Diploma of Architecture

(D. Arch)

Three Year Full Time Diploma Programme

SYLLABUS

2020-23

School of Architecture and Planning

LINGAYAS VIDYAPEETH

D.Arch, Semester-I- First year				
S. No.	**Subject Code**	**Subject Name**	**L-T-P**	**Credit**
1	DARC 1001	Architecture Design-I	0-0-12	6
2	DARC1002	Building Construction-I	0-0-4	2
3	DARC 1003	History of Architecture - I	0-0-2	1
4	DARC 1004	Computer Application in Architecture - I	0-0-2	1
5	DARC 1005	Architecture Graphic-I	0-0-6	3
6	DARC1006	Communication	0-0-2	1
			Total Credits	14

D.Arch, Semester-II- First year				
S. No.	**Subject Code**	**Subject Name**	**L-T-P**	**Credit**
1	DARC1009	Architecture Design-II	0-0-12	6
2	DARC1010	Building Construction-II	0-0-6	3
3	DARC 1011	History of Architecture - II	0-0-2	1
4	DARC1012	Computer Application in Architecture - II	0-0-2	1
5	DARC1013	Architecture Graphic-II	0-0-4	2
6	DARC 1014	Surveying & Levelling	0-0-2	1
7	DARC1015	Climatology	0-0-4	2
8	DARC1016	Building Services-I	0-0-2	1
9	DARC1017	Summer Internship-I		2
			Total Credits	19

D.Arch, Semester-III-Second Year				
S. No.	**Subject Code**	**Subject Name**	**L-T-P**	**Credit**
1	DARC 2001	Architecture Design -III	0-0-14	7
2	DARC 2002	Building Construction -III	0-0-6	3
3	DARC 2003	History of Architecture-III	0-0-4	2
4	DARC 2004	Computer Applications in Architecture-III	0-0-4	2
5	DARC 2005	Building Services -II	0-0-2	1
6	DARC 2006	Winter Internship-I		3
			Total Credits	18

D.Arch, Semester-IV-Second Year				
S. No.	**Subject Code**	**Subject Name**	**L-T-P**	**Credit**
1	DARC 2009	Architectural Design - IV	0-0-14	7
2	DARC 2010	Building Construction -IV	0-0-6	3
3	DARC 2011	History of Architecture - IV	0-0-4	2
4	DARC 2012	Computer Application in Architecture - IV	0-0-2	1
5	DARC 2013	Architectural Graphics III	0-0-2	1
6	DARC 2014	Building Services - III	0-0-4	2
7	DARC 2015	Estimation & Costing - I	0-0-2	1
8	DARC 2016	Summer Internship - II		2
			Total Credits	19

D.Arch, Semester-V-Third Year				
S. No.	**Subject Code**	**Subject Name**	**L-T-P**	**Credit**
1	DARC 3001	Architectural Design V	0-0-18	9
2	DARC 3002	Building Construction V	0-0-6	3
3	DARC 3003	Computer Application in Architecture-V	0-0-4	2
4	DARC 3004	Building Services IV	0-0-2	1
5	DARC 3005	Estimation & Costing-II	0-0-2	1
6	DARC 3006	Winter Internship -II		3
			Total Credits	19

D.Arch, Semester-VI-Third Year				
S. No.	**Subject Code**	**Subject Name**	**L-T-P**	**Credit**
1	DARC 3009	Architectural Design-VI	0-0-24	12
2	DARC 3010	Building Construction VI	0-0-4	2
3	DARC 3011	Human Values	0-0-2	1
4	DARC 3012	Computer Application in Architecture VI	0-0-4	2
5	DARC 3013	Summer Internship-III		2
			Total Credits	19

Program Outcomes (PO's)

PROGRAMME OUTCOMES are skill sets and attributes which all students will acquire during the program and will be competent in.

Architect Assistant will be able to:

1. Architectural knowledge: Interpreted the knowledge of Design parameters, mathematical analysis, construction technology, architectural fundamentals and latest development in various field for the solution of complex architectural design problems.
2. Problem analysis: Identify, formulate, review research literature and analysis of complex architectural problems reaching substantiated conclusions using first principles of basic design, users comfort concerns, climate oriented solutions, and architectural services.
3. Design/development of solutions: Design solutions for complex architectural problems and design system components or processes that meet the specified user and environmental needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental issues.
4. Conduct investigations of complex problems: Integrate research-based knowledge and research methods including experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern analytical tools and simulation of complex architectural activities with an understanding of the limitations.
6. The architect and society: Evaluate contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional architectural practice.
7. Environment and sustainability: Elaborate the impact of the professional architectural solutions in societal and environmental contexts, demonstrate the knowledge and need for sustainable development.
8. Ethics: Integrate ethical principles and commitment to professional ethics, responsibilities and norms of the architectural practice.
9. Individual and team work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
10. Communication: Communicate effectively on complex architectural activities with the architectural and allied community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
11. Project management and finance: Synthesize knowledge and understanding of the architectural and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Life-long learning: Relate to the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of environmental, social, economic, and technological changes.

Semester 1

Subject Code	Subject Name	Assigned Credit
DARC1001	Architecture Design-I	6
DARC1002	Building Construction-I	2
DARC1003	History of Architecture-I	1
DARC1004	Computer Application in Architecture-I	1
DARC1005	Architecture Graphic-I	3
DARC1006	Communication	1

Module 1		**DM1: Introduction to Architecture**
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-1001	Architecture Design-I	10
DARC-1002	Building Construction-I	20
DARC-1003	History of Architecture-I	25
DARC-1005	Architecture Graphic-I	5
DARC-1006	Communication	25

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Create an piece of art	K6 in Cognitive domain	Rubric/Viva
2	Appraise architecture profession	K4 in Cognitive domain	(MCQ's)
3	Correlate various courses in architecture pedagogy	K4 in Cognitive domain	(MCQ's)
4	Demonstrate hand eye Coordination through sketches	P5 in psychomotor domain	Rubric/Viva
5	Value role of human settlement in history	A3 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Unlearn the traditional classroom system and get acquainted to Project Based Learning
2. Learning graphical representation of everyday experience
3. Understanding professional ethics and values

Project: Expressions though graffiti/abstract art/collage/painting

COURSE CONTENT

DARC-1001 Architecture Design-I

Introduction to Architecture Profession, Roles, Responsibilities and Liabilities of an Architect and other professionals in the building and construction field. Architects Act-CoA, I.I.A, NASA.A brief summary of Architecture; its various definitions, associated aspects/dimensions, approaches through different ages and factors affecting architecture of a region. Relationship between basic design and architectural design, understanding of space, form, order and design.

DARC-1002 Building Construction-I

Introduction to commonly used building terminology, tools, materials and elements of a building from foundation to roof (Stepped footing & strip foundations, Plinth, DPC, Flooring, Walls, Door, Window, Sill, Lintel, Column, Beam, Slab, Parapet, Terracing.

DARC-1003 History of Architecture-I

Introduction to History of Architecture

Role of history in Architecture, Evolution of human habitat in History

Prehistoric Age

Introducing concepts of culture and civilization - Paleolithic and Neolithic culture - art forms and evolution of shelter - megaliths - agricultural revolution and its impact on culture and civilization with examples from Carnac and Stonehenge.

In reference to the Asia-minor region with nascent cities like Jericho, Catalhoyuk, and Hattasus etc.

DARC-1005 Architecture Graphics-I

Introduction to Art and graphics, its role and significance, basic Sketching techniques and line drawing, charcoal studies.Expression of Ideas and Concepts through visual communication.Using tools for graphics and architecture- setting up of parallel bar and drafting table.

Introduction to technical drawing, drawing equipment, Drafting and quality of lines with pencil, Basic Geometry- Construction of planes, curves, circles tangent and reLVlar polygons, Free hand and mechanical lettering- Free hand drawing and lettering for taitles, line work with the use of Drawing Instruments.

DARC-1006 Communication

Orientation to course and program, the system of education, assigning faculty mentors, assessing individual qualities, identification of fears, strength and weakness Inculcating human values and professional ethics, behavior towards faculty, staff and peers. Introduction teaching pedagogy- Syllabus, curriculum, Project Based Learning (PBL) and Outcome Based Education (OBE).Story writing to capture themes and images.

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
	S / P Internal Marks shall be awarded on students' work in the form of Assignments/ MCQs/ Case Study / Design Sheets / Reports / Models / Presentations / Seminars, which shall be evaluated by approved evaluation rubricby concerned faculty.

SUGGEST BOOKS:

1. Ching, Francis D. K. “Architecture: Form, Space and Order”, John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, “Universal Principles of Design”, Rockport – Publications, Massachussets
3. “The History of Architecture” by Sir Bannister Fletcher
4. Building Construction & Materials, S.C. Rangwala
5. Robert W. Gill, Rendering with Pen and Ink, Thames & Hudson; 1984

Module 2		**DM2: Product Analysis**
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-1001	Architecture Design-I	50
DARC-1002	Building Construction-I	40
DARC-1005	Architecture Graphic-I	35
DARC-1006	Communication	25

COURSE OUTCOME

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Appraise different types of structural forces	K4 in Cognitive domain	MCQ’s
2	Appraise the correlation between human measurements and surrounding	K4 in Cognitive domain	Rubric/Viva
3	Develop basic comm. Skills and sense of composition and design	K4 in Cognitive domain	Rubric/Viva
4	Create object with Movement function	P7 in psychomotor domain	Rubric/Viva
5	Participate in debates, group discussion and presentation	A3 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Linework, lettering, Autocad, google sketchup,
2. Composition in 2D and 3D
2. Introduction to technical drawing and print.

Project: 2D composition in color media & 3D composition using Sketchup
Geometrical Composition (2-D to 3-D composition and asymmetrical sculptures of geometric forms)

COURSE CONTENT
DARC-1001 Architecture Design-I

Unit-I: Elements of Design

Introduction to elements of Design like point, line, shape, form, texture, color; their definitions and expression quality. Application of elements in architectural design through the use of line, plane, solid and voids and application of texture, color, etc. Exercises like logo, cover page, greeting card, mural design etc. to be considered. Application of design elements in 2D and 3D compositions. Exercises of 3D compositions to be introduced

Model making workshop –Basic 3-D geometric forms

DARC-1002 Building Construction-I

Unit 1 Construction Process and Components:

1. Introduction to various components of a load-bearing structure
2. Sub-structure: Introduction to various methods, materials, tools and equipment used in Excavation; Foundation and Plinth.
3. Superstructure: Walls; Floors; Roofs (flat, sloping and vaults); Openings in walls- lintels (flat, corbelled, arched); sills; staircase; sun-shading devices.

To be explained through Section of a building sheet work and site visit to a live site.

DARC-1005 Architecture Graphic-I

Freehand Drawing

Drawing trees, Humans and furniture, 2D compositions using elements of Design, composition in color media.

Color Fundamentals

Perception of color and light, related definitions like hue, value, intensity, color wheel, color theory, color schemes, effect of color in architecture, color symbolism.

Basic technical Drawing and Lettering

Introduction to basics- introduction to subject and drawing equipment, Drafting and quality of lines with pencil, Basic Geometry- Construction of planes, curves, circles tangent and reLVlarpolygons, Free hand and mechanical lettering- Free hand drawing and lettering for titles, line work with the use of Drawing Instruments.

Scale and Dimensioning

Types and uses of scales: Plain, diagonal, comparative, and scale of chords, Scales used in architecture, Reducing and enlarging scales, Representative fraction, Dimensioning of lines andplanefiLVres, Measuring and drawing to scale the following: furniture items, rooms, doors and windows, etc.

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
	S / P Internal Marks shall be awarded on students' work in the form of Case Study / Design Sheets / Reports / Models / Presentations / Seminars, which shall be evaluated by approved evaluation rubric by concerned faculty.

SUGGESTED BOOKS:

1. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004..
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964..
3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India.
4. Punmia P. C., "Strength of Materials & Mechanics of Structures"
5. Khurmi R. S., "Strength of Materials

Module 3		**DM3: Language of Architecture**
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-1001	Architecture Design-I	30
DARC-1002	Building Construction-I	40
DARC-1003	History of Architecture-I	75
DARC-1004	Computer Application in Architecture-I	50
DARC-1005	Architecture Graphic-I	35
DARC-1006	Communication	50

COURSE OUTCOME

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Apply basic architectural terminologies in speech and writing	K3 in Cognitive domain	(MCQ's)
2	Appraise painting on the principles of design	K4 in Cognitive domain	Rubric/Viva
3	Appraise building form on the basis of solids, voids, shades and shadows	K4 in Cognitive domain	Rubric/Viva
4	Create forms using clay and pottery	P7 in psychomotor domain	Rubric/Viva
5	Participate in debates and group discussion	A3 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Developing concepts
2. Understandings- sense of space
3. Meaning of walls (Enclosure)
4. Establishing boundaries
5. Introduction to natural materials
6. Linework, lettering, Autocad, googlesketchup,
7. Composition in 2D and 3D
8. Introduction to technical drawing and print.

Project: Multiple projects to build Vocabulary of Architecture: Building Appraisal, enclosure without roof, concept (writing), Clay modelling and pottery, model and dwgs

COURSE CONTENT

DARC-1001 Architecture Design-I

Unit-I: Elements of Design

Introduction to elements of Design like point, line, shape, form, texture, color; their definitions and expression quality. Application of elements in architectural design through the use of line, plane, solid and voids and application of texture, color, etc. Exercises like logo, cover page, greeting card, mural design etc. to be considered. Application of design elements in 2D and 3D compositions. Exercises of 3D compositions to be introduced

Model making workshop –Basic 3-D geometric forms

DARC-1002 Building Construction-I

Unit 2 Building Materials:

Mud, Earth, fly ash, burnt brick- Manufacture, Classification, preparation and usage- Sectional Model of Hut using Mud as primary material

DARC-1003 History of Architecture-I

Ancient River Valley Civilizations

Nile, Indus, Tigris and Euphrates Rivers (Mesopotamia), yellow River(Chinese)

DARC-1004 Computer Application in Architecture-I

MS Office

MS Office - MS Word Create a document that can be used by previous versions of word, Saving Options.
Create a document -
Open a new document and start typing, Start a document from a template, Delete a document, Add a heading, Adjust the spaces between lines or Paragraphs, Insert a page break, Insert a picture or clip art, Insert or create a table, Headers, Footers, and Page numbers, Create a table of contents, Apply themes to Word documents, Add a cover page.
Read documents in Word - Read a document, Mark up a document, Find or look up words and phrases, Turn on or off - full screen reading view.
MS Office – MS Excel - Getting Started with Excel - Create a workbook, Enter data in a worksheet, Format a worksheet, Format numbers in a worksheet, Print a worksheet, Create an Excel table, Filter data by using an auto filter, Sort data by using an auto filter, Apply conditional formatting, Apply data validation, Create a formula, Use a function in a formula, Chart your data, Create a macro, Create a pivot table report, Activate and use an add-in
Keyboard shortcuts in Excel 2010 - Keyboard access to the ribbon, CTRL combination shortcut keys, Function keys, Other useful shortcut keys.
MS Office – MS Power point - Create a basic Power Point presentation -
Name and create a new presentation, Open a presentation, Save a presentation, Insert a new slide, Add, Rearrange and delete slides, Add text to a slide, Apply a template to your presentation, Apply a theme to add color and style to your presentation, Insert a picture or clip art and insert content or insert a screenshot, Add, Change, or Delete shapes, Create a smart art graphic, Add slide numbers, Page numbers, Date and time, Create a hyperlink, Deliver and distribute your presentation, View a slide show and View your speaker notes privately, while delivering a presentation on multiple monitors, Print out a presentation, Tips for creating an effective presentation

DARC-1005 Architecture Graphic-I

Measuring and drawing to scale the following: furniture items, rooms, doors and windows, etc.

FreeHand Drawing

Basic rendering and drawing techniques to depict textures: Scribbling, stippling, shading, hatching, doodling. Rendering 3D objects, still life sketching

Orthographic Projections

Introduction to orthographic projections - Planes of Projections, First angle projections, Drawing of lines, basic geometrical shapes in different positions, Projection of reLVlar rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in different positions, construction of plan, elevation and section of 3D objects and projections in various positions.

Surface Development

Surface development of solids and sectional solids- Study of development of surfaces, drawing of unfolded surfaces of right solids like Cubes, Prisms, Cylinders; drawing the development of the lateral surface of a pyramid & Cone.

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
	S / P Internal Marks shall be awarded on students' work in the form of Case Study / Design Sheets / Reports / Models / Presentations / Seminars, which shall be evaluated by approved evaluation rubric by concerned faculty.

SUGGESTED BOOKS:

6. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004..
7. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964..
8. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India.
9. Punmia P. C., "Strength of Materials & Mechanics of Structures"
10. Khurmi R. S., "Strength of Materials

Module 4		**DM4: Art and Architecture**
Contacts Hours		**72 (2 Weeks)**
Subject Code		**Max Marks**
DARC-1001	Architecture Design-I	25
DARC-1005	Architecture Graphic-I	10
DARC-1004	Computer Application in Architecture-I	25

COURSE OUTCOME

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Apply Elements of Design	K3 in Cognitive domain	Rubric/Viva
2	Create a 2D composition in color medium	K6 in Cognitive domain	Rubric/Viva
3	Create a 3D composition using Google Sketch up.	K6 in Cognitive domain	Rubric/Viva
4	Demonstrate better hand eye Coordination through line drawings using manual drafting	P5 in psychomotor domain	Rubric/Viva
5	Follow Gestalt theory of visual perception	A3 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Scale, Properties w.r.t Human Dimensions(Users),Adult/Child(Gender)
2. Understanding of ergonomics – to design furniture
3. Structures till equilibrium, loads
4. Presentation using (CAD, Sketchup, Photoshop)
5. Sketching perspective and isometric

Project: Shelter

COURSE CONTENT

DARC-1001 Architecture Design-I

Unit-I: Design Aspects- Ergonomics

Basic Ergonomics and anthropometrics, human body measurements, human functions and their implications for product and space requirements.Minimum and optimum areas for mono functions.User's data, Movement and circulation diagrams.Spatial interpretations – various activities and their relationship with spaces.

Unit-II: Product Analysis

Functional product analysis, user body dimensions, ease of use, comfort, material and aesthetics. Analysis of mechanical objects with movements – folding chair, tape dispenser, spectacles, compass, player, stapler, Pencil Sharpener with rotating handle, lock, wooden toys for kid, fountain pen, spray bottle etc. Redesigning product based on the findings

DARC-1004 Computer Application in Architecture-I

AutoCAD 2D 2017 – How to Open new file, sheet sets, Drawing tools

Sketch up 2016 – Tutorial on drawing 3d objects using sketchup

Adobe in Design, Presentation methods, preparing raw drawings for laser cutting machines

DARC-1005 Architecture Graphic-I

Orthographic Projections

Projection of reLVlar rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in different positions, construction of plan, elevation and section of 3D objects and projections in various positions.

NOTE:	Internal and external exams shall be carried out by a Jury of Internal & External Examiners which would be marked on the basis of the approved evaluation rubric
	S / P Internal Marks shall be awarded on students' work in the form of Case Study / Design Sheets / Reports / Models / Presentations / Seminars, which shall be evaluated by approved evaluation rubric by concerned faculty.
	Site Visit- Religious Place, Monumental Scale or Human Scale.

Semester 2

		Assigned Credit
DARC-1009	Architecture Design-II	6
DARC-1010	Building Construction-II	3
DARC-1011	History of Architecture-II	1
DARC-1012	Computer Application in Architecture-II	1
DARC-1013	Architecture Graphic-II	2
DARC-1014	Surveying and Levelling	1
DARC-1015	Climatology	2
DARC-1016	Building Services-I	1
DARC-1017	Summer Internship-I	2

Module 6		**DM6: Universal Design**
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-1009	Architecture Design-II	20
DARC-1011	History of Architecture-II	50
DARC-1016	Building Services-I	20
DARC-1014	Surveying and Levelling	30

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Analyze architecture of early river civilizations	K4 in Cognitive domain	Rubric/Viva
2	Organize furniture layout for mono-cellular units such as kitchen, toilet, bedroom, living room	K6 in Cognitive domain	Rubric/Viva
3	Analyze human activities on the basis of space requirement	K6 in Cognitive domain	Rubric/Viva
4	Apply basic concepts of water supply for mono-cellular unit	K4 in Cognitive domain	MCQ's
5	Apply basic concepts of surveying and levelling in design of mono cellular units	K4 in Cognitive domain	MCQ's

COURSE OBJECTIVES

1. Early river civilization
2. Brick
3. Anthropometry-mono cellular- kitchen, living room, bathroom
4. Services- water supply

Project: Analysis of human activities on the basis of space requirement on 1:1 scale

COURSE CONTENT

DARC-1009Architecture Design-II

Unit-I: Architectural Design Aspects

Basic anthropometrics, human functions and their implications for space requirements.Minimum and optimum areas for mono functions.User's data, Movement and circulation diagrams.Spatial interpretations – various activities and their relationship with spaces.

Unit-II: Floor Space Layout

Functional furniture layout, circulation, lighting and ventilation for spaces such as living/dining, kitchen, bedrooms, Architect's office, Doctor's clinic, Food parlor etc. Analysis of human activities on the basis of space requirement on 1:1 scale, chalk, new

Unit-III: Preliminary Architectural Design

Design of mono-cellular-unit/structure on a level plane, designing of simple activity spaces, designing of multiple but simple activity spaces involving primarily horizontal circulation

Note: The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing.

DARC-1011 History of Architecture-II

Ancient Civilizations: Aegean - With reference to cities in Aegean like Troy, Sparta, Mycenae

Egyptian Civilization

Egypt - Landscape and culture of Ancient Egypt- history - religious and funerary beliefs and practices - monumentality tomb architecture: evolution of the pyramid from the mastaba – Great Pyramid of Cheops, Gizeh etc. Temple architecture: mortuary temples and cult temples - Temple of Ammon Ra, Karnak, Khons - Temple of Abu Simbel (Rock Cut) etc. Mesopotamia - Urbanization in the fertile crescent - Sumerian, Babylonian, Assyrian and Persian culture, Evolution of city-states and their character, law and writing , theocracy and architecture - Ninveh, Khorsahbad, Marie, Babylon etc. Evolution of the zigLVrat - ZigLVrat of Ur, Urnamu etc., Evolution of the palaces - Palace of Sargon, Khorsabad - Palace at Persepolis.

DARC-1016 Building Services-I

Unit-I: Water Supply Requirements

Introduction to Water Supply; Water Requirement for different building types; storage, Storage and Distribution of Water - Different methods of water distribution boosting water, gravity and pressure distribution by storage tanks of individual buildings**.** Potable Water Standards, Domestic water demand, capacity of overhead tanks and calculation of water consumption.

Unit-II: Water Distribution Systems

Water distribution networks.Cold and hot water distribution within the building.Specifications and sketches of various plumbing fittings for buildings.Uses of valves, taps, and their different types.Layout of water supply lines in a domestic building.

DARC-1014 Surveying and Levelling

Introduction of Surveying.Plans, maps.Horizontal and Vertical measurements.Type of instruments for linear and anLVlar measurements.Chain surveying, Compass surveying, Theodolite, Tacheometry, Plane table surveying, Total stations, Dumpy level.TrianLVlation and traversing.Practical applications of surveying. Leveling, methods for leveling, reciprocal leveling, Rise and fall method, Height of the instrument method.Contour lines. Contour maps and necessity and LVidelines for drawing contour maps

NOTE:	Internal and external exams shall be carried out by a Jury of Internal & External Examiners which would be marked on the basis of the approved evaluation rubric
	S / P Internal Marks shall be awarded on students' work in the form of Case Study / Design Sheets / Reports / Models / Presentations / Seminars, which shall be evaluated by approved evaluation rubric by concerned faculty.
	Site Visit- Three to Four days educational trip to a different climatic zone.

Module 7		DM7: Moments
Contacts Hours		72 (2 Weeks)
Subject Code	Subject Name	Max Marks
DARC-1010	Building Construction-II	30
DARC-1011	History of Architecture-II	50
DARC-1012	Computer Application in Architecture-II	20

COURSE OUTCOMES

Architectural Graduate will be able to:		Knowledge domain and level	Evaluation Method
1	Construct structural model based on truss	K6 in Cognitive domain	Rubric/Viva
2	Make models/sketches based on Roman History	K6 in Cognitive domain	Rubric/Viva
3	Make models/sketches based on Greek History	K6 in Cognitive domain	Rubric/Viva
4	Analyze a room using Structural kinetics	K4 in Cognitive domain	Rubric/Viva
5	Apply basic rendering inVray	A2 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Natural Form, Kinetic Sculpture based on structures
2. Models and MCQs on History of Architecture

Project: turning torso, hands in motion-Model based on structures/history

COURSE CONTENT

DARC-1010 Building Construction-II

Brick and Clay Products

BRICKS: Manufacturing, Composition, Sizes, Properties and Classification of bricks, Tests for bricks. Introduction of Brickworks: masonry bonding & ornamental bonding, which will focus on: (types of Brick bonds: English, Flemish & Stretcher bond for both 230 mm & 115 mm brick wall, detail brick layout at corners, junctions and brick columns. Applicable IS Codes for Bricks.

Load Bearing Structures using Modular units-Stabilized Earth, Brick, Stone etc.

DARC-1011 History of Architecture-II

Unit-I: Greek Architecture

Classical orders and constituent elements of architecture - Column orders and the articulation of temples.Classification of temples, Geometry and symmetry of individual buildings and their relationship with others based on different organizing principles and conditions of site.Study of importance- Acropolis, Agora, Temples, Theatres, Tombs and House forms.

Unit-II: Roman Architecture

Introduction to building types to correspond the complex social functions and structure. Concrete and construction of vaults and domes.Uses of classical orders in surface articulation. Study of important forums, Temples, Basilicas, Theaters, Amphitheatres, Circuses, Tombs, Triumphal arches, palaces, houses and villas.

DARC-1012 Computer Application in Architecture-II

Google Sketch Up+ V-ray

Google Sketchup 3D, Drawing & Measurement Tools, creation of geometrical shapes & forms, union and intersection of forms. Application of color& materials.Introduction to editing tools, modifying existing shapes and forms, 3D drawings with site and surroundings, sciography& rendering in 3D drawings.Concept of camera and walkthrough.

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 8		DM8: Context
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-1009	Architecture Design-II	30
DARC-1010	Building Construction-II	30
DARC-1014	Surveying and Levelling	70
DARC-1016	Building Services-I	40
DARC-1013	Architecture Graphic-II	40
DARC-1015	Climatology	50

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Design a house with brick	K6 in Cognitive domain	MCQ's
2	Produce a measure drawings of a given building	K6 in Cognitive domain	Rubric/Viva
3	Adapt their design to climatic considerations	K6 in Cognitive domain	Rubric/Viva
4	Use surveying techniques and equipment to measure a building	K6 in Cognitive domain	Rubric/Viva
5	Organize and plan a study trip	A4 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Understanding context w.r.t historic site.
2. Graphical representation of landscape and built form/space

Project: Design a G+1 Residence in brick

DARC-1009 Architecture Design-II

Design of a G+1 residence in Brick.Focus will be on the construction details, site and context and their relationship to the built environment.

Introduction to element of site-planning and landscaping.Design of a group of buildings set in the context of the study with a focus on site and context.The design of the environment outside the building.

Unit-I: Ecology & Ecosystem

Concept of Ecology & Ecosystem, Resource analysis for various ecosystems and development imperatives (land, geology, soil, climate, water. vegetation) characteristics, exploitation, causative factors for degradation, analytical techniques.

Unit-II: Environmental Pollution

Definition, causes, effects, standard parameters and control measures of Air, Water, Soil, Noise, Marine, Thermal, Nuclear and Light pollution.

Causes, effects and control measures of urban and industrial waste.

Physical, Chemical and Biological transformation of pollutants.

Study tour:3-4 days study tour to a different climate zones to perform measured drawing/exhibition/photography/ documentation report

DARC-1010 BuildingConstruction-II

Construction Details for Brick Residence (Excluding doors and windows) - Foundation, Plinth, Walls, columns, Beam, Slab, Projections, Flooring, cavity wall, corbel, cornice, sill, lintel, parapet, drip course etc. All water supply services.

Timber theory

DARC-1014 Surveying & Leveling

Unit-I: Plane Surveying and Theodolite

Introduction to plane surveying, conventional tape measurement, electronic distance measurement – Meridians, Azimuths and bearings – Theodolites – Temporary and permanent adjustment – Horizontal and Vertical angle measurements – Electronic total station.

Unit-II: Leveling and Contouring

Differential leveling, Longitudinal & cross section leveling, Refraction & curvature correction, Reciprocal leveling -Tachometry – Stadia tachometry, tangential tachometry & substance tachometry-Contouring.

Unit-III: Calculation of Earthwork and GPS

Area, volume calculation of earth work – Introduction to Global positioning system – GPS surveying methods.

Unit-IV: Curve Surveying

Definitions, designation of curve, elements of simple curve - Settings of simple circular curve, Compound and reverse curve- Transition curve – Introduction to vertical curves.

Unit-V: Geodetic surveying

Introduction to geodetic surveying, TrianLVlation surveying – Base line measurement &correction, Satellite station.Surveying adjustments – Principle of least square and adjustment oftrianLVlation network.

DARC-1016 Building Services-I

Unit-I: Drainage Systems

Basic principles of disposal of waste water from buildings. Systems of drainage – separate, combined and partially separate system, advantages and disadvantages of each system. Concept, design and detailing of rainwater harvesting systems. Study of sanitary fittings, washbasins, WC's, bathtubs, sink, urinals, bidets, flushing cistern, traps etc. Proper location and ventilation of traps, intercepting chambers and inspection chambers.

Unit-II: Sanitation- Sewerage

Introduction, importance and purpose of sanitation, terminology and definitions; bacteria, invert, sewer, sewerage, refuse, collection and disposal of refuse. Man holes – drop manholes, manhole with intercepting trap, inspection chambers, self-cleansing velocity, drains on sloping sites, sub soil drainage, storm water disposal – catch basins, inlets, storm water reLVlators. Septic Tanks; Capacity calculations and Details of a Septic Tank, soak pit, soak well, design aspects, disposal of effluent. Systems of plumbing – single stack, one pipe, one pipe partially ventilated, two pipe disposal of waste water from buildings.

DARC-1013 Architecture Graphic-II

Aesthetics

Introduction to aesthetics and interpretation of its meaning, aesthetics (rasa) in artworks, definition of beauty, three basic parameters of judgment of art works (skill, originality & aesthetic quality), relation between art and life, application of aesthetic theories in visual arts

DARC-1015 Climatology-I

Unit – I Background:

Club of Rome, "Limits of Growth", TheBrundtland Report (UN), An Inconvenient Truth; these texts are to be read to understand the history of environmentaldegradation and the concepts that underlie a strategy towards sustainable habitat. TheChanging Climate, Factors Responsible for Change, Global Warming, Ozone Depletion, etc.

Interrelation between natural and built environment: An Overview Mapping the ecology of settlements and buildings. Water and Waste cycles; energy demand for production, transportation, construction andoperation of buildings; material consumption and natural resourcesWater: conservation, harvesting, recycling.Waste: minimizing, recycling, eliminate toxicity and management.Energy: conservation, renewable sources: wind, solar, geo-thermal, bio-fuels.Materials: minimizing, recycling, reducing energy content, life-cycle cost.

Unit-II Concept of Sustainable development

Case Studies of traditional / vernacular buildings andsettlements demonstrating relationship between climate, local material resources and settlement/ building formsThe "natural" or landscape environment as an aspect of deliberate design. Case studyillustrating traditional concepts of "garden", "park", relationship with river, lakes, drawn fromdifferent cultures. Analysis of contemporary city (case-study) and its challenges ofenvironmental sustainability- Energy, water, waste, air quality, transportation vis-à-vis theintegration of open space, water bodies and other natural systems into city form.

Unit-III Introduction to Climatology

a) Introduction to Climatology, Relation to Architecture, Macro and Micro Climate, Climatic Zones. Climatic data- parameters- relevance to design of built environment. Describing climate-climate summary chart, solar geometry- sun path diagram, heating and cooling periods. Psychometric charts.

b) Thermal Comfort: Factors and Balance, Body's Mechanism of Heat Production and Loss, Methods of Heat Transfer, Comfort Scale, Effective Temperature, operative temperature, CET, Adaptive comfort.

c) Heat transfer in Buildings: Sol Air Temperature, Solar Gain Factor, Thermal Quantities: Temperature, Heat, Heat Flow Rate Specific Heat, Conductance, Resistance, Surface Conductance, U value, Periodic Heat Flow, Time Lag & decrement factor, Effect of Different Materials, Effect of Multilayered Bodies - Insulation/Cavity (ECOTECT software may be used). Ventilation: Principles of Ventilation in Buildings.

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Module 9		**DM9: Arboretum**
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-1009	Architecture Design-II	45
DARC-1010	Building Construction-II	40
DARC-1016	Building Services-I	40
DARC-1012	Computer Application in Architecture-II	20
DARC-1015	Climatology	50

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Design a house with timber	K6 in Cognitive domain	Rubric/Viva
2	Illustrate constructional details using timber and stone	K3 in Cognitive domain	Rubric/Viva
3	Confirm to Indian tradition, crafts and culture	A2 in Affective domain	Rubric/Viva
4	Produce digital rendering of residence	K6 in Cognitive domain	Rubric/Viva
5	Develop understanding of the environment and related issues	A4 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Timber as material and joinery details
2. Basics of plan and elevation

Project: Timber kiosk/tree house/G+1 residence in Timber with stone foundation

DARC-1009 : Architecture Design-II

To Design a G+1 Building using timber as primary material, including doors, windows, flooring, walls, roof etc. in timber. Foundation can be done in stone.

DARC-1010: Building Construction-II

Unit-I: Timber and Wooden Products

Timber: Definition, obtaining timber from nature (Selection, Felling and Transportation),Conversion of timber, Seasoning, Storage, Defects in timber and its preservation. Use of different types of wood in various

parts of building. Industrial timber: veneers, plywood, fiberboard, etc. Bamboo: Basic concepts to use it as a building material. Applicable IS Codes for Timber.

Unit II: Carpentry in workshop

Timber Joinery; types of joints, lengthening and widening joints, common joints for various building and furniture works.

Types, Classification, Usage & the application of various tools & machinery used in the process.

Unit-III: Wooden Doors & Windows

DOORS: Details of doors which will include Basic Doors (Battened /ledged/Braced door), Flush Doors (both solid & hollow core flush doors) & paneled Door (both single & double shutter panel doors – in timber, wire mesh & glazed panel door.)

WINDOWS: Types of window which will include Casement window, fully glazed window, Ventilator Simple & pivoted, Fixed Glass window, louvered window, corner and Bay window. Hardware related to wooden doors & windows. Design & Details of Casement window.Introduction to Carpentry tools & basic techniques of carpentry; sawing, cutting, planning, chiseling and finishing.Understanding of timber joinery in construction and basic wooden joints for doors, windows and furniture.

DARC1016 Building Services-I (35 contact Periods)

Water supply and sanitation details to be prepared for the timber building design.

DARC-1012 Computer Application in Architecture-II

Google Sketch Up+ V-ray

Basics of Google Sketchup, Drawing & Measurement Tools, creation of geometrical shapes & forms, union and intersection of forms.Application of color& materials.Introduction to editing tools, modifying existing shapes and forms, 3D drawings with site and surroundings, sciography& rendering in 3D drawings.Concept of camera and walkthrough.

DARC-1015 Climatology

Unit-IV Architectural Design as a Response to Climate

Tool for Design in All climatic Conditions of India- Microclimatic Factors: Landform, topography, vegetation type and pattern, water bodies, street widths and orientation, ground character. Plan form and elements, building orientation, roof form, fenestration pattern, orientation and confiLVration, controls like shading devices, design of shading devices using available software's. Walls, choice of materials, roof materials, external colors and textures, layouts and internal finishes. (Ecotect and sketch up software may be used).Solar Passive Heating and Cooling Systems, roof pond, trombe wall, green house, air flow, stack effect, wind tower, earth air tunnel. Examples of Vernacular architecture of different climatic zones may be used to illustrate the above design processes.

Unit-V Energy

Introduction to sustainability &Intelligent buildings Social, economic, environmental factors, ecological footprint, local and worldwide sustainable benchmarks, building ecosystem, building lifecycle Concept.Concept of intelligent buildings, energy efficiency, vertical transportation systems, communication systems, security systems, building automation and lighting systems.

Green Rating Systems-GRIHA, IGBC, LEED. Case studies on alternative sources of energy- Sustainable design Principles and strategies, site design, energy management, renewable energy, sustainable material selection, water management, indoor air quality, alternative energy, environmental systems, environmental assessment methods.

Unit VI Building Management Systems (BMS)

Building Economics- Methods to control, monitor and optimize building services, eg., lighting, heating, security, CCTV and alarm systems, access control, audio-visual and entertainment systems, ventilation, filtration and climate control, etc., even time & attendance control and reporting (notably staff movement and availability).

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Module 10		DM10: Sciography
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-1013	Architecture Graphic-II	60
DARC-1009	Architecture Design-II	05
DARC-1012	Computer Application in Architecture-II	60

COURSE OUTCOME

Architectural Graduate will be able to:		Knowledge domain and level	Evaluation Method
1	Apply knowledge of sciography in architectural drawings	K3 in Cognitive domain	Rubric/Viva
2	Create digital portfolio of academic work	K6 in Cognitive domain	Rubric/Viva
3	Do a Presentation of academic work	A3 in Affective domain	Rubric/Viva
4	Analyze light and shade through Charcoal study	K4 in Cognitive domain	Rubric/Viva
5	Construct a scale model of a timber residence	K6 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. To study and learn live sketching (building perspectives) **to produce illusions, 3D perspectives**
2. Understanding light, shades, shadows and depth 3D forms to **produce depth in depth in drawings.**
3. To compile the semester work in a portfolio format

Project: Charcoal Studies

DARC-1009 Architecture Design II

Produce short articles about own work.Introduction Importance of architectural research and writing. Concept Writing LanLVage, Impersonal and formal lanLVage, Elements of style, Techniques.Visual Communication: Gestalt law of composition, using grids, typography, color, texture in composition of work in portfolio

DARC-1013 Architecture Graphic-II

Unit-I: One Point Perspective

Purpose and use of perspectives, Anatomy of a perspective-cone of vision, station points, picture plane, eye level horizon line, ground line, vanishing point, etc, One point perspective of simple objects, combination of geometrical forms, One point perspective of Interiors, Perspective of simple household furniture items. Building exterior and interior perspectives.

Unit-II: Two Point Perspective

Introduction to two point perspective, perspective of simple blocks.Preparation of Perspective by innovative methods like approximate method, Diagonal Method, Grid Method etc.Other innovative methods of perspective presentation.Introduction to shortcut methods in perspective drawing.Freehand perspective drawing.

Unit-III: Sciography

Principles of drawing shade and shadow with point source of light and light from Sun. Drawing exercises of sciography of simple objects on ground, simple building element (projections like sunshade) on walls.Sciography of complex and curvilinear elements on ground and on walls.

DARC-1012 Computer Application in Architecture-II

Illustrator, Indesign, Photoshop, MS Publisher to compose work portfolio digitally

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Semester 3

Subject Code	Subject Name	Assigned Credits
DARC-2001	Architecture Design-III	7
DARC-2002	Building Construction-III	3
DARC-2003	History of Architecture-III	2
DARC-2004	Computer Applications in Architecture-III	2
DARC-2005	Building Services-II	1
DARC-2006	Winter Internship-I	3

Module 11ARMO 2001		**DM11: Large Span**
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-2001	Architecture Design-III	15
DARC-2002	Building Construction-III	05

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Apply the basic concepts of concrete as a construction material	K3 in Cognitive domain	Rubric/Viva
2	Illustrate various structural systems	K3 in Cognitive domain	Rubric/Viva
3	Compare various properties of concrete through testing	K5 in Cognitive domain	Rubric/Viva
4	Make scale models of structural systems	K6 in Cognitive domain	Rubric/Viva
5	Justify the role of structural system in architectural design	A3 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1.To understand aspects of large spans w.r.t Trusses

2. Anatomy of trusses, To acquaint the students to usage of building materials such as Timber and Hardware, Damp Proofing Courses and Cement Concrete.

To familiarize the students with construction techniques for use of the above materials in building works. and joinery in carpentry

To familiarize the student with the basic building construction practices on site/yard.

Project: Structural Systems/ Trusses

DARC-2001 Architecture Design-III

Structural Systems in Architecture – Types form, Materials, Load transfer etc. Model making, truss design and analysis.

DARC-2002 Building Construction-III

Types of wooden and steel trusses, related terminology and their applicability for various uses.
Detailing of timber/ steel trussed roofs, Truss lighting (North lighting), Tubular steel trusses, north light glazing, roof covering/sheets and drainage details of trussed roofs. Steel as construction material.Riveted, bolted and welded joints, steel foundation.
Cement Concrete: mixing, Curing, Water Cement Ration, Qualities and workability
Concrete using special materials: Lime, fiber reinforced, polymer, fly ash, silica fume concrete, Temperature control, water proof concrete etc. Test for concrete to be performed in concrete testing lab

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Module 12		DM12: Sociology
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-2001	Architecture Design-III	10

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Analyze social behavior changes in an urban village	K4 in Cognitive domain	Rubric/Viva
2	Organize social field surveys	K6 in Cognitive domain	Rubric/Viva
3	Create art work based on social issues	K6 in Cognitive domain	Rubric/Viva
4	Predict attitude and social behavior	K5 in Cognitive domain	Rubric/Viva
5	Experience team work and social behavior patterns	A5 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Depicting expression, context, spatial via built form and materials
2. Relation between history and technology

Project: Artwork based on social issues (Murals, Collage, wall painting, poster, field survey

DARC-2001 Architecture Design-III

User oriented design, understanding client behavior levels, Field surveys, questionnaire preparation, poster making on social issues. Conduct Capacity building in a low income/rural settlement. Annova& SPSS

Art studio

Develop a hands on approach, skills of working with different materials and the ability to choose an appropriate material as and when required for presentation or design purposes. Working with model making materials like thermocol, paper, wire etc. Basic workshop techniques for carpentry and joinery, sheet metal work, fabrication and foundry as an extension to Building Construction course.

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Module 13		**DM13 : PAVILION**
Contacts Hours		216(6 Weeks)
Subject Code	**Subject Name**	**Max Marks**
DARC-2001	Architecture Design-III	25
DARC-2002	Building Construction-III	35
DARC-2003	History of Architecture-III	50
DARC-2004	Computer Applications in Architecture-III	25
DARC-2005	Building Services-II	65

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Apply basic concepts of electrical and lighting services	K3 in Cognitive domain	Rubric/Viva
2	Apply basic concepts of firefighting services	K3 in Cognitive domain	Rubric/Viva
3	Apply basic concepts of lift and escalators in a multipurpose halls	K3 in Cognitive domain	Rubric/Viva
4	Illustrate early Christian to gothic architectural history	K3 in Cognitive domain	Rubric/Viva
5	Create multipurpose hall on the basis of structural systems	K6 in Cognitive domain	Rubric/Viva

DARC-2001 Architecture Design-III

Architectural Design Process- Predesign, Site Analysis and Concept.Design of a Large-span multipurpose hall with incorporation of building services.Preparation of Design brief, performing case study, detailed drawing of foundation and cladding. 3d Model of Skin section and cladding details or be prepared

DARC-2002 Building Construction-III

Construction Details

Column, beams, slabs, RCC foundations, retaining walls, basic reinforcement details, DPC, staircase, expansion joints in RCC, introduction to folded plate and form active structures

Wall Finishing Materials

Introduction to internal & external wall finishing materials, their properties, use and methods of application.Types of mortar, plasters (smooth, rough, textured, grit-wash), cladding etc. Construction Details of external stone cladding & internal wooden panelling.

DARC-2003 History of Architecture-III

Early Christian Architecture & Byzantine Architecture

Development of early church and Roman basilica.Interiors of churches and the articulation of interiors to create spiritualized space.Study of Italian basilicas and churches. Centrality and interiors of both cross domed and cross in square plan churches. Study of Interior and Exterior of churches.Construction of domes over polygonal compartments through the use of pendentives.

Romanesque Architecture

Massiveness and verticality of medieval churches combination of five towered structures and longitudinal basilica.Gradual integration of tower from early to later examples.Integration of centralized and longitudinal plans.Articulation of external wall like arcaded interiors resulting in dematerialization of exterior.Study of important cathedrals and churches from Italy and France.

Gothic Architecture

Continued integration of centralized and longitudinal plans.Spatial and formal integration of Romanesque churches.Integration of wall and vault.Ribbed vault and the dissolution external wall to allow light.Sensitivity to light and use of stained glass for mysterious interiors.Need and development of different external buttressing.Study of important cathedrals and churches in France.

DARC-2004 Computer Applications in Architecture-III

Revit

DARC-2005 Building Services-II

Unit 1 Electrical

Introduction –Terminology and architectural symbols (as per NBC/NEC) for electricinstallations in buildings.Need to generate and save electricity, transmission and distribution ofelectricity (single and three phases), procuring service connection.Familiarization to various lighting accessories, wires and cables, metering,distribution panels / boards etc. for single and three phase supply.LVidelines for installation of fittings.

Design of simple electrical circuits –

Introduction to simple light and fan circuits.System of connection of appliances and accessories e.g. series and parallel connection, joint box system, looping-in system.

Systems of wiring –

Basic considerations. Various types of internal wiring systems e.g. cleat, casing and capping, batten and conduit (surface & concealed).

Protection of electrical installation and human life –

Basic considerations. Protection against excess current, short circuit earth fault and protection against electric shock.

Introduction to various types of protection devices e.g. switches, fuses and circuit breakers.
Need for earthing of domestic fittings and appliances, earthing and its relation with soil resistivity, earth electrodes, earth wires. Load assessment and selection of appropriate cross section of the conductor.

Unit 2 FIRE PROTECTION

Introduction Causes and spread of fire. Fire triangle/tetrahedron.Classes of fire.
Combustibility of materials and fire resistance. Building Plans, Drawings, and Schematics.

Fire Detection & Alarm Systems

Fire Detection Equipments - Heat and Smoke sensors. Fire Alarm Systems.

Fire Fighting &Extinguishing Techniques

First stage fire fighting equipment, Ladders, Snorkel Ladder.Fire fighting pump and water storage, Hose and hose fittings, Dry and wet risers, Automatic sprinklers. Fire ExtinLVishers - Portable fire extinLVisher and other fire fightingequipments.Means of escape, Fire escape, Fire doors, and Water curtains.

Unit-III: Lifts & Escalators

Brief history-types of Elevators like traction, Hydraulic etc., Double-decker, sky lobby, lift lobby, lift interiors etc., Definition and components of Elevator in a building: environmental considerations i.e., location in building, serving floors, grouping, size, shape of passenger car, door arrangement etc.,
Service requirements: Quality of service, quantity of service, time, passenger handling capacity, space and physical requirements, machine room spaces and their typical layout.
Escalators – Definition, Application, Capacity, Location and Arrangement in buildings. Space requirement, Conveyor belts-movement of passengers and goods.

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References

Sl.No Details

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5. A History of Architecture - Setting and Rituals , Spiro Kostof -, Oxford UniversityPress, London, 1985
6. History of World Architecture ,by Pier Luigi Nervi, General Editor - Series, Harry N.Abrams, Inc.Pub., New York,1972
7. Understanding Architecture: Its elements, history and meaning; by Leland M Roth; Craftsman House; 1994
8. History of World Architecture by .Lloyd and H.W.Muller, - Series, Faber and Faber Ltd., London,
9. National Building Code of India.
10. National Electrical Code.
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12. Handbook of Lighting Design by RudigerGanslandt&Harald Hofmann, DruckhausMaack, Lüdenscheid, 1992.
13. Interior Lighting Design - A Student's LVide.Kevin Kelly& Kevin O'Connell,
14. Mechanical and Electrical Equipment for Buildings, B. Stein and J. Reynolds, 10th Edition, 2005, Wiley & Sons Inc
15. The Building Systems Integration Handbook, R Rush, 1991, American Institute of Architects

Module 14		DM14: RCC
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-2001	Architecture Design-III	35
DARC-2002	Building Construction-III	60
DARC-2003	History of Architecture-III	50
DARC-2005	Building Services-II	35
DARC-2004	Computer Applications in Architecture-III	30

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Illustrate Reinforced Cement Concrete construction techniques	K3 in Cognitive domain	Rubric/Viva
2	Apply Reinforced Cement Concrete structural analysis to a residence	K3 in Cognitive domain	Rubric/Viva
3	Design institutional building for children with RCC	K6 in Cognitive domain	Rubric/Viva
4	Illustrate architectural historical concepts from renaissance period to rococo period	K3 in Cognitive domain	Rubric/Viva
5	Apply basic concepts of soil mechanics	K3 in Cognitive domain	Rubric/Viva

Project: institutional, public building, Kidzania

DARC-2001 Architecture Design-III

Building By Laws and Relations

Introduction to Building Bye Laws Introduction to building bye laws and reLVlation, Need and relevance, General definitions such as building height, building line, FAR, Ground Coverage, Set Back Line. Role of various statutory bodies governing building works like development authorities, municipal corporations etc.Introduction to Master Plan and understanding various land uses and related terminology. Development Authority Familiarizing with Building Bye-laws through NBC & Local Development Authority, State Housing board, etc. Interpretation of the Bye Laws applicable to residence in plotted developments, Group Housings, Commercial Buildings, Educational Buildings and other Public Institutions. Other statutory controlling authorities e.g. Water, Electricity, Fire, Airport, Archaeology BIS Codes
Introduction to various BIS codes in building industry

Site Planning

Introduction to building types and Density typology, Key plan, depicting context and site surrounding, building access, parking reLVlations as per NBC, special considerations for differently abled people in site. Showing site circulation-vehicular and pedestrian.Hardscape and Softscape. ROW, road width, types of open spaces, street and road typology
Theme Based Design

DARC-2002 Building Construction-III

Unit-I: Introduction to RCC and Building Components

Introduction to RCC; Types, Mixing, Curing, Water Cement Ratio, Properties and Workability.
Use of RCC in buildings. Relevant IS Codes for RCC works and tests. RCC Admixtures.
Introduction to RCC Components of a Building; Foundation, Columns, Beams, Walls, Slab etc;
Types of RCC Foundations, related terminology & details.

Unit-II: Staircase

Introduction to Staircase; its definition and related terminology.Types of Staircases, construction methods of – Masonry staircase, Timber staircase, RCC staircase, Steel Staircase and composite staircase.Study of fire escape staircase in view of building materials & construction technology.

Unit-III: Building Components & Details

Typical Building Sections of a Two Storied load bearing brick masonry and RCC framed building illustrating basic building components together with special features like toilet, staircase and DPC details.

DARC-2003 History of Architecture-III

Unit-I: Renaissance & Baroque Architecture

Background and influences on Renaissance Architecture. Characteristics of Renaissance Architecture in general. Eg: St Andrea, Mantua and Palazzo Rucellai by Leon Alberti, Villa Rotunda (Capra) by Palladio, (New) St Peter's Rome by Michelangelo and others, St Paul's London by Sir Christopher Wren.General characteristics of Baroque. Eg: St Peter's Piazza by Bernini.

Unit-II: Modern Movement in Europe

Transitional Period – A brief account of the situation before the changeover to Modern architecture in Europe. Palladian Revival in Britain, Greek revival and Gothic Revival Eg: Chiswick House, London, Mereworth castle, Kent, St Pancras Church, London, West Minister Palace, London, Arc de Triomphe, Paris. Impact of Industrial Revolution in Europe – The Social, economic and political changes effected,new requirements of the society, new materials and technological developments.

Unit-III: Modern Architecture in America

The Chicago School – works of Louis Sullivan, Early Industrial buildings, Contributions of Bauhaus, De Stijl movement, Italian Futurism, Art Noueavau movement and Arts and Crafts Movement to Modern Architecture.Eg: WainWright Building, St Louis, LVaranty Building, Buffalo, Crystal Palace, London. Bauhausschool at Dessau, Schroder house by Rietveld, Casa Mila, Casa Batlo, SagradaFamilia, Tassel House,Brussels, Paris Metro Station Entrance, Red house, Kent.

DARC 2004 Computer Applications in Architecture-III

V-Ray in Revit

DARC-2005 Building Services- II

HVAC Services

Need for mechanical ventilation in buildings. Rate of ventilation for different occupancies.

Methods and equipment employed for mechanical ventilation in buildings. Brief introduction to psychometric process, air cycle and refrigeration cycle. Summer and winter air-conditioning, calculation of air conditioning loads, Zoning: purpose and advantages. Air-distribution systems: Ducts and duct systems. Air-outlets Air-conditioning methods and equipment: window units, split units and central Air conditioning systems. Location of air-conditioning equipment in buildings. Architectural requirement of various equipment.

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 15		DM15 : Render/origami
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-2001	Architecture Design-III	15
DARC-2004	Computer Applications in Architecture-III	45

COURSE OUTCOMES

Architectural Graduate will be able to:		Knowledge domain and level	Evaluation Method
1	Analyzing and designing of new and complex origami.		Rubric/Viva
2	Understanding and analysis of Rigidity theory and Tensegrity.		Rubric/Viva
3	Generate model to understand fold and joint in origami.		Rubric/Viva
4	Making of multi-dimensional model using grasshopper.		Rubric/Viva
5	To develop the ability to move between digital representations and physical constructions.		Rubric/Viva

DARC-2001 Architecture Design-III

Origami intro: Origami alphabet, higher dimensions

Universality: Terminology history, practical strip folding, pseudopolynomial bounds, seam placement, hide gadget via simple folds.

Simple folds: Metal/wood/plastic motivation, definition, examples, linear-time algorithm, extra creases

Single-vertex crease patterns: Linear-time algorithm, local foldability examples, T-shirt folding, higher dimensions, why flat foldability.

Efficient origami design: Uniaxial, TreeMaker and Origamizer in practice, box-pleating tree method, tree method trianLVlation, universal molecule, gift wrapping, checkerboard gadgets, Origamizer software vs. mathematics, vertex/edge tucking molecules, Voronoi diagrams.

Artistic origami design: Jason Ku designs, other materials (dollars, cardboard, hydro, metal, polypropylene), tessellations, Tess, connected cranes, modular origami, business card cubes.

Architectural Origami: Origamizer, Freeform Origami, Rigid Origami Simulator.

Universal hinge patterns: Box-pleating history, maze-folding prints.

NP-hardness: Simple foldability, crease pattern flat foldability.

Fold and one cut: Software, scissor vs. mathematical cuts, tree folding, density, examples, how many disks, comparison to tree method, continuous flattening.

Pleat folding: TrianLVlatedhypars, smoothness, normals, mathematical vs. real paper, pleat folding algorithms, hypar folding.

Folding motions: Trouble with holes.

Linkages to sign your name: Sliding joints, contraparallelogram bracing, higher dimensions, semi-algebraic sets, splines.

Geometric construction: Straight edge and compass, origami axioms, angle trisection, cube doubling.

Rigidity theory: Pebble algorithms, rigid component decomposition, body-and-bar framework, anLVlar rigidity, 5-connected double bananas.

Tensegrities: Dot products, springs, software, sculpture.

Locked linkages: Why expansiveness, energy algorithm correctness, pointed pseudotrianLVlations (combinatorics, rigidity, universality, expansiveness, extremeness), linear equilateral trees can't lock, unfolding 4D chains.
Hinged dissections: Animations, polyform inductive construction, rectangle to rectangle, furniture, pseudopolynomial construction, 3D, Dehn invariant.

Polyhedron unfolding: Handles, holes, ridge trees; sun unfolding; zipper unfolding; more unfoldable**polyhedra**; NP-completeness of edge unfolding; band unfolding; continuous blooming.
Polyhedron unfolding: Topologically convex vertex-unfoldable polyhedron, unfolding orthogonal polyhedra with quadratic refinement.
Polyhedron folding: Pita forms, D-forms, seam forms, convex hull and crease properties, rolling belts, Burago-Zalgaller folding into nonconvexpolyhedra.
Polyhedron refolding: Fractal unfolding, three boxes, flat boxes.

3D linkage folding: ribosomes, HP protein folding NP-hardness, flattening is strongly NP-hard, flips, flipturns, deflations, pops, popturns.

DARC-2004 Computer Applications in Architecture-III

Using and Exploring 3D Models
Specify 3D views, Define a 3D view with a camera, Create previewanimations, Create motion path animations, Creating a simple 3D mesh, Editing faces and edges, Creating mesh surfaces, Converting meshes to solids, Editing surfaces

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Semester 4

Subject Code	Subject Name	Assigned Credits
DARC 2009	Architectural Design - IV	7
DARC 2010	Building Construction -IV	3
DARC 2011	History of Architecture - IV	2
DARC 2012	Computer Application in Architecture - IV	1
DARC 2013	Architectural Graphics III	1
DARC 2014	Building Services - III	2
DARC 2015	Estimation & Costing - I	1
DARC 2016	Summer Internship - II	2

Module 16		**DM16: Vernacular**
Contacts Hours		**50 (2 Weeks)**
Assigned Credits		**2**
Subject Code	**Subject Name**	**Max Marks**
DARC-2009	Architectural Design-IV	15
DARC-2011	History of Architecture-IV	10
DARC-2014	Building Services-III	40

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain & level**	**Evaluation Method**
1	Analyze concepts of vernacular architecture in different regions of India	K4 in Cognitive domain	Rubric/Viva
2	Apply basic principles of acoustics in built environment	K3 in Cognitive domain	Rubric/Viva
3	Display professional commitment to ethical practice on every day basis	A5 in Affective domain	Rubric/Viva
4	Make scale models of various styles of vernacular architecture in groups	P5 in psychomotor domain	Rubric/Viva
5	Illustrate basic application of vernacular architecture in contemporary scenario	K3 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. Building services/acoustics as prerequisite
2. Human Values and professional ethics
3. Vernacular architecture in India-Sheets models and analysis

Project: Analysis of Vernacular Architecture of a Unique Climatic Zone in India

DARC-2009 Architectural Design-IV

Elements of Vernacular Architecture- locality, context, water, light ventilation, wind, temperature, availability of material, skills and construction techniques.Study and analysis of vernacular architecture of various regions and climatic zones in India on the basis of given parameters.
Study of vernacular architecture, emerging out of the traditional way of life of the people in a given climatic context and region . Understanding how the social and physical environment, climate of the place, materials and methods of construction impact vernacular architecture.
Works of laurie baker etc.

DARC-2011 History of Architecture-IV

History of Indian Vernacular Architecture – Documentaries etc.

DARC-2014 Building Services III

Architectural Acoustic

Introduction to the study of acoustics – nature of sound, basic terminology – frequency, pitch, tone, sound pressure, sound intensity, decibel scale, loudness, threshold of audibility and pain, masking, sound and distance – inverse square law. Behavior of sound in enclosed spaces. Absorption of sound, sound absorption coefficient, reverberation, reverberation time calculation, use of Sabine's and Eyring's formulae, sound absorbents, porous materials, panel or membrane absorbers and cavity or Holmboltz resonators, role of functional absorbers. Absorption coefficients of indigenous acoustical materials, use of IS code 2526-1963. Material- Internal finishing and details.

Books: AishwaryaTipnis, Vernacular Traditions: contemporary architecture, The Energy and Resources Institute (TERI), 01-Jan-2012

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 17		**DM17: Steel**
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-2009	Architectural Design-IV	10
DARC-2010	Building Construction-IV	20
DARC-2012	Computer Application in Architecture-IV	25

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain & level**	**Evaluation Method**
1	Analyze structural design of steel buildings	K4 in Cognitive domain	Rubric/Viva
2	Apply basic concepts of steel as a construction material	K3 in Cognitive domain	Rubric/Viva
3	Design an abstract (conceptual) form using steel as a building material	K6 in Cognitive domain	Rubric/Viva
4	Illustrate steel construction details	K3 in Cognitive domain	Rubric/Viva
5	Make a scale 3 dimensional model with steel	P5 in psychomotor domain	Rubric/Viva

COURSE OBJECTIVES

1. Create an Abstract form using steel as a material – innovative 3D form
2. All the construction details to be designed in steel –cladding, foundation, anchor, counterweights
3. Apply a function to the abstract form in human scale
4. Result in terms of model with humans and constructing details in steel, INSDAG brief

Project: Steel Abstract form(Library, Auditorium)

Sheets / Drawing in one of the methods below
Deliverables- Design based and Report on Pre- fabrication/ Pre- casting theories.

DARC-2009 Architectural Design-IV

Design in Steel, Case studies of steel buildings, IS Codes of steel construction

DARC-2010 Building Construction-IV

Unit 1: Structural SteelWorks
Typical metal joinery - Mechanical (riveted & bolted), Soldering and Brazing and welding.
Detailing of structural steel work – Beam to Column joint, Beam to Beam joint, Column Splice, Column Base, Roof Truss to Column joint. IS codes for steel members

Unit 2: Doors & Windows (Metals)
Mild steel L and Z section Pressed steel section. Steel windows, their types, various sections and elements used in construction / fabrication. Relevant IS Codes for steel doors & windows.

Unit 3: Shutters(OperationalMechanisms)
Complete understanding of operational mechanism (automatic and manual) of variety of Rolling shutters and Collapsible shutters.

Unit 4-Industrial Construction
Structural Steel Works: Portal Frame Construction, north-light truss and lattice girder roof with various roof coverings.

DARC-2012 Computer Application in Architecture-III

Unit I- Mastering in Revit Architecture
Introduction, Modifying the view, Common tasks, System options, File locations, Spelling options, Settings,

Unit-2 Building the Model and Modify
Walls, Doors, Windows, Components, Architectural columns, Roofs, Ceilings, Floors, Openings, Model text, Model lines, Compound structure, Sloped surfaces, Stairs, Ramps, Railings, Adding and modify curtain wall. Attaching wall to roof, Modifying the entry deck, Modifying the roofs.

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Module 18		**DM18: Decoding Patterns**
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-2009	Architectural Design-IV	35
DARC-2010	Building Construction-IV	40
DARC-2011	History of Architecture-IV	45
DARC-2013	Architectural Graphics-III	100

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Analyze patterns in built form and nature	K4 in Cognitive domain	Rubric/Viva
2	Illustrate architectural history from Vedic to Dravidian period	K3 in Cognitive domain	Rubric/Viva
3	Organize and plan a study trip	A4 in Affective domain	Rubric/Viva
4	Create an art installation based on patterns (art thesis)	K6 in Cognitive domain	Rubric/Viva
5	Illustrate construction details related to non-ferrous metals, GRC , UPVC, Plastics rubbers and asbestos	K3 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. Understanding patterns from city core to a room
2. Relation of space and form in different scales

3. Art thesis- report on the process of deriving the art form, inspiration, creativity, installation process etc. 2D patterns and explanation, study of architectural pattern, deriving a 3D pattern, 3D Art Installation
4. Study Tour on Climate responsive architecture

Project: Art Thesis/Mural
Issue/context based design study (deep dive studios)

DARC-2009 Architectural Design-IV
Study of Hierarchy
In interiors, in building, in street in neighborhood.FiLVre ground, site analysis, site inventory.Study of the built environment and to develop a basic understanding of spaceandform.Looking at the immediate built environment and understanding its fundamentalcomponents and their impact on the surroundings. Analysis of Architects work and deciphering pattern in their work
Drawing techniques and methods.
Deep dive studios
Systems approach/ scientific approach to introduce significance of theoretical and philosophical dimensions in architecture.
• Objective knowledge vs. Subjective Ideas,
• Distinction of & relationship between Science and Philosophy
• Rational process and Empirical process
• Rules, Formulas, Principles and Theories.
• Accuracy vs. Indeterminacy in Design
• Analytic approach vs. Mimetic approach
• Old Architectural treatises in Europe and India
Study tour
City Core
DARC-2010 Building Construction-IV
Building materials- Rubber, GRC, Ferro-cement, UPVC, Non-Ferrous Metals, Plastics, Asbestos, water proofing materials

DARC-2011 History of Architecture-IV

Unit-I: Indus Valley Civilization and Vedic Period
Characteristic features of town planning and architecture of Indus Valley Civilization; City of Harappa, Mohanjodaro and Lothal, layout of domestic units & public facilities, building materials and construction technologies used.
The Vedic civilization; Layouts of Aryan Village, type of dwellings and building materials.
Unit-II: Jain & Buddhist Architecture
Evolution of Jain & Buddhist Architecture; Development by Ashoka, Hinayan&Mahayan styles of Buddhist architecture, Stupas, Monolithic Pillars, Rock cut architecture (Chaityas&Viharas),
Monestries, Rock edicts, Gandhar style.
Unit-III: Evolution of Temple Architecture
Beginning of Hindu Temple Architecture under the LVptas and Chalukyas.
Architectural features of buildings/temples, construction technology, building materials of Chalukyan style; Early Chalukyan Architecture, Later Chalukyan Architecture. Evolution at Badami, Aihole and Pattadakal, examples such as Ladh Khan, Durga, MaleLVti, Papanath Temple.
Unit-IV: Developments in Temple Architecture
Architectural features of buildings/temples, construction technology, building materials of Indo Aryan Style; Orissa Style – Kalinga Style, Khajuraho Style, LVjrat& Rajasthan Style.
Dravidian Style; Pallava Style, Chola Style, Pandya Style, Vijayanagar Style.
Late Pandya Style or Madura Style.

DARC-2013 Architectural Graphics-III

Unit 1 History of Indian Art Lectures on outline History of Indian Art, from earliest times to Mauryan Period.LVpta Period to Mughal Period, Company Style (British Period).

Renaissance in Indian art i.e. 19th century, Post-independence art of India. Contemporary arts and artist in India, Works of AbanindraNath Tagore, NandLal Bose, Jamini Roy, Amrita Sher Gill, M.F. Hussain, SatishLVjral and S.H.Raza

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Module 19		**DM19: Climate Responsive Architecture**
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-2009	Architectural Design-IV	40
DARC-2010	Building Construction-IV	35
DARC-2011	History of Architecture-IV	45
DARC-2014	Building Services-III	60

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain & level**	**Evaluation Method**
1	Internalize energy conscious concepts in built environments	A5 in Affective domain	Rubric/Viva
2	Design of hostel building based on principles of sustainability	K6 in Cognitive domain	Rubric/Viva
3	Create working drawings of a hostel building	K6 in Cognitive domain	Rubric/Viva
4	Construct and simulate a scale model of hostel building	P5 in psychomotor domain	Rubric/Viva
5	Illustrate Indian architectural history from Islamic to Colonial period	K3 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. To produce a set of working drawing and GFCs of project
2. Indian History of Islamic Architecture
3. Trip report
4. Climatology
5. Environmental Lab

Project: working drawing and GFCs of Hostel Building

DARC-2009 Architectural Design-IV

Design of climate responsive hostel building, using passive cooling techniques and strategies taught during the module.

DARC-2010 Building Construction-IV

Unit-I: Expansion Joints

Introduction to expansion joints, need and their types, design criteria as per IS codes, construction details at foundation, walls, floor and roof level. Study of materials used in their construction, filling and finishing.

Unit-III: Building Chemicals

Anti-termite treatment to foundation, masonry walls and wood work (pre-construction) water proofing and weather proofing materials like chemical admixtures and surface applications, sealants for water, smoke and fire proofing. Pest & rodent control treatment.

Unit-III: Interior Materials & Details

Types & Details of Internal Partition & False Ceiling systems.
Design and detailing of wardrobes, modular kitchens, cabinet shelves and show cases for residence, offices, book stores and commercial buildings, work stations using materials like plywood, PVC, marble, granite, cement, fiber board, gypsum products, particle board, wood wool, straw and any other materials introduced in the market.

DARC-2011 History of Architecture-IV

Unit-I: Introduction to Islamic Architecture

Introduction and understanding of "Islam's" philosophy and its interpretation in building types – Mosque, Tomb, Fort and their elements like dome, arches, minarets etc. Typical Layout of Mosque, its features and related nomenclature. Islamic Architecture Worldwide – Persia, Turkish, Arabian and their typical features

Unit-II: The Imperial Style

With reference to the Slave, Khalji, Tughlaq, Sayyid& Lodi Dynasties. Explanation withexamples of the buildings, construction technology, building materials used, evolution of form anddevelopment with significant changes over the time period.

Unit-III: The Provincial Style

Architecture at Punjab & Bengal, LVjrat, Bijapur, Jaunpur, Malwa and Deccan. Explain withexamples of the buildings, construction technology, building materials used, evolution of form anddevelopment with significant changes over the time period.

Unit-IV: Mughal Architecture

Concepts of city planning of various Islamic towns like Shahajahanabad and FhatehpurSikri. The Architecture developed under the rein of Babur, Humanyu, Akbar, Shahajan Period and later Mughal period and its implication on Indian traditional architecture.Explain with examples of the buildings, construction technology, building materials used,evolution of form and development with significant changes over the time period.

Unit V: Colonial Architecture

Colonial architecture and its amalgamation into India Architecture.

DARC-2014 Building Services III

Unit 1 Electrical Illumination Introduction –

Terminology and unit.Light and its characteristics – scattering, propagation, transmission, reflection, absorption, refraction and dispersion of light.Electromagnetic spectrum and visible radiation.

Illumination –

Types of illumination schemes e.g. Ambient, Task, Focal and Decorative etc. lighting.
Design considerations for illumination Schemes.Methods for lighting calculation – Watts per square meter, Light flux and Point to point method.

Sources of light (Electrical) –

Familiarization and understanding of electrical sources of light e.g. Thermal radiators - Incandescent, Halogen.Discharge lamps – Low pressure (fluorescent, compact fluorescent, sodium, cold cathode neon), High pressure (mercury, metal halide, sodium).New technologies - LED, Fiberoptics.

Luminaries –

Types of Luminaries – Indirect, Semi-indirect, General diffusing, Semi-direct

and Direct.

APPLICATION

Electrical Drawing The understanding of electrical needs for individual spaces e.g. Living room, Dining room, Bed room, Kitchen, Toilet, Staircases, and Corridors etc.

The electrical layout drawing for a residence.

Field / Market

Surveys

Familiarization to types of electrical luminaries available in market, manufactured by various brands e.g. Recessed mounted luminaries, Spot / Projectors, Surface mounted luminaries, Decorative luminaries, Pendant luminaries, Free-floor-standing luminaries, Up lights, Trunking lighting systems, Down Lights.

Module 20		**DM20: Facade**
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-2012	Computer Application in Architecture-IV	75
DARC-2010	Building construction-IV	05
DARC-2015	Estimation and Costing-I	100

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain & level**	**Evaluation Method**
1	Relate outer surface of buildings with its structure for performance improvement	K6 in Cognitive domain	Rubric/Viva
2	Create a building façade	K6 in Cognitive domain	Rubric/Viva
3	Analyze Glass as Building material	K4 in Cognitive domain	Rubric/Viva
4	Appraise manufacturing and processing of glass through industrial visit	K5 in Cognitive domain	Rubric/Viva
5	Justify the role of facade system in built environment	A3 in Affective domain	Rubric/Viva

Project: Building skin section design

Lectures from Glass academy/ MOOC to be incorporated.

DARC-2010 Building Construction-IV

Unit-I: Glass & Glazing

Introduction to Glass as building material, history of glass, manufacturing and properties of various types of glass like plate, tinted, decorative, reinforced, laminated glass block, fiber glass, glass murals, partially coloured glass, etching of glass and its applications in building industry for both exteriors and interiors. Glass fabrication techniques.

Application of glass in buildings, types of glazing, fixing methods, related hardware and construction details of glass curtain wall and structural glazing.

DARC-2015 Estimation and costing

Unit-I: Procedure of Estimation

Introduction to Building Estimate and its need, importance of estimation, types of estimates, mode of measurement of various items.

Procedure of estimating and preparation of Bill of Quantity (BoQ) – Method of building estimates; estimation of earth work, PCC, brick work, DPC, RCC works, plastering, stone and tile works, wood work, water supply and sanitary work. Estimating of quantities of materials like cement, sand, aggregate, brick,

reinforcement, tiles, structural steel for trusses, paints used in building, ACP, paneling and cladding, joinery etc.

Unit-II: Specifications

Brief and detailed specification (conforming to IS codes) for all items of works in the construction of a compound wall, septic tank, load bearing residential building, RCC framed office building, factory building with truss, etc; Specification of special items like false ceiling, decorative elements, flooring, wall cladding etc.

Unit-III: Analysis of Rates

Definition; method of preparation; quantity and manpower estimate for unit work.

Analysis of rates for items in building works like earth work, concrete works, first class brick work, reinforced brick and concrete work, cement plastering, DPC with cement mortar/ concrete, finishing (cement paint, distemper, acrylic emulsion, enamel paint) to walls & ceiling.

Local Schedule of Rates, market rates, measurement book, Running Account (RA) bill, interim and final certificate.

DARC-2012 Computer Application in Architecture-IV

Modeling With Energy Simulation Software

Ecotect and E-Quest

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SEMESTER 5

S. No.	Subject Code	Subject Name	Credit
1	DARC 3001	Architectural Design V	9
2	DARC 3002	Building Construction V	3
3	DARC 3003	Computer Application in Architecture-V	2
4	DARC 3004	Building Services IV	1
5	DARC 3005	Estimation & Costing-II	1
6	DARC 3006	Winter Internship -II	3

Module 21		**DM21: Congent 1**
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-3001	Architectural Design-V	15

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Design an art gallery	K6 in Cognitive domain	Rubric/Viva
2	Appraise renowned architects work to understand their design philosophies	K6 in Cognitive domain	Rubric/Viva
3	Appreciate various design styles and movements	A3 in Affective domain	Rubric/Viva
4	Make a scale model of art gallery	P5 in psychomotor domain	Rubric/Viva
5	Develop his own Philosophy/Rational thought process	A5 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. To study various philosophies in and philosophers in popular literature
2. Congent – Clear, logical and convincing

Project: Art Gallery

DARC-3001 Architectural Design-V

<u>Philosophy and Philosophers</u>

Idea of challenging the norm, questioning and analyzing the philosophies, manipulation and debate.
Learning through Videos on sociology
Following philosophers shall be studied individually and discussed – Plato, Aristotle, Immanuel Kant, Karl Marx, Michel Focault, Jacques Derrida, Friedrich Nietzsche, Rene' Descartes, David Hume, Jean Paul Sartre, Martin Heidegger, Socrates, Confucius
Popular philosophers in Architecture – PatricSchumarker, Christopher Alexander, Charles Jenx, Kevin Lynch, Jane Jacobs

Design Evaluation and Criticism: Value judgments in design, Appreciation of designer's skills, theories of perception and variability of perception. Theoretical issues in contemporary architectural though, Seminars on the works of selected Indian and International architects and related topics.

Part 1 - Exhibition of the study and analysis

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 22		**DM22: Congent 2**
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-3001	Architectural Design-V	15

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain &level**	**Evaluation Method**
1	Design an art gallery	K6 in Cognitive domain	Rubric/Viva
2	Appraise renowned architects work to understand their design philosophies	K6 in Cognitive domain	Rubric/Viva
3	Appreciate various design styles and movements	A3 in Affective domain	Rubric/Viva
4	Make a scale model of art gallery	P5 in psychomotor domain	Rubric/Viva
5	Develop his own Philosophy/Rational thought process	A5 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. Develop and understanding of architectural theories and act of being in time
2. Analyze and learn from master architects philosophies
3. Incorporate Philosophies in their work

Project: Art Gallery

DARC-3001 Architectural Design-V
Design of an Art Gallery based on the Philosophies studied

Architects Work
Frank Lloyd Wright, Le Corbusier, Hassan Fathy, PiterIssenman, Mario Botta, Nervey, Renzo Piano, Richard Roger, Santiago Calatrava, Ebenzer Harvard, Richard Mier, CiserPelli, Felix, Bernard Tshumi, ZahaHadid, Ero Saarinen, Charles Correa, B V Doshi, Raj Reval, AP Kanvinde

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 23		DM23: Dionysia
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-3001	Architectural Design-V	35
DARC-3002	Building Construction-V	40
DARC-3003	Computer Application in Architecture-V	15
DARC-3004	Building Services-IV	50

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Analyze large span roof forms	K6 in Cognitive domain	Rubric/Viva
2	Design an auditorium	K6 in Cognitive domain	Rubric/Viva
3	Apply the principles of acoustics in design of auditorium	K6 in Cognitive domain	Rubric/Viva
4	Compose a drama script and enact the same in groups	P6 in psychomotor domain	Rubric/Viva
5	Illustrate architectural history from modern to Contemporary period	K3 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. Scripting, Acoustics, performance, Set design, Video Making, Lighting and sounds, VR, Temperature control, AC control, Camera setting
2. Develop script, drama performance, apply history of, Auditorium design, apply acoustics

Project: Auditorium/theater

DARC-3001 Architectural Design-V

Dramatics, Introduction to designing of performance space-auditorium, theatre, cinema hall types on an intermediate scale.Importance of space programming, case studies and site analysis in architectural design. Importance of culture/traditions, and building byelaws in shaping built forms. Developing roof forms for large span structures, Angle of vision, types of Auditorium, Cinema Hall, Performance space.

DARC-3002 Building Construction-V

Interior cladding/ thermal performance standards, interior insulating assemblies, sound absorbers, reflectors etc. Interior Finishes.

DARC-3003 Computer Application in Architecture-V

Introduction to Rhino

DARC-3004 Building Services-IV

Acoustics:

HVAV Application

Unit 1

Acoustical Design The understanding the audio needs and layout for projects e.g. Auditoriums, Cinema halls, Conference rooms etc.

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 24		DM24: Decor
Contacts Hours		216 (6 Weeks)
Subject Code	**Subject Name**	**Max Marks**
DARC-3001	Architectural Design-V	35
DARC-3002	Building Construction-V	60
DARC-3005	Estimation and Costing-II	50
DARC-3004	Building Services-IV	50
DARC-3003	Computer Application in Architecture-V	10

COURSE OUTCOMES

Architectural Graduate will be able to:		Knowledge domain and level	Evaluation Method
1	Apply basic concepts of interior design	K3 in Cognitive domain	Rubric/Viva
2	Design interior of a restaurant	K6 in Cognitive domain	Rubric/Viva
3	Design a commercial kitchen	K6 in Cognitive domain	Rubric/Viva
4	Create furniture elements	K6 in Cognitive domain	Rubric/Viva
5	Estimate the cost of interiors in a built structure	K5 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. Interior environment, theme, ambience, material, color, texture and its impact on human psychology and behavior. Performing market surveys, soft furnishing and upholstery, floor finishes etc.

Project: Restaurant interiors / office interiors/ Hotel room/ Lobby

DARC-3001 Architectural Design-V

Introduction to Interior Design

Definitions related to interior design. Review of enclosing elements like walls, floors, ceilings, openings, staircases, furniture & design elements such as color, light textures in interior spaces.Principles of interior design.

History of Interior & Furniture Design

Concise understanding of evolution from ancient to modern, post-modern ideologies to contemporary (Egyptian, Greek, Roman, Gothic, Baroque, Renaissance, Arts and Crafts Movement, Art Nouveau, De Stilj, Modernism, Post Modernism and Contemporary).

Study of Materials, Finishes & their applications in Furniture & other Interior Elements

An in-depth understanding of the characteristics and workability of various materials used in interiors. Their classification could be on basis of elements of usage (floor, ceilings, walls, doors, windows and fabrics/upholstery) or materials based like wood, metal plastics and their variants.

Understanding innovation in Furniture & Interior Design

Modern materials, Modular furniture, interior landscaping, Fittings & fixtures.

Analysis & Design of Furniture

Analyzing existing designs of selected furniture on basis of ergonomics, user type, economics, material, joinery and maintenance to ascertain their suitability. Design furniture for specific use complying with the aforementioned formulated design criteria. Build scaled models of the designed furniture for better understanding of working and materials.

Analysis & Design of small Interior spaces

Analyze small selected interior spaces like study, bedroom, executive/ architect office, retail outlet, conference, reception & waiting lobby including toilets and kitchens in detail, for varied aspects like function, ergonomics, and materials and establishing detailed design criteria. Design of selected small interior spaces on specific sites/ locations based on formulated design criteria using modern design methodologies. Develop design details of the afore-designed projects for their furniture and finishing.

DARC-3002 Building Construction-V

Introduction to Aluminum as building material, advantage and disadvantages, study of various sections available for doors and windows together with accessories. Aluminum framed doors, windows & partitions types, design and construction details.Preparation of variety of surfaces, Application of various coats.

Finishes

Lime / Color wash, Dry distemper, Oil bound distemper,Cement paints, Acrylic emulsions, Synthetic enamels, Wall textures etc. Polishes and Varnishes

DARC-3003 Computer Application in Architecture-V

Rendering of interior Views

DARC-3004 Building Services-IV

Advanced Building Services with respect to Commercial Interors

DARC-3005 Estimation and Costing-II

Interior estimation only (to be revised)

Unit-I: Procedure of Estimation

Introduction to Building Estimate and its need, importance of estimation, types of estimates, mode of measurement of various items. Procedure of estimating and preparation of Bill of Quantity (BoQ) – Method of building estimates;

estimation of earth work, PCC, brick work, DPC, RCC works, plastering, stone and tile works, wood work, water supply and sanitary work. Estimating of quantities of materials like cement, sand, aggregate, brick, reinforcement, tiles, structural steel for trusses, paints used in building, ACP, paneling and cladding, joinery etc.

Unit-II: Specifications

Brief and detailed specification (conforming to IS codes) for all items of works in the construction of a compound wall, septic tank, load bearing residential building, RCC framed office building, factory building with truss, etc; Specification of special items like false ceiling, decorative elements, flooring, wall cladding etc.

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Module 25		DM25: BIM
Contacts Hours		**72 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-3003	Computer Application in Architecture-V	75
DARC-3005	Estimation and Costing-II	50

COURSE OUTCOMES

Architectural Graduate will be able to:		Knowledge domain and level	Evaluation Method
1	Analyze interior specifications	K4 in Cognitive domain	Rubric/Viva
2	Analyze interior estimation and costing	K4 in Cognitive domain	Rubric/Viva
3	Create a project report of Ground+1 brick residence	K6 in Cognitive domain	Rubric/Viva
4	Apply basic concepts of building information modeling software	K3 in Cognitive domain	Rubric/Viva
5	Model a DPR in BIM software	K6 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. Create a project report of Ground+1 brick residence in BIM

Project: Interiors rendering

COURSE OBJECTIVES

1. To introduce the fundamentals of Building Information Modeling (BIM).
2. To learn various workflows and procedures of BIM work-environment.
3. To develop basic skills in application of BIM tools and techniques in Architecture.

COURSE CONTENT

DARC-3003 Computer Application in Architecture-V

Unit-I: Introduction to BIM

Introduction to BIM, Concepts & Principles, User-Interface, Viewing the Model, Resources.
Understanding terms, elements and properties. Creating a project in BIM environment, creating levels and grids, creating conceptual design.

Unit-II: Basic Modelling

Modelling of walls, windows, doors, setting view range, components, columns, roof, ceiling, floors, openings, surfaces, stars, ramps, railings, curtain elements.
Understanding families and working with families, family editor, creating a component, in-place components, reference planes, voids, join/cut geometry. Rooms and areas.

Unit-III: Annotation and Visualization

Annotations; grids, dimensions, text, tags, rooms, schedules, sheets, symbols, creating views.
Setting of colour schemes, legends, openings.
Visualization; rendering, materials, lights, paint tool, decals.
Project phasing, detailing and preparing construction documents.

Unit-IV: Site and Solar Studies

Site, topo-surface, building pads, divided surface, creating topo-surface from CAD contours, massing studies.
Setting up and creating solar studies. Applying and removing constraints.

Unit-V: Maya/ Rhino/ Grasshopper

3D Max, Lumion or any other rendering software.

DARC-3005 Estimation and Costing-II

Unit-III: Analysis of Rates

Definition; method of preparation; quantity and manpower estimate for unit work. Analysis of rates for items in building works like earth work, concrete works, first class brick work, reinforced brick and concrete

work, cement plastering, DPC with cement mortar/ concrete, finishing (cement paint, distemper, acrylic emulsion, enamel paint) to walls & ceiling. Local Schedule of Rates, market rates, measurement book, Running Account (RA) bill, interim and final certificate.

Accounting Procedures Introduction to P.W.D accounts procedure, measurement book, daily labour, muster roll, stores, stock, and issue of material from stock, indent form, imprest account, cash book, mode of payment.

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SEMESTER 6

S. No.	Subject Code	Subject Name	Credit
1	DARC 3009	Architectural Design-VI	12
2	DARC 3010	Building Construction VI	2
3	DARC 3011	Human Values	1
4	DARC 3012	Computer Application in Architecture VI	2
5	DARC 3013	Summer Internship-III	2

Module 26		**DM26: Prefab**
Contacts Hours		**50 (2 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-3009	Architectural Design-VI	15
DARC-3010	Building Construction-VI	30

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Analyze defects and remedies in buildings	K4 in Cognitive domain	Rubric/Viva
2	Analyze retrofitting in buildings	K4 in Cognitive domain	Rubric/Viva
3	Analyze prefabricated speedy construction in a building	K4 in Cognitive domain	Rubric/Viva
4	Apply basic concepts of modular construction	K3 in Cognitive domain	Rubric/Viva
5	Appreciate the role of prefab construction in respect of technology, culture, time and environment	A3 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

1. To develop and include universal design principles
2. Designing in light weight construction – concrete, pre tensioning, post tensioning
3. Defects and remedies

Project: Analysis of buildings constructed through speedy construction

DARC-3009 Architectural Design-VI

Defects in Building

Analyze defects in building and understanding the role of advanced construction techniques. Defects in buildings and their remedies.

Universal Design- People needs

Principles of Universal Design,Universal Design Definition, seven principles:-Equitable Use
Flexibility in Use, Simple and Intuitive, Perceptible Information, Tolerance for Error, Low Physical Effort, Size and Space.

DARC-3010 Building Construction-VI

Unit1-Prefabrication Systems

Open prefab system, large panel prefab system, joints, pre-casting methods, materials, on-site and off-site prefabrication, components, etc.

Unit 2-Pre-stressed Concrete

Introduction, methods of pre-stressing and their application to large-space structures.

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 27		**DM27: Tall Buildings**
Contacts Hours		**72 (2 Weeks)**
Assigned Credits		**2**
Subject Code	**Subject Name**	**Max Marks**
DARC-3009	Architectural Design-VI	10
DARC-3010	Building Construction-VI	15
DARC-3011	Human Values	80

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Design core of a tall building	K6 in Cognitive domain	Rubric/Viva
2	Analyze structural system of a tall building	K4 in Cognitive domain	Rubric/Viva
3	Illustrate evolution of mega structures	K3 in Cognitive domain	Rubric/Viva
4	Analyze building on the basis of earthquake and dynamic loads	K4 in Cognitive domain	Rubric/Viva
5	Appreciate the role of services in tall building design	A3 in Affective domain	Rubric/Viva

COURSE OBJECTIVES

To design tall building core, earthquake resistant structures, structural grids- diagrid, tensegrity, fire proofing, historic evolution of tall buildings, contemporary mega structures

Project: Design core of a Tall Building

DARC-3009 Architectural Design-VI

Documentaries of Megastructures for analysis of high rise structures. Understanding structural grids, form geometry

DARC-3010 Building Construction-VI

Industrial Construction Structural Steel Works:Portal Frame Construction,
Construction for tall buildings

DARC-3011 Human Values

UNIT 1: Course Introduction - Need, Basic LVidelines, Content and Process for Value Education

1. Understanding the need, basic guidelines, content and process for Value Education
2. Self Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential validation- as the mechanism for self exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfill the above human aspirations: understanding and living in **harmony** at various levels

UNIT 2: Understanding Harmony in the Human Being - Harmony in Myself!

1. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
2. Understanding the needs of Self ('I') and 'Body' - *Sukh* and *Suvidha*
3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
4. Understanding the characteristics and activities of 'I' and harmony in 'I'
5. Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail
6. Programs to ensure *Sanyam* and *Swasthya*

- Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

1. *Understanding Harmony in the family – the basic unit of human interaction*
2. Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas)* and Respect (*Samman)* as the foundational values of relationship
3. Understanding the meaning of *Vishwas*; Difference between intention and competence
4. Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship
5. Understanding the harmony in the society (society being an extension of family): *Samadhan, Samridhi, Abhay, Sah-astitva*as comprehensive Human Goals
6. Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj),* Universal Order (*SarvabhaumVyawastha)*- from family to world family!

- Practice Exercises and Case Studies will be taken up in Practice Sessions.

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Module 28 ARMO 3008		**DM28: Neighborhood**
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-3009	Architectural Design-VI	40
DARC-3011	Human Values	20
DARC-3012	Computer Application in Architecture-VI	30

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Apply basic theory of design	K3 in Cognitive domain	Rubric/Viva
2	Analyze advance structural concepts	K3 in Cognitive domain	Rubric/Viva
3	Analyze advance services concepts-(automation)	K3 in Cognitive domain	Rubric/Viva
4	Illustrate basic concept of neighborhood and masterplans	K3 in Cognitive domain	Rubric/Viva
5	Design vertical housing	K6 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. Including building services and structural system
2. Area calculation, building byelaws, FAR/FSI, Height restrictions, covered area.

Project: mid rise/low rise housing

DARC-3009 Architectural Design-VI

Design of a medium to high-rise building in a dense urban setting. The problem shouldattempt to bring out a comprehension of the framework that outlines a building interior, thestructural system and the services core, and the relation of this interior with the exteriorenvironment through the building skin. The project should be of high services complexity withmechanical systems for space conditioning, parking and other services, and include theintegration of active energy systems

DARC-3011 Human Values

UNIT 4: Understanding Harmony in the Nature and Existence - Whole existence as Co-existence

1. Understanding the harmony in the Nature
2. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature
3. Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
4. Holistic perception of harmony at all levels of existence
    a. Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

1. Natural acceptance of human values
2. Definitiveness of Ethical Human Conduct
3. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
4. Competence in professional ethics:
    a) Ability to utilize the professional competence for augmenting universal human order
    b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,
    c) Ability to identify and develop appropriate technologies and management patterns for above production systems.
5. Case studies of typical holistic technologies, management models and production systems
6. Strategy for transition from the present state to Universal Human Order:
    b) At the level of individual: as socially and ecologically responsible engineers, technologists and managers
    c) At the level of society: as mutually enriching institutions and organizations

DARC-3012 Computer Application in Architecture-VI

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 29		DM29: Agora
Contacts Hours		**216 (6 Weeks)**
Subject Code	**Subject Name**	**Max Marks**
DARC-3009	Architectural Design-VI	35
DARC-3010	Building Construction-VI	25
DARC-3012	Computer Application in Architecture-VI	35

COURSE OUTCOMES

Architectural Graduate will be able to:		Knowledge domain and level	Evaluation Method
1	Analyse theory of design	K3 in Cognitive domain	Rubric/Viva
2	Analyse basic concepts of waste management	K3 in Cognitive domain	Rubric/Viva
3	Design a landscaped central court of vertical housing	K6 in Cognitive domain	Rubric/Viva
4	Write a dissertation	K5 in Cognitive domain	Rubric/Viva
5	Design a shopping mall	K6 in Cognitive domain	Rubric/Viva

COURSE OBJECTIVES

1. Study and analysis of a live site for site services and site planning.
2. Planning and designing of a campus.

Project: Institutional building complex

DARC-3009 Architectural Design-VI (130 Contact Periods)

problem of a complex building involving a high level of services and advanced structural systems eg. Sports complex, institutional campus. Exercises in simulation and conceptual modeling shall be conducted. The studio will also focus on sustainable design principles, including waste recycling, rain water Harvesting, site planning principles and landscaping.

DARC-3010 Building Construction-VI

Unit 1-Lightweight constructions

Hollow bricks, slabs, party wall and shell roofs.

Unit 2 Speedy Construction Methods

Types of floor construction - Beam & Slab, Waffle Grid Slab, Drop Beam & Slab, Flush Slab, Lift Slab Construction; Cast-in-situ service & stair cores; Cross wall & Box frame construction.

DARC-3012 Computer Application in Architecture-VI

NOTE:	Internal and external exams shall be carried out by a Jury of Internal or External Examiners which would be marked on the basis of the approved evaluation rubric
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Module 30		DM30: Management
Contacts Hours		**72 (2 Weeks)**
Assigned Credits		**2**
Subject Code	**Subject Name**	**Max Marks**
DARC-3010	Building Construction-VI	30
DARC-3012	Computer Application in Architecture-VI	35

COURSE OUTCOMES

Architectural Graduate will be able to:		**Knowledge domain and level**	**Evaluation Method**
1	Analyse building specifications	K4 in Cognitive domain	Rubric/Viva
2	Analyse building estimation and costing	K4 in Cognitive domain	Rubric/Viva
3	Appreciate the role of economics in built environment	K3 in Cognitive domain	Rubric/Viva
4	Apply building byelaws to their design	K3 in Cognitive domain	Rubric/Viva
5	Make a detail working drawing of shopping mall	K6 in Cognitive domain	Rubric/Viva

Project: Reports/Research/dissertation

DARC-3010 Building Construction-VI

-Introduction Aspects of Analysis of an Architectural project

DARC-3012 Computer Application in Architecture-VI

-Technical Writing Critical Appreciation of a Project: Analyzing on the basis of site, Built Form and Space, Spatial Organization, Materials and Techniques, Elements and Special Characteristics, Activity Pattern.

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