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**

-

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**

-

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**