Bachelor of Architecture

(Five Year Full Time Degree Program)

SYLLABUS

(B. Arch. First, Second & Third Year)

School of Architecture & Landscape Design

Shri Mata Vaishno Devi University Katra

(May 2019)

	ABBREVIATIONS / CODES / NOMENCLATURE
Course Code Convention	
SCT – LSAY Example ALL 9101 ALP 9102 ALS 9110	Course Code for various Courses / Subjects SC: School Code T: Course Type Code (Lecture/Studio/Practical/Project etc.) L: Course Level (1, 2, 3, 4 & 5 for First, Second years …) SA: Study Area / Sub Area Y: Semester Wise Course Number
AL	School Code (SoALD)
L	Lecture
P	Practical
U	Studio
E	Elective
C	Colloquium
D	Project Based
T	Training
S	Self Study
N	Non Credit
V	Special Lecture Topic
Teaching Scheme Convention	
L	Lecture
T	Tutorial
S	Studio
P	Practical
C	Course Credit
NC	Non Credit
NA	Not Applicable
Evaluation Scheme Convention	
Minor (MI)	(Mid Term Exams / Tests) I & II
Major (MA)	Semester End Examination (ESE)
FFCS	Fully Flexible Credit System
CBCS	Choice Based Credit System
Internal / Assignment (ASGN)	Marks awarded on the basis of Report on Theory Contents
Internal Assessment (INT)	Marks awarded by Course Coordinator on Practical Component
External Assessment / Jury (EXT)	Marks awarded by External Examiner(s) / Jury

Teaching and Evaluation Scheme

B. Arch. Course Structure (2019-20)					THEORY				PRACT./ STUDIO			
S. No.	Course Code	Course Title	L-T-P/S	Credits	Minor-I Marks	Minor-II Marks	Major Exam Marks	Internal/ Assignment	Internal Assess.	External Assess/Jury	Total	Exam Duration
		Semester-1 (New Scheme)										
1	ALU 1511	Architectural Design-I	2-0-6	5	NA	NA	50	50	50	50	200	6
2	ALU 1512	Building Materials & Construction-I	2-0-4	4	20	20	50	10	50	50	200	3
3	ALL 1513	Building Structures-I	2-1-0	3	20	20	50	10	NA	NA	100	3
4	ALL 1514	History of Architecture-I	2-1-0	3	20	20	50	10	NA	NA	100	3
5	ALU 1515	Architectural Drawings-I	2-0-4	4	25	25	50	NA	100	NA	200	3
6	ALU 1516	Basic Design & Visual Arts	0-2-0	2	15	15	30	NA	40	NA	100	3
7	ALP 1517	Model Workshop	0-0-4	2	NA	NA	NA	NA	100	NA	100	NA
8	PCN 1010	NSS		NC	As Per Course Coordinator / SMVDU Guidelines Issed from Time to Time							
		Semester-2 (New Scheme)										
1	ALU 1521	Architectural Design-II	2-0-6	5	NA	NA	50	50	50	50	200	6
2	ALU 1522	Building Materials & Construction-II	2-0-4	4	20	20	50	10	50	50	200	3
3	ALL 1523	Building Structures-II	2-1-0	3	20	20	50	10	NA	NA	100	3
4	ALL 1524	History of Architecture-II	2-1-0	3	20	20	50	10	NA	NA	100	3
5	ALU 1525	Architectural Drawings - II	2-0-4	4	25	25	50	NA	100	NA	200	3
6	ALU 1526	Arts & Graphics	0-2-0	2	15	15	30	NA	40	NA	100	3
7	ALP 1527	Surveying & Leveling	1-0-2	2	20	20	50	10	100	NA	200	3
8	LNL 1411	Language Lab - I	0-0-2	1	As Per Course Coordinator / SMVDU Guidelines Issed from Time to Time							
		Semester-3 (New Scheme)										
1	ALU 2511	Architectural Design-III	2-0-6	5	NA	NA	50	50	50	50	200	12
2	ALU 2512	Building Materials & Construction-III	2-0-4	4	20	20	50	10	50	50	200	3
3	ALL 2513	Building Structures-III	2-1-0	3	20	20	50	10	NA	NA	100	3
4	ALL 2514	History of Architecture-III	2-1-0	3	20	20	50	10	NA	NA	100	3
5	ALP 2515	Computer Applications in Architecture-I	2-0-4	4	20	20	50	10	100	NA	200	3
6	ALL 2516	Climatology	2-1-0	3	20	20	50	10	NA	NA	100	3
7	ALU 2517	Building Services I	2-0-2	3	20	20	50	10	100	NA	200	3
		Semester-4 (New Scheme)										
1	ALU 2521	Architectural Design-IV	2-0-6	5	NA	NA	50	50	50	50	200	12
2	ALU 2522	Building Materials & Construction -IV	2-0-4	4	20	20	50	10	50	50	200	3
3	ALL 2523	Building Structures-IV	2-1-0	3	20	20	50	10	NA	NA	100	3
4	ALL 2524	History of Architecture-IV	2-1-0	3	20	20	50	10	NA	NA	100	3
5	ALP 2525	Computer Applications in Architecture-II	2-0-4	4	20	20	50	10	100	NA	200	3
6	ALL 2526	Theory of Design	2-1-0	3	20	20	50	10	NA	NA	100	3
7	ALU 2527	Building Services-II	2-0-2	3	20	20	50	10	100	NA	200	3
		Semester-5 (New Scheme)										
1	ALU 3511	Architectural Design-V	2-0-6	5	NA	NA	50	50	50	50	200	12
2	ALU 3512	Building Materials & Construction-V	2-0-4	4	20	20	50	10	50	50	200	3
3	ALL 3513	Building Structures-V	2-1-0	3	20	20	50	10	NA	NA	100	3
4	ALL 3514	Principles of Management	3-0-0	3	20	20	50	10	NA	NA	100	3
5	ALP 3515	Computer Applications in Architecture - III	2-0-4	4	20	20	50	10	100	NA	200	3
6	ALL 3516	Acoustics & Lighting	2-1-0	3	20	20	50	10	NA	NA	100	3
7	ALL 3517	Sociology & Economics	3-0-0	3	20	20	50	10	NA	NA	100	3
		Semester-6 (New Scheme)										
1	ALU 3521	Architectural Design-VI	2-0-6	5	NA	NA	50	50	50	50	200	12
2	ALU 3522	Building Materials & Construction-VI	2-0-4	4	20	20	50	10	50	50	200	3
3	ALL 3523	Building Structures-VI	2-1-0	3	20	20	50	10	NA	NA	100	3
4	ALL 3524	Environmental Studies	3-0-0	3	20	20	50	10	NA	NA	100	3
5	ALU 3525	Working Drawings	2-0-4	4	20	20	50	10	100	NA	200	3
6	PCL 1067	Discourse on Human Virtues	3-0-0	3	20	20	50	10	NA	NA	100	3
7	ALL 3527	Specification & Estimation	2-1-0	3	20	20	50	10	NA	NA	100	3

In Case of any discretely in Teaching or Evaluation Scheme across documents, matter should be reported to Head of School for review, considered and decision.

ALU 1511				**Architectural Design - I**			Pre Requisites		Nil	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	6	5			50	50	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand dimensions of architecture and role and responsibilities of an architect.
2. Understand anthropometric data and its use in architectural design/floor space layout.
3. Apply basic design principles of using elements of architecture.
4. Develop the ability to translate abstract principles of design into architectural solutions for simple problems / nonfunctional units.

COURSE CONTENTS

Unit-I: Introduction to Architecture (24 Contact Periods)

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.

Unit-II: Architectural Design Aspects (24 Contact Periods)

Basic anthropometrics, human functions and their implications for space requirements. Minimum and optimum areas for mono functions. User's data, Movement and circulation diagrams. Standards / minimum dimensions for habitable areas and other activities as per NBC.

Spatial interpretations – various activities and their relationship with spaces.

Unit-III: Floor Space Layout (24 Contact Periods)

Dimensions of furniture and fixtures, functional furniture layout, circulation, lighting and ventilation for spaces such as living/dining, kitchen, bedrooms, Architect's office, Doctor's clinic, Food parlor etc.,

Unit-IV: Preliminary Architectural Design (24 Contact Periods)

Design of simple building elements such as Entrance Gate, Welcome Arch, Memorial edifice, Bus shelter and layout of park, Design of single user units like hostel room and integration of form and function.

Note: The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing. Students should carry out One Major, One Minor and Two Time Bound Architectural Design exercises.

SUGGESTED BOOKS

1. 'Principles of three Dimensional Design' by Wucius Wong.
2. "Time Saver Standards for Architectural Design Data" by John Hanock.
3. "Architectural Graphic Standards" by Ramsay and Sleeper.
4. "Space, Time and Architecture" by Gideon.
5. "Elements of Architecture from Form to place" by Von Meiss, Pierre.
6. Architecture: Form, Space and Order by Francis D. K. Ching, John Wiley & Sons, 2007.

ALU 1512				**Building Construction & Materials-I**			Pre Requisites		Nil	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand primary building materials (Brick, Stone, Cement & Lime) used in building construction, their properties, classification & types available.
2. Gather knowledge of manufacturing and judicial usage of building materials.
3. Understand and apply building materials as per procedures recommended by IS Codes.
4. Work Out / Apply appropriate details for building construction.

COURSE CONTENT

Unit-I: Introduction to Building Materials & Components (18 Contact Periods)

Introduction to commonly used building 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 etc.)

Unit-II: Brick and Clay Products (18 Contact Periods)

BRICKS: Manufacturing, Composition, Sizes, Properties and Classification of bricks, Tests for bricks. Introduction of Brickworks: *Types of Bricks & Quoins*, 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.

Unit-III: Rocks & Stones as Building Materials (18 Contact Periods)

Geological, Physical and Chemical classification of rocks/stones. Common building stones used in India and their various uses in building. Characteristic properties, identification of stones, dressing of stones. Introduction of Stonework; *Rubble and Ashlars masonry*. Applicable IS Codes for Stones.

Unit-IV: Lime and Cement (18 Contact Periods)

LIME: Classification of lime, fat and hydraulic lime; properties and use.
CEMENT: Composition and manufacturing of cement. Function of cement ingredients; setting, hydration and hardening of cement. Properties of cement – Fineness, Soundness, Setting time, etc Grades of cement and different types of cement used in construction. Storage of cement on site. Applicable IS Codes for Lime & Cement.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare sheets (on topics made *italics*) with applicable construction details in studio. Market survey of building materials shall be carried out as a group exercise.

SUGGESTED BOOKS

1. Building Construction & Materials, S.C. Rangwala
2. A text book of Building Construction, B.C. Punmia
3. Building Materials & Construction, Shushil Kumar.
4. Building Construction, Mackay WB Vol. 1-4
5. Construction Technology, Chudley Vol. 1-6

ALL 1513				**Building Structures-I**			Pre Requisites		Nil	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand distribution & calculation of force for analysis of the structures.
2. Understand the geometric properties of the different shapes.
3. Analyzing various force systems, work on problems relating to the resultant, equilibrium etc.
4. Analyzing the Beams & Trusses with different types of load conditions & different types of support conditions.

COURSE CONTENTS

Unit-I: **Introduction to Mechanics & Equilibrium of Forces** (8 Contact Periods)

Fundamental Principles - Vectorial Representation of Forces and Moments - Coplanar forces - Resolution and Composition of forces and equilibrium of particles – introduction of Forces on a particle in space - Equivalent system of forces - Principle of transmissibility - Single equivalent force - Free body diagram - Equilibrium of rigid bodies in two dimensions and Introduction to Friction - Laws of Coulomb Friction - Equilibrium of Bodies involving Dry friction. Application

Unit-II: **Properties of Surfaces and Solids** (7 Contact Periods)

Centroid - First moment of area - Second moment of area - moment and Product of inertia of plane areas - Transfer Theorems - Polar moment of inertia - Principle axes

Unit-III: **Bending Moments & Shear Forces** (7 Contact Periods)

Types of beams, supports and loadings. Bending Moment & shear force diagrams for simple beams with simple loading.

Unit-IV: **Analysis of Perfect Frames** (7 Contact Periods)

Trusses - Introduction - Simple Truss and Solution of Simple truss - Method of Joints - Method of Sections - Method of Tension Coefficient.

Unit-V: **Stresses and Strains** (7 Contact Periods)

Simple Stress and Strain: Introduction - Normal and Shear stresses - Stress - Strain Diagrams, Solution of simple problems –One Dimensional Loading of members of varying cross-section – Concepts of Elastic Constants.

SUGGESTED BOOKS

1. Engineering Mechanics – Statics and Dynamics by Tayal. A. K. (2009), 12th Edition, Umesh PubliMinorions, ISBN: 9788188114016.
2. Mechanics of Materials by Punamia B. C. (2010), 15th Edition, Laxmi publiMinorions (P) Ltd, ISBN: 9788131806463.
3. Engineering Mechanics – Statics and Dynamics by Shames I. H. (2006), 4th Edition, Prentice-Hall of India Private limited, ISBN- 9780133569247.
4. Engineering Mechanics – RK Bansal and Sanjay Bansal, Laxmi PubliMinorions, Delhi.
5. SOM by Khurmi, R.S.

ALL 1514				**History of Architecture - I**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students will be able to;

1. Understand architectural elements, forms, development trends, construction techniques, materials and technologies used in built environment through the times.
2. Understand transformation patterns in architecture during various kingdoms / time periods and analyse the contributing factors for the design development of different styles.
3. Familiarize themselves with the socio–economic, historical and political influences of time period in architectural development.

COURSE CONTENTS

Unit-I: Indus Valley Civilization and Vedic Period (09 Contact Periods)

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 & Budhist Architecture (09 Contact Periods)

Evolution of Jain & Buddhist Architecture; Development by Ashoka, Hinayan & Mahayan styles of Buddhist architecture, Architectural features of Stupas, Monolithic Pillars, Rock cut architecture (Chaityas & Viharas), Monestries, Rock edicts. Gandhar style of art and architecture.

Unit-III: Evolution of Temple Architecture (09 Contact Periods)

Beginning of Hindu Temple Architecture under the Guptas 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 like Ladh Khan, Durga, Maleguti, Papanath Temple.

Unit-IV: Developments in Temple Architecture (09 Contact Periods)

Architectural features of buildings/temples, construction technology, building materials of Indo Aryan Style; Orissa Style – Kalinga Style, Khajuraho Style, Gujrat & Rajasthan Style.
Dravidian Style; Pallava Style, Chola Style, Pandya Style, Vijayanagar Style, Late Pandya Style or Madura Style.

Teaching Methodology: Faculty shall impart teaching by lecture & presentations (with focus on free hand sketches); students shall prepare poster/reports/presentation illustrating various architectural styles as an individual or group exercise.

SUGGESTED BOOKS

1. "The History of Architecture" by Sir Bannister Fletcher, CBS (2002), ISBN: 978-8123906416
2. "Buddhist and Hindu Architecture" in India by Satish Grover
3. "Indian Architecture, Buddhist & Hindu Period" by Percy Brown, ISBN: 978-8123924571
4. "History of Architecture in India" by Christopher, Tadgell
5. "Ancient Indian Architecture (from Blossom to Bloom)" by Maheshwari & Garg, CBS (2001)
6. "Concepts of space in Traditional Indian Architecture" by Yatin Pandya, Grantha Corp. (2013)

ALU 1515				**Architectural Drawings - I**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	25	25	50		100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand and apply various drawing tools and accessories used in drafting and lettering techniques to produce any geometrical composition and form.
2. Gather understanding about the scale measurement; plane geometry, solid geometry and projections used as drawing technique.
3. Demonstrate basic understanding and handling techniques of orthographic projection.
4. Represent three dimensional forms in design projects using graphical presentation skills.

COURSE CONTENTS

Unit-I: Basic Technical Drawing and Lettering (18 Contact Periods)

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

Unit-II: Scale and Dimensioning (18 Contact Periods)

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

Unit-III: Orthographic Projections (18 Contact Periods)

Introduction to orthographic projections - isometric and axonometric projections, Planes of Projections, First angle projections, Drawing of lines, basic geometrical shapes in different positions, Projection of regular 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.

Unit-IV: Surface Development (18 Contact Periods)

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.

Teaching Methodology: Faculty shall impart teaching by lecture/demonstrations; students shall undertake exercises and prepare sheets in studio.

SUGGESTED BOOKS

1. Boaz Joseph , Architectural Graphic standards editor.
2. Bhatt, N.D., “Engineering Drawing: Plane and Solid Geometry”, Charotar Publishing House, 2006.
3. Ching, Francis D. K., “Architectural Graphics”, Van Nostrand Reinhold, 2003.
4. Leslie, Martin C., “Architectural Graphics”, Macmillan Pub Co, 1970.
5. Parkinson, A.C., “A First Year Engg. Drawing”, Sir Issac Pitman and Sons.
6. Black, Earl D., “Engineering and Technical Drawing”, Van Nostrand Reinhold Co., 1972.

ALU 1516				**Basic Design & Visual Arts**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
0	2	0	2	15	15	30		40		100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand and apply elements, principles and theories of arts and architectural composition.
2. Understand the conceptual, visual and perceptual issues involved in the design process.
3. Understand aesthetics and art appreciation from the perspective of theory and application.
4. Use various rendering techniques and types of rendering methods for presentations.

COURSE CONTENTS

Unit-I: Elements of Design (6 Contact Periods)

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

Unit-II: Colour Fundamentals (6 Contact Periods)

Colour fundamentals; perception of colour and light, related definitions like hue, value, intensity, colour wheel, colour theory, colour schemes. Effect of colour in architecture, colour symbolism.

Unit-III: Principles of Design (6 Contact Periods)

Introduction of Design principles like Balance, Harmony, Rhythm, Contrast, Symmetry, Scale, Proportions etc. leading to unity in design. Application of design principles in 2D and 3D compositions. Exercises of 3D compositions to be introduced.

Unit-IV: Aesthetics & Appreciation of Art (6 Contact Periods)

Introduction to aesthetics and interpretation of its meaning, aesthetics (rasa) in artworks, appreciation of art, 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.

Teaching Methodology: Faculty shall impart teaching by lecture, presentation & demonstrations; students shall undertake 2D & 3D composition exercises in studio.

SUGGESTED BOOKS

1. Foundations in Architecture: An Annotated Anthology of Beginning Design Project, Van Nostrand Reinhold NY, 1993.
2. Basic Visual Concepts and Principles for Artists, Architects and Designers by Charles Wallschlacgerm& Cynthia Busic-Snyder, McGraw Hill, New York 1992.
3. Design fundamentals in Architecture by V. S. Parmar, Somaiya PubliMinorions Pvt. Ltd., New Delhi, 1973.
4. Rendering with Pen + Ink, Thames & Hudson, 2003.
5. Logic and Design in Art, Science and Mathematics by Krome Barratt, Globe Pequot Press, 2005.
6. Architecture: Form, Space and Order by Francis D. K. Ching, John Wiley & Sons, 2007.

ALP 1517				**Model Workshop**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
0	0	4	2					100		100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Inculcate skills of cutting and joining in using simple materials like thick paper, thermocol, mountboard, wooden veneers etc.
2. Prepare models of 3D geometrical forms and other abstract forms.
3. Develop skills in creating art forms using various soft and flexible materials.

COURSE CONTENTS

Unit-I: Introduction to Model Making (12 Contact Periods)

Introduction to workshop tools.
Simple exercises in cutting and joining in thick paper, thermocol, mountboards, acrylic sheets and wooden veneers. Preparing simple geometrical forms like cube, prism, cone and pyramid of various sizes with different materials.

Unit-II: Art Forms & Art Work (12 Contact Periods)

Working with soft and / or flexible materials like clay, soap, PoP etc.
Exercises in casting / carving and molding in order to create art forms.

Unit-III: Building Forms (12 Contact Periods)

Preparing contours to model undulating / contoured sites.
Making presentation models of simple rooms, design units illustrating furniture, doors, windows.
Preparing small models of trees, shrubs, cars using different materials like therocol, foam, chaulk.

Unit-IV: Carpentry Works (12 Contact Periods)

Introduction to carpentry tools and instruments. Tips and precautions for working with wood.
Exercises in cutting, leveling and joint making with wood.

Teaching Methodology: Faculty / Instructor shall impart teaching by demonstrations; students shall undertake exercises in workshop. Preferably, exercises should be related to architectural and basic design topics introduced during the semester.

SUGGESTED BOOKS

1. Architectural Model Building: Tools, Techniques, & Materials, Roark T. Congdon.
2. Model Making: A Basic Guide, Martha Sutherland.
3. Model-Making: Materials and Methods illustrated edition, David Neat
4. Designing With Models: A Studio Guide To Making And Using Architectural Design Models, Criss B. Mills
5. Model Building for Architects and Engineers, John Taylor
6. Architectural Models, Rolf Janke

ALU 1521				**Architectural Design-II**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	6	5			50	50	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand the grammar of creating architectural space and form.
2. Understand and apply individual variables like light, movement, transformation, scale, structure and skin in the formation and evolution of architectural form.
3. Explore the relationship between human feelings and architectural form.
4. Develop the ability to translate principles of design with project requirements into architectural solutions for simple units.

COURSE CONTENTS

Creating Architectural Space and Form considering variables like light, movement, transformation, scale, structure and skin in the formation and evolution of architectural form.
Space Standards and NBC guidelines for building typologies.

In the earlier part of the studio, multi user based design exercise to be developed to introduce the various complexities in design. Small scale exercises shall be restricted to understanding and representation of walls, floors, roof planes, openings and structural elements. Projects shall be attempted with the help of models and sketches. Space making projects may be tied to the context, but objective shall be to illustrate the variables like colour, material, texture and scale in evoking the necessary conditions for the prescribed activity.
Medium scale project shall be formulated as a process of integrating the various elements of space making learnt earlier in the semester. Small scale design exercises to be introduced on topics like Architect's Office, Residence, College Canteen, Doctor's Clinic, Guest House etc.

Note:
The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing. Students should carry out One Major, One Minor and Two Time Bound Architectural Design exercises. The portfolio covering the above topics shall be presented for evaluation by external examiners.

NOTE:	End Term Evaluation (Major Exam) of Architectural Design shall be carried out in two stages. Jury of Internal and/or External Examiners and Design exercise for exam (50 Marks for Portfolio Evaluation + 50 Marks for Exam Answer Sheets Evaluation).
	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 the concerned faculty.

SUGGESTED BOOKS

1. 'Principles of three Dimensional Design' by Wucius Wong.
2. "Time Saver Standards for Architectural Design Data" by John Hanock.
3. "Architectural Graphic Standards" by Ramsay and Sleeper.
4. "Space, Time and Architecture" by Gideon.
5. "Elements of Architecture from Form to place" by Von Meiss, Pierre.
6. Architecture: Form, Space and Order by Francis D. K. Ching, John Wiley & Sons, 2007.

ALU 1522				**Building Construction & Materials-II**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Become aware of the primary building materials (timber and wood products) used in construction, their properties, classification & types available.
2. Equip themselves with the knowledge of building materials and their judicial usage.
3. Understand timber joinery for building works / doors / windows / furniture.
4. Analyse modalities and work out / apply appropriate details for building construction.

COURSE CONTENT

Unit-I: Timber and Wooden Products (18 Contact Periods)

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, fibreboard, etc. Bamboo: Basic concepts to use it as a building material. Applicable IS Codes for Timber.

Unit-II: Timber Joinery and Woodwork (18 Contact Periods)

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 and Windows (18 Contact Periods)

DOORS: *Details of doors which will include Basic Doors (Battened /ledged/Braced door), Flush Doors (both solid & hollow core flush doors) & Panelled 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.*

UNIT IV Roof types & construction- (18 Contact Periods)

Terms associated with roofs and its types, *roof construction comprising of King Post/ Queen Post trusses, purlins, and gable end*.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare sheets (on topics made *italics*) with applicable construction details in studio. Market survey of building materials shall be carried out as a group exercise.

SUGGESTED BOOKS

1. Building Construction & Materials, S.C. Rangwala
2. A text book of Building Construction, B.C. Punmia
3. Building Materials & Construction, Shushil Kumar.
4. Building Construction, Mackay WB Vol. 1-4
5. Construction Technology, Chudley Vol. 1-6

ALL 1523				**Building Structures-II**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Know the concept of stresses and strains and apply / analyze through exercises.
2. Understand the concept of shear force and bending moment and analyze for beams.
3. Calculate deflection in beams and trusses.
4. Understand and apply theory of columns for given cases.

COURSE CONTENTS

Unit-I: Principle Stresses, Strains and Torsion (8 Contact Periods)

Principle stresses and strains - Mohr's circle – Introduction to torsion - Torsion of shafts of circular section - torque and twist - shear stress due to torque

Unit-II: Shear Stresses and Bending Stresses (7 Contact Periods)

- Bending stresses and shear stresses in beams. Direct and bending stresses in compression members.

Unit-III: Deflection of Beams (7Contact Periods)

Introduction - Theory of bending - deflection of beams by Integration method.

Unit-IV: Indeterminate Structures (7 Contact Periods)

Concept of statically indeterminate structures, degree of indeterminacy, propped cantilevers for simple loads.

Unit-V: Theory of Columns (7 Contact Periods)

Theory of Columns - long column and short column - Euler's formula - Rankine's formula - Secant formula - beam column.

SUGGESTED BOOKS

1. Engineering Mechanics – Statics and Dynamics by Shames I. H. (2006), 4th Edition, Prentice-Hall of India Private limited, ISBN- 9780133569247.
2. Mechanics of Materials by Punamia B. C. (2010), 15th Edition, Laxmi publiMinorions (P) Ltd, ISBN: 9788131806463.
3. Engineering Mechanics – Statics and Dynamics by Tayal. A. K. (2009), 12th Edition, Umesh PubliMinorions, ISBN: 9788188114016.
4. Strength of Materials by R. K. Bansal, Laxmi PubliMinorions, New Delhi.
5. Mechanics of Materials, 8th Edition by Gere J. M. and Thimoshenko S. P. (2008), CBS Publishers & Distributors, ISBN: 9780534417932.

ALL 1524				**History of Architecture-II**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand architectural elements, forms, development trends, construction techniques, materials and technologies used in built environment during Islamic Period.
2. Understand transformation patterns in architecture during various kingdoms / time periods and analyse the contributing factors for the design development of different styles.
3. Familiarize themselves with the socio–economic, historical and political influences of time period in architectural development.

COURSE CONTENT

Unit-I: Introduction to Islamic Architecture (09 Contact Periods)

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.

Unit-II: The Imperial Style (09 Contact Periods)

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

Unit-III: The Provincial Style (09 Contact Periods)

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

Unit-IV: Mughal Architecture (09 Contact Periods)

Concepts of city planning of various Islamic towns like Shahajahanabad and Fhatehpur Sikri. 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.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare posters/sheets/presentations illustrating various architectural styles as an individual exercise.

SUGGESTED BOOKS

1. "The History of Architecture" by Sir Bannister Fletcher.
2. "Islamic Architecture in India" by Brown, Percy.
3. "History of Architecture in India" by Christopher, Tadgell.
4. "Architecture of Mughal India" by Catherine B Asher.
5. "Islamic Architecture of the Indian Subcontinent" by Bianca Maria Alferia.
6. "Indian architecture: Islamic period (1192-1857)" by Dr. Surinder Sahai.

ALU 1525				Architectural Drawings - II			Pre Requisites	Nil		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	25	25	50		100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Familiarize themselves with the relevant terminology and different types of 3D views.
2. Understand significance and prepare perspective views of building interior and exterior.
3. Identify the importance & need of presentation skills, economy of time, for effective communication in design.
4. Identify a type of line, intensity, thickness, text to draw a shape to implement a scale, dimension for a layout of sheet or drawing.
5. Understand basic principles of sciography and its application to the field of architecture.

COURSE CONTENTS

Unit-I: Metric Drawings (18 Contact Periods)

Types, uses and advantages, Isometric, Axonometric and Oblique views, Metric Drawing and projection and their Dimensioning, Metric of plane figures composed of straight lines, Metric drawing of simple and complex block.

Unit-II: One Point Perspective (18 Contact Periods)

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-III: Two Point Perspective (18 Contact Periods)

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-IV: Sciography (18 Contact Periods)

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.

Teaching Methodology: Faculty shall impart teaching by lecture/demonstrations; students shall undertake drawing exercises and prepare sheets in studio.

SUGGESTED BOOKS

1. Boaz Joseph , Architectural Graphic standards editor
2. Bhatt, N.D., "Engineering Drawing: Plane and Solid Geometry", Charotar Publishing House, 2006
3. Ching, Francis D. K., "Architectural Graphics", Van Nostrand Reinhold, 2003.
4. Leslie, Martin C., "Architectural Graphics", Macmillan Pub Co, 1970.
5. Parkinson, A.C., "A First Year Engg. Drawing", Sir Issac Pitman and Sons.
6. Black, Earl D., "Engineering and Technical Drawing", Van Nostrand Reinhold Co., 1972.

ALU 1526				**Arts & Graphics**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
0	2	0	2	15	15	30		40		100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Develop sensitivity towards freehand drawings and various artistic expressions.
2. Understand architectural elements as determining factor to perceive and articulate space.
3. Stimulate form space relation and to understand the principles of composition in the organization of space, shape, form, colour and texture.
4. Develop eye-mind-hand synchronization and perpetual skills.

COURSE CONTENT

Unit-I: **Freehand Drawings** (12 Contact Periods)

Freehand drawing – Eye-Mind-Hand synchronization and its significance for the architects.
Use of various drawing and sketching tools like pencils, ink pens, charcoal pencils etc. for freehand sketching. Exercises in free hand drawing of domestic furniture, street furniture, human beings, cars, trees, nature and still life etc incorporating various rendering skills and techniques to represent texture, material and finishing.

Unit-II: **Collage, Murals & Sculptures** (12 Contact Periods)

Collage with paper and various waste materials with theme and presentation. Mural with different materials on live scale. Sculpture with different materials like P.O.P, Clay etc.
Study of Solids and voids to evolve sculptural forms and spaces and explore the play of light and shade and application of color.
Analytical appraisal of building form in terms of visual character, play of light and shade, solids and voids etc.

Teaching Methodology: Faculty shall impart teaching by lecture, presentation & demonstrations; students shall undertake exercises in art studio as well as in outdoor.

SUGGESTED BOOKS

1. Foundations in Architecture: An Annotated Anthology of Beginning Design Project, Van Nostrand Reinhold NY, 1993.
2. Basic Visual Concepts and Principles for Artists, Architects and Designers by Charles Wallschlacgerm & Cynthia Busic-Snyder, McGraw Hill, New York 1992.
3. Design fundamentals in Architecture by V. S. Parmar, Somaiya PubliMinorions Pvt. Ltd., New Delhi, 1973.
4. Rendering with Pen + Ink, Thames & Hudson, 2003.
5. Logic and Design in Art, Science and Mathematics by Krome Barratt, Globe Pequot Press, 2005.
6. Architecture: Form, Space and Order by Francis D. K. Ching, John Wiley & Sons, 2007.

ALP 1527				**Surveying & Leveling**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
1	0	2	2	20	20	50	10	100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand the terminology, basics and different techniques of surveying.
2. Learn the field applicability and characteristics of the different survey tools, instruments and methods.
3. Understand types of errors encountered in different types of surveying and preventive measures.
4. Prepare a contour plan and mark geometrical shapes on ground.

COURSE CONTENT

Unit-I: Plane Surveying & Theodolite (15 Contact Periods)

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

Unit-II: Levelling & Contouring (7 Contact Periods)

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

Unit-III: Calculation of Earthwork & GPS (7 Contact Periods)

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

Unit-IV: Curve Surveying (7 Contact Periods)

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 (7 Contact Periods)

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

Teaching Methodology: Faculty shall impart teaching by lecture, presentation & demonstrations; students shall undertake field exercises in surveying and leveling.

SUGGESTED BOOKS

1. Surveying, Volume 1 & 2 by B. C. Punmia, Laxmi Publications.
2. GPS Principles and Applications by Satheesh Gopi, Tata Mc Graw Hill publishing company Ltd.
3. Surveying and Levelling by Subramaniyan R., Oxford University Press.
4. Surveying and Levelling by Kanetkar T.P., Vol I & II, Pune.

ALU 2511				**Architectural Design-III**			Pre Requisites	**ALU 1511**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	6	5			50	50	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Develop the ability to provide architectural solutions for simple problems.
2. Develop sensitivity to be more observant to their surroundings as a basic creative instinct.
3. Understand the architectural design process of multifunctional units while applying the learning of the previous semesters.
4. Understand the use of materials, construction techniques and structural systems used in the elements of built forms.

COURSE CONTENTS

Architectural design and representation of staircase in drawings.
Space standards applicable to cases as per scope of syllabus.
Introduction of exercises interconnecting basic design and architectural design, understanding the arrangement of solids for aesthetic consideration to foster basic architectural qualities in design like composition, vertical circulation and other human considerations like, privacy, convenience, comfort, etc.; understanding the significance of the factors in creating ideal built environment; learning the architectural design process.
Appraisal & architectural design of spaces like Crèche / Play School, Post Office or Primary Health Center. Medium scale project should be on design of Bank Branch, Canteen / Restaurant etc.

Note: The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing. One minor and one major Project shall be carried out during the semester together with two time bound exercises.

SUGGESTED BOOKS

1. "Time Saver Standards for Architectural Design Data" by John Hanock.
2. "Architectural Graphic Standards" by Ramsay and Sleeper.
3. "Space, Time and Architecture" by Gideon.
4. "Elements of Architecture from Form to place" by Von Meiss, Pierre.
5. Time Saver Standard for Site Planning by Chiara, J. D. (1984), McGraw Hill Book Co., NY.
6. Architecture: Form, Space, and Order by Ching, F. D. K. (1996), Van Nostrand Reinhold, New York.
7. Architecture Drafting and Design by Helper, D. and Wallach, P. (1987), Mc-Graw Hill Company, NY.
8. Designing room for children by Juliet, M. (1984), Little Brown and Company, London.
9. Neufert – Architect's Data by Neufert, E. (2000), Crosby Lockwood and Sons, London.

ALU 2512				**Building Construction & Materials-III**			Pre Requisites	**ALU 1512**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand RCC as building material, it's used in building construction, properties & grades.
2. Gather knowledge of manufacturing and judicial usage of building materials in construction of building elements like staircases, arches and lintels.
3. Understand construction techniques / methods as per procedures recommended by IS Codes.
4. Work Out / Apply appropriate details for building construction.

Unit-I: Introduction to RCC and Building Components (24 Contact Periods)

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 (24Contact Periods)

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 (24 Contact Periods)

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.

Unit-IV: Arches & Lintels (24 Contact Periods)

Spanning component; Arches & Lintels, *Type of Arches* in brick and stone, related terminology. Formwork, shuttering for RCC members, centering for arches.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare sheets (on the topics made *italics*) with relevant construction details in studio. Market survey of building materials shall be carried out as a group exercise.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare sheets (on topics made *italics*) with applicable construction details in studio. Market survey of building materials shall be carried out as a group exercise.

SUGGESTED BOOKS

1. Building Construction & Materials, S.C. Rangwala
2. A text book of Building Construction, B.C. Punmia
3. Building Materials & Construction, Shushil Kumar.
4. Building Construction, Mackay WB Vol. 1-4
5. Construction Technology, Chudley Vol. 1-6

ALL 2513				**Building Structures-III**			Pre Requisites	**ALL 1513**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand the methods of analysis & different techniques available for the analysis of structures.
2. Identify the best suitable method of analysis for various cases.
3. Understand the behavior of indeterminate structures and prepare SF / BM diagrams.

COURSE CONTENT

Unit I: Theorem of Three Moments (09 contact periods)

Static indeterminacy - Theorem of three moments - fixed & continuous beam - bending moment and shear force diagram.

Unit II: Moment Ditribution Method (09 contact periods)

Moment Ditribution Method, Bending moment and shear force diagram of continuous beams.

Unit III: Introduction to RCC (09 contact periods)

Working stress method – Moment of resistance of RCC beams. Introduction to singly, doubly and T beams.

Unit IV: Approximate Methods for Analysis of Multi-storeyed Frames (09 contact periods

Substitute frame method - portal method - cantilever method and Kani's method.

SUGGESTED BOOKS

1. Ramamurtham S. and Narayanan R. (2008), Strength of Materials, 3rd Edition, Dhanpat Rai Publications Company, ISBN: 9788187433545.
2. Ashok K. Jain, (2009), Advanced Structural Analysis with Finite Element & Computer Applications, Nem Chand & Brothers, ISBN 978-81-852-4081-7.
3. Hibbeler, R. C. (2005), Structural Analysis (5th Ed.), Pearson Education India, ISBN- 10: 0131470892.
4. S. S. Bhavikatti, (2005), Structural Analysis, 2nd edition, Vikas Publishing House, ISBN: 812-59-171-60.

ALL 2514				**History of Architecture - III**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students will be able to;

1. Understand architectural elements, forms, development trends, construction techniques, materials and technologies used in built environment across civilizations.
2. Understand transformation patterns in architecture during various kingdoms / time periods and analyse the contributing factors for the design development of different styles.
3. Familiarize themselves with the socio–economic, historical and political influences of time period in architectural development.

COURSE CONTENTS

Unit-I: Egyptian Architecture (8 Contact Periods)

Introduction to Egyptian Civilization, City Planning and Architectural characteristics, Tomb Architecture, Mastabas, Pyramids and Art Form in the ancient period – explain with examples of the buildings, construction technology, building materials used, evolution of form and development with significant changes over the time period.

Unit-II: History of Western Architecture (7 Contact Periods)

Mesopotamian Civilization, Babylonian, Assyrian, Architectural characteristics, Art Form – explain with examples of the buildings, construction technology, building materials used, evolution of architectural form and developments with significant changes over the time period.

Unit-III: Greek Architecture (7 Contact Periods)

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-IV: Roman Architecture (7 Contact Periods)

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.

Unit-V: Early Christian Architecture & Byzantine Architecture (7 Contact Periods)

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.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare posters/sheets/presentations illustrating various architectural styles.

SUGGESTED BOOKS

1. "The History of Architecture" by Sir Bannister Fletcher.
2. "A Global History of Architecture" by Fransis D. K. Ching.
3. "World History of Architecture" by Fazio M.
4. "History Encyclopedia' by Adams Simon.

ALP 2515				**Computer Applications in Architecture-I**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand the fundamental concepts of computer systems.
2. Develop understanding of hardware and software, their purpose and use.
3. Develop basic skills in application of Information Technology tools and techniques.
4. Use features of MS Office packages for documents.
5. Prepare Architectural Drawings using CAD software.

COURSE CONTENT

Unit-I: Introduction to Computer (18 contact periods)

Overview of Computer classification and Networks, LAN, MAN, WAN, Internet, Intranet, network topology. Internetworking: Bridges, Repeaters and Routers.

Technology of small computer system, terminology & operation principles of P.C., Introduction to application software and graphic system; and use of printers, scanner, plotter, File Management. Introduction to operating systems, windows and its applications. Basics of Internet & e-mail.

Unit-II: Documentation with Computers (18 contact periods)

Introduction to MS-OFFICE-2003 or higher version, Word document creation, editing, formatting table handling, mail merge. Excel-2003, editing, working, retrieval, important functions, short cut keys used in EXCEL. MS-Power Point; Job Profile, Elements of Power point, Ways of delivering Presentation, Ways of handling presentations e.g. creating, saving slides, show controls, Adding formatting, animation and multimedia effects.

Unit-III: Introduction to CAD (18 contact periods)

Understanding the use of drawing tools, Basics of CAD, Drawing & editing of 2D objects using CAD commands, setting drawing units, limits, size and dimensioning, text & labeling. Setting up of drawings of various simple architectural objects with complete text and dimensioning.

Unit-IV: Architectural Drawing using CAD (18 contact periods)

Architectural representation using hatch, colour and line type, use of multiline, style, block, use of symbol library, basic techniques for preparing architectural drawings. Concept of Model space & Paper space. Plotting & Print settings.

Teaching Methodology: Faculty/Instructor shall impart teaching by lecture/demonstrations; students shall undertake exercises in computer lab.

SUGGESTED BOOKS

1. Office 2000 Made Easy: The Basics & Beyond by Alan Neibauer, Tata McGraw Hill, 2000.
2. 2007 Microsoft Office System Step by Step (English) 2nd Edition by Joyce al. Cox, Publisher Microsoft Press.
3. AutoCAD Architectural User Guide by Autodesk Inc.
4. Understanding AutoCAD by Sham Tikoo.
5. In Simple Steps - AutoCad 2014 (English) 1st Edition (Paperback) by Kognanat Learning Solutions Inc., Publisher – Dreamtech Press (2014).

ALL 2516			**Climatology**				Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand elements and classification of climate, related terminology and relationship of climate with architecture.
2. Understand various concepts of climate analysis and its use in Architecture.
3. Understand parameters of human thermal comfort and formulate strategies for its achievement in built environment building.
4. Understand, apply and analyze parameters of thermal performance of buildings in various climatic zones.

COURSE CONTENT

Unit-I: Elements of Climate (6 Contact Periods)

Introduction – Elements of climate, instruments for their measurement and representations of climatic data. Earth Sun relationship. Classifications of tropical climates, Major climatic zones of India as per NBC. Study of traditional dwelling units in various climatic zones.
Macro, Micro & Site Climate; Effect of landscape elements on site climate.

Unit-II: Thermal Comfort (6 Contact Periods)

Thermal comfort: Effect of climatic elements on thermal comfort. Body's heat exchange with surrounding environment. Thermal comfort indices viz., Effective temperature, Bio-climatic chart.

Unit-III: Thermal Performance of Buildings (6 Contact Periods)

Thermal performance of building elements: effect of thermo-physical properties of building materials and elements on indoor thermal environment. Thermal properties of building materials; Conductivity, Resistivity, Diffusivity, Thermal Capacity, Time Lag and 'U' value. Construction techniques for improving thermal performance of walls and roofs. Recommended U values of building elements as per ECBC.

Unit-IV: Daylight & Ventilation (6 Contact Periods)

Day Lighting: Advantages and Limitations, Day light factor, components of Day light factor, design considerations. Shading Devices – Design of Shading Devices: Solar Azimuth and Altitude, Angle of Incidence, Wall Azimuth, Shadow Angles, Overheated Period, Sun Path Diagrams. Types of shading devices. Procedure of designing shading devices.
Natural ventilation: Functions of natural ventilation, Design considerations, effect of openings and external features on internal air flow.

Teaching Methodology: Faculty shall impart teaching by lecture / presentation & demonstrations; Students shall undertake relevant exercises in labs / studio.

SUGGESTED BOOKS

1. Manual of Tropical Housing and Building by *Koenigsberger, Ingersoll, Mayhew, Szokolay*, Climatic Design, Orient Longman Pvt. Ltd, 1973.
2. *Climate* Responsive Architecture by *Arvind Krishan*, Tata McGraw-Hill Publishing Company Limited New Delhi, 2001.
3. Buildings, Climate and Energy by *Markus & Morris,* Pitman Publishing Ltd. 1980.
4. Tropical Architecture – Maxwell Fry & Jane Drew.
5. Design Primer for Hot Climate – Allan Konya.
6. Climatology Fundamentals and application by John R Mather.
7. Energy Conservation Building Code 2008.

ALL 2517				**Building Services-I**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	2	3	20	20	50	10	100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand water requirements in various types of buildings and integration of water supply services in architectural design.
2. Understand terminology and basic principles of water supply and sanitation.
3. Understand functions of various plumbing fittings and fixtures, applicable IS Codes.
4. Develop design skills for water supply and drainage systems in buildings and prepare architectural drawings / drainage layouts.

COURSE CONTENTS

Unit-I: Water Supply Requirements (12 contact Periods)

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 public reservoirs / OHT to individual buildings**.** Potable Water Standards, Domestic water demand, capacity of overhead tanks and calculation of water consumption.

Unit-II: Water Distribution Systems (12 contact Periods)

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 in conformity with IS Codes.

Unit-III: Drainage Systems (12 contact Periods)

Basic principles of disposal of waste water from buildings. Ssystems 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-IV: Sanitation- Sewerage (12 contact Periods)

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 regulators.

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.

Teaching Methodology: Faculty shall impart teaching by lecture, presentation/demonstrations; Students shall undertake exercises in the form of assignments / charts / report and market survey of related building materials.

SUGGESTED BOOKS

1. National Building Code of India 2016 (Part 9 & 10).
2. Water supply and sanitary engineering by S.C.Rangwala, Charotar publishing house.
3. Water supply and sanitary engineering by Charanjit Shah, Galgotia publishers.
4. Design and practical handbook of plumbing, by Mohan & Anand.
5. Plumbing- Design and practice by Deolalikar
6. *Water Supply and Sanitation* by B. C. Punmia.

ALU 2521				**Architectural Design-IV**			Pre Requisites	**ALU 1521**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	6	5			50	50	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand the meaning of cultural and physical context of built environment and techniques of analyzing such contexts.
2. Understand various factors of the context that influences the design of built environments.
3. Understand parameters of Site Analysis and apply these for the given project site.
4. Work out zoning within the specified site and prepare architectural design of building for specific function.

COURSE CONTENT

Introduction to Site Analysis & Site Planning, Parking Requirements, Types of Parking, various layouts and related standards. Study of social and physical environment and methods of construction emerging out of the traditional way of life of the people in a given place. Design of a simple building for public activity, in a non-urban setting, or a situation without urban regulatory controls. Introduction to other role players in the architectural process viz, the client and the user.

Major studio project shall be introduced to deal with two or more distinctly different contexts with design requirements being identical to carry out Architectural Design as a Response to Climate. Choice of building materials for walls, roof, external colors and textures, layouts and internal finishes should be suitably considered as tool for architectural design solutions in respective climatic conditions. In the minor project, context with a number of constraints should be considered. Studio shall attempt to define the nature of relationship between built and un-built spaces; and the understanding of using uncovered / open spaces for functional needs shall be highlighted in architectural design presentation.

Topics: Motel, Recreation Club, Farm House, Primary School, Midway Shopping Complex etc.

Course Coordinator shall organize educational tour of students to facilitate case studies and general awareness to nearby / local or outstation localities, following University norms & procedures.
Note: The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing.
Students should carry out One Major, One Minor and Two Time Bound Architectural Design exercises. The portfolio covering the above topics shall be presented for evaluation by external examiners.

SUGGESTED BOOKS

1. ‘Principles of three Dimensional Design’ by Wucius Wong.
2. “Time Saver Standards for Architectural Design Data” by John Hanock.
3. “Architectural Graphic Standards” by Ramsay and Sleeper.
4. “Space, Time and Architecture” by Gideon.
5. “Elements of Architecture from Form to place” by Von Meiss, Pierre.
6. Architecture: Form, Space and Order by Francis D. K. Ching, John Wiley & Sons.

ALU 2522				Building Construction & Materials-IV			Pre Requisites		**ALU 1522**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Possess knowledge of Flooring, Roofing and Wall Finishing building materials used in construction, their properties, classification & types available.
2. Equip themselves with the knowledge of building materials and their judicial usage.
3. Understand construction details of various roofing system & trusses.

COURSE CONTENTS

Unit-I: Flooring (18 Contact Periods)

Requirements/Properties of good flooring materials, Types of flooring, methods of laying, Finishing of floors as per functional requirements with different finishes like cement, mosaic, terrazzo, tiles, concrete pavers, wood, epoxy, vinyl, carpets etc., Manufacturing & Properties of various Floor Tiles, *Construction Details of Timber Floor*.

Unit-II: Roofing Systems & Materials (18 Contact Periods)

Types and Forms of Roof; simple flat, jack arch, lean to roof and coupled roofs; Method of construction of *RCC roofs including terracing details*; *Coffered Slab, Flat Slab & Hollow roof construction*; Construction of domes (methodology), vaults and shell roofs. Roofing Materials & Terracing Details.

Unit-III: Trusses (18 Contact Periods)

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.

Unit-IV: Wall Finishing Materials (18 Contact Periods)

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 paneling*.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare sheets (on topics made *italics*) with applicable construction details in studio. Market survey of building materials shall be carried out as a group exercise.

SUGGESTED BOOKS

1. Building Construction & Materials, S.C. Rangwala
2. A text book of Building Construction, B.C. Punmia
3. Building Materials & Construction, Shushil Kumar.
4. Building Construction, Mackay WB Vol. 1-4
5. Construction Technology, Chudley Vol. 1-6

ALL 2523				**Building Structures-IV**			Pre Requisites		**ALU 1523**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Develop skills in structural design of beams, columns, slabs by limit state method.
2. Understand the limit state method of design of beams, columns and slabs.
3. Carry out structural design of building elements for low rise small scale buildings.

COURSE CONTENT

Unit I: Limit State Method – Flexure (9 Contact Periods)

Concept of limit state method - Moment of Resistance of rectangular beam sections and flanged beam sections - Design of rectangular beam sections and flanged beam sections.

Unit II: Design of Slabs and Staircases (Limit State Method) (9 Contact Periods)

Limit state design of one way slab & two way slab - Types of staircases – Design of staircases.

Unit III: Design of Compression Members (Limit State Method) (9 Contact Periods)

Design of axially and eccentrically loaded short & long column.

Unit IV: Design of Footings (Limit State Method) (9 Contact Periods)

Design of footing – strip footing for walls, square and rectangular footing for axially and eccentrically loaded columns - combined footing. Detailing for expansion joints in RCC framed buildings.

SUGGESTED BOOKS

1. Gambhir, M.L., (2011), "Fundamentals of Reinforced Concrete Design", Prentice-Hall of India. ISBN: 9788120330481.
2. S Unnikrishna Pillai & Devdas Menon, (2005), Reinforced Concrete Design, Tata Mcgraw Hill, ISBN: 9780070141100.
3. Varghese (2005), Advanced Reinforced Concrete Design, Prentice-Hall of India.
4. Gurcharan Singh (2005), Design of R.C.C. Structures in S. I. Units, Standard Publishers Distributors.
5. B. C. Punmia (2003), Design of reinforced concrete structures, Lakshmi Publishers. IS:456 (2000) & SP:16

ALL 2524				**History of Architecture-IV**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand architectural elements, forms, development trends, construction techniques, materials and technologies used in built environment during time Period.
2. Understand transformation patterns in architecture during various kingdoms / time periods and analyse the contributing factors for the design development of different styles.
3. Familiarize themselves with the socio–economic, historical and political influences of time period in architectural development.

COURSE CONTENT

Unit-I: Romanesque & Gothic Architecture (9 Contact Periods)

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 – pointed arch architecture, Notre Dame.

Unit-II: Renaissance and Baroque Architecture (9 Contact Periods)

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-III: Modern Movement in Europe (9 Contact Periods)

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-IV: Modern Architecture in America (9 Contact Periods)

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, Guaranty Building, Buffalo, Crystal Palace, London. Bauhaus school at Dessau, Schroder house by Rietveld, Casa Mila, Casa Batlo, Sagrada Familia, Tassel House, Brussels, Paris Metro Station Entrance, Red house, Kent.

SUGGESTED BOOKS

1. "The History of Architecture" by Sir Bannister Fletcher.
2. "Modern Architecture – A Critical History" by Frampton Kenneth.
3. "A Global History of Architecture" by Fransis D. K. Ching.
4. "World History of Architecture" by Fazio M.
5. History of Architecture – J E Swain
6. History of Architecture by Dora Couch
7. The Great Age of World Architecture – by GK Hiraskar

ALP 2525				**Computer Applications in Architecture-II**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. To equip students with skills required in using Computers as a tool for design, 3D modeling and rendering.
2. To familiarize the students with 3D drawing and sketching using appropriate softwares for Building visualization & Design representation.
3. Produce architectural drawings using CAD and illustration software programs with demonstrate an understanding of furniture, people and accessories, 3- dimensional renderings.

COURSE CONTENTS

Unit-I: 3D Modeling (24 Contact Periods)

Introduction to 3D modeling; Basic commands and usage of 3D drawing. Drafting basic geometrical forms and combinations of the same in three dimensions, editing of simple geometrical forms, addition and subtraction of 3D forms, Understanding Coordinate Systems and use of UCS. Introduction of solid modeling. Learning solid modeling commands, editing solid modeling. Working on different planes. 3D surfaces setting up elevation thickness and use of dynamic projections in ACAD. Exercise on wire mesh modeling.

Unit-II: Rendering 3D Models (24 Contact Periods)

Advanced 3D creation and rendering, Material application, Lighting, Camera setting, Background, Scenic development for still 3D images and their final editing in Photoshop or appropriate software.

Unit-III: 3D Modeling with SketchUP (24 Contact Periods)

Basics of Google Sketchup, Drawing & Measurement Tools, creation of geometrical shapes & forms, union and intersection of forms. Application of colour & 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.

Teaching Methodology: Faculty shall impart teaching by lecture/demonstrations; students shall undertake exercises and prepare sheets in studio.

SUGGESTED BOOKS

1. AutoCAD Architectural User Guide by Autodesk Inc.
2. Understanding AutoCAD by Sham Tikoo.
3. In Simple Steps - AutoCad 2014 (English) 1st Edition (Paperback) by Kognanat Learning Solutions Inc., Publisher – Dreamtech Press (2014).
4. Architectural Design with SketchUP by Alexender C. Schreyer.

ALL 2526				**Theory of Design**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Comprehend a theoretical framework in architectural thinking since antiquities thus developing sensitivity to link design and theory.
2. Understand, describe, and develop design as a process of inquiry, thought, and actions.
3. Understand theoretical concepts and contextual variations of thoughts through historical eras.
4. Apply theoretical standpoints in architectural design thinking and process.

COURSE CONTENTS

Unit-I: Design as a Tradition (8 Contact Periods)

Introduction to design, Role of Design in daily life and in society. Impact/function of Design, Indigenous Design Practices, Role of design in the changing social scenario. Role and responsibility of Designers. Aspects of Design.

Unit-II: Design Theory (8 Contact Periods)

Concept of visual language and visual design. Introduction to Gestalt laws, composition, figure and ground relationships, introduction to concept of negative space, use of symmetry, generation of patterns and textures using simple elements, use of grids in graphic composition, controls and display psycho-physiological aspects of design.

Management of Design Process, human factor in managing design / team work.

Unit-III: Form Studies (8 Contact Periods)

Use of combinatory as a method of 3D form generation. Form, material and process relationship. Form exploration in the context of products. Expressions in Form like soft, hard, warm, cold, precise, gross ,delicate , strong, fragile, rugged etc.

Study of product expressions by analyzing in terms of elements like form, proportion, colour, texture etc. Introduction to abstraction in form. Study of 3D abstraction in art and sculpture. Exploration of industrial material and processes as elements of design through 3D abstraction of entities in Nature.

Teaching Methodology: Faculty shall impart teaching by lecture / presentation & demonstrations; Students shall undertake home assignments / seminar presentations.

SUGGESTED BOOKS

1. 'Design Fundamentals (Elements, Attributes and Principles)' by Steven Bradley
2. 'Geometry of Design, Revised and Updated (Design Briefs)' by Kimberley Elam; Princetone Architectural Press.
3. 'Design Basics' 9th Edition by Stephen Pentak & David A. Lauer; Wadsworth Publishing.
4. 'Design as Art' by Bruno Munari; Penguin Modern Classics (UK)
5. ' A Book About Design: Complicated Doesn't Make It Good' by Mark Gonyea (ISBN13: 9780805075755).
6. 'Design Fundamentals' by Robert Gillam Scott; R. E. Krieger Pub. Co (1980).

ALL 2527				**Building Services-II**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	2	3	20	20	50	10	100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand terminology related to electrical & mechanical services as per IS Codes.
2. Develop sensitivity with respect to their integration into Architectural Design.
3. Learn various components of building services and formulate / apply strategies for their integration with architectural design.

COURSE CONTENT

Unit-I: Electrical Services (8 Contact Periods)

Terminology and Conventions as per IS Codes.
Importance of electrical services in buildings, introduction to commonly used terminology.
Supply and distribution of electricity to buildings – substations (including – high tension panels, transformers, low tension panels, generators) and overhead versus underground distribution systems, electrical panel boards (types, sizes, layout standards) etc.,
Internal supply and distribution – brief description of various cabling types, conduit, PVC casing and capping wiring systems; Earthing and brief description of protective devices – fuses, MCB's, ELCB, etc., Electrical load estimation, Introduction to power and lighting circuits. Indian Electricity Rules-Relevant codes of Practice.

Unit-II: HVAC Services (8 Contact Periods)

Terminology and Conventions as per IS Codes.
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 aspects / requirement of various equipment.

Unit-III: Lifts & Escalators (8 Contact Periods)

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.
Applicable IS Codes for Lifts and Escalators.

Teaching Methodology: Faculty shall impart teaching by lecture, presentation & demonstrations; students shall undertake field exercises in surveying and leveling.

SUGGESTED BOOKS

1. National Building Code of India 2005.
2. Building Services Handbook by Hall Fred.

ALU 3511				**Architectural Design-V**			Pre Requisites	**ALU 2511**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	6	5			50	50	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Carry out architectural design of multifunctional community buildings on an intermediate scale with emphasis on building byelaws, impact of culture, traditions and building construction on the built form.
2. Appropriately use building materials in view of their properties, aesthetic value and functional use.
3. Identify and integrate necessary provisions for building services in architectural design.

COURSE CONTENT

Introduction to fire & life safety regulations as per NBC (Part-4), urban development controls, codes and bye-laws. Exercise in articulation and manipulation of programmed needs criticism and evaluation of alternative concepts, decision-making process.
Introduction to designing of multifunctional community building 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.
Design problems based on technical criteria of given programme and site should be introduced.

Design of mid scale low rise buildings like Commercial buildings, Auditorium, Community Center, Public Library, Nursing Home.

Note: The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing. One minor and one major Project shall be carried out during the semester together with two time bound exercises.

SUGGESTED BOOKS

1. “Time Saver Standards for Architectural Design Data” by John Hanock.
2. “Architectural Graphic Standards” by Ramsay and Sleeper.
3. “Space, Time and Architecture” by Gideon.
4. “Elements of Architecture from Form to place” by Von Meiss, Pierre.
5. Time Saver Standard for Site Planning by Chiara, J. D. (1984), McGraw Hill Book Co., NY.
6. Architecture: Form, Space, and Order by Ching, F. D. K. (1996), Van Nostrand Reinhold, New York.
7. Architecture Drafting and Design by Helper, D. and Wallach, P. (1987), Mc-Graw Hill Company, NY.
8. Designing room for children by Juliet, M. (1984), Little Brown and Company, London.
9. Neufert – Architect’s Data by Neufert, E. (2000), Crosby Lockwood and Sons, London.

ALU 3512				Building Construction & Materials-V			Pre Requisites	**ALU 2512**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand Plastic, PVC and Paints as building material, their use in building construction, properties & application method.
2. Gather knowledge of fabrication of doors and windows in buildings and work out their construction details.
3. Understand construction techniques / methods as per procedures recommended by IS Codes.
4. Work Out / Apply appropriate details for building construction considering various materials.

COURSE CONTENTS

Unit-I: Plastic Products for Buildings (18 Contact Periods)

Plastics – types, properties and uses of plastics such as polycarbonates, acrylics, PVC, polymer films, Fiber Reinforced Plastic and UPVC in buildings. Typical construction details for plastic products.

Unit-II: Special Doors & Windows (18 Contact Periods)

Introduction to special doors for garages and workshops, *sliding doors*, *collapsible gate and rolling shutters*, revolving doors. Mechanized and electrically operated doors.
Steel windows: their types, various sections and elements used in construction / fabrication. Relevant IS Codes for steel doors & windows.

Unit-III: Aluminum Doors, Windows & Partitions (18 Contact Periods)

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.

Unit-IV: Paints (18 Contact Periods)

Introduction to finishing materials like paints, varnishes and distempers, emulsions, cement base paints, advanced paints & coatings. Constituents of oil paints, characteristics of good paints, types of paints and process of painting different surfaces like cement plaster, wood, metals etc.
Types of varnish, surface preparation and methods of applying varnish and French polish and melamine finish.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare sheets (on topics made *italics*) with applicable construction details in studio. Market survey of building materials shall be carried out as a group exercise.

SUGGESTED BOOKS

1. Building Construction & Materials, S.C. Rangwala
2. A text book of Building Construction, B.C. Punmia
3. Building Materials & Construction, Shushil Kumar.
4. Building Construction, Mackay WB Vol. 1-4
5. Construction Technology, Chudley Vol. 1-6

ALL 3513			**Building Structures-V**				Pre Requisites		**ALL 2513**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand the concepts of structural design of steel structures and construction details.
2. Analyze and design of plate girder, gantry girder for various applications.
3. Know different types of roofs, calculation of forces and design of roof trusses.
4. Carry out structural design of overhead water tanks.

COURSE CONTENT

Unit I: Simple and Built-up Beams (8 Contact Periods)

Introduction to need and types of connection in building structures - Design of Connections: Riveted, Welded and Bolted.

Unit II: Design of Tension and Compression Member (7 Contact Periods)

Design of tension members (single and built-up), Design of compression members (single and built-up column), Lacing - Battens

Unit III: Design of Beams and Plate Girders (7 Contact Periods)

Design of beams - simple and built-up beams - laterally supported and unsupported beams - concept of shear.

Introduction to Plate Girders and related terminology, curtailment of flange plates, Introduction to design of stiffeners and splices, concept of gantry girder.

Unit IV: Roof Trusses (7 Contact Periods)

Roof Trusses - Calculation of dead load, live load, wind load and earthquake load - Design of joints – supports - members for pitched roof truss and purlins.

Unit V: Water Tanks (7 Contact Periods)

Over-head water tanks – Introduction to design of rectangular water tank, cylindrical water tank and pressed steel tanks. Introduction to design of staging and foundation - Maintenance of Water tanks.

SUGGESTED BOOKS

1. Ramachandra (2004), Design of Steel structures, Vol. I & Vol. II, 4_{th} Edition, Standard Publishers Distributors, ISBN: 9780071544115.
2. Vajirani V. N., Ratwani M. M. and Mehra H. (2012), Design and Analysis of Steel Structures, 18_{th} Edition, Oscar Publications, ISBN: 9788174092953.
3. Syal I. C. (2009), Design of Steel Structures, Standard Publishers Distributors, New Delhi, ISBN: 9788180141270.
4. Ramchandra (2006), Non Linear Analysis of Steel Structures, Standard Publishers Distributors, ISBN: 9788180140785. IS: 800-2007 & Steel Table.
5. Ramamurtham, Design of Steel Structures.

ALL 3514				**Principles of Management**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
3	0	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students will be able to;

1. Understand the basic essence of management and its significance in profession.
2. Know the theories and processes of management and apply in given cases.
3. Understand the attributes of a project, phases in project cycle, stakeholders involved and their management.
4. Familiarize themselves with the setup and functioning of organizations.

COURSE CONTENT

Unit-I: Evolution of Management (8 Contact Periods)

Management concepts, definition, nature, importance; Management as Art, Science and calculations, Profession, Principles and Functions; Evolution of Management thoughts: Classical Theories, Behavioral Theories and Modern Management Theories.

Unit-II: Managerial Roles (7 Contact Periods)

Mintzberg's Managerial Roles; Management Levels and skills; Challenges of management; Era of dynamic engagement; Globalization and management.
Definition, Styles/Types, Process and Nature of Directing, Leadership, Motivation, Communication and Controlling.
Maslow's, Herzberg's and McGregopr's theories.

Unit-III: Management Process and Planning (7 Contact Periods)

Management Process; Planning Concept, Objectives, Types and Steps in Planning; Strategic Planning, Management by Objectives (MBO).
Decision making and steps in decision making, Forecasting meaning.

Unit-IV: Organization & Staffing (7 Contact Periods)

Organizing – definition and characteristics; Principles of organization, organizational structure, Peter Drucker concept, types of organizational structure (formal & informal); Authority, Responsibility and Accountability, span of control. Delegation, Centralization and Decentralization, Departmentalization. Staffing – Function, Meaning, Process and Importance.

Unit-V: Ethics and Corporate Social Responsibility (7 Contact Periods)

CSR – meaning, definition and importance. Areas of CSR.
Ethics – definition, meaning and importance. Basic approaches to ethics, Ethical and Unethical behavior, Code of Ethics, Whistle Blowing; Tools of Ethics: Values, rights, duties & morel rules; Encouraging ethical behavior and creating an ethical workplace; Current corporate social responsibility and ethical issues.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations/demonstrations; students shall prepare reports/charts/case studies as home assignments.

SUGGESTED BOOKS

1. 'Management' 5th edition by Tripathy P. C. and P. N. Reddy; TATA Mc-Graw Hill (2012).
2. 'Principles and Practices of Management' by B. P. Singh and T. N. Chhabra; Dhanpat Rai Publications (2008).
3. 'Management Theory and Practices with Case Studie' by Vandana Jain; International Book House (2012).

ALP 3515				**Computer Applications in Architecture-III**			Pre Requisites	**ALP 2515**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand difference between CAD and BIM.
2. Know and understand the fundamentals of Building Information Modeling (BIM).
3. Learn various workflows and procedures of BIM work-environment.
4. Develop basic skills in application of BIM tools and techniques in architecture and prepare 2D and 3D drawings using BIM software.

COURSE CONTENT

Unit-I: Introduction to BIM (18 contact periods)

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 Modeling (18 contact periods)

Modeling of walls, windows, doors, setting view range, components, columns, roof, ceiling, floors, openings, surfaces, stairs, 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 (18 contact periods)

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 (18 contact periods)

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.

Teaching Methodology: Faculty/Instructor shall impart teaching by lecture/demonstrations; students shall undertake exercises in computer lab and submit home assignments.

SUGGESTED BOOKS

1. Mastering Autodesk REVIT Architecture 2015 by Eddy Krygiel and Jamnes Vandezende (Wiley India Pvt Ltd).
2. Autodesk REVIT Architecture 2015 Essentials by Ryan Duell and Tobias Hathom.

ALL 3516				**Acoustics & Lighting**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand building sciences of lighting & acoustics with related terminology.
2. Understand lighting requirements as per NBC 2016 and work out lighting design for building interiors and exteriors. Develop sensitivity towards colors & lighting in built environment.
3. Understanding acoustics in buildings and its integration with architectural design and explain different phenomenon and principles related to sound propagation and their implications on building design.
4. Summarize common acoustical defects in halls / auditorium and the ways to avoid them.

COURSE CONTENT

Unit-I: Lighting in Built Environment (12 Contact Periods)

Quality and quantity of light; Definitions of related terminology. Requirements of lighting as per NBC 2005 for various tasks. Methods of lighting: ambient, task and accent lighting Systems of luminaries: direct, indirect etc. Various types of electrical lamps – incandescent, fluorescent/CFL, HID's, neon, CFL & LED lamps and their lighting characteristics. Design considerations for different types of occupancies and tasks, Preparation of a lighting and electrical scheme. Lighting Design; Total Lumen Method & Falling Flux Method.

Unit-II: Basics of Acoustics (12 Contact Periods)

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 or latest version.

Unit-III: Acoustical Design (12 Contact Periods)

Acoustical design requirement for halls used for speech, drama and music – general purpose halls used for both speech and music, cinema theatres, open air theatres. Study of auditoria designed and acoustically treated.

Introduction to environmental noise control, noise and its classification, outdoor and indoor noise, airborne noise and structure borne noise, impact noise, community and industrial noise.

Transmission of noise and transmission loss. Maximum acceptable noise levels. Means of noise control and sound insulations.

Teaching Methodology: Faculty shall impart teaching by lecture, presentation & demonstrations.

SUGGESTED BOOKS

1. "Environmental Acoustics" by Leslie L Doelle
2. "Acoustical Designing in Architecture" by Knudson, Vern
3. "Acoustics: Noise and Buildings" by Parich, Peter
4. "Architectural Acoustics" by David Egan
5. National Building Code of India 2005
6. Derek Philips; *Lighting in Architectural Design*.
7. G. K. Lal, *Elements of Lighting, 3-D Publishers*.

ALL 3517				**Sociology and Economics**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
3	0	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand basic concepts of sociology and social behavior of society.
2. To acquaint students to basic concepts of economics.
3. To understand the influence of sociology and economics on architecture and economic considerations in the society.
4. Comprehend the major issues in the development of architectural design in socio- cultural context

COURSE CONTENTS

Unit-I: Sociology (12 contact Periods)

Nature, scope and utility of Sociology, relation between Sociology and society. Human Development Index, Essential elements of society, bio-social and socio-cultural systems. Rural and urban communities and their characteristics. Origin, growth and influence of cities. Definition of urbanization – patterns of life and influence of urbanization on rural life, urbanization process in India.

Migration and its impact on urbanization, social problems of urbanization – problems relating to public health, public transport and public housing, sociological understanding of slums. Social surveys and Social research – principles of social research, scope of research, units of study, choice of research topics, sources of information, literature review – official and unofficial documents, library references, publication etc., Field survey – adoption of suitable techniques in field research viz., Questionnaires, interview, case study etc., analysis and classification of data.

Unit-II: Economics (12 contact Periods)

Definition of Economics, Economic laws, Economic goods, utility, value, price and wealth.

Economic organization of society. Consumption, wants, their characteristics and laws based upon them. Standard of living, market value, opportunity cost, the laws of diminishing, increasing and constant returns. Urban land values, land utilization, factors involved in development of urban land. Cost and Benefit indices, preliminary for building. Concepts of life cycle costing with reference to buildings. Time value of money-present worth and inflation. Sources of finance for buildings.

Teaching Methodology: Faculty shall impart teaching by lecture, presentation/demonstrations; Students shall undertake exercises in the form of assignments / charts / report and survey.

SUGGESTED BOOKS

1. “Sociology” by Neil J Smelsa
2. “Urban Economics” by Warner Z Hirsch.
3. ‘Social Stratification’ by Dipankar Gupta.
4. ‘Social Research Methods’Bryman, Alan.
5. “Urban Sociology” by Jayapalan N.
6. “Urban Sociology” by R. K. Sharma

ALU 3521			**Architectural Design-VI**				Pre Requisites		**ALU 2521**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	6	5			50	50	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand design principles of campus planning and large scale projects.
2. Understand and apply integration aspects of climate, environmental and ecological factors in architectural design.
3. Address site planning, landscape details, circulation and services, structural viability and interiors in architectural design, simultaneously.

COURSE CONTENT

Introduction to aspects related to campus planning (Campus Goals, Approach, Buildings / Structures, Landscape & Green Reserve, Development Density, Circulation of Pedestrian & Vehicular Traffic, Parking, Amenities & Services, Community Interface, Architectural Character, Sustainability etc.).
Institutional projects like facilities of higher learning, vocational training or a small-scale campus may be given. Project brief shall contain clearly articulated goals of the institutions regarding the role of built environment in its functioning.
Case studies of contemporary campus architecture shall be carried out.
Campus planning may be attempted as a two-stage project, with site planning, as one and other stage could be a detailed design of one of the identified buildings. The design has to respond to Climatic, Environmental and Ecological factors.
Topics: Engineering / Medical / Management / Architecture College Campus, Hotel Management / Fashion Design Institute, Housing.

Course Coordinator shall organize educational tour of students to facilitate case studies and general awareness to nearby / local or outstation localities, following University norms & procedures.

Note: The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing. Students should carry out One Major, One Minor and One Time Bound Architectural Design exercises. The portfolio covering the above topics shall be presented for evaluation by external examiners.

SUGGESTED BOOKS

1. National Building Code of India 2016
2. “Time Saver Standards for Architectural Design Data” by John Hanock.
3. “Architectural Graphic Standards” by Ramsay and Sleeper.
4. “Space, Time and Architecture” by Gideon.
5. Manual of Tropical Housing and Building, by Koenigsberger, Orient Longman.
6. Arvind Krishan, Climate Responsive Architecture, Tata McGraw- Hill Publishing Company Limited New Delhi, 2001.
7. Buildings, Climate and Energy by Markus & Morris, Pitman Publishing Ltd. 1980.

ALU 3522				Building Construction & Materials-VI			Pre Requisites	**ALU 2522**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	50	50	200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Possess knowledge of Flooring, Roofing and Wall Finishing building materials used in construction, their properties, classification & types available.
2. Equip themselves with the knowledge of building materials and their judicial usage.
3. Understand construction details of various roofing system & trusses.
4. Work Out / Apply appropriate details for building construction considering various materials.

COURSE CONTENTS

Unit-I: Expansion Joints (18 Contact Periods)

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-II: Glass & Glazing (18 Contact Periods)

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*.

Unit-III: Building Chemicals (18 Contact Periods)

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-IV: Interior Materials & Details (18 Contact Periods)

Types & Details of Internal Partitions (in Gypsum & Plywood/ Boards) & False Ceiling systems.

Study of building interiors features like 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.

Teaching Methodology: Faculty shall impart teaching by lecture/presentations; students shall prepare sheets (on topics made *italics*) with applicable construction details in studio. Market survey of building materials shall be carried out as a group exercise.

SUGGESTED BOOKS

1. Building Construction & Materials, S.C. Rangwala
2. Building Construction, Mackay WB Vol. 1-4
3. Construction Technology, Chudley Vol. 1-6

ALL 3523				**Building Structures-VI**			Pre Requisites	**ALL 2523**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. To understand the concept of bearing capacity of soil.
2. To design RCC cantilever retaining walls and gravity walls.
3. To understand concept of pre-stressed concrete.
4. To understand advanced structural systems such as vierendeel girder, space frame, geodesic dome, etc.

COURSE CONTENT

Unit-I: Soil Mechanics (8Contact Periods)

Introduction to soil mechanics – trial pits – bearing capacities of common soil – foundation problems at site. Active and passive pressures of soil – Rankins theory of earth pressure,

Unit-II: Retaining walls (7 Contact Periods)

Masonry retaining walls, RCC cantilever retaining walls, Counterfort type retaining wall

Unit-III: Special Foundations (7 Contact Periods)

Introduction to: Raft foundation, pile foundation, pile cap.

Unit-IV: Pre-stressed concrete (7 Contact Periods)

Introduction to pre-stressed concrete. Methods of pre-stressing, advantages and disadvantages of pre-stressing including simple problems.

Unit-V: Advanced Structural systems (7 Contact Periods)

Introduction to: Vierendeel girders, Space frames, Geodesic domes, Folded plates and shells, Constructional considerations for earthquake resistant structures, Large span structures like theatres, auditoriums and gymnasiums.

SUGGESTED BOOKS

1. R.S Khurmi SOM
2. K.L Rao, Calculations, design and testing of RCC
3. H.Segmour Harward, N-Structure- an Architect's approach.
4. Reynolds and Kent –Structural Steel work
5. Kane, Shah- Illustrated design of RC buildings.

ALL 3524			**Environmental Studies**				Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
3	0	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. To understand environment, external forces, influences, nature, behavior and the growth, development and maturity of living organisms.
2. To understand environment issues threatening the survival of mankind on earth.
3. To understand importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

COURSE CONTENT

Unit-I: Ecology & Ecosystem (6 Contact Periods)

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 (6 Contact Periods)

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.

Unit-III: Introduction to EIA & EMP (6 Contact Periods)

Role of EIA in the Planning and decision making process, definition and need, evolution and objectives, tasks and scope, methods of EIA; advantages and limitations.
EMP, Best practices in Environmental Protection and Conservation.

Unit-IV: Environmental Laws and Regulations (6 Contact Periods)

Introduction to Environmental Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Factories Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, MoEF Guidelines.

Teaching Methodology: Faculty shall impart teaching by lecture, presentation & demonstrations; students shall undertake exercises in art studio as well as in outdoor. Study of an environmental restoration site is suggested.

SUGGESTED BOOKS

1. "Environmental Studies' by Anubha Kaushik, C. P. Kaushik, New Age International Publishers.
2. "Environmental Studies" (from Crisis to Cure) by R. Rajagopalan, Oxford University Press.
3. "Environmental Studies" by Benny Joseph, Tata McGraw Hill Education Pvt Ltd.
4. "Principles of Environmental Science" by Cinningham, Tata McGraw Hill Education P. Ltd.
5. "Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards" Vol I & II by R. K. Tivedi, Enviro Media.
6. "Environmental Acoustics" by Leslie L Doelle

ALP 3525				**Working Drawings**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	0	4	4	20	20	50	10	100		200

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand type of drawings and documents required for construction purpose.
2. Learn and demonstrate the techniques of preparing working drawings following established practices and conventions.
3. Develop skills required in using Computers as a tool for producing working drawings.
4. Prepare the centerline drawings, service drawings, interior detailed drawings, schedule of openings that would be required for construction purpose.

COURSE CONTENT

Unit-I: Introduction to Working Drawings (24 Contact Periods)

Introduction to Type of Drawings and Schedules to be prepared for building construction purposes. Introduction to various components, list of drawings, details and their purpose/function in a set of working drawings of a medium and large project. Established practices of providing Allied information / Notes to be provided on various types of drawings. Check list as guide for preparation and checking of working drawing and details.

Unit-II: Drafting Conventions (24 Contact Periods)

Aspects of Architectural Drafting for GFC including Line work, Grids, Lettering, Dimensioning, Annotation, Title block(s), Office standards, Representation of different materials, Schedules / Tables and Notes on GFC Drawings. Drafting Conventions and Symbols, type of tags and graphic symbols used in GFC drawings. Method of representing various contents and specific information in working drawing / details.

Unit-III: GFC Drawings (24 Contact Periods)

Preparation of architectural GFC drawings and details of a medium / large project. Preparation of electrical drawings, water supply and sanitary drawings, structural drawings of a small project. Specifications of building materials and simple construction as separate document or annotated on the working drawings.

Teaching Methodology: Faculty shall impart teaching by lecture/demonstrations; students shall undertake exercises and prepare drawings in studio/computer lab.

The above drawings need to be prepared for one design project like Residence, Apartments, Factory buildings, Swimming pool etc., handled in an earlier architectural design studio.

SUGGESTED BOOKS

1. AutoCAD Architectural User Guide by Autodesk Inc.
2. The Professional Practice of Architectural Working Drawings by Wakita, Linde and Bakhoum (ISBN-13: 978-0470618158)
3. Working Drawings Handbook by Styles and Bichard, Elsevier / Architectural Press.
4. The Working Drawing The Architect's Tool by Park Books (ISBN 978-3-906027-31-9)

PCL1067				**Discourse on Human Virtues**			Pre Requisites		**Nil**	
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
3	0	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Distinguish between values and skills, and understand the need, basic guidelines, content and process of value education.
2. Understand the meaning of happiness and prosperity for a human being.
3. Understand harmony at all the levels of human living, and live accordingly.

COURSE CONTENT

Unit-I: Human Values (9 Contact Periods)

Understanding the need, content and process for Value Education. Self Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration. Continuous Happiness and Prosperity- A look at basic Human Aspirations. Basic requirements for fulfillment of aspirations of every human being with their correct priority Understanding Happiness and Prosperity correctly Method to fulfill the above human aspirations.

Unit-II: Harmony in the Human Being (9 Contact Periods)

Understanding the harmony in the Nature, Understanding Existence as Co-existence of mutually interacting units in all-pervasive space. Holistic perception of harmony at all levels of existence. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'. Appraisal of physical needs, meaning of prosperity in detail. Understanding and living in harmony at various levels.

Unit-III: Human Relationship (9 Contact Periods)

Understanding harmony in the Family- the basic unit of human interaction. Understanding values in human-human relationship; meaning of Justice and program for its fulfillment. Trust and Respect as the foundational values of relationship; Difference between intention and competence. Understanding the harmony in the society (society being an extension of family), Comprehensive Human Goals.

Unit-IV: Professional Ethics (9 Contact Periods)

Natural acceptance of human values, Definitiveness of Ethical Human Conduct.
Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order Competence in Professional Ethics.

SUGGESTED BOOKS

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
2. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and Harper Collins, USA
3. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
5. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.
6. A Nagraj, 1998, Jeevan Vidya Ek Parichay, Divya Path Sansthan, Amarkantak.
7. http://nptel.ac.in/courses/109104032/

ALL 3527				**Specification & Estimation**			Pre Requisites	**Nil**		
				Theory				Studio / Practical		
L	T	P/S	C	MI-01	MI-02	MA	ASGN	INT	EXT	TOTAL
2	1	0	3	20	20	50	10			100

COURSE OUTCOMES

After successful completion of this course, students shall be able to;

1. Understand Brief & Technical Specifications of building materials & works.
2. Develop skills in writing specifications for various building materials and items.
3. Understand need and procedure of preparing building estimates and tender documents.
4. Learn and apply good practices in writing specifications, preparing building estimates and tender documents for building works.

COURSE CONTENT

Unit-I: Specifications (12 Contact Periods)

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-II: Procedure of Estimation (12 Contact Periods)

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-III: Analysis of Rates (12 Contact Periods)

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.

Teaching Methodology: Faculty shall impart teaching by lecture, presentation & demonstrations; students shall undertake exercises (home assignments) in estimation and costing.

SUGGESTED BOOKS

1. National Building Code of India 2016.
2. 'Estimation and Costing' by S. K. Dutta.
3. 'CPWD Specification' of Govt of India.
4. 'Estimation and Costing in Civil Engineering' by B. N. Dutta.