sheet work on Brick bonds- English Bond, Flemish Bond, Rat Trap Bond, Decorative Bonding, Brick Jali, Cavity wall, etc. Arches: Elementary principles of arch construction. Definition of various technical terms and types of arches. Sheet work on brick arches.	20	1, 3, 5
4	Timber, Bamboo and Other Natural Materials	Timber: Classification, Characteristics, defects and preservation. Carpentry Joints and Tools. Bamboo: Bamboo as plant classification, Species, Properties, Strength, Processing, Working of Bamboo tools – Treatment and preservation of Bamboo and its uses, Thatch, Coir etc.	15	2, 3
5	Timber by Products	Timber by Products: Decorative and Commercial plywood, Ply-board, block boards, Particle board, Wood wool cement board, Fiber board (MDF), Insulation board, Compressed straw board, Veneers and Laminates.	12	1, 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. Mackay
Building Construction by S. C. Rangwala
e-Learning Source:
https://onlinecourses.nptel.ac.in/noc23_ag03/preview
https://www.cemnet.com/training/cmt01
https://www.vedantu.com/chemistry/uses-of-limestone
https://theconstructor.org/building/lime-classification-building-construction/15745/

	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	1	1	3	3	1					1	3	1	2		
CO2	3	3	3	2	1	1	2	1					2	3	1	2		
CO3	3	2	3	2	1	2	2	1					1	3	2	1		
CO4	1	2	2	2	3	3	2	1					1	3	1	2		
CO5	3	1	2	1	2	2	1	1					1	1	1	1		

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

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

Integral University, Lucknow

Effective from session: 2018 - 2019							
Course Code	AR103	**Title of the Course**	Architectural Drawing-I	**L**	**T**	**P**	**C**
Year	I[st]	**Semester**	I	1	-	2	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	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. λ Students shall be familiarized with a range of techniques of expression beginning with manual drawing. λ Familiarization with drafting tools and accessories. Learning drafting, lettering and rendering techniques. λ Comprehension and visualization of geometrical forms.						

Course Outcomes	
CO1	Develop the requisite level of proficiency in drawing with primary communication tool in the practice of architecture just like language.
CO2	Familiarize with a range of techniques of expression beginning with manual drawing.
CO3	Familiarize with drafting tools and accessories along with learning drafting, lettering and rendering techniques
CO4	Know about the comprehension and visualization of geometrical forms.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Familiarization With Drafting Tools And Accessories, Learning Drafting And Lettering Techniques	Drawing Instruments and their uses; Sheet-layout and formatting; Use of pencil and ink in sketching; Drafted and freehand architectural lettering; Lines: Concept and types of lines; line thickness; dimension lines, etc.	12	1, 3
2	Scales	Scales: Engineers scale, Graphical scale and Representation factor (R.F.) Scales on drawings; Types of scales: Plain scale and Diagonal scale, etc.	6	2
3	Geometrical Constructions	Dividing and bisecting methods for line, arc, angle etc; Drafting methods for parallel and perpendicular lines; drafting of regular polygons; determining the length of arc and circumference of a circle.	12	2
4	Orthographic Projections And Metric Drawing	Definition, meaning & concept; Principles and methods of projection: Orthographic projection; Planes of projection; Four Quadrants; First angle projection; Third angle projection; Projections of Point: When a point is situated in the first second and third quadrant, etc. Types used and advantage; Isometric, Axonometric & Oblique views; Metric drawings, projections and their dimensions, etc.	12	1, 3
5	Projection Of Lines	Line parallel to one or both the planes, contained by one or both the planes, perpendicular to one of the planes, inclined to one plane and parallel to the other, inclined to both the planes, perpendicular to both the reference planes, etc.	6	4

Reference Books:
Engineering Drawing by N. D. Bhatt
Design Drawing by D.K. Ching, Francis
Architectural Graphics by D.K. Ching, Francis
Fraser Reekie by Reekie's Architectural Drawing
http://www.cs.brown.edu
http://www.dtcc.edu/-document,project info - Arch.dwg.
http://www.technologystudent.com/designpro/ortho1.htm
http://www3.ul.ie/~rynnet/orthographic_projection_fyp/webpages/what_is_ortho.html
http://www.slideshare.net/yashlakdawala7/projection-ofpointandlinesengineering108com
http://rgpv-ed.blogspot.in/2009/09/projections-of-points-lines-planes-and.html
*www.ae.iitkgp.ernet.in/~anup/05section_of_**solids**.pdf*

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR104	**Title of the Course**	Architectural Graphics	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	**1**		**2**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	Understanding the essentials of art, with the aim to develop and enhance drawing skills in various aspects of art, in various mediums and techniques.						

Course Outcomes	
CO1	Demonstrate an understanding of basic art form & develop perception, the ability to think graphically and utilize drawing as a language of communication.
CO2	Learn the architectural rendering techniques for building exteriors and interiors by using pen & ink, color, values, tones, etc.
CO3	To develop a design idea into a coherent proposal and to communicate ideas and concepts through graphical representation.
CO4	Articulate an understanding of the visual impact of colors, lines, shapes and textures used in design & construct conceptual and presentation models as a design presentation tool for aesthetic exploration.
CO5	To draw inspiration and develop a sense of observation from their surroundings, society and things happening around them.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction to arts	Understanding art, its meaning and scope. Relevance of art in the field of architecture. Materials used for art: pencil, brush, airbrush, colour, etc. Various methods to express art with points, lines, strokes and tones.	10	1
2	Mode of arts	Colour theory, Colour compositions, shades and shadows, warm and cool colours, tones, etc. Understanding scale and proportion.	8	2, 3
3	To develop and enhance drawing skills in various aspects of art, in various mediums and techniques	Freehand drawing of basic geometrical shapes. Composition of basic Elements of Design: Point, Line, Shape, Form based on Principles of Design: Balance, Repetition, Rhythm, Unity, Contrast and Proportions. Enlargement and reduction of a drawing. Colouring basic geometrical figures and their composition. Understanding textures and their effect on an object etc. Exercises in collage to understand methods of composition with different elements, textures and colours. Sketching scenes from memory and observation of day to day life, nature, household objects, architectural accessories, and buildings. Rendering techniques in ink and colour. Effects of perspective in a drawing. Effects of light, shades & shadows and reflections on various objects.	12	2, 3
4	Understanding the need and objectives of presentation of visual environment	Need and purpose of developing simulation skills. Type and quality of visual communication skills and the role of preparers, presenters and interpreters in visual communication. Studying typical examples of methods used for successful presentation of architectural and environmental projects.	10	4
5	Developing an attitude towards architectural and environmental assessment and learning visual presentation of statistical data	Introduction to elements, principles and techniques of experiencing architecture. Studying and assessing live and proposed projects. Exposure of students to famous places and buildings of architectural interest during educational tours. Exposure to visual presentation of statistical data through pie, bar, & graphs and other illustrations.	8	4, 5

Reference Books:

Art in India by F. M. Asher,

Art an Introduction by D. G. Cleaver,

Rendering with Pen & Ink by R. W. Gill

Art & Techniques by L. Mumford

Mural Art in Architecture by B. S. Rawat

Our India by Masani, Minu

Our Mankind by Masani, Minu

Visual Simulation by Shepperd, R. J.Stephen
Learn Pencil shading Sketching-I, II, III by Narvekar,Subodh
Architectural Graphics Standards by Ramsey
e-Learning Source:
https://archive.org/details/FrancisD.K.ChingArchitecturalGraphics6thEd2015
https://www.re-thinkingthefuture.com/architectural-community/a2419-10-online-courses-for-architectural-rendering/
https://www.udemy.com/course/architectural-visualization-fundamentals/
https://www.skillshare.com/en/browse/architectural-rendering

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

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR105	**Title of the Course**	Surveying and Levelling	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	**1**	**2**	-	**3**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. Familiarization with the principles and techniques of Surveying and Leveling in Architecture. 2. Interpretation and preparation of contour maps. 3. To understand the fundamental concepts and methods of surveying using basic & advanced instruments for surveying and leveling.						

Course Outcomes	
CO1	Explain the importance and need of surveying in architecture, Types and classification of surveys, Plane and geodetic surveying.
CO2	Equipment and methods of plane tabling. The prismatic compass and its use; whole circle bearing; quadrant bearing
CO3	Different types of leveling instruments, temporary and permanent adjustments,
CO4	Characteristics of contour lines, direct and indirect methods of contouring, interpolation of contours.
CO5	Total Station and its application in surveying, Introduction to aerial survey, digital mapping, satellite Imaging, GPS and uses of GIS in plane surveying.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Different types of leveling instruments, temporary and permanent adjustments, leveling staff, and reduction of levels, errors in leveling, curvature & refraction, reciprocal leveling, profile leveling, cross sectioning.	12	1
2	Plane Table & Compass Surveying	Characteristics of contour lines, direct and indirect methods of contouring, interpolation of contours, interpretation and preparation of contour maps	12	2
3	Leveling and Contouring	Different types of leveling instruments, temporary and permanent adjustments, leveling staff, and reduction of levels, errors in leveling, curvature & refraction, reciprocal leveling, profile leveling, cross sectioning.	12	3
4	Advanced Instruments/Technology	Total Station: Total Station and its application in surveying, accessories, adjustments, functions and uses. Advantages over traditional theodolite. Introduction to aerial survey, digital mapping, satellite Imaging, GPS, uses of GIS in plane surveying	6	4
5	Practical Layout	On site lay out a small residential unit as per map and plan.	6	5

Reference Books:

Surveying & Levelling by N. N. Basak

Surveying and Measurements by S. K. Duggal,

Surveying and Measurement by B. C. Punmia

Higher Surveying by A. M. Chandra

Plane Surveying by Alakade

e-Learning Source:

http://www.whycos.org/cms/sites/default/files/pdf/projects/Pacific/Training/Surface_Waters/Levelling_and_surveying.pdf

http://www.tcd.ie/civileng/Staff/Brian.Caulfield/3A1/3A1%20Lecture%204.pdf

http://www.levelling.uhi.ac.uk/

	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	1	-	3	1	2	3	2	2					3	3	2	2		
CO2	3	3	3	1	-	2	3	2					3	2	3	1		
CO3	2	3	3	1	1	2	3	2					2	3	2	2		
CO4	-	3	3	2	-	3	2	2					3	3	2	3		
CO5	3	3	3	3	2	2	1	2					3	2	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR106	**Title of the Course**	Workshop Practice	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	**0**	**0**	**2**	**1**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	This course is aimed at imparting basic workshop and material handling skills and techniques necessary for preparing architectural models and art project while in calculating value for good craftsmanship.						

Course Outcomes	
CO1	To work with carpentry tools and equipments to be able to cut, plane, join, and finish wooden members. Making simple joints used in buildings and furniture and its significance on site.
CO2	Simple exercises to convert metal into desired shapes and forms.
CO3	To understand the process of making building models with various materials such as card-board, wood, plastics, plaster of Paris and metals, ability to make simple joints in timber, pipes and other materials, basic electrical circuits
CO4	To familiarize with making of actual scale model from card board, wood, sun pack and general metal etc.
CO5	Ability to prepare course file for workshop activities

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Understanding basic skills of carpentry**	Learning to work with carpentry tools and equipment is to be able to cut, plane, join, and finish wooden members. Making simple joints used in buildings and furniture and its significance on site. Familiarization with the handling of wood lathe machines and its application on site.	4	1
2	**Understanding basic skills of metal work**	**Fitting, welding and sheet metal shop** Learning to cut, bend, weld, solder, grind and file metals. Simple exercises involving the above to convert metal into desired shapes and forms.	4	2
3	**Model making**	To understand the process of making building models with various materials such as card-board, wood, plastics, plaster of Paris and metals, ability to make simple joints in timber, pipes and other materials, basic electrical circuits.	4	3
4	**Preparation of actual scale model**	Preparation of actual scale model	4	4
5	**Documentation**	Shop wise preparation of course file for workshop activities.	4	5

Reference Books:

Model Making by M. Werner.

Architectural Graphics. by F. D. K Ching.

Designing with models: A Studio guide to Architectural Process Models by B. M.Criss.

The Elements of Architecture by C. L. Morgan. and J. Nouvel

Lobolly House: Elements of a New Architecture by S. Kieran and J. Timberlake.

e-Learning Source:

Workshop Book: http://www.bspublications.net/downloads/05229cf9b012a3_workshop_Ch_1.pdf

Carpentry Shop: https://www.brcmcet.edu.in/downloads/files/n51e62e9ea2045.pdf

Model Making Guide: https://www.firstinarchitecture.co.uk/architectural-model-making-the-guide/

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	1	2	3	2	2					3	3	3	3		
CO2	-	3	3	1	-	2	3	2					3	3	2	2		
CO3	-	3	3	1	1	2	3	2					3	3	3	3		
CO4	-	3	3	2	-	3	2	2					3	3	3	3		
CO5	-	3	3	3	2	2	1	2					1	2	1	2		

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

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

Integral University, Lucknow

Effective from Session: 2018 -2019							
Course Code	AR107	**Title of the Course**	Computer Applications-I	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	1	2	-	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. To initiate students into theory and practice of Computer Applications in Architecture. 2. To familiarize students with computers so as to understand the complete management outlook of an architects' office besides architectural drawings. 3. To teach graphic applications specially 2 Dimensional for fast and attractive presentation of theme and ideas. 4. To teach utilization of knowledge of 3D modeling and its application in design.						

Course Outcomes	
CO1	How to Introduce students to initiate students into theory and practice of Computer Applications in Architecture.
CO2	How to familiarize students with computers so as to understand complete management outlook of an architects' office besides architectural drawings.
CO3	To teach graphic applications specially 2Dimensional for fast and attractive presentation of theme and ideas.
CO4	To teach utilization of knowledge of 3D modeling and its application in design.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Basic Computer Skills	Computer fundamentals Documentation and Presentation, Introduction to MS office Creating Specific Documents, Viewing & Navigating, Margins & Page Setup, Page Formatting, Listing & Tables, Referencing, Mail merge, saving & printing. Worksheet and Excel table basics. File Management: Recommended software's: Microsoft Office and open office.	10	1,2
2	Computer Aided Drafting	Introduction Understanding drawing skills, abilities and limitations of CAD. Understanding drawing skills, abilities and limitations of CAD. Recommended software's: Microsoft Office and open office.	8	1, 2,3,
3	Introduction of Workspace	Creating and opening a file. Default CAD screen setup, toolbars. Coordinate systems: WCS & basics of UCS. Ways of inserting a command. Learning basic drawing tools: Draw & Modify toolbar. Selection methods, Osnap, defaults & types of commands.	10	1,2,3,
4	Modifying Commands	Editing CAD entities: Understanding CAD helpers. Creating and editing Single line & multi-line texts. Making and inserting blocks, design centre. Working with layers.Recommended software's: Autodesk- AutoCAD.	10	1,3,
5	Working with CADD	Hatches, regions and boundaries. Adding dimensions; Basic plotting technique. Introduction to graphical software; different advance 2D and 3D object drawing methods, editing objects and modifying their associated properties.	10	2,3,

Reference Books:
Computer Fundamentals - Sinha, Richard
MS Office 2007 - Rutkosky, Lotia, Heathcote
MS Office 2010 - Breeden II, John
AutoCAD - Omura, George
Exploring Microsoft Office X - Breeden II, John
Adobe - Adobe Photoshop Element 4.0
Photoshop 7.0 - Romaniello, Steve
Understanding AutoCAD - Omura, George
e-Learning Source:
http://www.sin.fi.edu/-Computerdrafing
http://www.ccollege.hccs.cc.tx.us/-Comp.graphic
http://www.ciips.ee.uwa.edu.an/

	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					3	3	3	3		
CO2	2	3	3	2	2	2	2	2					3	3	2	2		
CO3	3	3	3	2	1	2	2	3					3	3	3	3		
CO4	3	3	3	2	2	3	3	3					3	3	3	3		

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

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

Integral University, Lucknow

Effective from Session: 2018 -2019							
Course Code	AR108	**Title of the Course**	Environmental Sciences	**L**	**T**	**P**	**C**
Year	I	**Semester**	I	2	-	-	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. To familiarize students with various environmental issues and relate them in context of Architecture 2. The purpose of this subject is to introduce to the students the basics of Ecological and Environmental systems and their Importance and interdependence 3. To understand the importance of environmental systems and its relation with human development. 4. To give an overview of environmental sciences and the natural resources available for sustainable human life. 5. To understand about legal rights and produce awareness in public and private professional conducts and ethics.						

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	The Multidisciplinary nature of Environmental Studies Definition, Scope and importance, need for public awareness. **Natural Resources** Renewable and non-renewable resources Natural Resources and associated problems: • Forest resources and over exploitation, deforestation, case studies. Timber extractions, mining, dams and their effects on forests and tribal people. • Water resources: Uses and over utilization of surface and ground water, floods, drought, conflicts over water, dams- benefits and problems. • Mineral resources: Uses and over exploitation, environmental effects of extracting and using mineral resources, case studies. • Food resources: World food problem, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizer pesticide problems, water logging, salinity, case studies. • Energy resources: Growing energy needs, renewable energy sources, use of alternate energy sources. Case studies. • Land resources: Land as resource, land degradation, man induced landslides, soil erosion and desertification. a) Role of an individual in conservation of natural resources. b) Equitable use of resources for sustainable lifestyles.	8	1,2,3
2	Ecosystems	Concept of an ecosystem • Structure and function of an ecosystem • Producers, consumers and decomposers • Energy flow in the ecosystem • Ecological succession • Food chains, food webs and ecological pyramids • Introduction, types, characteristics, features, structure and function of the following ecosystem: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (Ponds, streams, lakes, rivers, oceans, estuaries)	4	1, 2,3,
3	Biodiversity and Its Conservation	Introduction Definition: genetic, species and ecosystem diversity, Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at Global, National and Local levels, India as a mega diversity nation, hot spots of biodiversity, threats to biodiversity, habitat loss, poaching of wild life, man wild life conflicts, endangered and endemic species of India, conservation of Biodiversity: In situ and Ex situ conservation of biodiversity.	8	1,2,4

4	Environmental Pollution	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	1,3,4
5	Social Issues, Population and The Environment Social Issues and The Environment	From unsustainable to sustainable development, urban problems related to energy, water conservation, rain water harvesting, water shed management, resettlement and rehabilitation of people; its problems and concerns, case studies, environmental ethics; issues and possible solutions, wasteland reclamation, consumerism and waste products, Environmental Protection Act, Air (prevention and control of pollution) Act, Water (prevention and control of pollution) Act, Wild Life Protection Act, Forest Conservation Act, issues involved in enforcement of environmental legislation, Public awareness. Human Population and the Environment Population growth variation among nations, population explosion, family welfare programme, environment and human health, human rights, value education, HIV/AIDS, women and child welfare, role of information technology in the environment and human health, case studies.	6	2,3,5

Reference Books:

Computer Fundamentals by Sinha, Richard

Environmental Chemistry by A. K. De.

Environmental protection and laws by H. Jadhave,V.M. Bhosale

Elements of Environmental Engineering by K. M. Duggal

Environmental Science by V. K. Ahluwalia

Environmental Engineering by Sincer, P. Arcadio.

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

Environmental Impact Assessment of Water Resources Project by C Umesh Chaube

Environmental Legislation; Code no 727: AICTE

e-Learning Source:

http://pubs.rsc.org/en/journals/journalissues/ee#!recentarticles&all

www.sustainable.org/environment

https://www.worldwildlife.org/threats/pollution

home.southernct.edu/~gravess1/scsu_courses/.../env301-chapt12.ppt

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	1	-	3	-	-	2	3					2	3	2	2		
CO2	3	-	-	3	-	-	2	3					2	3	1	3		
CO3	3	1	-	2	3	-	3	2					1	3	2	1		
CO4	3	1	-	2	3	-	3	2					1	3	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR109	**Title of the Course**	Architectural Design-II	**L**	**T**	**P**	**C**
Year	I	**Semester**	II	3	0	6	12
Pre-Requisite	AR101	**Co-requisite**	Nil				

Course Objectives	1. To introduce architectural design as a process and as a final product; to understand fundamentals of space, form and order in architecture. 2. Understanding design as function. 3. To involve students in a design project that will develop their understanding of simple space planning and functional aspects of good design; to enable the students apply theoretical knowledge learnt in the previous semester in architectural design exercise. 4. Indoor space, outdoor space, the concept of space in buildings. The relationship between man and space. Defining spaces and the degree of enclosure. Organization of spaces, fenestration, and character of facade, enclosure and internal spaces. 5. Quality and hierarchy of space (private/semi-private/public/semi-public).

Course Outcomes	
CO1	Understand architectural design as a process and as a final product and the fundamentals of space, form and order in architecture.
CO2	Understand the design as function.
CO3	Develop their understanding of simple space planning and functional aspects of good design and theoretical knowledge.
CO4	Know about the Indoor space, outdoor space, the concept of space in buildings and the relationship between man and space, defining spaces and the degree of enclosure, Organization of spaces, fenestration and character of facade, enclosure and internal spaces.
C05	To make student understand and develop the quality and hierarchy of space (private/semi-private/public/semi-public).

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Unit-I	**To develop understanding of single unit design with respect to human scale, requirement and need.**	48	1
		Application of anthropometrics in different spaces. Suggested Exercises Designing of several indoor space such as Bathroom, Kitchen, Bedroom, Dining, Living, etc.	24	1 & 3
3	Unit-II	**Understanding design synthesis of multi-functional spaces in a single space.** Suggested Exercises Design exercises such as Gates, kiosks, bookstall, bus stand, police booths, milk booths, advertisement booths, florist shops, tea stall, shelter in park, etc.	30	3
4	Unit-III	**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.	42	1, 2, 3, 4 & 5

Reference Books:

Architecture: Form, Space and Order, 3rd Ed. Hoboken: John Wiley & Sons by F.D.K. Ching.

Understanding Architecture: Its Experience History and Meaning, 3rd Ed. Philadelphia: West-view press. by L.M. Roth,

The dynamics of architectural form. Berkeley and Los Angeles: University of California Press. by A. Rudolf

The Theory of Architecture–Concepts themes and Practices by A. J. Paul .

Elements of Space making. by Pandya, Y. 96

Elements of architecture – from form to place. 1st Ed. New York: Routledge. by V. M. Peter.

Analyzing Architecture by S. Unwin

Measured Drawings by Shing,Patrick LAU Sau

e-Learning Source:

https://sdgs.un.org/goals

https://www.who.int/health-topics/air-pollution

https://www.conserve-energy-future.com/causes-effects-solutions-depletion-natural-resources.php#:~:text=Resource%20depletion%20happens%20when%20the,fishing%2C%20mining%2C%20logging%20etc.

https://www.sciencedirect.com/science/article/abs/pii/S0360544220305168

	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	-	3	-	-	2	3					2	3	1	1		
CO2	3	-	-	3	-	-	2	3					2	1	3	2		
CO3	3	1	-	2	1	-	3	2					3	1	2	3		
CO4	3	1	-	2	3	-	3	2					3	1	1	1		
CO5	3	1	-	3	2	-	2	3					2	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR110	**Title of the Course**	Building Construction and Materials-II	**L**	**T**	**P**	**C**
Year	I	**Semester**	II	**2**	**2**	**2**	**6**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. To develop understanding about building elements and their construction principles 2. To develop understanding about composition of various compatible building materials for construction. 3. 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	Know about building elements and their construction principles.
CO2	Understand the composition of various compatible building materials for construction.
CO3	Understand the design abilities by applying basic principles of construction and choosing appropriate materials and techniques as per current market trends.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction to basic building elements	Foundation, Plinth, walls, Sills, Chajjas, Portico, Piers, Roof, Parapet, Coping, Corbelling, Cornices, Staircases etc. Sheet work of Typical Brick Wall Section from Foundation to Roof including all basic building elements.	18	1
2	Mortar & concrete	Availability, preparation and uses of Mud, Lime and Cement mortar; Lime and Cement concrete, mortar composition ingredients, water cement ratio, various tests to check the Mortar properties.	18	2
3	Foundation & DPC	Need for foundations, types, preliminary design criteria, Foundation in brickwork and concrete, Detail of spread foundation for load bearing walls of various thicknesses, Types and basic details of various concrete footings, DPC: Water-proofing and damp proofing for walls, roofs, basements, retaining walls etc., Study waterproofing materials like Asphalt, bitumen and synthetic, new materials in the market. Sheet work on laying of horizontal and vertical damp proof courses.	20	3
4	Glass, paints and varnishes	Glass: Ingredients and manufacture of Glass, forms, properties of Glass for building purposes and structural uses, glass processing- Sheet, Float, Plate and Toughened. Paints and Varnishes: Type of Paints and Varnishes, Characteristics, variety in their application and appropriateness in building works.	20	3
5	Introduction to advanced building materials and construction techniques	Introduction to advanced Building Materials and Construction Techniques as per latest available resource and market trend and decided by the subject teacher	20	3

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. Mackay,
Building Construction by S. C. Rangwala
e-Learning Source:
https://civiljungle.com/difference-between-mortar-and-concrete/
https://www.civillead.com/difference-between-mortar-and-concrete/
https://dreamcivil.com/dpc-treatment-in-buildings/
https://www.engineeringcivil.com/advanced-construction-techniques.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	1	2	3	2	-	-	3	2					3	3	2	3		
CO2	-	1	3	3	-	-	3	2					3	2	1	2		
CO3	3	2	3	2	2	1	3	3					3	3	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR111	**Title of the Course**	Architectural Drawing and Graphics-I	**L**	**T**	**P**	**C**
Year	I	**Semester**	II	1	0	2	2
Pre-Requisite	AR103	**Co-requisite**	Nil				
Course Objectives	1. The course aims at developing the requisite level of proficiency in drawing, which is seen as a communication tool in the practice of architecture just like language. 2. Students shall be familiarized with a range of techniques of expression beginning with manual drawing. 3. Learning drafting, lettering and rendering techniques. 4. Visualization of geometrical forms.						

Course Outcomes	
CO1	Efficient in drawing, which is seen as a communication tool in the practice of architecture just like language.
CO2	Familiarize with a range of techniques of expression beginning with manual drawing.
CO3	Learn drafting, lettering and rendering techniques.
CO4	Visualize of geometrical forms.
CO5	Develop appropriate graphic skills and technical drawings which is helpful to explain the contents of a design.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Projection of Planes and Solids	Perpendicular to both the reference planes, Perpendicular to one plane and parallel to the other plane, Projections of planes parallel to one of the reference planes, etc. Perpendicular to one plane and inclined to the other, Projections of planes inclined to one reference plane and perpendicular to the other, etc. Axis parallel to both, H.P. & V.P.; Axis inclined to one reference plane and parallel to other; Projections of solids with axis inclined to H.P. and V.P., etc.	9	2, 4
2	Section of Solids	Section planes, true shape of a section. Section of solids (prisms, pyramids, cylinders, cones)	9	2, 4
3	Drawing Skills	Organizing and creating backgrounds for an architectural drawing: designing formats, criterion for selection of medium and modes of presentation such as: function differentiation, cone of vision, floorscape and landscape. Drawing and rendering of natural elements and their incorporation in architectural drawings, such as: trees, plants, creepers, rockery, water bodies, pathways, sky, water and reflection in water. Drawing human figures in various forms and postures.	9	1, 3
4	Development of Surfaces	Development of lateral surfaces of right solids like prisms, cylinders & surfaces of pyramid & cone.	9	4
5	Rendering and Sciography	Introduction/ meaning of sciography Projection of sciography in plans and elevations. Rendering with different techniques: dry brush, airbrush, spray brush, line-stroke, cut-paste, etc. Rendering in different mediums: oil pastels, pastels, water colours, poster colours, charcoal, pencil colours, etc. Expressing designs from conceptual to planning stage in the form of 2-dimensional and 3- dimensional sketches.	12	3, 5

Reference Books:

Engineering Drawing by N.D. Bhatt

Design Drawing by D. K. Ching, Francis

Architectural Graphics by D. K. Ching, Francis

Rendering with Pen & Ink by W. Robert Gill

Architectural Drawing by Reekie, Fraser, Reekie's

Architectural Graphics Standards by Ramsey

e-Learning Source:

http://www.dtcc.edu/-document,project info - Arch.dwg.

http://www3.ul.ie/~rynnet/orthographic_projection_fyp/webpages/what_is_ortho.html

www.ae.iitkgp.ernet.in/~anup/05section_of_**solids**.pdf

	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	1	3	3	2	-	1	2	2					3	3	3	3		
CO2	2	3	3	3	-	1	1	2					3	2	3	2		
CO3	1	2	2	3	-	1	1	3					3	3	2	3		
CO4	3	3	3	3	2	2	2	3					3	3	2	2		
CO5	2	2	1	3	-	1	1	3					2	2	3	3		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR112	**Title of the Course**	Visual Communication	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	II	**1**	-	**2**	3
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. Understanding the essentials of art. 2. To develop and enhance drawing skills in various aspects of art, in various mediums and techniques. 3. Understanding the need and objectives of presentation of visual environment. 4. Developing an aptitude towards architectural and environmental assessment. 5. Learning visual presentation of statistical data. 6. Introduction to elementary Visual Communication Skills, such as, communication graphics (sketches, renderings, perspectives, architectural illustrations), scale models, photographs.						

Course Outcomes	
CO1	Understand the essentials of art.
CO2	Study and find better drawing skills in various aspects of art, in various mediums and techniques.
CO3	Aptitude towards architectural and environmental assessment.
CO4	Learning visual presentation of statistical data
CO5	Elementary Visual Communication Skills, such as, communication graphics (sketches, renderings, perspectives, architectural illustrations), scale models, photographs

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Understanding the need and objectives of presentation of visual environment	Need and purpose of developing simulation skills. Type and quality of visual communication skills and the role of preparers, presenters and interpreters in visual communication. Studying typical examples of methods used for successful presentation of architectural and environmental projects.	12	1, 2, 3 & 4
2	Developing an aptitude towards architectural environment assessment and learning visual presentation of statistical data	Introduction to elements, principles and techniques of experiencing architecture. Studying and assessing live and proposed projects. Exposure of students to famous places and buildings of architectural interest during educational tours. Exposure to visual presentation of statistical data through pie, bar, & graphs and other illustrations.	10	3, 4 & 5
3	Learning visual presentation of statistical data	Exposure to visual presentation of statistical data through pie, bar, & graphs and other illustrations	10	1, 4 & 5
4	Introduction to elementary visual communication skills such as communication graphics (sketches, renderings, architectural illustrations) and scale models	Exposure of students to good drawing, rendering, model making materials and techniques. Encouraging students to take up sketching, painting etc. as a hobby.	8	2,4 & 5
5	Introduction to photography, computer-aided design/drafting (cadd) graphics, video image processing and video simulation as tool of pictorial presentation	Exposure of students to good architectural illustrations, perspectives, photographs and CADD graphics. Encouraging students to take up photography as a hobby.	8	3,4 & 5

Reference Books

Art an Introduction by D. G. Cleaver

Art in India By F. M. Asher
Rendering with Pen & Ink By . W. Gill
Art & Techniques By L. Mumford
Mural Art in Architecture, Visual Design in Islamic Architecture by B. S. Rawat
Our India with 100 illustrations by Minu Masani
Our Mankind by Minu Masani
Visual Simulation by Shepperd, R. J.Stephen
e-Learning Source:
http://www.sin.fi.edu/-Computerdrafing
http://www.ccollege.hccs.cc.tx.us/-Comp.graphic
http://www.ciips.ee.uwa.edu.an/

	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	2	1		2	3	3	3	1					1	2	1	2		
CO2	2	3	3	3	2	2	1	3					1	2	2	2		
CO3	3	2	3	2	2	2	1	1					2	3	2	1		
CO4	2		2	2		2	2	2					3	3	2	2		
CO5	2	2	3	2	1	2	2	1					2	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR113	**Title of the Course**	ARCHITECTURAL STRUCTURES - I	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	II	**2**	**0**	**0**	**2**
Pre-Requisite	Nil	**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.						

Course Outcomes	
CO1	Theory of structures for architects. Technical names and functions of various structural components from foundation to roof. Fundamentals of mechanics.
CO2	Types of Loads - Dead Load, Live Load, Impact Load, Earthquake Load, Wind Load and Snow Load. Mechanical properties of different materials such as tensile strength, fatigue strength and comprehensive strength.
CO3	Definition, Cause, Effect, Units, Force as vector, Graphical representation. Resolution of forces by graphical and analytical methods. Types of forces – Co planar, Non-Co planar, Concurrent, Non-Concurrent, and parallel forces.
CO4	Elasticity, stress, strain, types of stresses, elastic limit, Hook's law, modulus of elasticity, stresses in composite bars, linear strain, Poison's ratio, shear stress, principal stresses and strains.
CO5	Definition, centre of gravity of plane figures, centre of parallel forces. Definition, important theorems, section modulus, calculation of moment of inertia by first principle and its application, moment of inertia of composite sections.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Aims, objectives and scope of study of Theory of structures for architects. Technical names and functions of various structural components from foundation to roof. Fundamentals of mechanics. S.I. system Units.	8	1
2	Loads and mechanical properties of materials and their use in building	Types of Loads - Dead Load, Live Load, Impact Load, Earthquake Load, Wind Load and Snow Load. Mechanical properties of different materials such as tensile strength, fatigue strength and compressive strength.	8	2
3	Force and moments	Definition, Cause, Effect, Units, Force as vector, Graphical representation. Resolution of forces by graphical and analytical methods. Types of forces – Coplanar, Non-Coplanar, Concurrent, Non-Concurrent, and parallel forces. Triangle of forces, parallelogram of forces, equilibrium of forces. Conditions of equilibrium by analytical and graphical methods.	8	3
4	Simple stresses and strains	Elasticity, stress, strain, types of stresses, elastic limit, Hook's law, modulus of elasticity, stresses in composite bars, linear strain, Poison's ratio, shear stress, principal stresses and strains.	4	4
5	Centre of gravity and moment of inertia	Definition, centre of gravity of plane figures, centre of parallel forces. Definition, important theorems, section modulus, calculation of moment of inertia by first principle and its application, moment of inertia of composite sections.	4	5

Reference Books:

Elements of Structural Analysis by S. A. Bari

Structure and Architecture by A. J. Macdonald

Strength of Materials by R. K. Rajput

Introduction to Structural Analysis by B. D. Nautiyal

e-Learning Source:

www.brown.edu/Departments/Engineering/Courses/En4/.../Forces.pdf

http://web.mit.edu/4.441/1_lectures/1_lecture5/1_lecture5.html

my.safaribooksonline.com/...simple-stresses-and-strains/chapter001_xht..

fetweb.ju.edu.jo/staff/che/ymubarak/Strength-lectures/chapter1.pdf

https://sites.google.com/site/mechanicalstuff4u/contents-of-m/engineering-mechanics-4/centre-of-gravity-moment-of-inertia

http://johnarner.com/apphysics/week21/lesson21.html

http://www.urminsky.ca/wp-content/CP12011/chapter7part2Post4up.pdf

	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	-	2	3	2	-	3	2	1					2	3	1	2		
CO2	-	2	3	2	-	3	2	1					2	2	2	2		
CO3	-	2	3	2	-	3	2	1					3	3	3	3		
CO4	-	3	3	2	-	3	3	2					2	3	3	1		
CO5	-	2	3	2	-	3	2	1					3	2	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR114	**Title of the Course**	Site Exposure and Construction Yard	**L**	**T**	**P**	**C**
Year	1st	**Semester**	II	-	**2**	-	**1**
Pre-Requisite	AR102	**Co-requisite**	AR110				
Course Objectives	1. To develop understanding of basic building elements/ components; hands on experience about working tools, their application and site safety measures. 2. To familiarize and hand experience to the students with the construction method and techniques adopted for various stages of project execution on site. 3. To understand the actual drawing requirement and the various aspects of drawing and site coordination required on site during the execution of a project.						

Course Outcomes	
CO1	Have ability to prepare different types of products from clay and also prepare different grades of cement mortar. Gaining skills to prepare different kind of brick bonds at construction yard practically.
CO2	Develop ability to prepare arches in the construction yard.
CO3	Develop an ability to prepare some useful product from metal and wood in the studio.
CO4	Have ability to prepare a scale model using wood, metal, paper or clay etc.
CO5	Developing ability to prepare proper documentation of site visits as a portfolio.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	CLAY PRODUCTS	Clay products: Preparation of clay and making some clay product. Cement: Preparation of various kind of mortar, Making and testing of concrete cubes made of various grade of cement. Trenching, shoring and Laying of foundation courses for various wall thicknesses. Brick bonds (multiple wall thicknesses): English Bond, Flemish Bond, Rat Trap Bond, Decorative Bonding, Brick grills, Cavity wall, etc. Laying of damp proof course over the wall, use of various other waterproofing materials.	8	CO1
2	ARCHES	Arches: Various kind of arches used in building industry, vaults, domes etc.	8	CO2
3	WOOD AND METAL WORK	Making, fixing, painting, washing of wooden & metal elements e.g. Door frames, door panels, parapet, railings etc.	8	CO3
4	MODEL MAKING	Making of some innovative structural shed made of bamboo or other natural materials studied before.	4	CO4
5	SITE EXPOSURE	Relevant site visit (s) and their documentation techniques.	4	CO5

Reference Books:

Materials and Construction by James a Pratt

Brickwork bonds by Menyashev Ramil

e-Learning Source:

https://architizer.com/blog/practice/details/technical-details-brick-bonds-and-patterns/

http://www.tcd.ie/civileng/Staff/Brian.Caulfield/3A1/3A1%20Lecture%204.pdf

https://testbook.com/question-answer/a-type-of-bond-in-a-brick-masonry-in-which-each-co--60d594ed7766863649c96432

	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	1	3	3	2	3	3	3	2					1	1	1	1		
CO2	2	2	2	2	2	2	2	2					2	2	2	2		
CO3	3	3	3	3	3	3	3	3					3	3	3	3		
CO4	1	1	1	1	1	1	1	1					1	1	1	1		
CO5	2	2	2	2	2	2	2	2					3	2	3	3		

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

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

Integral University, Lucknow

Effective from Session: 2018 -2019							
Course Code	AR115	**Title of the Course**	Computer Applications-II	**L**	**T**	**P**	**C**
Year	I	**Semester**	II	1	2	-	2
Pre-Requisite	AR107	**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 4. forms, mapping, rendering and presentation techniques. 5. To make students create integrated design documents by taking full advantage of the building model. 6. 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	Advanced Computer Aided 2D and 3D Drafting	Texts; dimensioning Drawing unit association; scaling; associating limits; organizing drawings in custom layouts, templates. Recommended softwares: Google Sketchup, AutoCAD.	8	1,2,3,4
2	Specific Commands & Plugins	Concept of blocks and object grouping; styles; organizing objects in layers; hatching techniques; introduction to symbol libraries.	6	1, 2,3,
3	Basic Digital Modeling	Understanding complex commands like P-line, 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	6	1,2,3,
4	Modeling Principals	Introduction to modeling terminology and concepts. Introduction to tools and concepts necessary to design and draw. Learning solid and hollow massing.	6	2,3,4
5	Practical Work	Creating 3D models with a metric unit system. Digitized design projects. Recommended software's: Google Sketchup, AutoCAD	6	2,3,4

Reference Books:
Adobe Photoshop Element 4.0 - Adobe
Photoshop 7.0 - Romaniello, Steve
Understanding AutoCAD - Omura, George
AutoCAD command reference - Omura, George
e-Learning Source:
http://www.focusnet.co.uk/cib/library/physdishous
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	PSO7
CO1	3	3	3	1	1	1	3	3					1	3	3	2		
CO2	3	3	3	2	2	2	3	3					2	3	1	2		
CO3	3	3	3	2	1	2	2	3					1	3	2	3		
CO4	3	3	3	2	2	3	3	3					2	3	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2018 - 2019							
Course Code	AR116	**Title of the Course**	History of Architecture, Art & Culture-I	**L**	**T**	**P**	**C**
Year	1st	**Semester**	II	2	-	-	02
Pre-Requisite	Nil	**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 the 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 evolution of human civilization and human settlements.
CO2	Understand the influence of geographical location, socio-cultural, religious, political systems, people's beliefs, climate and other factors on architecture
CO3	Know about the development of civilization, its architectural implications in terms of time, space, form and structure
CO4	Develop an outlook on settlement patterns of ancient civilization and comparing same in modern societies
CO5	Identify problems related to settlements and thereby understand how to solve it

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**PREHISTORIC / PRIMITIVE ARCHITECTURE**	Primitive people, shelters, settlements, burial systems, megaliths and memorials. Eg: Oval huts near Nice, Dolmen tomb, Gallery grave, Passage grave, Cairns, Tumulus, Houses at Catal Huyuk, Stonehenge etc.	04	1
2	**NILE VALLEY CIVILISATION**	Study of socio-cultural, religious and political systems, people's beliefs, climate and other factors influencing Architecture, character of human settlements, typology of Shelters and buildings, Religious burial systems and Cult temples of Egypt, construction methods and materials used.	06	2
3	**INDUS VALLEY CIVILISATION**	Contributions of Archaeologists, Timeline, socio-cultural, religious and political systems, settlement planning pattern, typology of Shelters and civic buildings, Citadel, Granary, Great baths, civic utility systems.	10	3
4	**ARYAN / VEDIC CIVILISATION**	Timeline with reference to Indus Valley Civilisation, settlement planning pattern and Town forms by planning pattern (Dandaka, Nandyavartha etc.), typical Vedic village, and shelter types by shape and material used, Torana and Sacred railings.	06	3 & 4
5	**EUPHRATES AND TIGRIS VALLEY CIVILISATIONS**	Architectural character as a reflection of climate and geology, planning of Palaces of Assyria and Persia, Ziggurats and corbelled drains of Assyria, Staircases of Persepolis, physical planning of Babylonia, Ur-Sumar. **Chinese Civilisation:** Architectural character, building typologies, settlement pattern, Settlement layout and planning principles adopted.	06	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

S. (1962 Experiencing Architecture. 2nd Rev. Ed. Cambridge: MIT Press by Rasmussen

e-Learning Source:

http://www.nios.ac.in/media/documents/316courseE/ch29.pdf

http://prezi.com/ifubcui3ikau/development-of-indian-civilization/

http://www.vernaculararchitecture.com/

http://education.nationalgeographic.com/education/standards/national-geography-standards/12/?ar_a=1

	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				2	1	1	3						**3**	**2**	**2**	**3**		
CO2				1	2	2	3						**2**	**1**	**3**	**3**		
CO3	3		2	3			2	1					**3**	**2**	**3**	**2**		
CO4	3	2		2			3	1					**3**	**2**	**2**	**2**		
CO5		3	2	2		1	2	3					**2**	**1**	**2**	**1**		

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

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

Integral University, Lucknow

Effective from Session: 2018-2019							
Course Code	AR117	**Title of the Course**	**Educational Tour and Documentation**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	II	**-**	**-**	**-**	**1**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. To develop understanding and get students familiarized about the well-known places, buildings, and architects work in India. 2. To introduce and get students familiarized about the usages and application of various architectural principles over the design environment. 3. To introduce the measuring technique of any site/ building etc and get it drafted on a sheet. 4. To develop the skill of visualization or transferring the visual image in to the sketches on sheets.						

Course Outcomes	
CO1	Student familiarize about the well-known places, buildings, and architects work in India
CO2	Understand about the usage of various architectural principles over the design, environment.
CO3	Understand about the application of various architectural principles over the design, environment.
CO4	Learn and knows the measuring technique of any site/ building etc and get it drafted on sheet
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	***Suggestive places to visit***	Places 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. Visual- Photographs/ sketches to reinforce the objectivity of the syllabus. Documentation and presentation of complete tour work consisting of measure drawing 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	PSO3	PSO4	PSO5	PSO6
CO1	1	2	3	2	1	2	2	1					2	1	2	2		
CO2	1	2	3	2	1	2	3	2					2	3	2	1		
CO3	1	3	3	2	1	2	3	2					3	2	2	3		
CO4	3	3	2	1	1	2	2	1					2	3	1	2		
CO5	3	3	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**

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	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**	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 ● Basic residence design ● Studio Design ● Students own room Design	44	1, 2, 3, 4 & 5
2	**MEDIUM SIZE BUILDINGS WITH REPETITIVE UNITS.**	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**	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**

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	1. To develop understanding about construction principles. 2. 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. 3. Construction technology and appropriate materials for other building elements, interior finishes shall be considered under this subject from simple examples to complex. 4. 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. 5. 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:

httpshttps://cpwd.gov.in/publication/manualdw.pdfdrive.google.com/drive/folders/1Kf6c6UbCRJB5h9K2r-1bLoSIAmR1dmtu?usp=share_link

https://www.civilengineeringweb.com/2020/07/what-is-timbering.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	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		

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

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

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	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. 2. Students shall be familiarized with a range of techniques of expression beginning with manual drawing. 3. To introduce the students to graphic treatment of three-dimensional drawings. 4. To develop perception and presentation of architectural forms and buildings. 5. To familiarize the students with preparation of perspectives by innovative methods. 6. To introduce the students with perspectives of interiors.						

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 dimentional 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/michelleecheve/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		

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

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

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, deign 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

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	-	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		

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

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

Integral University, Lucknow

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	Fundamental concepts of demography and its elements for planning Analytical and quantitative techniques of demography and its application in housing and town planning Cultural and social institutions and their impact on the individual personality and group behavior, e.g., religious, economic, political, marriage and family Crime and juvenile delinquency in poorly designed human settlements.	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 hobbits 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
CO1	2	3	3	1	2	1	3	2					2	3	2	2		
CO2	2	3	3	1	3	2	3	2					3	3	3	2		
CO3	3	3	3	2	2	2	2	2					3	2	1	3		
CO4	3	3	2	2	2	3	3	2					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**

Integral University, Lucknow

Effective from Session: 2019 - 2020							
Course Code	AR206	**Title of the Course**	History of Architecture, Art & Culture-I	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	**2**	**-**	**-**	**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 Arthashasthra 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 Liugi 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.encylopedia.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		

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

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

Integral University, Lucknow

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	Different types of 3D modeling techniques; Solid creation; Editing; Creating complex solids; Lathing, displacement, lofting, Boolean operations on solids etc.	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**

Integral University, Lucknow

Effective from Session: 2019-2020							
Course Code	AR 208	**Title of the Course**	Building Services-Water Supply & Sanitation	**L**	**T**	**P**	**C**
Year	**II**	**Semester**	III	**2**	**-**	**-**	**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**

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	Audit Course is to be undertaken before the commencement of III semester classes. This assignment could be a 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. SUGGESTIVE EXERCISES Report Writing PowerPoint Presentations Measure drawing etc.	-	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**

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	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 CO	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 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**

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	1. To develop understanding about construction principles. 2. Construction technology and appropriate materials for structural systems, roofing, enveloping and interior finishes shall be considered under this subject from simple examples to complex. 3. 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**

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	*Fundamentals* Introduction to climatology and its importance in architecture Elements of climate, Global climate factors, Interrelationship of climatic elements and psychometric chart *Climatic Zones* 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	10	1 & 3
2	THERMAL COMFORT AND SOLAR CONTROL FOR HUMAN COMFORT	*Thermal Comfort* 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 *Solar Control* 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.	12	2 & 3
3	PRINCIPLES OF THERMAL DESIGN IN BUILDINGS	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). 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	8	1, 3 & 4
4	DAYLIGHT, VENTILATION AND CLIMATE RESPONSIVE	*Daylight* 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;	10	2 &4

	ARCHITECTURAL DESIGN	*Ventilation and Air Movement* 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**

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**

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	1. To teach the importance of a site and its content in architectural creations. 2. To orient the students towards several influencing factors which governs the siting of a building or group of buildings in a given site 3. To teach various techniques of site analysis through exercises and case studies. 4. To teach the students the methodology of preparing a site analysis diagram. This will serve as a prelude to any architectural creation. 5. To understand the concept of sustainability and sustainable development. 6. To inform the various issues like climate change, ecological footprint, etc. 7. To understand low impact construction practices, life cycle costs and alternative energy resources. 8. 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**

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

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	1. Understanding of period in terms of contexts of location, climate and other parameters. 2. Introduction to the architecture of the ancient world and understanding architecture of periods in terms of space, form and structure. 3. Familiarizing with typical examples of building type. 4. To generate an understanding about the development of civilization and its architectural implications.						

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 *Byzantine examples:* 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 *Romanesque examples:* 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. *Representative Examples:* 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 *Architecture of the Delhi Sultanate* Establishment of the Delhi Sultanate Imperial style of Delhi: Slave, Khalji, Tughlaq, Sayyid & Lodhi dynasties; Development of basic mosque and tomb prototypes. *Representative Examples:* 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 *Representative examples:* Pazzi Chapel, S.Lorenzo, S. Spirito of Florence, St. Andrea, St. Pietro, Montrio, 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

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

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 Liugi 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.tornoto.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**

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

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/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	1	3	3		

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

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

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	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 ofelectricity in basement and upper floor as per NBC Application of above studies in current design problems and preparing designlayout and details as per the NBC Standards.	8	5

Reference Books:

Abnwos, 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

	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	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**	**Sign & Seal of HoD**

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	***Suggestive places to visit***	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**

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR301	**Title of the Course**	Architectural Design-V	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	V	**3**	-	**6**	**12**
Pre-Requisite	AR210	**Co-requisite**	Nil				
Course Objectives	1. To expose the students to the complexities of proving shelter for people from different socio-economic background in close proximity to each other, in urban areas. 2. To sensitize the students about land scarcity and expose them to different typologies of high-density housing. 3. To expose the students to the challenges of bigger scale site planning involving a group of buildings. 4. To enable the students, apply theoretical knowledge learnt in previous semesters in architectural design exercise. 5. Issues related to housing shortages, basics of housing finance, incremental housing, sites and services schemes, slums and squatter settlements are to be discussed in the class. 6. The students are expected to design in a climate responsive and environment friendly way while planning medium sized housing complexes. 7. The students are expected to carry out detailed site analysis, documenting physical features, vegetation, land forms soil characteristics, slope analysis and natural drainage patters. 8. Site planning exercise should depict understanding of vehicular and pedestrian movement patterns, land grading and conservation of ecologically sensitive features.						

Course Outcomes	
CO1	Learn the art of collecting data and to carry out analysis for the process of evolving design and individuality of approach.
CO2	Understanding site planning: organization, scale, hierarchy, orientation and climate.
CO3	Understand complex services in multi-storied buildings; understanding the architectural content of services in buildings.
CO4	Implicate knowledge of design fundamentals and knowledge gained in other subjects to develop better design solutions.
CO5	Develop appropriate graphic skills and presentation techniques (models, rendering) to explain the contents of a design.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Exercise - I	Designing of public leisure and health facilities. Suggested Exercises Neighbourhood shopping centre Healthcare facilities Sports Club	50	1 & 2
2	Exercise - II	Designs to accommodate masses. Application of building bye-laws and codes of practices in design. Suggested Exercises Housing / Apartments / Condominiums Resorts, etc	50	1, 3 & 5
3	TIME PROBLEM	Design of any small scale shall be carried out in design week from introduction to final Submission 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. The problem introduced in design week to be judged by external experts.	44	1 & 4

Reference Books:

Time Saver Standards for Building Types by J. D. Chaira. and M. J. Crosbie

A Comparative analysis of 20th C. houses by H. Hareguchi

Design Process: A Primer for Architectural and Interior by S. F. Miller

Geoffrey Bawa: The Complete Works by D. Robson

e-Learning Source:

http://digital.library.unt.edu/ark:/67531.

	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	2	2		1	1	2					1	3	2	2		
CO2	3	3	2	3	2	2	1	3					1	2	2	3		
CO3	3	3	3	3	1	2	2	3					3	1	1	1		
CO4	2	2	3	3		2	3	3					3	1	2	2		
CO5	2	2	1	3		1	1	3					2	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR302	**Title of the Course**	Building Construction & Material - V	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	V	**1**	**2**	**2**	**5**
Pre-Requisite	AR211	**Co-requisite**	AR305				
Course Objectives	1. To develop understanding about construction principles. 2. Construction technology and appropriate materials for structural systems, roofing, enveloping and interior finishes shall be considered under this subject from simple examples to complex. 3. To introduce and familiarize the students with the basics of seismic design and construction methods. 4. 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 develop understanding about construction principles
CO2	Construction technology and appropriate materials for structural systems, roofing, enveloping and interior finishes shall be considered under this subject from simple examples to complex.
CO3	To introduce and familiarize the students with the basics of seismic design and construction methods.
CO4	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.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Curtain walls**	Curtain walls in glass, aluminum, Precast concrete units etc. for buildings like laboratories, offices, Showrooms, Multiplexes, Malls etc. and their joinery details.	16	1&2
2	**Designing for earthquakes**	Building earthquake resistant buildings: Characteristics as regards size of buildings, horizontal and vertical layout of buildings, adjacency of buildings; Ductility for good seismic performance: type of materials, elementary design concept, flexibility, working drawings to cater to details required for earthquake resistant building in Seismic Zone V.	16	1&3
3	**Prefabrication, pre-stressing**	Prefabrication: Open prefab system, large panel prefab system, joints, pre-casting methods, materials, on-site and off-site prefabrication, components, etc.; Pre-stressed Concrete: Introduction, methods of pre-stressing and their application to large-space structures	16	1&4
4	**Structural steel works**	Typical metal joinery- Riveted and bolted, soldering, brazing and welding; Detailing of structural steel work- beam to column joint, beam to beam joint, column splice, column base and roof truss to column joints, Study of roof truss (steel) etc.	16	4&2
5	**Industrial construction**	Structural steel works: Portal frame, North-light truss and Lattice girder roof with various roof coverings.	16	2&3

Reference Books:

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

Building Materials by S. K. Duggal

Materials of Construction by D. N. Ghosh

Building Construction – Vol. I and II by W. B. Mackay

Building Construction by S. C. Rangwala

Construction Technology Vol. III by R. Chudley

Earthquake Resistant Design of Structures by M. Shrikhande and P. Agarwal

Earthquake Resistant Building Construction by Hemant Kumar Sharma

e-Learning Source:

Earthquake Resistant Design: https://www.iitk.ac.in/nicee/IITK-GSDMA/EBB_001_30May2013.pdf

Building Materials & Construction: https://archive.nptel.ac.in/courses/105/102/105102088/

	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	1	2	2	2		1	1	2					2	3	2	2		
CO2	2	3	2	3	2	2	1	3					3	3	3	1		
CO3	3	3	3	3	1	2	2	3					3	3	3	2		
CO4	2	2	3	3		2	3	3					3	3	2	2		
CO5													3	3	3	1		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 21							
Course Code	**AR303**	**Title of the Course**	**HOUSING**	**L**	**T**	**P**	**C**
Year	III	**Semester**	V	2	-	-	2
Pre-Requisite	Nill	**Co-requisite**	Nill				
Course Objectives	1. To enable the students to understand the fundamentals of housing needs, housing finance and housing techniques with relation to social and environmental effect. 2. To understand strategies adopted in Mass Housing projects of various nature and issues related to design considerations.						

Course Outcomes	
CO1	Theoretically understand the fundamentals of housing needs.
CO2	Understand housing finance and housing techniques with relation to social and environmental effect.
CO3	Understand strategies adopted in Mass Housing projects of various nature and issues related to design considerations
CO4	Understand planning principles with respect to housing.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Housing and its importance in architecture and its relationship with neighborhood and city planning. Significance of housing in National development and social well-being of its citizens; Housing economics, Global housing scenario with emphasis on third world countries.	6	1 & 4
2	Housing Definitions Need and Shortage	Defining and understanding various types of Housing viz. Mass Housing, Group Housing, Apartments, Row Housing, Site and Services, Slums and Squatter housing, Exponential Housing, Social Housing; Assessment of Housing Need, Shortage, and Demand. Economic categorization – EWS, LIG, MIG, and HIG; Quantitative and qualitative aspects of housing.	10	2, 3 & 4
3	Housing Policies and The Role of Housing Agencies	Understanding and evaluation of National and State Housing Policies and programmes in India; Policy framework for urban housing; Affordable Housing, Low Income and Low-Cost Housing.An introductory study of Housing Boards, Development Authorities, and Cooperative Housing Societies in tackling the housing problem of the Country. A brief study of Housing Finance Institutions like HUDCO, HDFC, NHB, etc.	10	1, 2& 4
4	Housing Design and Development Process	Understanding of factors affecting the residential location and site planning, social and physical facilities; revisiting FAR, Density, and Ground coverage norms and standards for the development of housing estates; Determination of Housing mix. Undertaking a conceptual exercise for a small group housing project.	10	4
5	Case Studies	Exclusive case studies relating to Plotted Housing, Slums and High- rise Housing /Apartments including detailed analysis of Unit designs and basic principles of Estate Management.	06	1 & 4

Reference Books:

Mans Struggle For Shelters In An Urbanizing World by Abrams Charles

Urban Housing Strategies by Babur Mumtaz & Patweikly.

Low Income Housing In The Developing World by Geoffrev K.Paul,

Housing By People by John F.C Turner,

Housing, Climate And Comfort by Martin Evans,

Environment And Design In Housing by Lewis Davidson Gotlieb,

Urban Housing Strategies. by Babur Mumtaz and Patweikly,

Urban Housing in Developing Economy by O. P. Miglani .

Urban Housing and Slums by A. K. Jain,

e-Learning Source:

https://www.india.gov.in/topics/housing/urban-housing

https://data.gov.in/keywords/urban-housing

https://www.hudco.org/Site/FormTemplete/frmTemp1PLargeTC1C.aspx?MnId

	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	1	1	1	1	3	1	3	2					3	2	3	2		
CO2	3	2	2	1	3	1	1	3					3	3	3	1		
CO3	3	3	3	1	2	2	1	1					3	3	3	2		
CO4	2	2	1	3	3	1	3	1					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**

Integral University, Lucknow

Effective from Session: 2020-2021							
Course Code	AR 304	**Title of the Course**	Building Bye Laws	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	V	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	AR301				
Course Objectives	1. Familiarization with Development Control Rules and Building byelaws 2. To acquaint the students with various codes of practices/ acts relating to building construction. 3. To make the student appreciate the implications of issues emerging from an urban context.						

Course Outcomes	
CO1	To make students understand how to maintain the overall massing of the city in an urban context.
CO2	To familiarize student with development of design according to Control Rules and Building Bye laws of Local Authority.
CO3	To understand the plan approval process from the sanctioning authority.
CO4	To make students aware about the various codes of practices and different acts regarding the construction of building
CO5	To make students aware about the Norms and standards for different typology of users.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Historical background; Relevance; Definitions. ; NBC, Master and Zonal plan; Land-use etc	04	1
2	Building Regulations	General Building Requirements like Setback, Ground Coverage, Height, F.A.R., Density, Room sizes, Light and Ventilation etc.	08	2
3	Procedure For Obtaining Building Permit	Procedure for obtaining Building Permit (including online procedure)- compounding and completion certificate. Development Control rules including open spaces, road widths, junctions, parking norms, community facilities etc	08	3
4	Fire Protection And Fire Safety Requirements	Classification of Buildings based on occupancy, Fire Zones, Types of construction, General requirements of all individual occupancies and General Exit requirements. Fire protection requirements for high rise buildings- 15m in height or above	08	4
5	Special Requirements	Special requirements for group housing, multistoried and special buildings like malls, multiplexes, convention centers, SEZ's etc. Norms for differently abled, senior citizen and children.	04	5

Reference Books:

Bhawan Nirman Avam Vikas Upvidhi, Lucknow Development Authority, Lucknow

2016 National Building Code of India

Master plans of relevant town/city.

Modern building Bye Laws.

e-Learning Source:

http://www.urbanindia.nic.in/publicinfo/byelaws/Chap-2.pdf

https://www.upavp.com/gov_planning.htm

http://uparchitects.org/rev_bye_laws3.htm

http://jmc.nic.in/forms/byelaws.pdf

	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	3	3	1		
CO2	-	3	-	-	3	-	-	1					3	3	1	1		
CO3	3	2	1	1	2	-	-	2					3	3	2	1		
CO4	1	3	2	2	2	-	1	2					2	3	2	2		
CO5	3	2	1	1	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**

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR305	**Title of the Course**	Architectural Structures-IV	**L**	**T**	**P**	**C**
Year	III	**Semester**	V	**1**	**2**	**-**	**2**
Pre-Requisite	AR213	**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.						

Course Outcomes	
CO1	Forces and their resolution.
CO2	Bending stresses and its nature for different sections.
CO3	Shear stresses and various sections.
CO4	Nature of deflection and angle of slope in cantilever and simply supported beams for different kind of loading.
CO5	Behavior of columns and struts after their loading, understanding through different theories.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**STRESSES IN TRUSSES**	Forces in members, analytical method; method of joints, method of sections	10	1
2	**BENDING STRESSES**	Bending equation, bending stresses in symmetrical and asymmetrical sections.	10	2
3	**SHEAR STRESS**	Shear stress distribution in various sections	9	3
4	**DEFLECTION OF BEAMS**	Differential equation of deflected beam, double integration method, Macaulay's method, statically determinate beams and propped cantilever, moment area method.	9	4
5	**COLUMNS AND STRUTS**	End conditions, effective length, slenderness ratio, Euler's and Rankin's formulae.	10	5

Reference Books:

Elements of Structural Analysis by S. A. Bari

Structure and Architecture by A. J. Macdonald

Strength of Materials by R. K. Rajput

Engineering Mechanics by R. K. Bansal

Mechanics of Structures by S. B. Junnarkar

Strength of Materials by R. S. Khurmi

Elements of Engineering Mechanics by S. Mukharji

Engineering Mechanics: A Textbook of Applied Mechanics by S. Ramamurtham

Analysis of Structures. Vol. I by Vazirani and Ratwani

e-Learning Source:

http://emweb.unl.edu/NEGAHBAN/EM223/note12/note12.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	PSO5	PSO6
CO1	1	1	1	1	1	1	1	1					3	3	2	2		
CO2	2	2	2	2	2	2	2	2					2	3	3	3		
CO3	3	3	3	3	3	3	3	3					3	2	3	2		
CO4	2	2	2	2	2	2	2	2					3	2	3	2		
CO5	2	3	3	2	2	3	2	2					1	3	2	1		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	**AR306**	**Title of the Course**	**History of Architecture, Art & Culture-IV**	**L**	**T**	**P**	**C**
Year	III	**Semester**	V	1	2		2
Pre-Requisite	AR215	**Co-requisite**	Nil				
Course Objectives	1. Understanding of period in terms of contexts of location, climate and other parameters. 2. Understanding of period in terms of contexts of location, climate and other parameters. 3. To understand the development in the Western Architecture from Renaissance to the Contemporary with emphasis on the underlying parameters, philosophy, intentions and expressions of associated periods/ movements as a response to the context of time, location and aspirations. 4. Familiarizing with typical examples of building type. 5. Familiarizing with typical examples of building type. 6. To generate an understanding about the development and its architectural implications.						

Course Outcomes	
CO1	Know about the period in terms of contexts of technology and other parameters.
CO2	Know the development in the modern period with emphasis on the underlying parameters, philosophy, intentions and expressions of associated periods/ movements as a response to the context of time, location and aspirations.
CO3	Understand the building type and its architectural style.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**LEADING TO A NEW ARCHITECTURE AND REVIEWING INDUSTRIALIZATIO N**	Beginnings of modernity, Origin and development of Neo Classicism, Structural Neo classicists: Marc Antonie Laugier, acques Germain Soufflot, Karl Friedrich Schinkel, Henri Labrouste; Romantic Neo classicists: Claude Nicolas Ledoux, Etienne-Louis Boulle, Durand,Jefferson Industrialization and its impact, Emergent new building / space types, Growing need for mass housing, Development of Industrial material and construction technologies- concrete, glass and steel, structural engineering, standardization, Industrial exhibitions, Chicago School and skyscraper development. ***Reviewing Industrialization:*** Opposition to industrial arts and production, Arts and Crafts movement in Europe and America: William Morris, Philip Webb Art Nouveau: Victor Horta, Van De Velde, Antonio Gaudi, C. R.Mackintosh Vienna secession: Josef Hoffman, Joseph Maria Olbrich, Frank Lloyd Wright's early works	10	1, 2 & 3
2	**MODERN MOVEMENT AND INTERNATIONAL STYLE**	Second phase of Industrial Revolution (development of automobiles and elevator technologies, rise of mass-production paradigm); Emergence of Modern Architecture, Chicago School, De Stijl movement, Bauhaus movement and CIAM, International style, Post War reconstruction in Europe, and its influences on Modern Architecture, Philosophies of minimalism and Form Follows Function; works of great modern masters (Peter Behrens, Edwin Lutyens, Walter Gropius, Mies Van der Rohe, Le Corbusier, later works Frank Lloyd Wright; Louis Kahn, Alvar Alto etc;). Planning thoughts associated with Modernism: Towers in the sky and automobile dependent urban thoughts of Corbusier and Wright, The International Style: simplification of the Modern architecture into steel and glass cubes- an overview of the works of Philip Johnson; Critiquing Modernism: Brutalism: projects of Smithsons and Aldo Van Eyck, writings of Jane Jacobs, Robert Venturi, Aldo Rossi and Christopher Alexander.	15	1, 2 & 3
3	**POST MODERNISM**	*Post modernism of Reaction:* Architecture entrenched in place and history; sarcastic approval of expression, ornament, symbolism and context - an overview of the works of James Stirling, Michael Graves, Charles Moore. *Post modernism of Resistance:* Disregard for historical imagery; revival of the ideals of the Modern Architecture of the 20's; exaggerated and sophisticated revival of the grid and Corbusier's geometry - an overview of the works of Richard Rogers, Norman Foster, Richard Meier.	6	1, 2 & 3

4	**HI-TECH AND HISTORICISM**	Synthesis of the Hi-Tech and Historicism - an overview of the works of Cesar Pelli, Aldo Rossi, Renzo Piano	4	1 & 2
5	**DECONSTRUCTION**	Deconstruction as a reaction to the Post Modern; non-perfection as important as perfection, narrative and representational; traditional purity of form, geometry and structure in question - an overview of the works of Frank O. Gehry, Peter Eisenman, Bernard Tschumi, Rem Koolhas, Zaha Hadid, and Daniel Libskind *Alternative practices and idea:* Oil crisis of the 1970s and rising environmental consciousness; Theory of New Urbanism and Sustainable Urban Development. *Critical Regionalism*- Ideas and works of Laurie Baker, Hasan Fathy, Ralph Erskine, Lucien Kroll, Ando, Bawa, Barragan, Siza	12	1, 2 & 3

Reference Books:
A History of Architecture by Sir Banister Fletcher,
Modern Architecture - A Critical by K. Frampton
Modern Architecture since 1900 by W. J. R. Curtis.
Architecture in the Twentieth Century by P. Gossel & G. Leuthauser.
The Language of Post-Modern Architecture by C. Jencks
The eyes of the skin: Architecture and the senses. by J. Pallasmaa
Biomimicry in Architecture by M. Pawlyn .
Architecture and disjunction. by B. Tschumi..
Complexity and Contradiction in Architecture by R. Venturi. .
Vitruvius: The ten books on architecture by P. Vitruvius, M. H. Morgan.
e-Learning Source:
http://architecture.arizona.edu/sites/default/files/projects/MAPP%20Tucson%20context%20study.pdf
http://www.studentpulse.com/articles/515/the-rise-and-fall-of-modernist-architecture
http://www.visual-arts-cork.com/architecture/international

	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	1	-	3	3	2	-	3	2					2	3	2	1		
CO2	1	-	-	3	3	-	3	2					3	2	3	2		
CO3	1	2	-	3	1	-	3	3					3	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR307	**Title of the Course**	BUILDING SPECIFICATION	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	V	**1**	**2**	**0**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To acquaint students with methodology of writing specifications with reference to building trades, materials, Workmanship and performance of different items of work and introducing the students to specifications as an Integral part of contract document for building projects.						

Course Outcomes	
CO1	Introduction, definition, importance and scope of the subject. Correct form of specification writing – avoiding ambiguity and conflicting statements. Form and sequence of clauses, study and use of standard specifications.
CO2	Detailed specification writing of various building materials, e.g. bricks, sand, lime, glass, paints, metals, timber and its products, which includes about selection of materials with their trade names, manufacturers specifications of allied products such as block board, plywood, soft board, aluminum, steel etc.
CO3	DPC and DPM, General idea about water proofing in basement, swimming pool, toilets, kitchen, terraces and water tanks etc.
CO4	Superstructure in cement mortar, plastering and painting, flooring, whitewashing, distempering and painting, cement paint, stone masonry, mud phuska, terracing and others.
CO5	Gen. Specifications for Electrical, plumbing and gas supply arrangement within building. Lighting and Earthling, sewage disposal, rain water harvesting etc.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Specification writing**	Introduction, definition, importance and scope of the subject. Correct form of specification writing – avoiding ambiguity and conflicting statements. Form and sequence of clauses, study and use of standard specifications drafted by C.P.W.D., PWD & MES etc.	8	1
2	**Specification of General Building Materials**	Detailed specification writing of various building materials, e.g. bricks, sand, lime, glass, paints, metals, timber and its products, which includes about selection of materials with their trade names, manufacturer's specifications of allied products such as block board, plywood, soft board, aluminum, steel etc. Identifying a section by their weight, gauge etc. Specifications for alternative building materials and finishes, Wall cladding, facades, ACP, suspended concrete floors, concrete hollow blocks, tampered concrete and Architraves etc.	8	2
3	**Sub-structure work**	DPC and DPM, General idea about water proofing in basement, swimming pool, toilets, kitchen, terraces and water tanks etc.	8	3
4	**Super structure**	Superstructure in cement mortar, plastering and painting, flooring, whitewashing, dis tempering and painting, cement paint, stone masonry, mud phuska, terracing and others. Specifications for concrete work including mixing, transportation, placing and curing of concrete, concrete add mix scaffolding required for R.C.C. Works.	8	4
5	**Services specification & market survey**	Gen. Specifications for Electrical, plumbing and gas supply arrangement within building. Lighting and Earthing, sewage disposal, rain water harvesting etc. A comprehensive market survey required for different building material including their make, quality/grade and size.	8	5

Reference Books:

Estimating, Costing, Specification & Valuation by M. Chakarborty

CPWD Specifications and schedule of rate analysis

I. S. 1200 Parts I to XXV – Method of Measurement of Building and Civil Engineering Works, Bureau of Indian Standards

Cost studies of buildings, Pearson Higher Education by A Ashworth

Standard Handbook for Civil Engineering

Standard Schedule of Rates for Delhi, CPWD & UPPWD

Standard Specifications, CPWD & UPPWD

National Building Code of India (Latest Edition), Bureau of Indian Standards

e-Learning Source:

Building Materials & Construction: https://nptel.ac.in/courses/105102088

Schedule of rates: https://cpwd.gov.in/Publication/DSR_Vol_1_Hindi_2018.pdf

Building Specification Vol – I: https://cpwd.gov.in/Publication/Specs2009V1.pdf

Building Specification Vol – II: https://cpwd.gov.in/Publication/Specs2009V2.pdf

	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	1	3	2	1	2	2	2	1					1	3	2	2		
CO2	2	3	3	2	-	3	2	1					3	3	2	3		
CO3	3	3	3	2	-	2	2	1					2	3	3	2		
CO4	2	3	3	1	-	2	2	1					1	3	3	2		
CO5		3	2	1	1	2	1	1					1	2	2	3		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR-308	**Title of the Course**	BUILDING SERVICES - MECHANICAL	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	V	**1**	**2**		**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. To understand advanced building services pertaining to natural and mechanical ventilation, and their application to built forms. 2. To make students aware about Fire- fighting methods, rules, regulations and equipments. 3. To understand the incorporation of Mechanical and fire fighting Services in building design. 4. To understand and prepare layout and details for design project in architectural design.						

Course Outcomes	
CO1	Demonstrate an understanding of building construction as it relates to firefighter safety, building codes, fire prevention, code inspection, and firefighting strategy.
CO2	Understand the basic fundamentals of mechanical systems.
CO3	Understanding the concept of Fire and methods used as fire-fighting.
CO4	Understanding of working of Lift and escalator as a mechanical device
CO5	Develop an understanding of local codes in reference to the topics of this course

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**HVAC (HEATING VENTILATION AND AIR CONDITIONING)**	Heating and Ventilation: Heating of spaces – local and central heating, heating equipments, Comfort conditions, temperature control, humidity control, air filtration, rate of ventilation, Control Room for centralized Heating System. Natural & Mechanical ventilation in buildings, Plenum system, exhaust system, plenum and exhaust system; and air filters. Duct sizes for mechanical ventilation as per NBC standards.	9	2
2	**HVAC (HEATING VENTILATION AND AIR CONDITIONING)**	Air Conditioning: Principles of Air-conditioning, refrigeration cycle and air cycle, working of window air conditioners, split air conditioners and central air-conditioning: parts, standards and location criterion, air distribution systems: fans, filters, ductwork, outlets, and dampers. Classification & working of AHU, norms and load calculation of air-conditioning as per NBC standards	10	2
3	**LIFTS AND ESCALATORS**	Types of lifts, parts, working, terminology: average travel, lift carrying capacity, rated load, rated speed, RTT, lift well, machine room and size. Lift Control Systems. Requirements for installation of lifts, market survey. Grouping of lifts and design standards of a lift lobby. Function and working of Escalators.	10	4
4	**FIRE SAFETY SYSTEMS AND EQUIPMENTS**	Fire- causes and spread of fire. Fire Alarm and Detection System, Fire Protection Systems and Equipments, Fire Fighting Equipments, Hydrant Systems, Fire Extinguishers- Gas taps, Foam, Portable	10	1 & 3
5	**APPLICATION IN DESIGN**	Introduction and calculation of shaft sizes, Fire Control room and location as per NBC Application of above studies in current design problems and preparing design layout and details.	9	2 & 4

Reference Books:

Fire Safety in Buildings by V. K. Jain.

Handbook of Designing and Installation of Services in Building Complex by V. K. Jain.

Heating, Ventilation and Air Conditioning- Systems and Equipments 2000 ASHRAE Handbook,

Handbook of Mechanical & Electrical systems for Buildings by H. E.Bovay

e-Learning Source:

http://www.epa.gov/iaq/schooldesign/hvac.html

http://en.wikipedia.org/wiki/HVAC

http://www.teriin.org/ResUpdate/reep/ch_5.pdf

http://en.wikipedia.org/wiki/Elevator

	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					2	3	1	2		
CO2	3		2	3		2	1	3					1	2	2	3		
CO3	2	3		3		3	1	1					3	2	1	1		
CO4	3		2	2		3	3	1					3	1	2	2		
CO5	3	2			3	2	3	1					2	3	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR309	**Title of the Course**	**Non-Teaching Credit Course (Summer Assignment)**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	V	**-**	**-**	**-**	**1**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	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. To inculcate the habit of reading books related to architecture and allied subjects in a structured manner. 3. 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	Audit Course is to be undertaken before the commencement of III semester classes. This assignment could be a 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. SUGGESTIVE EXERCISES Report Writing Power Point Presentations Measure drawing etc.	-	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	PSO3	PSO4	PSO5	PSO6
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**

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR310	**Title of the Course**	**ARCHITECTURAL DESIGN - VI**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	VI	**3**	**-**	**6**	**12**
Pre-Requisite	AR301	**Co-requisite**	Nil				
Course Objectives	The objectives of this studio are twofold. The first objective is to expose the students to the challendesigning functionally complicated buildings, having a complex array of activities and services; The objective is to familiarize the students to the task of coordinating integration of structural design and specbuilding services in the framework of architectural design. The third objective is to let the students und advanced construction technology and newer building materials.						

Course Outcomes	
CO1	Learn the art of collecting data and to carry out analysis for the process of evolving design and individuality of approach.
CO2	Understanding site planning: organization, scale, hierarchy, orientation and climate.
CO3	Understand complex services in multi-storied buildings; understanding the architectural content of services in buildings.
CO4	Implicate knowledge of design fundamentals and knowledge gained in other subjects to develop better design solutions.
CO5	Develop appropriate graphic skills and presentation techniques (models, rendering) to explain the contents of a design.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Muti-storeyed service orientedand recreational building.**	a) Emphasis on the design of services intensive, multi-storeyed, buildings in tighturban spatial context. b) Design focuses on closed environment, with emphases on interior spaces,integration of various services, and conformance with regulatory norms. c) The external environment to take into consideration circulation of emergencyvehicles and parking optimisation. The design studio may be closely synchronised with working drawing studio. *Suggested Exercises*Hotel Design Hospital Design	55	1,2,3
2	**The focus of thestudio is on functionality andintegration of advanced technology and services in multi-storeyed buildings.**	*Suggested Exercises* Mixed use multi-storeyed building.	55	2,3,4
3	**Time Problem**	Design of any small scale shall be carried out in design week from introduction tofinal Submission 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. The problem introduced in design week to be judged by external experts.	34	1,2,3,4,5
4				
5				

Reference Books:

Baiche, B. and Walliman, N., Neufert Architects Data, 4th Ed. Oxford : Wiley-Blackwell

Chiara, J. D. and Michael, J. C., Time Savers Standards for Building Types. Singapore :McGraw Hill Professional.

Gauzin-Muller, D., Sustainable Architecture and Urbanism: Concepts, Technologies,Examples. 1st Ed. Basel

Huxtable, A-L. (1984)., Tall Buildings Artistically Reconsidered
Kloft, E. and Johann, E., High-rise Manual: Typology and Design, Construction and Technology, 1st Ed. Basel : Birkhauser Verlag AG
Markus, K., Rollbacher, R., Herrmann, E., Wietzorrek, U. and Ebner, P., Typology+:Innovative Residential Architecture. Basel : BirkhauserVerlag AG.
Parker, D. And Wood, A. (2013), The Tall Buildings Reference Book. New York : Routledge
Wood, A. and Ruba, S. (2012), Guide to Natural Ventilation in High Rise Office Buildings. New York : Routledge
e-Learning Source:
Design Standards for Aged and Handicapped People: https://cpwd.gov.in/Publication/aged&disabled.pdf
Regulations on details of Doors and Windows for a Residential Buildings: https://cpwd.gov.in/Publication/manualdw.pdf

	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	2	2	-	1	1	2					2	2	1	2		
CO2	3	3	2	3	2	2	1	3					3	3	3	3		
CO3	3	3	3	3	1	2	2	3					2	2	2	1		
CO4	2	2	3	3	-	2	3	3					3	3	3	2		
CO5	2	2	1	3	-	1	1	3					3	2	3	2		

Ar. Shweta Verma
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Effective from Session: 2020 - 2021							
Course Code	AR311	**Title of the Course**	Building Construction & Material - VI	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	VI	**1**	**2**	**2**	**5**
Pre-Requisite	AR302	**Co-requisite**	Nil				
Course Objectives	1. To develop understanding about construction principles. 2. Construction technology and appropriate materials for structural systems, roofing, enveloping and interior finishes shall be considered under this subject from simple examples to complex. 3. To understand design limitations due to authority guidelines and making drawings/ details necessary for final execution of a project. 4. To introduce and familiarize the students with the advance construction techniques and methods. 5. The subjects should also focus on developing design abilities by applying basic principles of construction and choosing appropriate materials and techniques and mechanical technology as per market trends.						

Course Outcomes	
CO1	Knows about the construction principles used in the construction industry
CO2	Understand the trending Construction technology and appropriate materials for structural systems, roofing, enveloping and interior finishes
CO3	understand the design limitations with respect to authority guidelines for execution of a project
CO4	Familiarization of the students with the advance construction techniques and methods.
CO5	Understand & knows about the appropriate materials and techniques and mechanical technology as per market trends.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Sound proof construction**	Sound proof partitions and doors for recording studios, Cinemas, broadcasting studios etc. alongwith their construction details, finishes, and specification.	16	1,2
2	**Special construction**	Methods, types of floor construction: Beam & slab, waffle grid slab, drop beam and slab, flush slab and lift slab construction, Cast-in-situ service and stair cores, Cross wall and box frame construction.	14	1,2,3
3	**Vertical movement means**	Lifts, Elevators and Moving Walkways/ Travelators: Lifts of various types such as passenger, goods, hospitals etc. (with special reference to Design of lift cage), Constructional requirements for their installation and their detail- Escalators and Walkways/ Travelators etc.	14	1,3,4
4	**Retrofitting of structures**	Need of retrofitting, Techniques of retrofitting of structural components, Advanced retrofitting techniques of foundations, Beams, and other structural elements etc.	18	1,2,3,4
5	**Defects and remedies in buildings**	The study of various defects in buildings and their remedies: Defects caused by so many factors starting from the construction stage to occupied stage. A detailed portfolio will be prepared which includes the defects, deriving forces and the practiced solution along with any other remedial solution suggested by the student.	18	4,5

Reference Books:

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

Building Materials by S. K. Duggal

Materials of Construction by D. N. Ghosh

Building Construction – Vol. I and II by W. B. MAckey

Building Construction by S. C. Rangwala

Construction Technology Vol. III by R chudley

e-Learning Source:

Introduction to Lean Construction: https://archive.nptel.ac.in/courses/105/106/105106213/

Construction Methods & Equipment Management: https://archive.nptel.ac.in/courses/105/103/105103206/

Basic Construction Material: https://archive.nptel.ac.in/courses/105/106/105106206/

Characterization of Construction Material: https://archive.nptel.ac.in/courses/105/106/105106200/

	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	2	-	-	-	2	3					3	2	2	2		
CO2	1	2	3	2	1	3	3	2					2	3	3	1		
CO3	3	2	3	3	3	2	2	3					3	2	3	1		
CO4	3	2	3	1	-	2	-	3					3	2	3	3		
CO5	2	3	3	2	2	2	1	2					3	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 21							
Course Code	AR312	**Title of the Course**	Working Drawing and Details	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	VI	**-**	**4**	**-**	**2**
Pre-Requisite	AR203	**Co-requisite**	Nil				
Course Objectives	1. To develop understanding about good for construction drawings. 2. To introduce and familiarize the students with the contemporary construction method with special reference to advance constructional detail. 3. To understand design limitations due to authority guidelines and making drawings/ details necessary for final execution of a project. 4. The subjects should also focus on developing design abilities by applying basic principles of construction and choosing appropriate materials and techniques and mechanical technology as per market trends and site limitations.						

Course Outcomes	
CO1	To learn and study the types of drawings.
CO2	To introduce and familiarize the students with the contemporary construction method with special reference to advance constructional detail.
CO3	To understand design limitations due to authority guidelines and making drawings/ details necessary for final execution of a project.
CO4	To develop design abilities by applying basic principles of construction. and choosing appropriate materials and techniques and mechanical technology as per market trends and site limitations.
CO5	To develop abilities for selecting appropriate materials and techniques and mechanical technology as per market trends and site limitations.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Building Blocks	Structural Plan: Coordinated foundation layout with details, Plinth beam layout & detail, Column layout & detail, Lintel, Chajja, Projection plan & detail etc. Floor Plan(s): Coordinated ground floor plan; Coordinated first floor plan (typical); Coordinated terrace plan, Flooring pattern layout etc.	16	1-4
2	Building Blocks	Elevation & Sections: Coordinated elevation drawing, Coordinated sections, skin sections etc. Door/window/ventilators design/ drawing; door and window schedule, design, details etc.	08	1-4
3	Building Blocks	Services: Electrical layout plan and schedule; plumbing layout and schedule; toilet plan & details- complete with all fittings& fixtures; kitchen details complete with all fittings& fixtures etc.	16	1-4
4	Site Plan	Site/building set-out plan, Landscape plan & detail of various design elements used in previous design exercises, Drainage layout, Electrical layout, Fire fighting layout.	16	1-4
5	Details	Staircase details including railings; Design detail of entrance gate, grills, parapet and/or railings; Septic tank detail, Water harvesting pit details. Toilet/ Kitchen's counter finishes, dado details etc.	08	5

Reference Books:

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

Architectural Drafting and Design by Jefferis, A. and Madsen, D.A.

Details in Architecture: Vol. I-V by Joe, B. (Ed).

Plans Sections Elevations – Key buildings of the twentieth century. by R. Weston.

e-Learning Source:

https://www.designingbuildings.co.uk/wiki/Working_drawing

https://www.slideshare.net/sanjibsengupta18/architectural-working-drawing-248307290

https://www.pearsonhighered.com/assets/samplechapter/0/1/3/2/0132740648.pdf

	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	2	3	2	1	2	1	2	1					2	3	2	1		
CO2	2	2	1	2	2	3	2	2					3	2	3	2		
CO3	1	3	3	3	1	2	1	3					3	3	3	1		
CO4	3	2	2	3	2	1	2	2					2	3	3	2		
CO5	2	3	3	1	1	2	2	2					2	2	3	1		

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

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Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	**AR313**	**Title of the Course**	**Architectural Structures-V**	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**1**	**2**	**-**	**2**
Pre-Requisite	AR305	**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. Design of structural elements in reinforced cement concrete and steel structures.						

Course Outcomes	
CO1	Familiarizing about pre stressing technology and its application in modern construction.
CO2	Understanding about how to obtain effective and economical RCC section using pre-stressing technology.
CO3	Understanding role of riveted and welded joint in tresses and steel frames.
CO4	Understanding role of framed structure during considering earthquake resist design.
CO5	Have developing basic skill to use structural design software's and their importance.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**PRE-STRESSED CONCRETE**	Introduction: principles and systems, loss of pre-stress, analysis and design of pre-stress beams.	8	1
2	**REINFORCED CONCRETE BUILDINGS IN SEISMIC ZONES**	Effect of earthquake on concrete buildings, Role and design of beams, columns and joints in RC buildings. Planning for reducing earthquake effects on buildings.	6	2
3	**STEEL STRUCTURES**	Design of riveted and welded connections (simple cases only), tension and compression members, beam and plate girder, introduction to grillage foundation and trusses.	6	3
4	**EARTHQUAKE RESISTANT DESIGN**	Elements of Earthquake Engineering, zoning, base shear, lateral forces, ductile detailing and introduction to new codes.	6	4
5	**INTRODUCTION TO COMPUTER-AIDED STRUCTURAL DESIGN**	Demo of practical problems using STAAD taking G+3 framed RCC structure case.	6	5

Reference Books:

Elements of Structural Analysis by S. A. Bari

Structure and Architecture by A. J. Macdonald

Strength of Materials by R. K. Rajput

Engineering Mechanics by R. K. Bansal

Mechanics of Structures by S. B. Junnarkar

Strength of Materials by R. S. Khurmi

Elements of Engineering Mechanics by S. Mukharji

Engineering Mechanics: A Textbook of Applied Mechanics by S. Ramamurtham

Analysis of Structures. Vol. I by Vazirani and Ratwani

e-Learning Source:

http://www.cement.org/cement-concrete-basics/products/prestressed-concrete

	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	2	3	3	2	-	2	2	1					1	3	2	3		
CO2	1	2	3	2	-	1	1	-					2	2	3	2		
CO3	3	3	3	3	-	3	2	1					2	3	2	1		
CO4	1	2	3	2	-	2	1	1					3	2	2	1		
CO5	1	3	3	2	2	3	1	3					2	3	3	2		

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR314	**Title of the Course**	Urban Legislation	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	2	-	-	2
Pre-Requisite	AR304	**Co-requisite**	Nil				
Course Objectives	1. Familiarization with Development Control Rules and Building Byelaws. 2. To acquaint the students with various codes of practices/ acts relating to building construction. 3. To make the student appreciate the implications of issues emerging from an urban context						

Course Outcomes	
CO1	Students knows and familiarized with Development Control Rules
CO2	Students knows and familiarized with building bye laws of respective areas
CO3	Understand the use of various codes of practices with respect to standards of construction industry
CO4	Understanding of the working of acts of building construction. .
CO5	Develop an understanding of implications of issues emerging from an urban context in construction.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction and Brief Description**	Objective and Methodology of Urban legislations	8	1 & 5
2	**Uttar Pradesh State Acts and Rules**	● Uttar Pradesh (Regulation of Building Operations) Act. 1958 ● Uttar Pradesh Avas Evam Vikas Parishad Adhiniyam, 1965 ● Uttar Pradesh Urban Planning and Development Act, 1973 ● Uttar Pradesh Parks, Playgrounds and Open Spaces (Preservation and Regulation) Act, 1975 ● The Uttar Pradesh *Apartment* (Promotion of Construction, Ownership and Maintenance) *Act*, *2010*	6	2 & 3
3	**Central Acts and Rules**	● The Ancient Monuments and Archaeological Sites and Remains Act -1958 along with 2010 Amendment ● The Constitution (Seventy-Fourth Amendment) Act, 1992 ● The Special Economic Zones Act, 2005 ● Land Acquisition, Rehabilitation and Resettlement Act, 2013 ● The *Real Estate (Regulation and* Development) *Act*, 2016	6	3
4	**Environmental Protection Acts and Rules**	● The Slum Areas (Improvement and Clearance) Act, 1956 ● Water (Prevention and Control of Pollution) Act, 1974; ● Air (Prevention and Control of Pollution) Act, 1981 ● The Environment (Protection) Act, 1986 ● Coastal Regulation Zone Notification-2011 ● E-Waste Management Rules, 2016	8	4
5	**Special Acts and Rules**	● The Delhi Urban Arts Commission Act 1973 ● The National Capital Region Act 1985 ● Delhi Metro Railway (Operation and Maintenance) Act, 2002	4	1, 2 & 4

Reference Books:
Bhawan Nirman Avam Vikas Upvidhi, Lucknow Development Authority, Lucknow
Master plans of relevant town/city.
National Building Code of India- 2005
Unified Building Byelaws of U. P. Government -2008
IS Code- 8888
The U.P. Urban Planning and Development Act 1973 Environmental Protection Act 1986
Energy Conservation Building Codes of India- 200
National Building Code of India 2016
The Uttar Pradesh (Regulations and Building operations) Act. 1958.
e-Learning Source:

http://www.urbanindia.nic.in/publicinfo/byelaws/Chap-2.pdf
https://www.upavp.com/gov_planning.htm
http://uparchitects.org/rev_bye_laws3.htm
http://jmc.nic.in/forms/byelaws.pdf

	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	-	1	3	2	1	2	2	1					3	3	2	3		
CO2	2	-	3	1	-		3	1					3	3	3	2		
CO3	-	2	-	-	-	3	-	1					3	2	3	1		
CO4	3		1	2	3	2	2	3					3	2	3	1		
CO5	-	3	-	3	1		1	3					3	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR315	**Title of the Course**	Principles of Human Settlement	**L**	**T**	**P**	**C**
Year	III	**Semester**	VI	**1**	**2**	**-**	**2**
Pre-Requisite	AR205	**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 the 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	To introduce the subject of Town planning to students of architecture so that the students can relate to the architectural projects in context of planning.
CO2	To develop basic skills in planning surveys, analysis, generating alternative planning strategies
CO3	Evaluation of options and preparation of plans.
CO4	Understand planning principles and their evolution.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Man and Environment	Basic concepts of settlements, civilization, environment (natural and built), habitat, community. Man-Environment interaction: A brief description of major types of environment, major components of human environment interaction, Biological and behavioral responses to human settlements.	14	2, 3.4
2	Evolution of Planning Thought in India And Abroad	Evolution of Planning process in India with reference to Indus Valley Civilization and Vedic period. Ancient: Early cave and hut settlements, Mesopotamia, Jericho, Ancient Roman and Greece settlements. Medieval: Delhi and Fatehpur Sikri. Gothic and Renaissance with reference to extensive settlement system, city characteristics, infrastructure and transportation. Modern: Jaipur, Chandigarh.	10	1, 3, 4
3	The Human Settlement System	Vancouver Declaration on Human Settlements (1976), Physical components of Human Settlements such as shelter, infrastructure and services, Principles of Human Settlements.	12	3, 4
4	Urban and Rural Settlements	Classification of Settlements. Basic differences between rural and urban settlements, semi agricultural and semi urban settlements. Urban Settlements: The commercial city, the industrial city, the transportation city, the recreational city, educational cities. Rural settlements: Types and hierarchies of rural settlements: farmstead, nomadic, semi-nomadic, composite and permanent rural settlements.	12	2, 3, 4

Reference Books:

Urban Pattern by B. Gallion.

Fundamentals of Town Planning by G. K. Hiraskar,

City in History by Lewis Mumford.

History Builds the Town by Auther Korn.

Town Planning by S. C. Rangwala.

Town Planning in Ancient India. planning by B.B. Dutt.

Urban and Regional by Gowda Rame.

e-Learning Source:

http://www.nios.ac.in/media/documents/316courseE/ch29.pdf

http://prezi.com/ifubcui3ikau/development-of-indian-civilization/

http://education.nationalgeographic.com/education/standards/national-geography-standards/12/?ar_a=1

	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	1	1	1	3	3	1	3	2					3	2	2	3		
CO2	2	2	2	3	3	1	3	3					2	2	1	2		
CO3	3	2	3	3	2	2	1	2					3	3	3	1		
CO4	2	2	1	3	2	1	3	1					2	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR316	**Title of the Course**	ESTIMATION & VALUATION	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	VI	**1**	**2**	**0**	**2**
Pre-Requisite	AR307	**Co-requisite**	AR505				
Course Objectives	1. To initiate the students into theory and practice of estimating and quantity surveying. 2. To inculcate awareness regarding factors affecting cost of buildings. 3. To familiarize the student with the commonly used methods of preparing estimates of Architectural Projects.						

Course Outcomes	
CO1	Definition, Aim and object, Scope and importance of subject, types of estimates - approximate and detailed.
CO2	Procedure of estimating, Calculation of quantities, schedule of rates. Exercises of estimating (with different methods) of small buildings including interior schemes, plumbing work and electrical installations etc.
CO3	Principles of analysis of rates, rates of labour and materials, exercises in rate analysis of different building works, e.g. earthwork for foundations, PCC, masonry, RCC, flooring, timber work etc.
CO4	Costing of a small residential unit project. Introduction to computer-based software for cost estimation.
CO5	Importance and scope of subject for an architect, Essential characteristics of valuation, elements of valuation, value classification and types of valuation, difference between cost, price and value, factors affecting valuation, techniques of valuation of landed and building property.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**	
1	**Estimating and its various methods**	Definition, Aim and object, Scope and importance of subject, types of estimates - approximate and detailed. Methods for estimation viz-a-viz Plinth area method, carpet/floor area method, cubic content method, approximate quantity method and number system	8	CO1	
2	**Detailed estimates**	Procedure of estimating, Calculation of quantities, schedule of rates. Exercises of estimating (with different methods) of small buildings including interior schemes, plumbing work and electrical installations etc. Measurements of typical elements, viz. Arches, steps and polygonal rooms	8	CO2	
3	**Analysis of Rates**	Principles of analysis of rates, rates of labour and materials, exercises in rate analysis of different building works, e.g. earthwork for foundations, PCC, masonry, RCC, flooring, timber work etc. preparing Bill of Quantities by using advance software's	8	CO3	
4	**Costing practices**	Costing of a small residential unit project. Introduction to computer-based software for cost estimation.	8	CO4	
5	**Valuation**	Importance and scope of subject for an architect, Essential characteristics of valuation, elements of valuation, value classification and types of valuation, difference between cost, price and value, factors affecting valuation, techniques of valuation of landed and building property. Standard rent calculation, depreciation, preparation of valuation reports	8	CO5	

Reference Books:
Estimating, Costing, Specification & Valuation by M. Chakarborty
CPWD Specifications and schedule of rate analysis
I. S. 1200 Parts I to XXV – Method of Measurement of Building and Civil Engineering Works, Bureau of Indian Standards
Cost studies of buildings, Pearson Higher Education by A Ashworth
Standard Handbook for Civil Engineering
Standard Schedule of Rates for Delhi, CPWD & UPPWD
Standard Specifications, CPWD & UPPWD
National Building Code of India (Latest Edition), Bureau of Indian Standards

e-Learning Source:
Building Specification Vol – I: https://cpwd.gov.in/Publication/Specs2009V1.pdf
Building Specification Vol – II; https://cpwd.gov.in/Publication/Specs2009V2.pdf
Schedule of Rates Vol – I: https://cpwd.gov.in/Publication/DSR_Vol_1_Hindi_2018.pdf
Schedule of Rates Vol – II: https://cpwd.gov.in/Publication/DSR_Vol_2_Hindi_2018.pdf

	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	2	3	3	2	1	2	2	1					2	2	2	1		
CO2	3	3	3	2	-	2	2	2					2	3	1	2		
CO3	2	1	2	2	-	2	2	1					3	3	1	3		
CO4	1	3	3	2	-	2	2	1					3	2	2	2		
CO5	2	3	3	1	1	2	2	1					3	3	1	2		

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

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

Integral University, Lucknow

Effective from Session: 20200 - 2021							
Course Code	AR317	**Title of the Course**	Building Services-Acoustics	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	VI	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	AR311				
Course Objectives	1. To initiate students into theory and practice of acoustics. 2. Applying in architectural design and preparing layout and details						

Course Outcomes	
CO1	Understand standard measurement methods that are used in building acoustics and Analyze acoustic properties of typically used materials for design consideration. .
CO2	Apply prediction methods to assess the transmission of noise in buildings, its mitigation and reverberation of sound.
CO3	Select appropriate building constructions for the solution of practical noise problems and evaluate their performance
CO4	Make basic room acoustic measurements and determine the various indicators used for auditorium acoustics
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	**INTRODUCTION**	Fundamentals of acoustics: nature of sound Basic terminology: frequency, pitch, tone, sound pressure, sound intensity, decibel scale, loudness, threshold of audibility and pain, masking, sound and distance – inverse square law, background noise, reverberation, echo, reverberation time (T20, T30, EDT T60), optimum reverberation time, clarity, definition, loudness, ray diagram, testing rooms, anechoic chambers, reverberation chambers.	5	2
2	**BEHAVIOUR OF AUDIBLE SOUND AND COMMON ACOUSTICAL DEFECTS**	Behaviour of sound in an enclosed spaces – reflection of sound, nature of reflection from plane, convex and concave surfaces, sound diffraction, Absorption of sound, sound absorption coefficient, reverberation, reverberation time calculation, use of Sabine's and Eyring's formulae,	6	2
3	**CONSTRUCTIONAL MEASURES FOR SOUND INSULATION OF BUILDINGS**	Sound absorbents, porous materials, panel or membrane absorbers and cavity or Holmboltz resonators, role of functional absorbers Bass trap, acoustical detailing of interior spaces, hollow & composite wall construction, flooring & ceiling. Absorption coefficients of indigenous acoustical materials, use of IS code 2526-1963 Simulation software: EASE, Odeon etc.	8	4
4	**NOISE CONTROL**	External noise source and its control (Traffic, Rain, industry etc.), Source within buildings and its control (Fans, chillers, boilers, HVAC noise sources), air born and structure borne sound transmission, vibration isolation, damping. Site planning, Background noise criteria (NR, PNC, STI), Noise barrier, Types and design of Noise barrier, Urban Soundscape, Keynote, foreground and soundmark, Hi-fi, lo-fi, micro and macroscale modelling.	8	1 & 3
5	**ACOUSTICAL DESIGN**	Site selection, acoustics of ancient Greek and Roman theatres Design of open air theatre, acoustical design of Lecture halls, meeting rooms, recording studios, auditoriums, concert halls, churches, home theatres, cinema theatres etc.	5	2 & 4

Reference Books:

Engineering Materials by R. K. Rajpoot,

Building Construction by S. C. Rangwala .

Auditorium acoustics and architectural design by M. Barron.

Concepts in Architectural Acoustics by D. M. Eagan

e-Learning Source:

http://www.airah.org.au/iMIS15_Prod/Content_Files/Divisionmeetingpresentations/QLD/

http://www.soundvent.co.uk/building-services-acoustics-dos-and-donts/

http://calteches.library.caltech.edu/98/1/Watson.pdf

https://law.resource.org/pub/bd/bnbc.2012/gov.bd.bnbc.2012.08.03.pdf

	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					2	2	1	2		
CO2	3		2	3		2	1	3					3	1	3	2		
CO3	2	3		3		3	1	1					2	2	1	1		
CO4	3		2	2		3	3	1					3	1	2	1		
CO5	3	2			3	2	3	1					2	3	1	2		

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

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

Integral University, Lucknow

Effective from Session: 2020 - 2021							
Course Code	AR318	**Title of the Course**	**Educational Tour and Documentation**	**L**	**T**	**P**	**C**
Year	**III**	**Semester**	VI	**-**	**-**	**-**	**1**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	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. Making students familiarize with various kind of architecture for a given single resource (recreational architecture) 3. Understanding site planning: organization, scale, hierarchy, orientation and climate. 4. Understanding complex services in multi-storied buildings; understanding the architectural content of services in buildings. 5. Development of various styles with reference to the influencing factors such as geographical, geological, climatic, religious social and political conditions.						

Course Outcomes	
CO1	Student learn the art of collecting data and to carry out analysis for the process of evolving design and individuality of approach
CO2	Students familiarize with various kind of architecture for a given single resource (recreational architecture).
CO3	Understand site planning: organization, scale, hierarchy, orientation and climate.
CO4	Understand complex services in multi-storied buildings; understanding the architectural content of services in buildings.
CO5	Developed various styles with reference to the influencing factors such as geographical, geological, climatic, religious social and political conditions.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	***Suggestive places to visit***	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· ***Suggestive exercises*** Case study - presentation on complex services of any building taken Case study - presentation on the intelligent building parameter/sustainable parameter applicable over the building taken. Case study - presentation on challenges and solution in a site plan of any campus visited. Measure drawing (as built drawing). . **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	PSO3	PSO4	PSO6	PSO7
CO1	3	3	2	1	3	3	2	2					3	2	1	2		
CO2	3	3	2	1	3	3	2	2					2	3	1	2		
CO3	2	2	2	1	2	2	2	3					3	2	2	3		
CO4	3	3	2	1	2	3	2	1					3	2	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**

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR401	**Title of the Course**	Architectural Design-VII	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	3	-	6	12
Pre-Requisite	AR310	**Co-requisite**	Nil				
Course Objectives	1. To expose the students to the challenges of designing functionally complicated buildings, having a complex array of activities and services; 2. To familiarize the students with the task of coordinating the integration of structural design and specialized building services in the framework of architectural design. 3. To let the students understand advanced construction technology and newer building materials..						

Course Outcomes	
CO1	Know about the challenges of designing functionally complicated buildings, having a complex array of activities and services
CO2	Familiarize with the coordinating integration of structural design and specialized building services in the framework of architectural design
CO3	Know and understand advanced construction technology and newer building materials.
CO4	Apply up-to-date information for planning and operation of urban transport.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Exercise - I**	**Transit-Oriented Buildings** Airports, Railway/Metro stations, ISBT, etc.	48	1, 2, 3 & 4
2	**Exercise - II**	**To Focus on Following Design Parameters** High Rise Service-oriented Technologically Advanced structural systems Automation	48	1, 2 & 3
3	**Time Problem**	Design of any small scale shall be carried out in design week from introduction to final Submission, Design week problems 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. The problem introduced in design week to be judged by external experts.	48	1,2 & 3

Reference Books:

Architecture Form, Space and Order by D.K.Ching, Francis

Design Fundamentals by V.S Parmar

Form, Line to Design by Scott Van Dyke

Design Fundamentals by Scott R

Architects Hand Book and Planning by E&OE

e-Learning Source:

Urban Transit System Planning: https://archive.nptel.ac.in/courses/105/105/105105208/

NBC 2016: https://archive.org/details/nationalbuilding01/in.gov.nbc.2016.vol1.digital

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	2	-	1	3	2					3	3	3	2		
CO2	3	3	2	3	2	-	1	3					3	2	3	1		
CO3	-	2	3	1	3	1	3	3					3	3	2	3		
CO4	3	3	3	2	2	3	2	3					3	3	3	3		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR402	**Title of the Course**	Building Construction & Materials - VII	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	1	2	2	5
Pre-Requisite	AR311	**Co-requisite**	Nil				
Course Objectives	1. To develop understanding about construction principles. 2. Construction technology and appropriate materials for structural systems, roofing, enveloping and interior finishes shall be considered under this subject from simple examples to complex. 3. To understand design limitations due to authority guidelines and making drawings/ details necessary for final execution of a project. 4. To introduce and familiarize the students with the advanced construction techniques with special reference to energy saving in terms of module base design practice as well as green building concept. 5. The subjects should also focus on developing design abilities by applying basic principles of construction and choosing appropriate materials and techniques and mechanical technology as per market trends.						

Course Outcomes	
CO1	To know about the construction equipments like Electric hand tools, Earth Moving and Excavation and Transportation machines.
CO2	Understand Defects and Remedies in Buildings.
CO3	Know Modular Coordination, Standardization in building design and their components
CO4	Know construction techniques about Domes, Shells and Folded Plates.
CO5	Understand Communication Systems & mechanical means of transportation both vertical and horizontal transportation in a building.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**MODULAR COORDINATION**	Aims, basis, planning, dimensioning, Assembly of components, Tolerances, Modules, Referencing system, Grids, Positioning of functional elements: slabs, walls, staircases, Tiles, etc	16	1,2&3
2	**MODERN CONSTRUCTION EQUIPMENTS**	Electric hand tools, Cranes, Excavators, Trenchers, Bulldozers, Fork Lift, Dumpers, Laser line Level, Scraper, Drifter, Jack Hammer, Breakers, and Conveyors etc.	14	1,2&5
3	**ADVANCED STRUCTURAL SYSTEM**	Advanced structural system and construction techniques with special reference to high rise buildings	18	3,4&5
4	**ALTERNATE CONSTRUCTION MATERIAL AND TECHNIQUES**	Alternative and advanced Building Materials: Ferro cement, Fly ash bricks, Ashcrete, Titanium Dioxide, Foamed Concrete, Graphene etc. High Performance Concrete, Self–compacting Concrete (SCC), High Volume Fly Ash Concrete (HVFA), Condensed Silica Fume (CSF), Self–curing, Shrinkage-free concrete, Translucent Concrete, Sandwich Panels etc.	16	3&4
5	**PNEUMATIC STRUCTURES**	Domes Shells, Folded Plates and other surface active structures: Folded Plates and barrel shells, hyperbolic paraboloids, and domes in R. C. C., Geodesic domes and space frames etc.	16	4

Reference Books:
Building Construction of Buildings, Vol. I, II and IV by R. Barry
Building Materials by S. K. Duggal
Materials of Construction by D. N. Gosh
Building Construction by S. C. Rangwala
Construction Technology Vol. III by R. Chudley
e-Learning Source:
https://www.studocu.com/in/document/galgotias-university/building-construction/modular-coordination/17283869
https://www.slideshare.net/MOHANAHARIHARANR/modern-construction-equipments
https://www.viatechnik.com/modern-construction-machines-theyre-used/
https://www.britannica.com/technology/pneumatic-structure

	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	-	1	3	3	-	2	2	2					2	3	3	3		
CO2	1	2	3	2	1	3	3	2					3	3	3	2		
CO3	3	2	3	3	-	2	2	3					3	2	2	2		
CO4	3	3	3	2	-	2	3	3					2	2	2	3		
CO5	2	3	3	2	-	2	1	2					2	2	2	3		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR403	**Title of the Course**	**LANDSCAPE DESIGN AND CONSTRUCTION**	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	**-**	**4**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	AR401				
Course Objectives	1. To recognize landforms, plantation water bodies and structures as major landscape elements. 2. To analyze the site elements as potentials and constraints, synthesize them to evolve simple landscape sche						

Course Outcomes	
CO1	Students knows and familiarized with the background of Landscape design in the field
CO2	Students knows and familiarized with the elements of landscape in planning and design
CO3	To learn about the variety of trees and plants. The benefits we get from planning them in different conditions.
CO4	Understand and analyses the working of landscape graphics in construction
CO5	Understand & knows about the appropriate materials and techniques and technology used in the landscaping construction as per market trends.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction and History**	Meaning, definitions, scope, objective and its relevance to Architecture and Site Planning. Landscape style: formal and informal, Types of Gardens: Egyptian, Roman, Chinese,Hindu-Buddhist, Mughal, Japanese, etc. Suggested exercises: small garden design, kitchen garden design, etc.	8	1
2	**Major Landscape Elements, Site Analysis and Planting**	Visual, physical, environmental & synthesis in small landscape design incorporating landscape elements. Landforms, rocks, plantation, water bodies and fountains, constructs with their use in landscaping. Site planning with special reference to Green Architecture. Suggested exercises: Design of roundabout, fountain, cascades, etc.	12	2,3
3	**Plant Identification and Suitability**	Botanical and common names, form, texture, salient properties and their appropriateuse. Effects of trees and plants on microclimate. Suggested exercises: Charts to classification.	12	2,3
4	**Landscape Graphics**	Conventional symbols in presentation drawings, e.g.: trees, shrubs, ground cover, hedges, edges etc. Conceptual drawings, preliminary landscape plans, planting plans and drawings. Suggested exercises: Large courtyards designs, outdoor spaces, etc.	16	4,5
5	**Landscape Design and Construction Techniques**	Site preparation, Grading, Site Drainage and Erosion Protection, Landscape--Retaining wall and stairs, Landscape paving, Fences and Freestanding walls, Grass laying,Wooden decks, Outdoor furniture and lighting. Suggested exercises: Incorporation of landscape design in ongoing design problem.	16	5

Reference Books:

Simonds, J.O., *Landscape Architecture*

Bose, T.K., & Chowdhary, B.S., *Tropical Garden Plants*

Randhawa, M.S., *Flowering Trees*

Little Wood, Michael, *Landscape Detailing (Surfaces)*

Santapan, H., *Common Trees*

Appleton., *The Experience of Landscape*.

Geoffrey, and Jellico, S, *The Landscape of Man.*

Holl, G. P., *Questions of Perception Phenomenon logy of Architecture*.

Laurie., *An Introduction to Landscape Architecture*

Lynch, K., *Site Planning. Cambridge*

Reid, G., *Landscape Graphics*.

Simonds, J. O., *Landscape Architecture: A Manual of Land Planning and Design*

e-Learning Source:

http://www.gardenvisit.com/landscape_architecture/landscape_debate/definition_eid

http://agritech.tnau.ac.in/horticulture/horti_Landscaping_types%20of%20garden.html

http://www.localhistories.org/gardening.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	2		1	3		3	1						3	1	1		

CO2	2	3	3			2		3					3			3		
CO3	1		3	1	2		1	1						3	3			
CO4		3	3	3	1		1	1					2			3		
CO5	3	2		3	3	2	3	1						1	3	3		

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Effective from Session: 2021 - 2022							
Course Code	AR404	**Title of the Course**	Theory of Design	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	**1**	**2**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	AR401				
Course Objectives	1. The course will focus on creating a deep understanding about Architecture and Design from a theoretical perspective. 2. The course will help students to develop a strong design vocabulary, how and by what means to communicate their design and to understand the philosophy and the undercurrents of the design process.						

Course Outcomes	
CO1	To understand Architecture and Design from a theoretical perspective.
CO2	To develop a strong design vocabulary, how and by what means to communicate their design
CO3	To understand the philosophy and the undercurrents of the design process.
CO4	To understand various ideologies and context of designs thereby developing their own philosophy and applying the same knowledge in their own design skills.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction	Introduction to theory, design, philosophy, aesthetics - chronological overview from Stone Age to Postmodernism. Discussions/Presentations on Works/Philosophies of Plato, Aristotle, Karl Marx, Vitruvius Pollio, Louis Sullivan, etc.	10	1
2	Modernism	The principles and philosophy of modernism- in art, design and architecture, worldview, theories & perceptions of time and space, mode of reasoning. Discussions/Presentations on Works/Philosophies of Frank Lloyd Wright, Walter Gropius, Le Corbusier, Pablo Picasso, Immanuel Kant, etc.	12	2
3	Structuralism & Postmodernism	The principles and philosophy of Postmodernism- in art, design and architecture, worldview, theories & perceptions of time and space, mode of reasoning. Discussions/Presentations on Works/Philosophies of Le Corbusier, Charles Moore, Louis Kahn, Renzo Piano, Aldo Rossi, Herbert Spencer etc.	8	3
4	Post-Structuralism/Deconstruction	The principles and philosophy of Post-Structuralism, of art, design and architecture, worldview & mode of reasoning. Discussions/Presentations on Works/Philosophies of Jacques Derrida, Peter Eisenman, Bernard Tschumi, Juhani Pallasmaa, Frank O Gehry, Daniel Libeskind, Rem Koolhaas, Zaha Hadid, etc. Biomimicry/biomimetics: The principles, philosophy and Examples. Discussions/ Presentations on Works/Philosophies of Antoni Gaudi, Norman Foster, Michael Pawlyn.	12	4
5	Contemporary Indian architects	The principles and philosophy of Indian architects in art, design and architecture, worldview, theories & perceptions of time and space, mode of reasoning. Discussions/Presentations on Works/Philosophies of Laurie Baker, A.P. Kanvinde, B.V.Doshi, J.A.Stein, Charles Correa, Raj Rewal, Hafeez Contractor, Gautam Bhatia, Uttam Jain, Romi Khosla, etc.	6	4

Reference Books:

A History of Architecture by Sir Banister Fletcher,

Modern Architecture since 1900 by W. J. R. Curtis

Modern Architecture - A Critical History by K. Frampton

Architecture in the Twentieth Century by P. Gossel & G. Leuthauser

The Language of Post-Modern Architecture by C. Jencks

e-Learning Source:

https://study.com/academy/lesson/modernism-in-architecture-definition-history.html

https://www.archdaily.com/931129/12-important-modernist-styles-explained

https://www.invaluable.com/blog/postmodern-architecture/

https://www.academia.edu/8859069/A_Search_for_Post_Modernism_in_Indian_Architecture

	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	2	2	2	2	1	-	3	2					3	2	3	1		
CO2	2	3	2	1	2	-	3	2					3	1	2	3		
CO3	3	3	2	2	1	-	2	3					3	3	1	3		
CO4	3	3	2	3	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**

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	**AR405**	**Title of the Course**	**Architectural Structures-VI**	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	**2**	**-**	**-**	**2**
Pre-Requisite	AR313	**Co-requisite**	AR402				
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. Design of structural elements in reinforced cement concrete and steel structures.						

Course Outcomes	
CO1	Purpose and Architectural Aspects of Shear Walls, Its behavior and structural details.
CO2	Understanding Folded plate as a form-active system, Cross-sectional dimensions of folded plate.
CO3	General understanding of shell behavior, Historical perspective Modern day use.
CO4	Different structural systems for high rise buildings and their advantages and disadvantages.
CO5	Understanding general structural behavior of tension systems.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**SHEAR WALL CONSTRUCTION**	Introduction, Purpose and Architectural Aspects of Shear Walls, Its behavior and Comparison with conventional Load bearing wall and frame structure, Classification and types, Construction process	6	1
2	**FOLDED PLATE, PLATES AND GRIDS**	Folded Plate: General understanding of folded plate, Folded plate as a form-active system, Cross-sectional dimensions of folded plate, Ferro cement as a material for folded plate construction, examples modern day use. Plates and Grids: General understanding of structural behavior of plates and grids, one and two way action, grid floor, rectangular and skew grids, T-beam action, filler slabs, Examples of modern day use.	6	2
3	**SHELLS AND SPACE FRAME**	Shells: General understanding of shell behavior, Historical perspective Modern day use, thick shell thin sell, membrane stresses in thin shell, geometry of shells, of and Meridian stress. Space Frame: General understanding of structure of space frame, space structures against plane structures, examples of modern day use.	6	3
4	**HIGH RISE STRUCTURES**	Principles of high rise structures, different structural systems for high rise buildings, advantages and disadvantages of each, considerations in multistory frame for wind, examples of modern day use.	6	4
5	**TENSILE STRUCTURES**	Principles of tensile structures, understanding general structural behavior of tension systems, sag and cross sectional area of cables, cable suspended and cabled stayed structure, examples of modern day use.	8	5

Reference Books:

Structures In Architecture: The Building Of Buildings, Prentice Hall Inc., 1963 by Heller Robert and Salvadori Mario

Precast Concrete Structures (2nd Edition) by Kim S. Elliott

Prefabricated Structure by ARS Pub. Chennai V. Soundara Rajan

Earthquake resistant design of structures by S. K. Duggal

Safety, Health and Environment Handbook by K.T. Narayanan

e-Learning Source:

http://www.cement.org/cement-concrete-basics/products/prestressed-concrete

Structure form & Synergy: https://archive.nptel.ac.in/courses/124/107/124107012/

Dynamics of Structure: https://archive.nptel.ac.in/courses/105/101/105101209/

	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	1	2	3	2	3	3	2	1					3	3	2	2		
CO2	1	3	2	2	-	3	2	1					2	3	2	1		
CO3	1	3	3	2	3	3	2	1					3	3	3	1		
CO4	1	2	3	2	2	3	2	1					3	2	3	1		
CO5	1	3	3	2	-	2	3	1					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**

Integral University, Lucknow

Effective from Session: 2021-2022							
Course Code	AR 406	**Title of the Course**	**TOWN PLANNING**	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	1	2	-	2
Pre-Requisite	AR303	**Co-requisite**	Nill				
Course Objectives	1. To introduce the subject of Town planning to students of architecture so that the students can relate to the architectural projects in context of planning. 2. To develop basic skills in planning surveys, analysis, generating alternative planning strategies and evaluation of options and preparation of plans.						

Course Outcomes	
CO1	To introduce the subject of Town planning to students of architecture so that the students can relate to the architectural projects in the context of planning.
CO2	To develop basic skills in planning surveys, analysis, and generating alternative planning strategies
CO3	evaluation of options and preparation of plans.
CO4	Understand planning principles and their evolution.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Introduction to the subject of Town Planning, need of study of Town Planning for an architect. Planning Theories – Theories by Le Corbusier, Sir Pattrick Geddes, Sir Ebenezer Howard, C.A. Doxiadis, Clarence Perry and Lewis Mumford	08	1, 2 & 4
2	Development of Towns/ Cities	Development of new towns and cities. Study of new towns such as New Delhi, Chandigarh, Gandhinagar, Noida, and Navi Mumbai Study existing settlements with respect to current theories in planning	12	2, 3 & 4
3	Planning Principles and Techniques	Planning Surveys, Planning Standards, Preparation of Master plans, Zoning and Development controls	10	1, 2 & 4
4	Traffic and Transportation Planning	Introduction to traffic and transportation planning Roads and traffic studies, Awareness of concepts related to various traffic problems in India. Understanding of PCU, Traffic volume, Road capacities, Road types; their sections and intersections, parking areas, pedestrian & slow-moving traffic planning, Traffic calming as per IRC guidelines. Modern Transportation systems: New concepts in mass and rapid transportation systems e.g. BRT, LRT and Metro rail.	10	1, 2 & 3
5	Introduction of Governing Bodies	Planning Process & Standards Understanding of the planning process. Relevance of standards in planning as per UDPFI guidelines prepared by TCPO. Introduction to professional bodies like ITPI, CTCP, DDA, LDA.	08	1

Reference Books:

Urban Pattern by B. Gallion.

Fundamentals of Town Planning by G. K. Hiraskar

City in History by Mumford, Lewis.

History in the town by Korn, Auther.

Town Planning by S. C. Rangwala

e-Learning Source:

http://www.collectionscanada.gc.ca/obj/s4/f2/dsk3/ftp04/MQ61319.pdf

http://archive.org/stream/principlesofcity00lohmrich/principlesofcity00lohmrich_djvt

http://www.srmuniv.ac.in/downloads/townplaning.pdf

http://urbanindia.nic.in/legislations/sub_legis/ulcra_1976.pdf

http://megrevenuedm.gov.in/acts/land-aquisition-act-1894.pdf

http://indiarentalagreement.com/what-is-rent-control-act/

	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	1	1	1	3	3	1	3	2					3	2	3	3		
CO2	3	3	1	1	3	1	1	3					3	3	2	1		
CO3	2	2	3	1	2	2	1	1					3	3	3	2		
CO4	2	2	1	3	2	3	3	3					3	2	3	1		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR407	**Title of the Course**	Elective I - Architectural Photography	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	2	-	-	2
Pre-Requisite	AR112	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Learning about the history and basics of photography.
CO2	Learning about the use of camera.
CO3	Understanding of camera settings.
CO4	Understanding the use of different rules of photography.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction	History of photography, Types of photography, elements like line, shape, colour, texture, etc.	6	1
2	Introduction To Camera	Parts of a camera, automatic and manual settings, types of cameras	6	2,3
3	Settings Of Camera	ISO, Aperture, shutter speed, Concept of lighting	10	1,2,3,4
4	Rules Of Photography	Compositions, Rule of third, leading lines, rule of odds, triangles, setting frames, light exposure, depth of field, etc.	10	1,2,3,4
5				

Reference Books:

Understanding Exposure: How to Shoot Great Photographs with a Film or Digital Camera by Bryan F. Peterson

The Photographer's Eye by Michael Freeman

e-Learning Source:

https://www.udemy.com/course/photography-masterclass-complete-guide-to-photography/

https://www.udemy.com/course/mobile-photography-masterclass-for-instagram/

https://www.udemy.com/course/mobile-photography-for-beginners-master-your-smartphone/

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	1	3	3	2	3	2	3	1					2	3	2	1		
CO2	2	2	3	3	3	2	1	3					1	2	1	1		
CO3	3	3	3	1	2	2	1	1					2	3	2	2		
CO4	2	3	3	1	1	2	1	1					1	3	2	1		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR408	**Title of the Course**	Elective-I (Art in Architecture)	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	2	-	-	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Understanding the art around the world.
CO2	Study and understanding the relation of art and architecture.
CO3	Analyze and implementation of previous works of artist in today's world.
CO4	Learn the process of documenting the work

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Role of art in history of World Architecture	4	1
2		Symbiotic relationship of art and architecture	4	1,2
3		Application of different art forms in architecture	6	2,3
4		Works of different artists and architects that reflects the inter relationship.	8	1,2,3
5	Documentation	Documentation of the different types of Artwork by different artist of the work.	10	1,2,3,4

Reference Books:

Art and Architecture: A Place between by Jane Rendell

The Art-Architecture Complex by Hal Foster

The Art of Architecture by Stanislaus Von Moos by Le Corbusier

e-Learning Source:

https://www.researchgate.net/publication/346028731_Art_and_Architecture

https://www.eden-gallery.com/news/is-architecture-art

https://owlcation.com/humanities/Deriving-Meaning-from-Art-and-Architecture

https://www.janerendell.co.uk/wp-content/uploads/2009/03/Art-and-Architecture-prepublication.pdf

	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	1	3	3	2	-	2	1						1	2	3	1		
CO2	2	2	3	2	1	1	1						2	2	3	1		
CO3	3	3	3	1	1	2	1						2	3	3	2		
CO4	2	3	3	1	1	1	3						1	3	2	1		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR409	**Title of the Course**	Elective - I (Applied Ergonomics)	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	To understand the basics and importance of ergonomics
CO2	To understand the domains of ergonomics and gross human anatomy.
CO3	To apply and analyse the integration of ergonomics in design and architecture
CO4	To analyse the needs of special users using principles of ergonomics
CO5	To develop and design architectural solutions according to ergonomic principles

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction**	Introduction to Human Function, Human centred design	6	1
2	**Ergonomics and Design**	Human being in the manmade world and importance of ergonomics, Gross human anatomy	8	2,3
3	**Ergonomics Design**	Ergonomics and Design, Physical Ergonomics, Tools and techniques for Ergonomics., Cognitive Ergonomics	8	3,4
4	**Anthropometrics**	Introduction to Anthropometrics: static and dynamic; Disability, Ageing and	6	4
5	**Inclusive Design**	Inclusive Design- Built environment for the physically handicapped	4	3,4,5

Reference Books:

R. S. Bridger, "Introduction to Ergonomics", CRC Press.

Work Systems and the Methods, Measurement, and Management of Work, by Mikell P. Groover, ISBN 0-13-140650-7. ©2007 Pearson Education, Inc., Upper Saddle River, NJ. All rights reserved.

An Introduction to Human Factors Engineering by Christopher D. Wickens

The practice and management of Industrial Ergonomics by David C. A.

Engineering Psychology and Cognitive Ergonomics (Ed. Don harris)

e-Learning Source:

Applied Ergonomics - Course (nptel.ac.in)

Applied Ergonomics | Journal | ScienceDirect.com by Elsevier

	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					2		3	1					1	3	2	2		
CO2		2	3	1			2						1	3	3	2		
CO3	3	2			1			2					1	2	2	3		
CO4	2	2	1	2	3	1		3					1	1	3	2		
CO5	3	2		2	1			3					2	1	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR410	**Title of the Course**	Elective - I (Graphics and Product Design)	**L**	**T**	**P**	**C**
Year	**IV**	**Semester**	VII	**2**	**-**	**-**	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	To understand the basics and importance of Graphic Design
CO2	To understand the domains Product design.
CO3	To apply and analyze the integration of graphic design in design and architecture
CO4	To analyze the needs of special users using principles of product design
CO5	To develop and design architectural solutions according to product design

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction**	Introduction to Graphic and Product Design- Elements, principles and their applications	8	1, 2 & 4
2	**Principles of product design**	Concept of Form and Space, Considerations of Color, Pattern, Texture and Proportion in products and product environments.	8	2 & 5
3	**Manufacturing process**	Relating Form to Materials and Processes of Manufacture;	4	4 &5
4	**Software and presentation**	Use of Computers for Form generation	6	1 & 4
5	**Case studies**	Case studies	6	2

Reference Books:

The Laws of Simplicity by John Maeda

The Design of Everyday Things by Don Norman.

Product Design byAlex Milton

e-Learning Source:

https://s3.amazonaws.com/designco-web-assets/uploads/2019/05/InVision_PrinciplesOfProductDesign.pdf

https://www.researchgate.net/publication/320767533_PRODUCT_DESIGN_PRINCIPLES

	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	1		2		2			1					3	2	2	2		
CO2		3	3	1			2						2	3	1	2		
CO3	3	2	1		1		2	2					3	3	2	1		
CO4	2	1	1	2	2	1		3					2	1	2	2		
CO5	2	2		2	1			3					2	2	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2021-2022							
Course Code	AR411	**Title of the Course**	Elective-II (Barrier Free Environment)	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Able to understand the basics of Barrier free Environment and its need in the current world.
CO2	Know the Principles, Goals of Barrier free Environment and various design spectrums.
CO3	Understand the Barrier free design: Universal - Inclusive - Accessible Design, Universal Design for Learning (UDL) and Use of Assistive technologies.
CO4	A mini project will help the student to deal with projects in future.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Introduction**	Introduction to Barrier free environment, Scope and Need in Architectural design. Types of disabilities- Non-ambulatory, Semi ambulatory, visually challenged, Hearing Impaired.	6	1 & 2
2	**Standards and Guidelines**	Standards and Norms for various facilities to meet disabled people's standards for safety, convenience and usability.	7	2
3	**Deep Dive-1**	Barrier free designing in various building types : Institutional,	5	3
4	**Deep Dive-2**	Barrier free designing in various building types : Residential, Recreational etc.	4	3 & 4
5	**Mini Project**	As per brief introduced by course teacher (based on unit 03 and 04).	10	4

Reference Books:

Creating Inclusive Environments, 2012 - Edward Steinfeld and Jordana L. Maisel, Universal Design –

Universal Principles of Design, 2003 by William Lidwell, Kritina Holden, Jill Butler

Universal Methods of Design, 2012 by Bruce Hanington, Bella Martin

Barrier-Free Design, 1996 CPWD by James Holmes-Seidle

e-Learning Source:

A Review of Barrier-Free Design in Built Environment by Anjali Sharma and Kuldeep Kumar

Barrier Free Design for Disabled Persons by Pl Falta

Behavioral Factors in Barrier-Free Design By Adaptse EA UFMG

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

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR412	**Title of the Course**	Elective-II (Urban Design)	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	**2**	-	-	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. Initiating students in theory and understanding of Architectural Urban Design. 2. Making students well versed in the process of Urban Design at undergraduate level so that they could further develop in the profession or studies at postgraduate levels if the student so desires. 3. Studying and finding better techniques that can be applied to improve Urban Design. 4. Understanding the scope and limitation of Urban Designing. 5. Understanding Urban Design as a profession. 6. Discussion on Previous research works/ articles on Urban Design. 7. Understanding Types of Urban Designing techniques and various Applications.						

Course Outcomes	
CO1	Understand Urban Design and its process.
CO2	Study and find better techniques of Urban Design.
CO3	Analyze, troubleshoot, and implement Urban Design related solutions with previously done works and researches.
CO4	Learn the process of documenting the work of Urban Design.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Introduction**	Concepts of Urban Design as distinct from architectural design and city planning.	8	1, 2 & 3
2	**Urban design terminologies**	Parameters of urban design,concept of space and its articulation principles of urban design,	8	3 & 4
3	**Effects of urban growth**	Effect of urban growth patterns	4	4
4	**Effects on city**	the resultant influence of urban design forms on cityscape.	6	1 & 4
5	**Urban Design now**	Evolution and reconstructive study of live examples of urban design.	6	4

Reference Books:

The Death and Life of Great American Cities by John Jacobs

Image of the City by Kevin Lynch

A new theory of urban design by Christopher Alexander

e-Learning Source:

https://uccrn.ei.columbia.edu/sites/default/files/content/pubs/ARC3.2-PDF-Chapter-5-Urban-Planning-and-Design-wecompress.com_.pdf

https://www.sandiego.gov/sites/default/files/legacy/planning/genplan/pdf/generalplan/adoptedudelem.pdf

	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	1	3	3	2	3	2	3	1					2	2	2	2		
CO2	2	2	3	3	3	2	1	3					3	3	1	2		
CO3	3	3	3	1	2	2	1	1					3	3	2	3		
CO4	2	3	3	1	1	2	1	1					2	2	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR413	**Title of the Course**	Elective-II (Interior Design)	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	**2**	**-**	**-**	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. Initiating students in theory and understanding of Interior Design. 2. Making students well versed in the process of Interior Design at undergraduate level so that they could further develop in the profession or studies at postgraduate levels if the student so desires. 3. Studying and finding better techniques that can be applied to improve Interior Design. 4. Understanding the scope and limitation of Interior Designing. 5. Understanding Interior Design as a profession. 6. Discussion on Previous research works/ articles on Interior Design. 7. Understanding Types of Interior Designing techniques and various Applications.						

Course Outcomes	
CO1	Understand Interior Design and its process.
CO2	Study and find better techniques of Interior Design.
CO3	Analyze, troubleshoot, and implement Interior Design related solutions with previously done works and researches.
CO4	Learn the process of documenting the work of Interior Design.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Unit 1**	Principles of Interior Design and their application.	6	1, 2 &3
2	**Unit 2**	Elements of Interior Design – Space, light and illumination, color, texture, furniture (movables & built-in), fittings and fixtures.	6	3 & 4
3	**Unit 3**	Understanding the works of Great Masters.	6	4
4	**Unit 4**	Modern trends and contemporary attitudes to Interior Design e.g. Modular furniture.	6	1 & 4
5	**Unit 5**	Design of interiors and making estimates for the designed projects.	8	4

Reference Books:

Time-Saver Standards for Interior Design and Space Planning by Joseph De Chiara

The Interior Design Reference & Specification by Mimi Love, Chris Grimley

The 100 most important designers of the past 100 years by Jennifer Boles, Inspired Design

Residential Interior Design: A guide to Planning Spaces by Maureen Mitton

Deborah Needleman, Domino: The Book of Decorating

e-Learning Source:

https://www.2020spaces.com/ebook-how-to-start-interior-design-business/

https://www.2020spaces.com/ebook-choosing-the-best-interior-design-software/

	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	1	3	3	2	3	2	3	1					2	2	2	2		
CO2	2	2	3	3	3	2	1	3					3	3	1	2		
CO3	3	3	3	1	2	2	1	1					3	3	2	3		
CO4	2	3	3	1	1	2	1	1					2	2	3	2		
CO5																		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR414	**Title of the Course**	Elective-II (Architectural Conservation)	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VII	2	-	-	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Understand conservation and its process.
CO2	Study and find better techniques of conservation.
CO3	Analyze, troubleshoot, and implement conservation related solutions with previously done works and researches.
CO4	Learn the process of documenting the work of conservation.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction	Definitions of basic terms in conservation, natural and cultural heritage, history and theory of conservation.	4	1
2	Introduction to UNESCO	Legislation in conservation. Meaning of cultural heritage, its conservation and sustainability, ICOMOS charters and UNESCO discourse on cultural heritage conservation.	6	1,2
3	Conservation of Built Heritage	To understand the meaning of the built heritage conservation, its integration in environmental planning and development. Meanings of vernacular architecture for local communities.	8	2,3
4	Conservation Processes	Conservation methods are consolidation, reproduction, reconstruction, preservation, deterioration perversion, rehabilitation, and restoration.	8	3,4
5	Documentation process.	Relating the knowledge and understanding to present the document by past and present situation and uses.	6	1,2,3,4

Reference Books:

Architectural Conservation by Aylin Orbasil

A history of Architectural Conservation by Emily Gunzburger Makas

The Conservation Movement: A History of Architectural Preservation: Antiquity to Modernity by Miles Glendinning

e-Learning Source:

https://www.un.org/youthenvoy/2013/08/unesco-united-nations-educational-scientific-and-cultural-organization/

https://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf

http://orcp.hustoj.com/wp-content/uploads/2016/01/1964-The-context-of-the-Venice-Charter-1964.pdf

https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SAR1502.pdf

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	1	3	3	2	3	2	3	1					1	1	1	3		
CO2	2	2	3	3	3	2	1	3					1	2	2	3		
CO3	3	3	3	1	2	2	1	1					1	1	1	3		
CO4	2	3	3	1	1	2	1	1					2	1	1	2		

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

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

Integral University, Lucknow

Effective from Session: 2021 - 2022							
Course Code	AR415	**Title of the Course**	Practical Training	**L**	**T**	**P**	**C**
Year	IV	**Semester**	VIII	**-**	**-**	**-**	**3**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	1. Each student is required to undergo 'Practical Training' in the VIII Semester. The Head of the Department will approve the office/ institution of the 'Practical-Training' in consultation with the Training Coordinator / Training and Placement cell of the University. 2. The aim and objectives of the 'Practical Training' is to enable the students to gain the kind and range of practical experience which will prepare them for their likely responsibilities, immediately after qualifying B. Arch. Course. 3. The student must try to seek a variety of experiences in his/her 'Training office' to acquaint himself/herself with various works, procedures etc. of the architecture profession. Preferably the students must opt their Training offices in developed cities to have maximum exposure of new material, technologies, building practices etc.						

Course Outcomes	
CO1	Become a responsible person immediately after qualifying B.Arch. courses.
CO2	Learn various work, procedures etc. of the architecture profession.
CO3	Explore new material, technologies, building practices, etc.
CO4	Understand the site features and way of construction with various technologies.
CO5	Enhance the professional development skill to deal with the client, labor, vendor, etc.
CO6	Know the environment of a well-established office that can be helpful for future purposes.

S. No.	**Title**	**Content**
1	Aim and Objectives of Practical Training	The student must try to seek a variety of experiences in his/her 'Training office' to acquaint himself/herself with various works, procedures etc. of the architecture profession. Preferably the students must opt their Training offices in developed cities to have maximum exposure of new material, technologies, building practices etc.
2	Criteria for selection of a Training Office	● In case of a proprietorship firm, the proprietor shall be an architect; also, the firm shall have at least two or more architects as employees/associates. ● In the case of 'Partnership' / 'Pvt. Ltd.' Firms, at least one of the partner/directors shall be an architect, and the firm shall have at least one or more architects as Partner/director/employee/ associate. ● In case of a 'Public-sector' /'State or Central Government office/academic institute or a multinational organization", there shall be a separate wing for architectural consultancy works consisting of architects. ● The said architect (Proprietor/Partner/Director/Head of Department/Chief Architect etc.) shall have at least 05 years of working experience and the organization should have a variety of projects. ● Training in Foreign Country can be undertaken under the Registered Architect of that Country but has to be specifically approved and monitored by the Head of the Department.
3	Arranging/Fixing-up the Training office	● The Faculty of Architecture, Integral University, directly or through the 'Training and Placement Cell' of the University may provide a list of offices, along with their addresses of some well-established and recognized architects. Addition, alteration and deletion in such a list may be made from time to time in conformity to 'Criteria' as laid down for selection of a training office. ● After seeking advice from 'Training and Placement Cell', the student shall make his/her options available to the Training and Placement Cell. ● With the help of 'Training and Placement Cell', the student shall make all efforts to settle his/her appointment as trainee with an established and recognized architect.
4	Working Relationship between the Architect and the Trainee	The architect shall provide enough works to the trainee to keep him/her occupied. He shall expose the trainee to different aspects of professional practice. The tasks given to the trainee shall include preparation of the following: ● Sketch designs, presentation drawings etc. ● Municipal drawings according to the byelaws, ● Workings drawings and details. ● Estimates, bill of quantities & specifications. ● Models, perspectives and photographs. Reports, progress charts etc. ● Besides above the trainer will facilitate; Discussions with the Clients, Structural Consultants, Services Consultants etc.
5	Honorarium/Stipend	● The architects usually pay some amount as honorarium/stipend to meet out of pocket expenditure to the trainee. The University shall have no objection if the trainees accept/receive such honorarium/stipend. ● The mode and amount of the honorarium shall depend upon the office and be based upon a mutual agreement between the employing architect and the trainee. However, it shall neither be a claim of the trainee nor binding on the architect but for proper professionalism and to maintain the dignity of profession, the

		training office of architects pay a respectable amount as stipend/honorarium. ● The University/Training and Placement cell of the Institute shall not in any way be responsible for the payment against any sorts of damages, whatsoever.
6	Code of conduct for the trainee	● He/she shall abide by the rules, regulations and general instructions of the office/firm. He/she shall remain punctual and regular in attendance. ● He/she shall make all efforts to learn the work involved in the profession, and if so required for work, shall attend the office beyond the scheduled time in the office. ● He/she shall respect and obey the senior members of the office/firm. ● He/she shall take up the job with full responsibility and show utmost interest in the work allotted. ● He/she shall inform the institute/training and placement cell about joining in the training office, its address and contact numbers. He/she shall also inform the address of the accommodation acquired during the training period. ● He/she shall remain in regular touch with the University/ 'Training and Placement Cell' and shall keep the Training and Placement Cell fully informed about his/her progress in the training office. ● In case of any complaint or misconduct, the University/Training and Placement Cell may take suitable and strict action against the student.
7	Joining and Leaving the Training Office	● The trainee is expected to join the training office on the scheduled date, and submit his 'Joining Report' on the letterhead of the office duly signed by Head of the Training to the Training Coordinator Institute in the Performa prescribed for the purpose and contained in the Log Book. ● The trainee must obtain a 'No Dues Certificate' duly and get relived from the office at the end of the training period or before changing the 'Training Office'. The trainee must submit this 'No Dues Certificate' along with the Log Book.
8	Change of Training Office	● In case of any emergency, a trainee may be permitted to change the training office/place of training once only during the entire period of training. He/she shall inform the Principal/Director/Head of Department/Officer in-charge of the 'Training and Placement Cell', and seek prior permission for such a change ● The total duration of the practical training shall be the sum of the period of stay in different offices. It shall be in conformity with the 'Duration of Training' as prescribed in the 'Ordinances, Scheme of Examination & Syllabus' of the University
9	Continuous Assessment and Monitoring	The Trainee will have to submit through e-mail fortnightly progress reports to the Training Coordinator of the Department of Architecture, Integral University, on the prescribed format, who shall monitor the progress of each and every trainee and suggest remedial measures as and when required. The Training Coordinator will also remain in constant touch with the Trainer to ensure that the trainee is going on as per the aim and objectives of the training.
10	Final Submissions	After completion of practical training, the trainee is required to submit the following in the University: ● 'Certificate' of successful completion of the practical training mentioning the attendance in percentage, from the architect. ● 'Daily Diary' with details of the day to day work record, which will be returned to the student after assessment and viva voce examination. The suggested 'Performa' of the page of the daily diary is available in the prescribed 'Log-Book'. ● 'Training report' supplemented with the prints and documents of work done during practical training. The prints and documents shall be obtained with the permission of the architect's office and shall be duly signed by the 'Supervisor'. ● Training report shall be submitted in three copies. First copy shall be returned to the student after assessment of sessional marks and viva voce examination. The second copy shall be retained by the Training and Placement Cell/library. These shall be presented in A-4 size with ring binding.
11	Internal Assessment (Sessional Marks)	An internal assessment of the training will be conducted by an internal jury consisting of Two Senior Faculty Members and the Training Coordinator.
12	Viva Voce Examination	Viva Voce Examination shall be conducted by a Jury constituted by the Examination Department of the University which will consist of following Members: ● Two Senior Faculty Members ● One Practicing Senior Architect.
13	Failures	In case the student/ trainee remains unsuccessful or fails in completing his/ her training, internal assessment or viva- voce examination, he/she shall have to repeat the whole semester and will not be promoted to the next class till successfully completing and clearing the Practical Training.

	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	-	-	-					3	2	3	3		
CO2	3	3	2	3	-	-	1	3					3	2	3	3		
CO3	2	2	3	3	2	2	1	3					3	2	3	3		
CO4	2	3	3	2	3	3	1	3					3	2	3	3		
CO5	1	3	3	2	3	1	1	3					3	2	3	3		
CO6	-	3	1	-	2	1	-	-					3	2	3	3		

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

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

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR 501	**Title of the Course**	Architectural Design - IX	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**3**	**-**	**6**	**12**
Pre-Requisite	AR401	**Co-requisite**	Nil.				
Course Objectives	To expose the students to the complexities of large-scale architectural interventions in specific urban settings, having multiple stakeholders.						

Course Outcomes	
CO1	Students are to be exposed to the complexities of large-scale architectural projects, often involving a group of buildings in a public realm and having multiple stakeholders
CO2	Students are encouraged to look beyond the concerns of individual building projects to address the interface between public and private realm; and also contextualize their design interventions to the surrounding urban environs.
CO3	To understand the correlation between, physical, socio-cultural, environmental and socioeconomic dimensions of the built environments, so as to identify opportunities and constraints associated with large-scale urban interventions
CO4	To carry out site analysis and site planning at a real life location, considering its location context, physical features, views, orientation, volumetric analysis and figure ground study of the built-form characteristics, visual imageries, street-scape and skyline analysis; pedestrian, vehicular circulation pattern, and utility networks.
CO5	To apply understanding to a realistic site to create physical environments through basic tools of master planning, such as: movement networks, open spaces, suggestive built form, infrastructure network and planning norms.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Unit 1	Design exercise could be any medium to large scale project in the public domain, situated within an existing (and preferably compact) urban fabric, such as: redevelopment of commercial areas, waterfront development, transit-hubs, market squares, densification along transit corridors, mixed use complexes. Site analysis and site planning at a real life location, considering its locational context, physical features, views, orientation, volumetric analysis and figure ground study of the built-form characteristics, visual imageries, street-scape and skyline analysis; pedestrian, vehicular circulation pattern, and utility networks. Correlation between, physical, socio-cultural, environmental and socioeconomic dimensions of the built environments, so as to identify opportunities and constraints associated with large-scale urban interventions. Creation of physical environments through basic tools of master planning, such as: movement networks, open spaces, suggestive built form, infrastructure network and planning norms.	135	1, 2, 3, 4 & 5
2	Unit 2	Time Bound Exercise: Data collection and its analysis, impact of Climatic conditions and socio-economic factors, formulation of user requirements, philosophy based concept development and final design (Plans, elevations, Sections, views, 3 Dimensional physical model, perspectives etc). Library study, Prototype case-studies, anthropometrics and standards. Analyzing the existing environment and its surrounding in specific urban context of architecture character, heritage/historical value, transportation, services and socioeconomic factors. Zoning, 3-D massing, road networks, landscape, services, social facilities etc.	9	1, 2, 3, 4 & 5

Reference Books:
Architecture Form, Space and Order by Francis D.K.Ching
Design Fundamentals by R Scott
Architects Hand Book and Planning by E&OE
Form, Line to Design by Scott Van Dyke
e-Learning Source:
https://www.udg.org.uk/about/what-is-urban-design
https://uccrn.ei.columbia.edu/sites/default/files/content/pubs/ARC3.2-PDF-Chapter-5-Urban-Planning-and-Design-wecompress.com_.pdf
https://en.wikipedia.org/wiki/Urban_design
https://www.icevirtuallibrary.com/toc/jurdp/current

	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	2	1	3	1	1	3	2	3					3	2	1	1		
CO2	3	1	2	2	-	2	2	2					3	1	2	1		
CO3	2	1	3	3	-	2	1	2					3	2	3	1		
CO4	2	1	2	3	-	2	2	3					3	1	3	1		
CO5	3	2	3	3	1	3	2	3					3	2	3	1		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR502	**Title of the Course**	Research Methodology & Dissertation	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**2**	**2**	**-**	**3**
Pre-Requisite	Nil.	**Co-requisite**	Nil.				
Course Objectives	1. Application of literature review / study and/or case - study methodology for a preparation of a minor research / dissertation on any topic in architecture (relevant to any chosen objective or any aspect of the Thesis Project). 2. Application of scientific methods / tools and techniques for conducting post – occupancy evaluation of buildings / built complexes / built-environment [case studies] and drawing inferences [for application as design guidelines in the next phase: Thesis project. 3. Application of Presentation techniques [for presenting dissertation / outcome of the study] and techniques of Thesis / Dissertation / Project Report writing. 4. Preparation of the initial synopsis for the selected thesis project.						

Course Outcomes	
CO1	Define, articulate and use terminology, concepts, and theory in their field and know how to use them
CO2	Articulate a clear research question or problem and formulate a hypothesis thereby preparing a synopsis for architectural thesis project
CO3	Identify and demonstrate appropriate research methodologies, know when to use them and apply problem solving skills to constructively address research setbacks
CO4	Identify and practice research ethics and responsible conduct in research
CO5	Use library and other tools to search for existing body of research relevant to their topic

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Research and project design	Concept and process of research Types of research – fundamental and applied including interdisciplinary and multidisciplinary approach Ethical aspects of research. Conducting academic research, literature search and review Developing a research question, hypothesis and methodology, Designing research proposal	16	1,2
2	Research methods and personal reflection	Quantitative and qualitative research methods Personal planning skills – managing a research project Reflective approaches to Personal Reflection theory at work Personal and professional ethics in research issues	16	2,3
3	Minor dissertation	Each student shall prepare a minor research / dissertation on any topic in architecture relevant to any chosen objective or any aspect of the Thesis Project. The minor dissertation shall be a research based conceptual study directly associated with the thesis topic. It shall be submitted in the form of a report with appropriate referencing, bibliography etc. and the highlights shall be also presented as a seminar.	8	3,4
4	Thesis project proposal	Each student shall submit three proposals for the project he/she wants to undertake in order of preference from which the final topic may be selected. The project shall be LIVE as far as possible. Each of the proposals should be furnished with the following information: ● Selection of the Thesis Topic - An architectural thesis at the undergraduate level will be on a topic which can result in tangible 'built environment' solution and thereby offers unlimited scope for the choice of an architectural design thesis. In most of the cases, the students shall be encouraged to choose 'live programmes' as their thesis topic but hypothetical topics shall also be permitted as long as the validity of the topic and its context can be established - the size of the project in both the cases has no relevance. The validity of the topic shall be established from the issue/s involved, the challenges of design, or can even be to encourage the inherent and acquired aptitude of a student For the purpose of allotting a thesis topic, students shall be required to submit the synopsis of at least two design oriented topics of which one shall be approved. ● Authority Proposing the project with address ● Site area, location ● Brief about the project giving broad requirements, cost etc.	12	3,4
5	Thesis project introduction and case studies	After the thesis topic is finalized, the student has to present a seminar on his/her topic. (Stage I) The introductory seminar will include presentation of the topic furnishing the above	12	4,5

		mentioned information along with selection of case studies of the buildings, structures that are directly associated with the thesis topic [minimum 2], format / questionnaire for case studies, literature review / study [also minimum 1 case study from secondary sources], requirements, current design trends/ philosophies etc.		

Reference Books:

Doing Your Research Project by Judith Bell

Architectural Research Methods by Groat, Linda and David Wang,.

Visual Research Methods in Design. by Sanoff, H. (1991).,

Technical Communications – Principles and Practices by Raman Meenakshi and Sharma Sangeeta,

A manual for Writers of Research Papers, Theses and Dissertation by Kate L.Tourabian,

Joseph Gibaldi, MLA handbook for Writers of Research Papers

e-Learning Source:

Research Methodology: https://archive.nptel.ac.in/courses/127/106/127106227/

Qualitative Research Methods & Research Writing: https://archive.nptel.ac.in/courses/127/105/109105115/

Methodology of Design Research: https://archive.nptel.ac.in/courses/107/108/107108011/

	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	-	2	3	3	-	3	3	2					3	3	1	1		
CO2	1	1	3	2	1	-	2	3					3	2	3	2		
CO3	-	3	3	3	1	-	2	3					3	3	3	2		
CO4	-	2	2	1	3	-		3					2	2	2	3		
CO5	-	1	2	3	-	2	3	3					3	1	3	3		

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

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

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR 503	**Title of the Course**	Advance Construction Technology & Materials	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**2**	**-**	**2**	**5**
Pre-Requisite	AR402	**Co-requisite**	Nil.				
Course Objectives	The subjects should also focus on developing design abilities by applying basic principles of construction and choosing appropriate materials and techniques.						

Course Outcomes	
CO1	To study the advancements in construction with new materials as substitutes to conventional materials.
CO2	To familiarize the students with an overview of construction planning and scheduling.
CO3	To familiarize the students with the manufacture, storage and transportation of concrete elements.
CO4	To inform the various equipment used in the construction industry and the criteria for choice of equipment.
CO5	To familiarize the students with new methods and equipment of new technologies.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction	General building requirements: NBC, Definitions, Development regulations, Classification of buildings, Requirements of parts of buildings; Introduction and the needs for ultra-performance materials in building design as a substitute to conventional materials, the properties of the contemporary materials – multidimensional, repurposed, recombinant, intelligent, interfacial, transformant etc	16	1 &2
2	Composite Materials And Construction Systems	Composite Materials: Types, terminology and classification of materials, Composite materials manufacturing process. Use of composite materials namely Polymer Matrix Composites (PMCs), Fiber Reinforced Polymers (FRPs) along with cement, steel, aluminum, wood, glass, for thermal insulation, fire protection, coating and painting and structural monitoring etc. Construction Systems: Structural systems and design- Planning - pre-stressed concrete constructions - precast concrete and pre- fabrication system - Modular coordination.	12	2
3	Construction Practice, Methods And Equipment	Construction Practice: Modern Construction Materials - Manufacture, storage, transportation and erection of precast component forms- Types of molds and scaffoldings in construction - safety in erection and dismantling of constructions. Construction Methods and Equipment: Use of equipment for construction and related activities-Ready mix concrete plant- Choice of construction equipment for different types of works.	12	2&3
4	Nanomaterials and Nanocomposites	Introduction: definition, manufacture types of Nanomaterials. Properties, performance of the Nano materials in building construction, types and application of Nano materials like carbon nanotubes etc and Nano composite used with cement, steel, aluminum, wood, glass, for thermal insulation, fire protection, coating and painting and structural monitoring etc.; Nano technologies in building and construction.	16	4
5	Digital And Tensile Materials	Types of materials and its constitution, manufacturing and construction technology and requirement for 3D printed buildings structure and Extra-terrestrial printed structures. Tensile fabric structure by digital printing, translucent fabric, thin-film photovoltaics, texlon foil, PVC (poly vinyl chloride) coated polyester cloth and PTFE (poly tetra fluoro ethylene) (teflon) coated glass cloth.	08	4 & 5

Reference Books:

Building Construction of Buildings, Vol. I, II and IV R. Barry

Building Materials by S. K. Duggal

Building Materials Products, Properties and Systems by M. Gambhir, NehaJamwal

Prestressed Concrete Structures by P. Dayaratnam

e-Learning Source:

https://www.nanowerk.com/nanotechnology-in-construction-industry.php

https://youtu.be/qWBA-6NgIJg

https://application.wiley-vch.de/books/sample/3527337806_c01.pdf

https://www.researchgate.net/publication/349073862_APPLICATIONS_OF_TENSILE_STRUCTURES

	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	-	1	3	3	-	2	2	2					2	1	1	2		
CO2	1	2	3	2	1	3	3	2					1	2	2	1		
CO3	3	2	3	3	-	2	2	3					2	2	1	2		
CO4	3	3	3	2	-	2	3	3					2	2	2	1		
CO5	2	3	3	2	-	2	1	2					1	1	1	1		

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

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

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR504	**Title of the Course**	Architectural Structural Systems	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**1**	**2**	**-**	**2**
Pre-Requisite	AR405	**Co-requisite**	Nil				
Course Objectives	1. To clarify the basic principles underlying the inventions of various structural ideas with a view to bridge the gap between architectural theory and structural reality. 2. To understand the relationship between architectural structure and architectural form with a view to stimulate the faculty of conceiving and developing new systems						

Course Outcomes	
CO1	Able to understand structural ideas, the difference between structural analysis and systems.
CO2	Understanding the nature and behavior of an active structural system.
CO3	Understanding the nature and behavior of vector active structural systems.
CO4	Understanding the nature and behavior of bulk active structural systems.
CO5	Understanding the nature and behavior of surface active structural systems.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction And Classification of Structural Systems	Validity, extent and content of structural knowledge necessary for an architect, need for understanding structural ideas, the difference between structural analysis and creation of structures, development of various forms. Classification of structural systems: Form-active structure systems, vector-active structure systems, bulk-active structure systems, surface-active structure systems, vertical structure systems.	8	1
2	Form-Active Structure Systems	Cable systems, tent systems, pneumatic systems, arch systems	10	2
3	Vector-Active Structure Systems	Flat-truss systems, curved-truss systems: singly, doubly and spherical systems, space-truss systems: prismatic and pyramidal.	10	3
4	Bulk-Active Structure Systems	Beam System, frame systems, beam grid and slab systems.	10	4
5	Surface-Active Structure Systems	Prismatic folded structure systems, pyramidal folded structure systems, single curved shells, rotational shell system, and anticlastic shell systems.	10	5

Reference Books:

Structure Systems by Engel, Heinrich,

Structure in Architecture – The Building of Buildings by M. Salvadori.

Advance reinforced concrete design by P.C.Varghese.

Structural Design & Drawing Reinforced Concrete & Steel by N Krishna Raju

Steel Structures Design & Drawing by Prof. Harbhajan Singh Col. (Retd.)

e-Learning Source:

en.wikipedia.org/wiki/Structural_system

https://engineering.purdue.edu/~ahvarma/CE%20371/Lecture1.pdf

http://workgroups.clemson.edu/AAH0503_ANIMATED_ARCH/M.Arch

	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	1	3	2	3	3	2	3	2					2	3	2	1		
CO2	1	2	3	3	-	2	3	1					2	2	3	2		
CO3	1	3	2	3	2	3	3	1					3	2	3	1		
CO4	1	3	3	3	2	3	3	1					3	2	2	1		
CO5	1	3	2	3	-	2	3	1					2	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR505	**Title of the Course**	Project Management	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	1	2	-	2
Pre-Requisite	AR316	**Co-requisite**	Nil.				
Course Objectives	1. To understand different management techniques suitable for design and build projects. 2. To understand the management system for accomplishing scope, quality, time & cost. 3. Ability to understand a project from concept to commissioning, feasibility study & facility program, design, construction to commissioning.						

Course Outcomes	
CO1	To make them understand the concepts of Project Management for planning and execution of projects.
CO2	To make them understand the feasibility analysis in Project Management and network analysis tools for cost and time estimation.
CO3	Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.
CO4	Understand the contract management, Project Procurement, Service level Agreements and productivity.
CO5	Understand the conceptual clarity about project organization and feasibility analyses – Market, Technical, Financial and Economic.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Management and the environment	Evolution of management thought, managing in Global Environment Social and ethical responsibility of management Introduction to project management, construction industry, stakeholders, roles, responsibilities and functional relationships	10	1
2	Project organization and superintendence	Organization planning and organization chart, Decision making and planning functions, personnel requirement and division of work, records of cost and payment, percentage completion report, changes in contract, disputes and stoppages	10	1 & 2
3	Personnel and financial management	Personnel Human resource management, managing work groups, Leadership, motivation, communication and negotiations Organization change and development Financial Functions of financial management, financial objectives, analysis and interpretation of financial information, sources of long term and short-term finance, project appraisal and capital budgeting.	10	3 & 5
4	Time management and scheduling	Introducing time and resource estimation, Work breakdown structures, Liner scheduling methods - bar charts, LOB, their limitations Principles, definitions of network-based scheduling methods: CPM, PERT. Network representation, Network analysis – forward and backward passes.	10	3
5	Office management and entrepreneurship	Organizing work, staffing, delegation and decentralization Filing and Indexing. IT application in office management and procedure. Enterprise Resources Planning (ERP), Customer Relationship Management (CRM), Customer satisfaction, Quality and Excellence Entrepreneurship The entrepreneurs' tasks and special challenges of entrepreneurship Design office management and Construction management.	8	4

Reference Books:

Planning and control with PERT/CPM by Dr. B.C. Punmia and K.K. Khandelwal Project

Microsoft office Project 2003 Bible by Elaine Marmel

Microsoft office Project 2003 Bible by Elaine Marmel,

Green Construction Project Management and Cost Oversight by Sam Kubba

Callahan, M. T., Quackenbush, D. G., & Rowings, J. E. Construction Project Scheduling.

e-Learning Source:

https://www.pmi.org/about/learn-about-pmi/what-is-project-management

Project Planning & Control: https://archive.nptel.ac.in/courses/105/106/105106149/

Project Management: https://archive.nptel.ac.in/courses/110/104/110104073/

Project Management for Managers: https://archive.nptel.ac.in/courses/110/107/110107081/

https://www.apm.org.uk/resources/what-is-project-management

	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	3	2	2	3	3	3					3	2	3	3		
CO2	3	3	3	1	3	3	3	2					3	3	2	3		
CO3	3	2	3	3	3	2	2	2					3	3	2	2		
CO4	3	2	2	2	3	3	3	2					3	2	3	2		
CO5	2	3	3	3	1	2	2	3					3	2	3	1		

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

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

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR506	**Title of the Course**	Professional Practice-I	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**1**	**2**	**-**	**2**
Pre-Requisite	Nil.	**Co-requisite**	Nil.				
Course Objectives	To introduce the aspects of professional conduct, duties and responsibilities, legal rights and procedure of the architectural profession.						

Course Outcomes	
CO1	Acknowledge the social responsibilities and duties of an architect.
CO2	Comply with CoA norms, regulations, guidelines in practice and be able to process registration with CoA.
CO3	Recognize the critical role of various national and International professional bodies in promotion and regulation of the architectural profession.
CO4	Appraise the morals and ethics in architectural profession, familiarity with the conditions of engagements and Architect's liability as per CoA.
CO5	Knowledge of legal provisions for architectural practice and develop the ability to set up practice and office management.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Architect's Role in Society And Careers In The Profession	Architect's role in society and careers in architectural profession – Self-employment or private practice, jobs in government, public sector and local bodies, Jobs in private sector including MNC's.	08	1
2	The Architects Act - 1972 (Including Amendments Thereof)	Brief description, Constitution of the Council of Architecture, COA Regulations 2018, Registration procedure, Certificate of Practice (COP), Architectural Design Competition Guidelines.	10	2
3	Professional Bodies In India And Abroad	Detailed study of Indian Institute of Architects (IIA), Introduction to U.P. Architects Association (UPAA); The Architects Regional Council Asia (ARCASIA); Royal Institute of British Architects (RIBA); American Institute of Architects (AIA); Commonwealth Architects Association and UIA (Union International des Architects); Institute of Indian Interior Designers (IIID), Institute of Town Planners (India)(ITPI), Institution of Valuers, Institution of Engineers (IE).	10	3
4	Code Of Professional Conduct, Conditions Of Engagement And Scale Of Charges	COA's Architects (Professional Conduct) Regulations -1989, Professional ethics, Conditions of Engagement with the Client and Scale of professional fees, Mode of payment, Architects Professional Liability.	10	4
5	Office Setup And Management	Setting of practices, Nature of firms- Sole Proprietary, Partnership, Limited Liability Partnership (LLP); registration of the Firm, Filing and Recording of letters and drawings, Liability under Income Tax Act, Service Tax Act, Consumer Protection Act, Goods and Services Tax (GST), FERA etc.	10	5

Reference Books:

Handbook of Professional Documents by C.O.A.,

Handbook on Professional Practice by I.I.A.,

Professional Practice by R. H. Namavati

Theory and Practice of Valuation by R. H. Namavati.

Architects and their Practices by Symes, Martin,

e-Learning Source:

www.coa.gov.in/acts/acts.htm, https://en.wikipedia.org/wiki/Council_of_Architecture

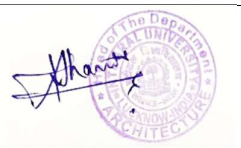
https://creativemindsnitc.files.wordpress.com/2012/04/role-of-architects-in-society.pdf, http://www.arcasia.org/, www.aia.org

http://www.architecture.com/files/ribaholdings/policyandinternationalrelations/international/,

www.itpi.org.in/, www.coa.gov.in/acts/conduct1989.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	PSO5	PSO6
CO1		3		1	3		2	2					3	2	2	2		
CO2		3	3		2		3	1					2	2	2	2		
CO3		3		1			3	1					2	2	2	2		
CO4		3	2		3		3	1					2	3	3	2		
CO5		3	2	1	3		3	1					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**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR 507	**Title of the Course**	Architectural Journalism	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**2**	**-**	**-**	**2**
Pre-Requisite	Nil.	**Co-requisite**	Nil.				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Postgraduate levels if the student so desires.						

Course Outcomes	
CO1	To analyze the role of writing in architectural journalism.
CO2	To assess various techniques and methods of researching and writing architectural research papers.
CO3	To explain the potential of architectural writings and journalism.
CO4	To publish a research paper on an architectural topic.
CO5	To aware the latest techniques for development of skills in this field

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction	Introduction to journalism, key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism.	8	1, 2
2	Technologies in Journals	Environment, Social Change, Persuasion- Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking.	6	2
3	Contemporary Architectural Journalism	Role of the Editor - Editing of Articles, Features and other stories - Editing for online newspaper and magazines - Text preparation, Mode of presentation, Standards and Guidelines for documentation, Code of ethics, Basic knowledge on Press laws, Press Council of India, Multimedia/online journalism and digital developments.	8	1, 3
4	Discussions and Issues	Regional, National and International discussion forums, Changes in contemporary and historical design practices. Discussions on topics needed in an architectural journal and current issues - types of journals, works of key architectural journalists, Public Discourse on the Internet.	5	4
5	Architectural Photography	Introduction to architectural photography and role of the photographic image in the global world – basic instruction in Photojournalism Equipment: cameras and lenses – techniques: film speed, exposure measurement, gray scale– photo- finishing and editing digital images.	5	5

Reference Books:

Feature Writing for Newspapers and Magazines", 4th edition, Longman, 2000 by Edward Jay Friedlander and John Lee,

The Arts and Sciences of Criticism", Oxford: Oxford University Press, 1999 by Fuller, David & Waugh, Patricia eds.

Principles and Practices of News for the Web", Holcomb Hathaway Publishers, Scottsdale, AZ, 2005 by Foust, James, Online Journalism,

Professional Architectural Photography", Focal Press, 2001. by M. Harris,

e-Learning Source:

Ward, S. J. A. "Philosophical Foundations of Global Journalism Ethics." Journal of Mass Media Ethics., Vol. 20, No. 1, 3-21, 2005 8.

M .Heinrich, "Basics Architectural photography", BikhauserVerlag AG, 2008.

	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	2	3	2	1	1	1					2	2	1	3		
CO2	3	2	2	2	3	2	2	2					3	3	2	1		
CO3	2	2	1	2	2	3	2	2					2	2	3	2		
CO4	2	1	3	3	2	1	1	1					1	2	3	1		
CO5	2	3	2	2	2	3	2	3					2	3	3	1		

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

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

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR508	**Title of the Course**	Theater/ Film Set Design (Elective-III)	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil.				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Postgraduate levels if the student so desires.						

Course Outcomes	
CO1	To understand the basic architectural knowledge of set design and it's typology.
CO2	To implement theme based set design that should be effectively functional.
CO3	To understand the difference between the traditional and contemporary stage design.
CO4	To be aware of all the modern technology that is a part of stage design by allocating the space.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Unit- I	History of set and backdrop design for performance	6	1
2	Unit-II	Theme based design strategies	12	2
3	Unit- III	Period and modern sets	6	3
4	Unit- IV	Technology application	8	4

Reference Books:

Behind the Scenes P. Adler

Joseph Urban by John Loring

Making the Scene by Brockett et al. Oscar.

The Most Beautiful Opera Houses in the World BY Pecqueur Antoine

e-Learning Source:

https://www.behance.net/search/projects/?search=STAGE+DESIGN&sort=recommended&time=month

https://study.com/academy/lesson/what-is-stage-design.html

https://unsplash.com/s/photos/stage-design

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	3	2	2	3	2					3	2	3	3		
CO2	2	2	3	3	2	3	3	2					2	2	2	3		
CO3	3	3	2	3	2	3	2	3					3	2	3	2		
CO4	2	1	2	3	2	1	3	2					2	3	2	2		
CO5	3	3	3	3	2	3	3	1					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**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR509	**Title of the Course**	Elective-III (Vernacular Architecture)	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**2**	**-**	**-**	**2**
Pre-Requisite	Nil.	**Co-requisite**	Nil.				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Postgraduate levels if the student so desires.						

Course Outcomes	
CO1	To develop understanding about the concept of Vernacular in building industry.
CO2	To see the historical timeline in buildings/ settlements considering Vernacular techniques
CO3	To develop understanding about correlation between vernaculars enabled Vs normal buildings.
CO4	To develop the understanding about the materials and techniques used in vernacular architecture
CO5	The subjects should also focus on developing design abilities by applying principles of vernacular architecture

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Definition and classification of Vernacular architecture.	8	1, 2
2	Approaches in vernacular architecture	Different approaches and concepts to the study of vernacular architecture	6	2, 3
3	Planning in vernacular architecture	Forms spatial planning, cultural aspects, symbolism, color, art.	4	4
4	Vernacular techniques	Materials of construction and construction technique of the vernacular architecture of India (of all four zones); western influences on vernacular architecture of India.	4	4, 5
5	Vernacular base exercise	Exercise on the basis of vernacular concept	10	5

Reference Books:

Vernacular Traditions: contemporary architecture by Aishwarya Tipnis

Vernacular Architecture of India: Traditional Residential Styles and Spaces by Tejinder S. Randhawa

American Vernacular, Buildings, and interiors, by Herbert Gottfried and Jan Jennings 1870-1960

Illustrated Handbook of Vernacular Architecture by R. W. Brunskill

e-Learning Source:

https://www.edx.org/learn/vernacular-architecture

https://onlinecourses.swayam2.ac.in/cec19_ar01/preview

https://onlinecourses.nptel.ac.in/noc22_ar17/preview

	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	PSo
CO1		3	3				3	1					3	3	2	2		
CO2	2	2		3	2	3							3	3	3	2		
CO3	2		3	3		3	2	2					3	3	3	3		
CO4		2		3		3		3					2	2	2	2		
CO5	3			3	3								3	3	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR510	**Title of the Course**	**Low Cost Architecture (Elective-III)**	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	2	-	-	2
Pre-Requisite	None	**Co-requisite**	None				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Postgraduate levels if the student so desires.						

Course Outcomes	
CO1	To understand the exact concept & definition of low cost Architecture.
CO2	To explore various modern cost-effective technologies and material.
CO3	To be aware of the various norms and it's applicability.
CO4	To prepare the analysis matrix for a given low cost project in future.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Unit- I**	Need for low-cost buildings, both in the rural and the urban sectors.	6	1
2	**Unit-II**	Use of cost-effective technologies through the use of local materials, up gradation of traditional technologies, prefabrication etc.	8	2
3	**Unit- III**	Innovations of building techniques for low cost construction.	4	2
4	**Unit- IV**	Analysis of space norms for low cost buildings. Study of usage pattern of low cost building by the inhabitants, cost analysis of low cost buildings.	8	3
5	**Unit-V**	Comparative analysis of building materials and cost.	6	4

Reference Books:
Behind the Scenes BY P. Adler
Urban by Loring John . Joseph
Making the Scene by Brockett et al. Oscar.
The Most Beautiful Opera Houses in the World BY Pecqueur Antoine
e-Learning Source:
https://www.behance.net/search/projects/?search=STAGE+DESIGN&sort=recommended&time=month
https://study.com/academy/lesson/what-is-stage-design.html
https://unsplash.com/s/photos/stage-design

	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**	**3**	**3**	**2**	**3**	**2**					**3**	**2**	**3**	**3**		
CO2	**3**	**2**	**1**	**3**	**2**	**2**	**2**	**1**					**2**	**2**	**2**	**3**		
CO3	**2**	**2**	**2**	**1**	**3**	**3**	**2**	**3**					**3**	**2**	**3**	**2**		
CO4	**2**	**1**	**2**	**2**	**2**	**3**	**1**	**1**					**2**	**3**	**2**	**2**		
CO5	**2**	**3**	**1**	**3**	**3**	**3**	**3**	**1**					**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**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	AR511	**Title of the Course**	Elective-IV (Vastu Shastra)	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	To develop understanding about concept of Vastu Shastra in building industry.
CO2	To see the historical timeline in buildings/ settlements considering Vastu Shastra.
CO3	To develop understanding about correlation between Vastu Sastra and various principles of building architecture.
CO4	To analyze the difference of Vastu Shasta enables design over the normal building.
CO5	The subjects should also focus on developing design abilities by applying principles Vastu Shastra.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Introduction: Vastu Shastra, its purpose, nature and scope.	8	1 & 2
2	Vastu and It's effect	Vastu principles and its effect, Art of building as per Vastu Shastra, Vastu principles and modern architecture.	6	2 & 3
3	Role of Vastu in Buildings	Role of various mandalas and Vastu Purush Mandala, site selection, shapes of plots, Orientation aspect.	4	4
4	Recommendations in Vastu	Recommendations on site/plot, location, configuration of various areas, inner and outer spaces within and outside the building etc.	4	4 & 5
5	Vastu enabled Design	Application of Vastu Shastra.	10	5

Reference Books:

Vaastu Purusha Mandala: Energy Grid for Building Layouts : Traditional and Contemporary by V. Ganapati Sthapati

Vastu Architecture by Michael Borden 2011

The ancient science of Vastu by Dr. Jayshree Om

e-Learning Source:

Vastu Purusha Mandala: A human ecological framework for designing living environments by Jayadevi Venugopal.

Vastu Purusha Mandala Of Property by Dr Uday Dokras.

	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					3	3	2	2		
CO2	2	2		3	2	3							3	3	3	2		
CO3	2		3	3		3	2	2					3	3	3	3		
CO4		2		3		3		3					2	2	2	2		
CO5	3			3	3								3	3	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR 512	**Title of the Course**	Behavioral Architecture	**L**	**T**	**P**	**C**
Year	**V**	**Semester**	IX	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	To learn different human psychology and human behavior.
CO2	To learn and able to design contextual spaces and for different age groups.
CO3	To study organizational and behavioral assumptions in planning and geometry of towns and neighborhood spaces.
CO4	To learn and create designs according to community, occupancy and contextual requirements.
CO5	To learn patterns of activities and sensitivity of open spaces

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction To Behavioral Architecture	Designing for pattern and activities, Archetypal activities/Archetypal spaces, planning of public spaces with reference to age groups and activities.	06	1
2	Building Systems	Room use: geometry & meaning, hidden behavioral assumptions: adjacencies, vertical bypass & horizontal bypass, various stages in the design of building subsystems	06	1 & 2
3	Building – Behavioral Interface	Geometry of spaces, their meaning & connotations, Social organization of buildings, Behavioral assumptions in the planning of new towns and neighborhoods, Behavioral assumptions in the planning of new towns and neighborhoods.	06	1 & 3
4	Behavioral Design	Process organization chart: affinity matrices, pictograms: behavioral design process model, design context, activity / adjacency relationship, evaluation chart: Area use frequency program, simultaneous use. community utilization map, occupancy load profile: defensible space, EDRA etc.,	08	4
5	Urban Environment	Patterns of activity in time and space – the ecology of a neighborhood park and playground, cross cultural issues – social & psychological issues in the planning of new towns, environmental perceptions and migration, awareness and sensitivity to open spaces – environmental cognition.	06	5

Reference Books:

Clovis Heimsath – Behavioral architecture – Mc graw hill, 1977

David canter & Terence lee – Psychology and the built environment – Halstead press , New York, 1974

Christopher Alexander et al. – A pattern language –Oxford university press

Kevin Lynch – The image of a city –Cambridge MIT, 1973

e-Learning Source:

https://journals.sagepub.com/doi/abs/10.1177/001088047801900109?journalCode=cqxa

http://eprints.covenantuniversity.edu.ng/10271/4/The%20Role%20of%20Architecture%20in%20Shaping%20Human%20Behaviour.pdf

	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	2	3	2	1	1	3					2	2	1	1		
CO2	3	2	2	2	3	2	2	2					3	1	2	1		
CO3	2	2	1	3	2	1	2	2					2	2	3	2		
CO4	2	1	3	3	2	1	1	1					3	2	3	1		
CO5	2	3	2	2	2	1	2	3					2	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR513	**Title of the Course**	ELECTIVE-IV (Contemporary Process in Architecture Design)	**L**	**T**	**P**	**C**
Year	V	**Semester**	IX	2	-	-	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Learn various contemporary theories of media and its perspective
CO2	Integration of sociocultural and technological history as a futuristic approach.
CO3	Learn to evolve methodology that integrates use of design software with traditional construction methods.
CO4	Providing students with specific knowledge and skill sets or 'inputs' to outcome based, student-centered educational approach.
CO5	Students learn to develop surfaces with 2D and 3D softwares.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Investigation of contemporary theories of media and their influence on the perception of space and architecture	6	1
2	Digital Architecture	Aspect of digital architecture; The sociocultural and technological ferment of Post modernism and Deconstructivism movement, along with advancement in technical capabilities brought about a radical departure from traditional planning in architecture.	8	1 & 2
3	Experimental leanings of digital architecture	Disciplines of Digital Materiality and Tectonics, Performative design and Techniques and Technologies in Morphogenetic Design	5	3 & 5
4	Contemporary Process	Emerging phenomena such as increasing formal and functional abstractions, Diagrams, Diagrammatic Reasoning, Animation and Design, Digital Hybrid	8	3, 4 & 5
5	Geometries and Surfaces	Fractal Geometry, Shape Grammar, Hyper Surface, Liquid Architecture, Responsive Architecture.	5	3 & 5

Reference Books:

Branko Kolarevic; Performative Architecture: Beyond Instrumentality

Toshiko Mori; Textile/Tectonic: Architecture, Material, and Fabrication

Antoine Picon ; Digital Culture in Architecture

Ali Rahim; Contemporary Processes in Architecture

e-Learning Source:

https://www.researchgate.net/publication/276290653_Digital_Design_-_Experiment_In_Contemporary_Architecture

https://www.researchgate.net/publication/278685701_Digital_Architecture_and_Intelligent_Buildings_A_Suitable_Approach_to_Proper_Implementation_of_Sustainable_Development_Components_in_the_Third_Millennium

https://www.researchgate.net/publication/337872347_The_four_factors_influencing_media_architecture#fullTextFileContent

https://www.lth.se/fileadmin/lth/student/Arkitekt/filer/programmet/kurser/VT10/AFO125_LaboratoryforSpatialExperiments.pdf

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	1	3	3	2	3	3	3	3					3	2	3	1		
CO2	2	3	3	3	2	1	1	3					3	3	3	2		
CO3	3	3	3	3	2	3	3	3					3	3	3	3		
CO4	3	3	3	2	2	3	3	3					3	2	3	2		
CO5	3	3	3	3	2	3	3	3					3	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR 514	**Title of the Course**	Elective-IV (Structure and Architecture)	**L**	**T**	**P**	**C**
Year	Vth	**Semester**	IXth	**2**	**-**	**-**	**2**
Pre-Requisite	AR405	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Able to understand monolithic and rock cut structures and arcuate construction vaults and flying buttresses techniques.
CO2	To familiarize with post Industrial modular construction of large span and suspension structures in steel and Concrete through case study.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction**	History of development of monolithic and rock cut structures.	6	1 & 2
2	**History of Structural Design in the Pre Industrial Era**	Trabeated construction – arcuate construction vaults and flying buttresses - tents and masted structures and bridges through ancient and medieval history.	6	1, 2 & 3
3	**History of Structural Design in the Post Industrial Period**	Post Industrial modular construction of large span and suspension structures in steel and Concrete.	6	2 & 4
4	**Structure in De-constructivism**	Principle and features of De-constructionism, material used in de-constructivism.	6	2 & 3
5	**Case Study**	Contemporary Structural Expression Through Case Studies of important buildings such as KCR Terminal at Hung Hom, Hong Kong, Standsted Airport Terminal, London etc.	8	4 & 5

Reference Books:

The pre-Industrial Revolution, 1500–1700 by Roberet C. Allen

Preindustrial versus postindustrial architecture and building techniques by Inge Vestergaard

History of Structural Design in the Post Industrial Period

Towards a Post Industrial Architecture Design and Construction of Houses for the Information Age by Gregory L. Demchak

e-Learning Source:

https://academic.oup.com/book/888/chapter-abstract/135478999?redirectedFrom=fulltext

https://www.researchgate.net/publication/267212688_Preindustrial_versus_postindustrial_architecture_and_building_techniques

https://en.wikipedia.org/wiki/History_of_structural_engineering

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	1	3	1	3	1	-	2	-					1	3	3	1		
CO2	2	2	2	2	1	1	1	1					2	2	-	2		
CO3	1	2	1	1	1	-	2	2					2	3	3	1		
CO4	1	2	3	3	2	-	2	3					1	-	2	-		
CO5	2	3	2	1	1	1	2	3					2	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR 515	**Title of the Course**	Architectural Thesis	**L**	**T**	**P**	**C**
Year	**5th**	**Semester**	X	**3**	**-**	**10**	**18**
Pre-Requisite	AR501	**Co-requisite**	Nil				
Course Objectives	To prepare a student to independently handle and present all aspects of an architectural design from its evolution to final solution in totality.						

Course Outcomes	
CO1	To make students conversant with the complete process of design: problem identification, formulation of requirement, evolution of a design criteria and preparation of the design proposals.
CO2	To enable students with the process of intensive study and research with respect to case studies, literature studies and standards of design.
CO3	To enable students with the understanding of the context of design; the context of place, people and time. And its impact on design solution.
CO4	To make students verse with the incorporation of building services in the design project.
CO5	Enhancing their presentation skills: verbal and visual for demonstrating their project using software skill and 3-d modelling skill.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Site analysis and Requirement formulation	Thesis Methodology, Project brief; inventory and site study: Detailed site analysis.	26	1, 2, 3, 4 & 5
2	Literature study and case studies	Selection criteria of case studies and literature studies – critical Analysis and inferences	39	1, 2, 3, 4 & 5
3	Concept Development	Concept and sketch design through drawings and models.	26	1, 2, 3, 4 & 5
4	Technical drawings	Design development in the form of site plan(s), Floor plan(s), sections and elevations, structural system and service compliance.	60	1, 2, 3, 4 & 5
5	Presentation and 3d Modelling	Detailed rendered drawings with electives and model with final thesis report.	57	1, 2, 3, 4 & 5

Reference Books:
Archiving Architectural Thesis 2009- CoA
Archiving Architectural Thesis 2013- CoA
Previous Year Thesis reference
e-Learning Source:
https://www.coa.gov.in/pub_show.php?pub_cat_id=1&lang=1
https://www.behance.net/search/projects/?search=Architecture+Thesis
https://www.kadvacorp.com/design/architecture-thesis-topics/
https://architecture.mit.edu/news/explore-thesis-projects-class-2021

	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	2	2	1	2	1	2					3	3	2	1		
CO2	3	3	2	3	2	2	1	3					3	2	3	2		
CO3	3	2	3	3	1	2	2	3					3	3	3	2		
CO4	2	2	3	3	1	2	3	3					2	3	3	2		
CO5	2	3	2	3	1	1	1	3					1	2	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2022-2023							
Course Code	AR516	**Title of the Course**	Professional Practice-II	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	2	-	-	2
Pre-Requisite	AR506	**Co-requisite**	Nil				
Course Objectives	To acquaint the students with most of the general aspects of Building contracts, Arbitration, Easement rights & Intellectual property rights.						

Course Outcomes	
CO1	Knowledge and acquaintance with the building contract and tender documents.
CO2	Understand the procedure of arbitration and preparation of awards.
CO3	Knowledge of legal provisions for easement rights and architect's role in guiding his client.
CO4	Need and application of intellectual property right (IPR) in the profession of architecture
CO5	Importance of Client- Architect - Contractor relationship

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**TENDERS AND CONTRACTS**	Types of building contracts, preparation of tender documents, inviting and opening of tenders, E-tender, comparative statements, Architect's recommendations and signing of contract	08	1
2	**ARBITRATION**	Arbitration, arbitrators, umpire, conduct, powers and duties of arbitrators and umpires, nature of arbitration, procedure of arbitration and preparation of awards	6	2
3	**EASEMENTS**	Introduction to various easements, processes and precautions to protect easement rights	8	3
4	**INTELLECTUAL PROPERTY RIGHT (IPR)**	Introduction and the need for intellectual property right (IPR) for architects, IPR in India – Genesis and Development, Copyright Act-1957 including 2012 amendment, Ownership and copyright of Drawings and Designs	5	4
5	**SKILL DEVELOPMENT**	Skill development for improved Client- Architect - Contractor relationship	5	5

Reference Books:

Handbook of Professional Documents by C.O.A.,

Handbook on Professional Practice by I.I.A.,

Professional Practice by R. H. Namavati

Theory and Practice of Valuation by R. H. Namavati.

Architects and their Practices by Symes, Martin

e-Learning Source:

http://www.designingbuildings.co.uk/wiki/Tender_documentation_for_construction_projects

https://acquisition.gov/far/current/html/FARTOCP16.html

http://admis.hp.nic.in/himpol/Citizen/LawLib/c88.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	PSO5	PSO6
CO1		3	2				3						3	3	3	2		
CO2		3	2				3						3	2	1	2		
CO3		3	2				3						2	2	2	2		
CO4		3	2				3						2	3	2	2		
CO5		3	2				3						3	2	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR517	**Title of the Course**	**BUILDING ECONOMICS**	**L**	**T**	**P**	**C**
Year	**V**	**Semester**	X	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To develop an understanding among the students regarding management of physical and human resources including evaluation techniques pertaining to a business organization in general and specific to the construction industry.						

Course Outcomes	
CO1	To familiarize students with the basic concepts of economics and their influence on architecture
CO2	To understand the interdependency of building economics in architecture and other sciences
CO3	To familiarize students with the basic concepts of project financing in architecture & construction industry
CO4	To understand the role of latest techniques in economic performance of the building
CO5	To familiarize students with the application and feasibility of economics in architectural projects

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**INTRODUCTION: ELEMENTARY CONCEPTS OF ECONOMICS**	Definitions, Needs & Wants, Nature & Scope of Economics. *Micro Economics:* Factor of production-Characteristics and importance, demand supply analysis, competitive market and determination. *Macro Economics*- National income and its distribution, inequalities of income distribution, its causes and measures, Economic system in India.	8	1
2	**RELATION TO ARCHITECTURE, ENGINEERING AND OTHER SCIENCES**	Meaning and scope of building economics, Issues and challenges associated with building projects. Building Efficiency, Building Life-cycle. Costs and Benefits of Building – Monetary and Non-Monetary	6	1,2
3	**PROJECT FINANCING**	Equity, Financing Institutions in Financing Process, Interim Finance and Permanent Financing, Bank Loan - Simple Interest and Compound Interest. Types of Mortgage, Lease Arrangements	6	2,3
4	**ECONOMIC PERFORMANCE OF BUILDING**	Decision making by using techniques of economic performance to measure tangible and non-tangible issues, Cost-Benefit Analysis, Incremental Analysis and Multi-criteria Analysis	6	3,4
5	**VALUE ENGINEERING**	Concept, its application to Architectural Projects, Real Estate Pro-Form analysis *Feasibility Analysis*: Concept and Types of Feasibility, Feasibility Analysis	6	5

Reference Books:

Modern Economic theory by K.K. Dewett

Economic for Engineers by M.L. Gupta

Micro-Economic theory by Samuelson

Building Economics for Architects by T. Mann.

Construction Management and Accounts, B. L. Gupta and Amit Gupta

Project Planning and Control with PERT and CPM, B. C. Punmia and K. k. Khandelwal

Stone, P.A. Building Economy: Design Production and Organisation a synoptic view, 2nd ed., Pergamon Press, Oxford, 1976

Mann, Thorbjoern (1992) Building Economics for Architects. Wiley

e-Learning Source:

Building Economics Report | Request PDF (researchgate.net)

(PPT) Building Economics | Krishna Sharma - Academia.edu

R. Preston McAfee, Introduction to Economic Analysis, Freely available on http://www.mcafee.cc/Introecon/IEA2007.pdf licensed under the Creative Commons.

An Introduction to Microeconomics - Course (nptel.ac.in)

	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	3	3	2	1	2	2	1					2	2	3	2		
CO2	3		3	3	2	2	2	3					3	2	3	2		
CO3	1	3	3	2	1	2	3	2					3	2	2	1		
CO4	3		3	3	2	2	2	3					3	2	1	2		
CO5	1	3	3	2	1	2	2	1					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**

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR518	**Title of the Course**	Elective-V (Green Architecture)	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	2	-	-	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Understanding of the green concepts and trends envisioned by earlier theorists and architects
CO2	Understanding of the sustainable architectural concepts
CO3	Understanding of the emerging architectural paradigms
CO4	Knowledge of new building materials, green building technologies
CO5	Application of advanced software by architects in green architecture

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction	Study of alternative energy sources being developed for use in architectural applications and energy conservation methods.	4	1,2
2	Component of Green Architecture	Aluminum Weather Resistant Insulated Access Panel , Energy Efficient Windows, Green Roof, Solar Power, Water Conservation, Recycling, Landscaping	6	1,2
3	Philosophies	Design philosophies of sustainable and energy conscious architecture.	8	1,2,3
4	Case Studies	Study of materials and their implementation in green architecture.	10	1,2,3,4
5	Documentation	Understanding the importance of green Architecture and implementation in their design	4	1,2,3,4,5

Reference Books:

Green Architecture by Taschen

Green Architecture Now by Taschen

e-Learning Source:

https://library.uniteddiversity.coop/Ecological_Building/Green_Building-Guidebook_for_Sustainable_Architecture.pdf

https://www.researchgate.net/publication/313103712_Green_Building

https://www.rcac.org/wp-content/uploads/2014/12/grn-bldg-guide_4-20-09.pdf

https://www.construction21.org/articles/h/the-7-green-building-components.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	1	1	2			3	2					3	1	1	2		
CO2	1	1	1		2		3	2					3	1	2	2		
CO3	3	2	1		2		1	1					1	1	2	2		
CO4	1	2	2	1	1	2		3					2	3	3	1		
CO5	3	2	1	1				3					2	3	2	3		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR 519	**Title of the Course**	Elective-V (Futuristic Architecture)	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Understanding of the future concepts and trends envisioned by earlier theorists and architects
CO2	Understanding of the contemporary architectural concepts
CO3	Understanding of the emerging architectural paradigms
CO4	Knowledge of new building materials, future building technologies
CO5	Application of advanced softwares by architects in futuristic architecture

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Unit-01	Introduction to futurology	8	1
2	Unit-02	Brief review of design philosophy of past and present and the trends experienced. Future concepts envisioned by earlier theorists and architects like Antonio Saint Elia	6	2
3	Unit-03	Futuristic building forms and structural systems. Future concepts envisioned by earlier theorists and architects like Le Corbusier, F.L.Wright.	4	3,4
4	Unit-04	Futuristic building materials.	4	4
5	Unit-05	Futuristic construction technique and technologies.	10	5

Reference Books:

Building for Tomorrow: Visionary Architecture From Around the World by PAUL CATTERMOLE

Designing Suburban Futures by JUNE WILLIAMSON

The Future of Architecture Since 1889 by JEAN-LOUIS COHEN

e-Learning Source:

Futuristic Architecture | Origin, Design & Characteristics - Video & Lesson Transcript | Study.com

10 Futuristic design concepts - RTF | Rethinking The Future (re-thinkingthefuture.com)

	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	1	2			3	3					3	1	1	2		
CO2	2	1	1		2		3	2					3	1	2	2		
CO3	3	2	1		2		1	3					3	1	2	2		
CO4	2	3	3	1	1	1		2					2	3	3	1		
CO5	3	2	1	1				3					2	3	2	3		

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: 2022 - 2023							
Course Code	AR 520	**Title of the Course**	Elective-V (Disaster Management)	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Understanding of the future concepts and trends envisioned by earlier theorists and architects
CO2	Understanding of the Disaster management in architectural concepts
CO3	Understanding of the emerging new ideas for disaster management
CO4	Knowledge of new building materials, future Techniques
CO5	Application of advanced softwares by architects in disaster management

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Unit-01	Introduction to disaster management, Indian scenario	8	1
2	Unit-02	Understanding of disaster, Hazard and its classification	6	2
3	Unit-03	Vulnerability, Capacity, Risk. Various types of disasters.	4	3,4
4	Unit-04	To understand in detail for the causes, adverse effects, distribution patterns, mitigation measures of Earthquake, Tsunami, Cyclone, Flood and Landslide	4	4
5	Unit-05	Disaster management cycle.	10	5

Reference Books:

Disaster management and Preparation by LARRY COLLINS

Disaster management Handbook

Textbook of Disaster management By Ak Shrivastava

e-Learning Source:

https://think-asia.org/bitstream/handle/11540/5035/disaster-management-handbook.pdf?sequence=1

http://sdmassam.nic.in/pdf/publication/undp/disaster_management_in_india.pdf

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	2	1	2	3	2	1	2					2	3	2	3		
CO2	2	1	3	2	2	2	2	2					2	2	1	3		
CO3	2	2	2	3	2	3	2	2					1	2	2	3		
CO4	1	3	2	3	2	2	2	3					2	2	2	3		
CO5	3	2	1	2	1	1	1	1					2	2	1	3		

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: 2022 - 2023							
Course Code	AR521	**Title of the Course**	**Elective-V (Waste Management)**	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students to identify the waste management practice in community and town level and promoting a healthy and sustainable environment for the citizens.						

Course Outcomes	
CO1	Able to identify waste and its disposal problems.
CO2	Develop an ability to waste segregation at micro and macro level.
CO3	Able to understand the importance of waste laws and there relevance.
CO4	Familiarize with advance waste disposal techniques.
CO5	Prepare students as a responsible and sensitive citizen to achieve the sustainable growth of the India.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction**	Identification of problems of waste disposal in urban areas, contemporary solid waste management scenario in India. Role of state and central government policies for the efficient waste management	8	1
2	**Origin of waste**	Waste types, waste segregation and quantification at micro and macro level.	4	2
3	**Waste management**	Waste hierarchy, integrated waste management programme for the Municipal solid waste, waste management laws.	10	3
4	**Waste disposal**	Waste disposal technologies and landfilling	6	4
5	**Sustainability in waste management**	Resource recovery, advancement in waste management for a greener and cleaner environment.	4	5

Reference Books:

Wastewater Engineering Treatment and Reuse by Metcalf & Eddy

Sewage Waste Disposal and Air Pollution Engineering by Santosh Kumar Garg

e-Learning Source:

https://easyengineering.net/sewage-waste-disposal-and-air-pollution-engineering-by-santosh-kumar-garg/

	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	2	3	3	2	-	2	2	1					1	3	2	1		
CO2	1	2	3	2	3	1	1	-					2	2	3	2		
CO3	3	3	3	3	-	3	2	1					2	3	2	2		
CO4	1	2	3	2	-	2	1	1					3	2	2	3		
CO5	1	3	3	2	2	3	1	3					2	3	3	2		

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

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR522	**Title of the Course**	ELECTIVE-VI (FUTURISTIC BUILDING MATERIALS, CONSTRUCTION TECHNIQUES AND TECHNOLOGIES)	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Understand the future techniques in building technology
CO2	Understand the future techniques in building technology
CO3	Aware and learn about the designing futuristic building.
CO4	Students knows to how futuristic technologies in architecture can be adopted in today's perspective
CO5	Discussed and learn on Previous research works/ articles, Understanding Types and techniques

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**INTRODUCTION**	Evolution of contemporary architectural concepts such as biomimicry, Adaptive reuse. "Zero energy" and "Energy +" buildings with emphasis on an integrated approach.	6	1
2	**FUTURISTIC BUILDING MATERIALS**	Futuristic materials and its uses in the building, impact of materials on the environment, properties and its implementation in building construction, effectiveness of the material.	6	1,2
3	**CONSTRUCTION TECHNIQUES**	Futuristic building material, its utility in diversified structures and spaces, aesthetics, durability and sustainability of constructions, Green buildings, Radial approach to futuristic building form and, structure system.	8	2,3
4	**CONSTRUCTION TECHNOLOGIES**	High rise and long Span Architecture, Futuristic approach towards disaster mitigation. Socio-cultural and economic impacts of future urban habitat.	6	3,4
5	**APPLICATION IN DESIGN**	Futuristic Homes. Building information modeling (BIM) in futuristic architecture, 3D printing technology and its implementation in building construction.	6	4,5

Reference Books:

American chemical society journel/biomacromolecules

Transparent wood, revolutions ahead in architecture and electronics by Marianna Mäki-Teeri in 2017

e-Learning Source:

https://www.archdaily.com/938213/material-of-the-future-4-architects-that-experiment-with-cross-laminated-timber?ad_medium=mobile-widget&ad_name=most-visited-article-show

https://www.re-thinkingthefuture.com/article/20-great-movies-every-architect-should-watch/

https://www.researchgate.net/publication/235976161_Metallic_Foams_Current_Status_and_Future_Prospects

	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				2	1		3						1	2	2	1		
CO2				1	2		3						1	3	2	2		
CO3	3		2	3			2						1	2	3	2		
CO4	3	2		2			3						1	3	2	2		
CO5		3	2	2	2		2						3	3	1	2		

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

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

Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	AR523	**Title of the Course**	Elective-VI (Transport Planning)	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	**2**	**-**	**-**	**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	To make students understand the basic principles of the transportation system.
CO2	To understand the complexities of transport infrastructure and management.
CO3	To make students understand about the various type of transportation surveys.
CO4	To make students understand the collective results and implication of the transport planning through case studies.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Roads and transport services in urban and rural settlement, Scope and dimensions of transport Planning.	5	1
2	Mass Transport system	Mass transportation in urban environment; Urban form in relation to traffic and transportation patterns.	7	2
3	Sustainability in Transport	Sustainable transport systems; Environmental considerations in it, New innovations and concepts in traffic and transportation.	6	2
4	Case Study	Case studies on best practices of traffic management and transportation services from India and abroad.	4	2 & 3
5	Mini Project	Mini survey on Transport survey (As per brief introduced by course teacher).	10	4

Reference Books:
Crisis in road transport by Mohinder Singh and L.R. Kadiyali
Traffic engineering and transportation planning, L. R. Kadiyali
Environmental scenario in India by Mukerjee S. and Chakraborty D. (Eds)
e-Learning Source:
NPTEL lectures
Coursera
Udemy

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

Integral University, Lucknow

Effective from Session: 2022 - 2023							
Course Code	AR524	**Title of the Course**	Elective-VI (Building System Integration)	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	**2**			**2**
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Relate the human factors of environmental design to the function and characteristics of building systems.
CO2	Describe the function, characteristics, and operation of normative building systems.
CO3	Compare the opportunities and limitations of traditional and integrated design processes to create high-performance buildings.
CO4	Describe the integrated design process approach to the creation of high-performance buildings.
CO5	Discuss the value of whole-building energy simulations as part of the integrated design process.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**INTRODUCTION**	System and Sub- systems in buildings, analysis of sub- systems and its relationship.	4	1,2
2	**HUMAN FACTORS IN BUILDING DESIGN**	Climate-Responsive Design and Human Factors in Building Design, Human Comfort	6	2,3
3	**THE PEOPLE IN IDP: ROLES AND RESPONSIBILITIES**	The Integrated Design Process in Theory and Practice, The People of IDP: Roles and Responsibilities, Facilitating the Integrated Design Process	6	2,3
4	**TRADITIONAL AND INTEGRATED DESIGN**	Building systems in different building typologies, Optimizations and sub- system.	8	4
5	**WHOLE-BUILDING ENERGY SIMULATION**	Energy Consumption in Buildings, Calculations for Demonstrating Energy Efficiency, Simulating the Performance Properties of Architectural Systems, Energy Consumption in Buildings: An Eight-City Analysis	8	3.4,5

Reference Books:

The Building Systems Integration Handbook, R Rush, 1991, American Institute of Architects

Building Services: A Guide to Integrated Design: Engineering for Architect, RP Parlour, 2008, Integral Publishing

National Building Code of India (Latest Edition), Bureau of Indian Standards.

Brophy, V., & Lewis, J. (2011). A green Vitruvius: Principles and practice of sustainable architectural design, 2nd ed. Washington, DC: Earthscan

e-Learning Source:

https://www.arch.columbia.edu/courses/23196-2069

https://www.athabascau.ca/science-and-technology/about/discover-our-academic-disciplines/raic-centre-for-architecture.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	**2**	**1**	**3**	**2**	**1**	**3**	**2**	**1**					2	1	1	3		
CO2	**3**	**2**	**3**	**1**	**1**	**2**	**2**	**1**					2	2	3	3		
CO3	**2**	**1**	**3**	**2**	**1**	**1**	**2**	**1**					3	2	2	2		
CO4	**2**	**1**	**3**	**2**	**1**	**3**	**2**	**1**					2	2	3	3		
CO5	**3**	**2**	**3**	**1**	**1**	**2**	**2**	**1**					3	2	2	2		

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

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

Integral University, Lucknow

Effective from Session: 2022-2023							
Course Code	AR525	**Title of the Course**	Elective-VI (Infrastructure Planning and Management)	**L**	**T**	**P**	**C**
Year	V	**Semester**	X	2	-	-	2
Pre-Requisite	Nil	**Co-requisite**	Nil				
Course Objectives	To enable students a choice of subjects at the undergraduate level itself so that these could be further developed in the profession or studies at Post Graduate levels if the student so desires.						

Course Outcomes	
CO1	Students will grasp the necessity and importance of developing urban infrastructure.
CO2	Understand the ways in which infrastructure planning projects are implemented. Techniques of data collection and analysis would be taught as part of this course.
CO3	Knowledge of the fundamentals of Traffic and Transportation Engineering and Probability and Statistics is the desired prerequisite for the course.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	Introduction	Introduction to infrastructure planning, definition and categorization of infrastructure as applicable to urban and rural planning, Norms and standards, etc.	15	1, 2 & 3
2	Social-Physical Infrastructure	Basic definition, concept, typology, Norms & standards.	15	1 & 2
3	Water Supply and Sanitation	Source of supply, transmission and distribution, treatment methods, and design guidelines. Sanitation – concepts, disposal systems,Wastewater – generation, disposal system Storm water drainage – systems	12	2
4	Traffic and Transportation	infrastructure and facilities for transport, Roads, Volume, Traffic Volume, Data required for provision and planning of urban networks and services.	12	2 & 3
5	Case Study and Documentation	Visit to Infrastructure Development Agency and submit report.	06	1, 2 & 3

Reference Books:

Crisis in road transport by Mohinder Singh and L.R. Kadiyali

Traffic engineering and transportation planning by L. R. Kadiyali

Environmental scenario in India 2012 by Mukerjee S. and Chakraborty D. (Eds)

e-Learning Source:

https://link.springer.com/book/10.1007/978-3-030-48559-7

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	3	2	3	2	1	2					3	3	3	3		
CO2	3	3	2	2	2	2	3	2					3	3	2	3		
CO3	3	3	2	3	2	1	1	2					3	2	1	3		

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

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