



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.	36	1
		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.		
		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		

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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.dccc.edu/~document/project info - Arch.dwg.
http://www.technologystudent.com/designpro/ortho1.htm
http://www3.ul.ie/~rymnet/orthographic_projection_fyp/webpages/what_is_ortho.html
http://www.slideshare.net/yashlaxdawala7/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			

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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	PO1	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		

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Integral University, Lucknow

Effective from Session: 2018 - 2019						
Course Code	AR105	Title of the Course	Surveying and Levelling	L	T	P
Year	I	Semester	I	1	2	-
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/Tech nology	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/>

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		

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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.brcmct.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	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		

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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	<ol style="list-style-type: none"> 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/-Computerdrafring	
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		

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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: <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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: <ol style="list-style-type: none"> 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. Jadhve, 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
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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	<ol style="list-style-type: none"> 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.
CO5	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>

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
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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	<ol style="list-style-type: none"> To develop understanding about building elements and their construction principles To develop understanding about composition of various compatible building materials for construction. 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	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	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
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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	<ol style="list-style-type: none"> 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/~rynet/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
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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/-Computerdrafting
http://www.ccollege.hccs.cc.tx.us/-Comp.graphic
http://www.ciips.ee.uwa.edu.au/

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
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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 compressive 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:
<i>Elements of Structural Analysis</i> by S. A. Bari
<i>Structure and Architecture</i> by A. J. Macdonald
<i>Strength of Materials</i> by R. K. Rajput
<i>Introduction to Structural Analysis</i> 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://joharner.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		

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

PO-PSO	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
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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 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	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/	

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

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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	1 st	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

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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	<ol style="list-style-type: none"> 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	<i>Suggestive places to visit</i>	<p>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.</p> <p>Visual- Photographs/ sketches to reinforce the objectivity of the syllabus. Documentation and presentation of complete tour work consisting of measure drawing work</p> <p>An abroad tour could be arranged depending on the student willingness with proper consent from their parents/ guardians.</p>	-	1,2,3,4,5

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	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

<p>Ar. Shweta Verma Name & Sign of Program Coordinator</p>	<p>Sign & Seal of HoD</p>
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