Integral University, Lucknow

Effective from Session: 2016							
Course Code	DAR 401	**Title of the Course**	BUILDING SERVICES-II	**L**	**T**	**P**	**C**
Year	2ND YEAR	**Semester**	4TH SEM	**1**	**3**	**-**	**40**
Pre-Requisite		**Co-requisite**					
Course Objectives	To enable students to analyze the functional requirements of building services, design HVAC systems, fire safety systems, and vertical transportation systems, and ensure their integration into building designs with an emphasis on compliance, safety, and performance optimization.						

Course Outcomes	
CO1	To teach the principles and design techniques for air conditioning and ventilation systems that ensure thermal comfort and indoor air quality.
CO2	They will understand advanced building services pertaining to natural and mechanical ventilation, and their application to build forms.
CO3	To make students aware about Fire-fighting methods, rules, regulations and equipment.
CO4	To enable the selection and design of vertical transportation systems that meet the requirements of different building types and usage patterns.
CO5	The subject aims at Understanding complex Services in multi-storied buildings. They will Understand the architectural content of services in buildings.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
UNIT-I	**Air conditioning**	Basic definition such as latent heat, ton of refrigeration etc. Different systems of A. C. central air conditioning and direct expansion systems Chilled water system, Package units, windows units, console evaporative type coolers	8	CO1
UNIT-II	**Ventilation**	Requirement size and position of openings, Air-flow pattern inside and outside buildings. Natural and artificial, space opening in interior and AC supply and ducting plans.	6	CO2
UNIT-III	**Fire Protection**	General, Fire resisting properties of materials. Fire resistant construction. Fire protection requirements for multistoried building. Safety against fire in theaters and cinema halls. Fire detecting and extinguishing system.	8	CO3
UNIT-IV	**Lifts**	Special features required for physically handicapped and elderly Lifts of various types such as passenger, goods, hospital etc. (with special reference to Design of lift cage) Definition, Design Considerations, Location, Sizes, Component parts- Lift Well, Travel, Pit, Hoist Way, Machine, Buffer, Door Locks, Suspended Rope, Lift Car, Landing Door, Call Indicators, Call Push	10	CO4
UNIT-V	**Escalators**	Different types of elevators and Escalators, Freight elevators, Passenger elevators, Hospital elevators, Uses of different types of elevators Escalators.	8	CO5

References Books:

Building services: S.M. Patil

e-Learning Source:

https://www.youtube.com/watch?v=GzEMdQk1QTk

https://www.youtube.com/watch?v=_PoAwHJkS_8

PO-PSO	PO													PSO			
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PO13**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	-	-	-	3	2	-	3	-	2	-	-	1	-				
CO2	-	-	-	3	3	-	2	-	1	3	1	-	-				
CO3	-	-	-	3	-	-	2	-	-	-	-	-	2				
CO4	-	-	-	3	-	-	3	-	-	-	-	-	1				
CO5	-	-	-	3	2	-	2	-	-	3	-	1	2				

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

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University,

Effective from Session: -2016							
Course Code	DAR-402	**Title of the Course**	HISTORY OF ARCHITECTURE	**L**	**T**	**P**	**C**
Year	II	**Semester**	IV	03	01	00	-
Pre-Requisite	NONE	**Co-requisite**	NONE				
Course Objectives	• The emphasis of this subject is to Highlight The salient features of style, awareness about the planning, construction, function and aesthetics of historical buildings. • They Will appreciation of architectural style as a product of the time, place and culture in the western world. • Introduction to the architecture of the ancient world and understanding architecture of periods in terms of space, form and structure • Familiarizing with typical examples of building type						

Course Outcomes	
CO1	The Emphasis of This Subject is to Highlight The salient features of style, awareness about the planning, construction, function and aesthetics of historical buildings
CO2	They Will Appreciation of architectural styles product of the time, place and culture the western world
CO3	Introduction to the architecture of the ancient Ancient world and understanding architecture of periods in terms of space, form and structure
CO4	Familiarizing students with early human civilization and their Architecture type.
CO5	Understand the Evolution of Modern Architecture

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	UNIT I	INDIAN STYLE Islamic architecture in India. Architecture of pathan dynesties and their works in Delhi region (Imperial style) provincial styles like Punjab, Bengal, Ahmedabad, Malwa, Bijapur and Mughal Architecture in Delhi region. WESTERN STYLE Historical architecture, Gothic Renaissance and Baroque.	12	1
2	UNIT II	Indo-Islamic Architecture (Mughal Architecture), Egyptian Architecture, Greek Architecture	07	2
3	UNIT III	Central Asian Architecture, Roman Architecture, Persian Architecture	07	3
4	UNIT IV	Mesopotamian Architecture,Vedic Architecture,Buddhist & Jain Architecture HinduNorth Indian styles.	07	4
5	UNIT V	Modern trends in Architecture, its concept and scope, Works and Philosophy of eminent architects like Frank Lloyed Wright, Walter Groupius and Behaus.	07	5

References Books:

Ancient Indian Architecture (From Blossom to Boom) by Sanjeev Maheshwari.

A History of Architecture by Sir Banister Fletchers.

e-Learning Source:

A History of Western Architecture: Greece & Rome: (PART-I-https://youtu.be/fXAMR6-7eFw?si=ytWzDq4kxiNrI38-) (PARTII-https://youtu.be/CwK1qtxDTeY?si=L1g6Bo-5DKbjiSSB)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS8	PS9	PS10	PS11	PS12	PS13	PSO1	PSO2	PSO3
CO1					2					3				2		
CO2					2					3			2	2		
CO3		2								3				2		
CO4										3			1	2		
CO5					1					3				2		1

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

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Effective from Session: 2016							
Course Code	DAR-403	**Title of the Course**	Building Construction-I	**L**	**T**	**P/ST**	**C**
Year	II	**Semester**	IV	**1**	**1**	**3**	
Pre-Requisite		**Co-requisite**	NA				
Course objectives	• To initiate the students into theory and practice of estimating and quantity surveying. • To inculcate awareness regarding factors effecting cost of buildings						

Course Outcomes	
CO1	To develop understanding of Construction Principles and theories.
CO2	To introduce and familiarize student with construction method and techniques.
CO3	Imparting brief knowledge in building construction like foundations, D.P.C, bricks and stone masonry, arches and lentils.
CO4	Imparting brief knowledge about Doors and Windows
CO5	Imparting brief knowledge about Roof and Roof covering.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
UNIT-I	**Brick foundations, D.P.C. AND Foundation**	Definition and purpose of foundations, Introduction to different types of foundations. Timbering to trenches for foundations. Study of simple strip foundations for load bearing walls and piers, method of laying D. P. C. Foundation-Shallow foundations-Introduction, types of shallow foundations, Deep foundations Introduction, types of Pile foundations	9	CO-1
UNIT-II	**Brick Toothing, Masonary**	Brick Toothing General principles of construction in brick Toothing, brick on edge and brick on end etc., Bats and closers, Bonds in Brick work, stretching bond, English bond, double and single Flemish Bonds etc. in different types of mortars. Masonary Technical terms, Head, Stretcher, bond, Core, Header Course, Stretcher Course, Bed facing, Hearting, Joint, Bat, Closing, King Closure, Queen Closer, Beveled Closure, Frog, Quoin, Plinth Course, Sill, Jamb, Reveal, String Course, Cornices, Corbel.	8	CO-2
UNIT-III	**Stone Masonary, Arches and Lintels**	Stone Masonary Joints in Stone Masonry, Rubble Masonry, Ashlar Masonry Arches and Lintels Introduction. Technical terms used in Architectural work. Description of various types of arches and lintels. Method of arch and lintel construction.	7	CO-3
UNIT-IV	**Doors & windows**	Introduction to joints in carpentry and various types of doors & window, construction of door/window frames. Introduction of Batten doors, Ledged and batten doors and Ledged, Braced and batten doors, Details of Panelled doors and Flush doors. Details of hardware related to these doors	8	CO-4
UNIT-V	**Roof & roof coverings**	Introduction to different types of roofs roof covering with their suitability to various functions e.g. flat, couple, close couple, Lean to & double lean to roof. Roof coverings with slate and tile	8	CO-5

References Books:

1. Sushil Kumar, Building construction.
2. Gurcharan Singh, Building Construction Engineering.

e-Learning Source:

1. https://www.youtube.com/live/fysIAYNBoe4?si=KA-oGiTxqZvYx-va

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PSO1	PSO2	PSO3
CO1	-	-	-	-	2	-	-	-	-	3	2	-	-	-	3	2
CO2	-	-	-	-		-	-	-	-	3	2	-	-	3	-	-
CO3	-	-	-	-	1	-	-	-	-	3	1	-	-	1	-	2
CO4	-	-	-	-	2	-	-	-	-	3	2	-	-	-	3	-
CO5	-	-	-	-	3	-	-	-	-	3	2	-	-	1	-	2

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

Name & Sign of Program Coordinator	Sign & Seal of HoD

Integral University,

Effective from Session: -2016							
Course Code	DAR-404	**Title of the Course**	ARCHITECTURE GRAPHICS-II	**L**	**T**	**P**	**C**
Year	II	**Semester**	IV	01	00	03	-
Pre-Requisite	NONE	**Co-requisite**	NONE				
Course Objectives	• Architecture graphics-II proceeds the goa l of its predecessor, which improve upon the skills learned that are helpful throughout the development and evolution of an Architectural design form inception to its competition.						

Course Outcomes	
CO1	It Further Develops the Techniques, methodologies, and graphic tools used in visualizing, creating and conveying architectural ideas and concepts
CO2	thoroughly address the skills to develop different views of an Architectural drawing like isometric view, and one-point, two-point and three-point perspective
CO3	Introduction to the Principles of Shades And shadows
CO4	Drawing Presentation drawings
CO5	Familiarizing students with the graphical tools used to communicate ideas

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	UNIT I	Principles of shades and shadows, Drawing shades and shadows of lines, planes, solids and architectural building elements	08	1
2	UNIT II	Study of drawing shadows in isometrics, Shades and shadows of typical building on plan and elevation, Shades and shadows in perspective	09	3
3	UNIT III	Complete presentation of selected or given architectural design with perspective views by any method including approximate method	07	2
4	UNIT IV	Presentation drawings of floor plans, elevations, landscapes in site plan etc.	06	4
5	UNIT V	Orientation exercise in different mediums in Pencil, Ink, Water colours, Pastels, etc. Theory of composition, theory of colours Drawing indoor and outdoor sketching in pencil and ink.	10	5

References Books:

Architecture Graphics by N.D. BHATT

e-Learning Source:

Fundamentals of Architectural Drawing and Sketching (https://youtu.be/wg7yT3mmCNk?si=c-mjUW3wT-nekwCr)

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PSO1	PSO2	PSO3
CO1		3				3									2	
CO2		3				3									2	
CO3		1				3									2	
CO4						3									3	
CO5		1				3									1	

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

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Effective from Session: 2016							
Course Code	DAR-405	**Title of the Course**	ENVIRONMENTAL POLLUTION & CONTROL	**L**	**T**	**P**	**C**
Year	II	**Semester**	IV	**3**	**1**	**0**	
Pre-Requisite		**Co-requisite**	NA				
Course Objectives	To classify and analyze various types of pollution, their sources, and their effects, with an emphasis on air, water, noise, radioactive, solid waste, and thermal pollution, along with methods for their control and mitigation.						

Course Outcomes	
CO1	Know fundamental components of the environment (earth, water, air, space, and energy) and their interactions within ecosystems,
CO2	Know about various types of pollution (air, water, solid waste, thermal, noise, and radioactive), their sources, effects, and measurement
CO3	Know sources and effects of noise and radioactive pollution on living and non-living systems
CO4	Review types, sources, and components of solid waste, including city and industrial waste. Explore

UnitNo.	Title of the Unit		Contact Hrs.	Mapped CO
UNIT-I	**Ecology. Pollution and its Classification**	Ecology of Environment Elements of environment: Earth, water, air, space and energy. Ecology: Living and non-living concepts lead to ecology. Ecosystem: Terrestrial, aquatic and marine effects of environmental pollution on ecological balances. Pollution and its Classification: Definition, Classification, Air, Water, Solid waste, Thermal, Noise and Radioactive Pollution. Different parameters of pollution.	9	CO-1
UNIT-II	**Water Pollution**	Sources, Transport of Pollutants, Effect of water pollutants on man, animal, plant and material, various types of pollutants. Mainly discuss various types of waste from the community, general characteristics of domestic & industrial wastes and their effects on environment, disposal methods on land and water, criteria of disposal by dilution. Stream sanitation. Sampling and monitoring instrumentation for water pollution and control.	8	CO-2
UNIT-III	**Air Pollution**	Sources, Types of air pollutants, Transport of air pollutants, dispersion by single and multiple sources. Control equipment, filters, electrostatic precipitators, and wet scrubbers, fume combustion by incineration, Air pollution control in new and old plants.	8	CO-3
UNIT-IV	**Noise Pollution and Radioactive Pollution**	Sources, measurement of pollution. Degree of noise, Echoes and their control. Industrial noise, unit characteristics occupational injuries due to noise, criteria and standard for occupational injuries due to noise. Means to control noise in industry. Radioactive Pollution: Sources and effect on humans, animals, plants and materials, measurement, means to control, preventive measures.	8	CO-1
UNIT-V	**Solid Waste Pollution**	Solid Waste Pollution: Review of various types of solid waste, sources, and components of solid waste, city garbage and industrial solid waste handling and disposal equipment. Method of disposal, salvage and recovery, Volume reduction in solid waste.	7	CO-2

References Books:

1. SOLID WASTE MANAGEMENT: S.K. GARG

e-Learning Source:

1. https://www.youtube.com/watch?v=tDirNlSuMu0&pp=ygVEbGVjdHVyZXMgb24gZW52aXJvbm1lbnRhbCBwb2xsdXRpb24gYW5kIGNvbnRyb2wgYnkgbml0dHRyIGNoYW5kaWdhcmg%3D

PO-PSO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 14	PSO 1	PSO 2	PSO 3
CO1	2		2	3							2		2		
CO2	2		2	3							2				3
CO3	2		2	3							2			2	2
CO4	2		2	3							2		2		

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

Name & Sign of Program Coordinator	Sign & Seal of HoD

Integral University, Lucknow

Effective from Session: 2016							
Course Code	DAR 406	**Title of the Course**	ARCHITECTURE DESIGN -II	**L**	**T**	**P**	**C**
Year	2ND YEAR	**Semester**	4TH SEM	**1**	**0**	**5**	**60**
Pre-Requisite		**Co-requisite**					
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. • Making student learn the art of collecting data and to carry out analysis for the process of evolving design and individuality of approach. • Understanding site planning: organization, scale, hierarchy, orientation and climate • Understanding complex services in multi-storied buildings; understanding the architectural content of services in buildings. • Implication of knowledge of design fundamentals and knowledge gained in other subjects to develop better design solutions.						

Course Outcomes	
CO1	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.
CO2	To develop perception and presentation of architectural forms and buildings.
CO3	Student shall develop understanding the range of techniques of expression beginning with manual drawing.
CO4	Familiarization with drafting tools and accessories.
CO5	Introduction to Interior Schemes of different buildings.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
UNIT-I	Introduction	Inception of Circulation Diagrams, Analysis of area requirements and functional layouts of small units.	10	CO1
UNIT-II	Design Problem 1	Design problems on building types such as residence, apartments etc.	8	CO2
UNIT-III	Design Problem 2	Schools / Colleges.	6	CO3
UNIT-IV	Design Problem 3	Public building/complexes.	6	CO4
UNIT-V	Designing	Preparing interior schemes for small residences, clinics, nursery, restaurants, shops, sub-post office etc.	10	CO5

References Books:

Form, Space & Order By D.K. Ching

Indian Time Saver

NEUFERT

e-Learning Source:

https://youtu.be/0lent3mq6CE?si=IAMlBxCGtkyjTbbw

https://youtu.be/25JkMSFNHOw?si=5MAB8KHF6A884sAn

PO-PSO	PO													PSO			
CO	**POI**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PO13**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	-	1	3	-	-	-	3	1	2	-	3	3	3	-	1	3	
CO2	-	-	-	2	3	-	-	-	3	3	1	-	-	3	-	1	
CO3	-	1	-	3	2	-	3	1	1	-	-	2	1	-	2	-	
CO4	-	2	-	-	3	-	3	1	-	-	-	2	2	-	-	2	
CO5	-	-	3	-	2	1	-	-	2	-	-	-	-	-	3	-	

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

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2016							
Course Code	DAR-451	Title of the Course	AUTO CAD LAB	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	**1**	**0**	**3**	**-**
Pre-Requisite		**Co-requisite**	NA				
Course Objectives	• To teach students the fundamental and advanced tools of AutoCAD for architectural drafting. • To enable the creation of accurate 2D and basic 3D architectural designs.						

Course Outcomes	
CO1	Students will become familiar with office practice and standards
CO2	Students will become familiar with AutoCAD two dimensional drawings.
CO3	Students can make accurate and precise drawings like plan, section and elevation of a building.
CO4	Gain introductory knowledge of 3D modeling in AutoCAD, enabling basic visualization of architectural concepts.
CO5	Enhance 2D and 3D drawings with hatching patterns, gradients, and fills for improved visual representation.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Experiment No.1	Use of various commands of Auto-Cad. When to use key board and Mouse.	4	CO1
2	Experiment No.2	Activation of command through pull down Menu, through icons or by using key board.	4	CO2
3	Experiment No.3	Preparation of basic presentation drawings like Site plan, Floor plans, Sections, Elevations.	4	CO3
4	Experiment No.4	Preparation of basic 3-D drawings.	4	CO4
5	Experiment No.5	Different rendering techniques.	4	CO5

References Books:

1. Lab Manual

e-Learning Source:

1.

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	2	3	-	-	2	-	-	2	-	-	-
CO2	-	3	-	-	-	3	3	-	-	2	-	-	2	1	-	2
CO3	-	2	-	-	-	2	3	-	-	3	-	-	1	-	2	-
CO4	-	3	-	-	-	3	-	-	-	3	-	-	-	2	3	3
CO5	-	2	1	2	-	3	-	2	-	3	-	-	-	3	3	-

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

Name & Sign of Program Coordinator	**Sign & Seal of HoD**

Integral University, Lucknow

Effective from Session: 2016							
Course Code	DAR-456	Title of the Course	CONSTRUCTION TECHNIQUE LAB	**L**	**T**	**P**	**C**
Year	II	**Semester**	III	**0**	**0**	**3**	**-**
Pre-Requisite		**Co-requisite**	NA				
Course Objectives	• To teach students the fundamental and advanced tools of AutoCAD for architectural drafting. • To enable the creation of accurate 2D and basic 3D architectural designs.						

Course Outcomes	
CO1	Construction lab is the onsite implementation of the theories learned in building construction, which further assures the understanding of construction.
CO2	To familiarize them with the different building material and their effective role indifferent stages of building construction.
CO3	Also, makes them aware of the errors that appear while implementation of those theories learned inbuilding construction.
CO4	Understand various construction materials and their applications in building projects.
CO5	Students Gain hands-on experience with construction tools, machinery, and modern technologies.

Unit No.	Title of the Unit		Contact Hrs.	Mapped CO
1	Experiment No.1	Layout of a building.	3	CO1
2	Experiment No.2	To construct brick bonds (English and Flemish bonds) in one, one and half and two brick thick.	3	CO2
3	Experiment No.3	To construct walls. L, T and cross junction, Columns.	3	CO3
4	Experiment No.4	Construction of Masonry Walls	3	CO3
5	Experiment No.5	Flooring: Laying of flooring on an already prepared lime concrete base.	3	CO4
6	Experiment No.6	Plastering and Pointing of wall	3	CO4
7	Experiment No.7	Finishing of wall surface by Lime, Distemper etc. and calculation of material in 100 m2 wall area	3	CO4
8	Experiment No.8	Use of Special type of shuttering/cranes/heavy machines in construction work.	3	CO5

References Books:

1. Lab Manual

e-Learning Source:

1.

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	2	2	-	2	-	3	-
CO2	-	-	-	-	-	-	-	-	-	3	1	-	2	-	2	2
CO3	-	-	-	-	-	-	-	-	-	1	1	-	1	-	2	-
CO4	-	-	-	-	-	-	2	-	-	-	-	1	-	-	3	3
CO5	-	-	-	-	-	-	3	-	2	3	-	-	2	-	3	-

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

Name & Sign of Program Coordinator	Sign & Seal of HoD