



HINDUSTAN
INSTITUTE OF TECHNOLOGY & SCIENCE
(DEEMED TO BE UNIVERSITY)

SCHOOL OF PLANNING, ARCHITECTURE AND DESIGN EXCELLENCE

CURRICULUM AND SYLLABUS

Under CBCS

(Applicable for Students admitted from Academic Year 2018-19)

B. Arch. (Bachelor of Architecture)

SCHOOL OF PLANNING, ARCHITECTURE & DESIGN EXCELLENCE

Vision & Mission of the University

Motto:

To make every man a Success and no man a Failure.

Vision:

To be an International Institute of Excellence, providing a conducive environment for education with a strong emphasis on innovation, quality, research and strategic partnership blended with values and commitment to society.

Mission:

The Mission of the Institute is

- To create an ecosystem that promotes learning and world class research, to nurture creativity and innovation.
- To instill highest ethical standards and values.
- To pursue activities for the development of Society.
- To develop national and International collaborations with institutes and industries of eminence.
- To enable graduates to become future leaders and innovators.

Vision and Mission of the School of Architecture

Vision:

To facilitate the creation of built environment by adopting holistic approaches to promote sustainable development in Architecture & Planning.

Mission:

- To qualify students to address concerns of the 21st century and making them globally competent.
- To empower students by imparting Architecture and Planning knowledge in diverse areas with social commitment.
- To enable them to handle the complexities of modern requirements and encouraging exploration, innovation and creative experimentation in shaping the living environment.

B.Arch (Bachelor of Architecture)
PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The program is expected to enable the students to

- PEO I** Provide a broad and inspiring architectural education by developing skills and knowledge of architectural design, practice and technology; while stimulating critical analysis and speculative exploration of a range of methodologies and critical positions, through the atelier system
- PEO II** To train and make future architects competent to face challenges posed by modern world due to all round development in technology and materials
- PEO III** Apply academic knowledge toward solving architectural problems and presenting ideas in a broad range of architectural and construction related settings
- PEO IV** Communicate and demonstrate design creativity, graphic skills, verbal presentation and organizational skills
- PEO V** Perform all professional responsibilities independently, as a team member, or part of a multi-disciplinary team
- PEO VI** Demonstrate a knowledge of architectural history, theory, and practice in the solution of architectural design problems in a global society
- PEO VII** Retain and preserve rich vernacular architectural values by encouraging use of locally available material technology

PROGRAM OUTCOMES (ALIGNED WITH GRADUATE ATTRIBUTES) (PO)

At the end of this program, graduates will be able to

- PO1** To develop and implement academic measures to adopt modern techniques at the same time keeping balance with time tested traditional values.
- PO2** An ability to conceptualize and coordinate designs, addressing social, cultural, environmental and technological aspects of architecture
- PO3** An ability to work collaboratively with teams of architects and various interdisciplinary design teams involved in the building industry
- PO4** Awareness of the global influences of architecture and an understanding of how design influences the complex modern world system
- PO5** Be able to utilize freehand drawing, architectural graphics, and model building skills in the solution of design problems

- PO6** Develop communication skills through drawn, visual, verbal and written representations of architectural propositions and their cultural, professional, and technical implications.
- PO7** To involve them in group activities so that the team building becomes the nature of their work for the comfortable outcomes in the specializations they might choose
- PO8** To make them understand the current social and economic networks for the feasible outcomes
- PO9** To make them aware of traditional values and historic significances to develop the understanding of the past and respect them
- PO10** Engage the process of design and building in the discourse of social, ethical and professional responsibility.
- PO11** An ability to apply and integrate computer technology in design processes and products
- PO12** To establish and nurture linkages with frontline national/international educational/research institutions for continuously evolving global perspective.

B.ARCH (BACHELOR OF ARCHITECTURE)									
(260 CREDIT STRUCTURE)									
SEMESTER - I									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
THEORY									
1	PC	ARB4101	History of Architecture - I	3	0	0	3		3
2	PC	ARB4102	Theory of Architecture -I	3	0	0	3		3
3	BS	ARA4103	Applied Mechanics	2	2	0	3		4
THEORY CUM STUDIO									
4	PC	ARB4111	Visual Arts and Appreciation	1	0	2	2		3
5	PC	ARB4112	Architectural Graphics-I	1	0	4	3		5
STUDIO									
6	PC	ARB4131	Basic Design	0	0	12	8		12
PERSONALITY DEVELOPMENT									
7	H	ELA4102	Communication Skills	2	0	0	2		2
TOTAL							24		32
SEMESTER - II									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
THEORY									
1	PC	ARB4116	History of Architecture – II	3	0	0	3		3
2	PC	ARB4117	Theory of Architecture –II	3	0	0	3		3
3	BS	ARA4118	Mechanics of Structures	2	2	0	3		4
THEORY CUM STUDIO									
4	BS	ARA4126	Materials and Construction-I	1	0	4	3		5
5	PC	ARB4127	Architectural Graphics - II	1	0	4	3		5
STUDIO									
6	PC	ARA4141	Architectural Design-I	0	0	9	6		9
7	PC	ARB4142	Workshop (Model Making)	0	0	4	2		4
VALUE ADDED PROGRAMME									
8	PAECC		Study Tour (Regional)	Minimum of 5 Days					
9	PAECC		Summer Internship	Minimum of 2 weeks					
TOTAL							23		33

CURRICULUM AND SYLLABUS B.Arch – ARCHITECTURE

B.ARCH (BACHELOR OF ARCHITECTURE)									
(260 CREDIT STRUCTURE)									
SEMESTER - III									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
THEORY									
1	PC	ARB4201	History of Architecture - III	3	0	0	3		3
2	BS	ARA4202	Design of R.C.C. Structures	2	2	0	3		4
3	BS	ARA4203	Building Services –I (Water Supply and Sanitation)	3	0	0	3		3
4	BS	ARA4204	Environmental Science for Architecture	3	0	0	3		3
5	SEC	ARB4205	Design Communication	3	0	0	3		3
THEORY CUM STUDIO									
6	BS	ARA4211	Materials and Construction -II	1	0	4	3		5
STUDIO									
7	PC	ARB4231	Architectural Design- II	0	0	12	8		12
VALUE ADDED PROGRAMME									
8	PAECC	ARB4235	Evaluation of Study Tour (Regional)				1		
9	PAECC	ARB4236	Evaluation of Summer Internship				1		
TOTAL							28		33
SEMESTER - IV									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
THEORY									
1	PC	ARB4216	History of Architecture -IV	3	0	0	3		3
2	BS	ARA4217	Building Services –II (Lighting and Illumination)	3	0	0	3		3
3	BS	ARA4218	Surveying , Levelling and Site Planning	3	0	0	3		3
4	BS	ARA4219	Climate and Built Environment	3	0	0	3		3
5	BS	ARA4220	Design of Steel and Composite Structures	3	0	0	3		3
THEORY CUM STUDIO									
6	BS	ARA4226	Materials and Construction - III	1	0	4	3		5
STUDIO									
8	PC	ARB4241	Architectural Design- III	0	0	15	10		15
VALUE ADDED PROGRAMME									
	PAECC		Study Tour (South India)						Minimum of 10 Days
	PAECC		Summer Internship						Minimum of 2 weeks
TOTAL							28		35

CURRICULUM AND SYLLABUS B.Arch – ARCHITECTURE

B.ARCH (BACHELOR OF ARCHITECTURE)											
(260 CREDIT STRUCTURE)											
SEMESTER - V											
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH		
THEORY											
1	PC	ARB4301	Contemporary Architecture	3	0	0	3		3		
2	BS	ARA4302	Building Services –III (HVAC)	3	0	0	3		3		
3	PE	E1	Elective I	3	0	0	3		3		
4	PE	E2	Elective II	3	0	0	3		3		
5	NE	OE1	Open Elective I	2	0	0	2		2		
THEORY CUM STUDIO											
6	BS	ARB4304	Materials and Construction -IV	1	0	4	3		5		
STUDIO											
7	PC	ARB4331	Architectural Design- IV	0	0	12	10		12		
VALUE ADDED PROGRAMME											
8	PAECC	ARB4335	Evaluation of Study Tour (South India)				1				
9	PAECC	ARB4336	Evaluation of Summer Internship				1				
TOTAL							29		34		
SEMESTER - VI											
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH		
THEORY											
1	BS	ARA4316	Architectural Acoustics	3	0	0	3		3		
2	PE	E3	Elective III / Online Course / Self Study	3	0	0	3		3		
3	PE	E4	Elective IV / Online Course / Self Study	3	0	0	3		3		
THEORY CUM STUDIO											
4	SEC	ARA4303	Computer Simulation and Modelling	1	0	4	3		5		
5	BS	ARA4326	Materials and Construction -V	1	0	4	3		5		
LAB											
6	BS	ARA4327	Building Information Modelling	1	0	4	3		5		
STUDIO											
7	PC	ARB4341	Working Drawing	0	0	12	8		12		
8	PAECC	ARB4342	Guided Study				2	2			
VALUE ADDED PROGRAMME											
9	PAECC		Study Tour (North India)	Minimum of 15 days							
10	PAECC		Summer Internship	Minimum of 2 weeks							
TOTAL							28		33		

B.ARCH (BACHELOR OF ARCHITECTURE)									
(260 CREDIT STRUCTURE)									
SEMESTER - VII									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
THEORY									
1	PC	ARB4401	Landscape and Ecology	3	0	0	3		3
2	PC	ARB4402	Human Settlement and Planning	3	0	0	3		3
3	BS	ARA4403	Estimation and Specification	3	0	0	3		3
4	PAECC	ARB4404	Professional Practice	3	0	0	3		3
5	PE	E5	Elective V / Online Course / Self Study	3	0	0	3		3
6	PE	E6	Elective VI / Online Course / Self Study	3	0	0	3		3
7	NE	OE2	Open Elective II	2	0	0	2		2
STUDIO									
8	PC	ARB4431	Architectural Design V	0	0	15	10		15
VALUE ADDED PROGRAMME									
9	PAECC	ARB4435	Evaluation of Study Tour (North India)				1		
10	PAECC	ARB4436	Evaluation of Summer Internship				1		
TOTAL							32		35
SEMESTER - VIII									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
THEORY									
1	PAECC	ARB4441	Practical Training	0	0	32	21		32
TOTAL							21		32
SEMESTER - IX									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
THEORY									
1	PC	ARB4501	Urban Design and Renewal	3	0	0	3		3
2	PC	ARB4502	Urban and Rural Housing	3	0	0	3		3
3	PAECC	ARB4503	Project Management	3	0	0	3		3
4	PE	E7	Elective VII / Online Course / Self Study	3	0	0	3		3
5	PE	E8	Elective VIII / Online Course / Self Study	3	0	0	3		3
STUDIO									
6	PC	ARB4531	Architectural Design - VI	0	0	12	8		12
7	PAECC	ARB4532	Dissertation / Guided Study/ Documentation	0	0	4	2		4
TOTAL							25		31

B.ARCH (BACHELOR OF ARCHITECTURE)									
(260 CREDIT STRUCTURE)									
SEMESTER - X									
SL. NO	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
THEORY									
1	PE		Elective IX	3	0	0	3		3
2	PE		Elective X	3	0	0	3		3
STUDIO									
3	PC	ARB4541	Thesis	0	0	24	16		24
THEORY									
TOTAL							22		30

CURRICULUM AND SYLLABUS B.Arch – ARCHITECTURE

LIST OF PROFESSIONAL ELECTIVES WITH GROUPING - SEMESTER WISE									
SEM (Elec tive No.)	COURSE CATEGORY	COURSE CODE	NAME OF THE COURSE	L	T	P	C	S	TCH
V (E1)	PE	ARC4351	Theory of Design	3	0	0	3		3
	PE	ARC4352	Vernacular Architecture	3	0	0	3		3
	PE	ARC4353	Visual Communication and Architecture	3	0	0	3		3
V (E2)	PE	ARC4354	Site Planning and Landscape	3	0	0	3		3
	PE	ARC4355	Furniture Design	3	0	0	3		3
	PE	ARC4356	Building Performance and Rating System	3	0	0	3		3
VI (E3)	PE	ARC4366	Behavioural Architecture	3	0	0	3		3
	PE	ARC4367	Architectural Journalism and Photography	3	0	0	3		3
	PE	ARC4368	Architectural Design with Glass (Special Elective)	3	0	0	3		3
VI (E4)	PE	ARC4369	Landscape Construction	3	0	0	3		3
	PE	ARC4370	Industrial Architecture	3	0	0	3		3
	PE	ARC4371	Appropriate Building Technology	3	0	0	3		3
VII (E5)	PE	ARC4451	Architectural Design with Steel (Special Elective)	3	0	0	3		3
	PE	ARC4452	Architecture of the Future	3	0	0	3		3
	PE	ARC4453	Kinetic Architecture	3	0	0	3		3
VII (E6)	PE	ARC4454	Interior Lighting and Landscape	3	0	0	3		3
	PE	ARC4455	Set Design	3	0	0	3		3
	PE	ARC4456	Earthquake Resistant Structures	3	0	0	3		3
IX (E7)	PE	ARC4551	Urban Economics and Sociology	3	0	0	3		3
	PE	ARC4552	Real Estate Development	3	0	0	3		3
	PE	ARC4553	Conservation and Preservation	3	0	0	3		3
IX (E8)	PE	ARC4554	Environmental Impact Assessment	3	0	0	3		3
	PE	ARC4555	Graphics and Product Design	3	0	0	3		3
	PE	ARC4556	High-rise Buildings	3	0	0	3		3
X (E9)	PE	ARC4566	Smart and Sustainable Cities	3	0	0	3		3
	PE	ARC4567	Architectural Criticism	3	0	0	3		3
	PE	ARC4568	Interior Accessories and Furniture Design	3	0	0	3		3
X (E10)	PE	ARC4569	Entrepreneurship Skills for Architects	3	0	0	3		3
	PE	ARC4570	Infrastructure Planning and Management	3	0	0	3		3
	PE	ARC4571	Advanced Construction Techniques	3	0	0	3		3

SEMESTER – I

COURSE TITLE		HISTORY OF ARCHITECTURE – I			CREDITS	3
COURSE CODE		ARB4101	COURSE CATEGORY	PC	L-T-P-S	3- 0- 0- 0
CIA		50%			ESE	50%
LEARNING LEVEL		BTL-3				
CO	COURSE OUTCOMES					PO
1	Attain comprehensive knowledge about the development of Aryan and Mauryan civilization and identify different building materials & techniques used by them					2,4,9
2	Attain a comprehensive knowledge about the development of Buddhist architecture.					2,4,9
3	Gain knowledge on the evolution of Hindu temple during the Gupta and Chalukyan period					2,4,9
4	Attain a comprehensive knowledge about the rock cut and stone architecture of Dravidian period and trace later developments in South India.					2,4,9
5	Appreciate different plan forms of the Indo Aryan temple with the aid of sketches.					2,4,9
Prerequisites : Nil						
MODULE 1 - ANCIENT INDIA						
Indus Valley Civilization - Culture and pattern of settlement. Impact of Aryan culture - Vedic village and the rudimentary forms of bamboo and wood, wooden construction under the Mauryan rule. Suggested Reading: <i>Early Indian Architecture: Cities and City-Gates by Ananda K. Coomaraswamy</i>						
MODULE 2 - BUDDHIST ARCHITECTURE						
Hinayana and Mahayana Buddhism - Interaction of Hellenic & Indian ideas in Northern India - Architectural production during King Ashoka's rule - Ashokan Pillar, Sarnath, Rock cut caves at Barabar, Sanchi Stupa. Salient features of a Chaitya hall and Vihara, Rock cut architecture in the Western and Eastern ghats - Karli, Viharas at Nasik, Rani gumphas, Udaigiri -TaktiBahai, Gandhara Suggested Reading: <i>Studies in Early Buddhist Architecture of India by H Sarkar</i>						
MODULE 3 – HINDU ARCHITECTURE						
Evolution of Hindu temple - Early shrines of the Gupta and Chalukyan periods – Tigawa temple, Ladh Khan and Durga temple, Aihole, Papanatha and Virupaksha temples, Pattadakal. Suggested Reading: <i>The Hindu temple: an introduction to its meaning and forms by G Michell</i>						
MODULE 4 – DRAVIDIAN ARCHITECTURE						
Dravidian culture - Rock cut productions under Pallavas –Shore temple, Mahabalipuram -Dravidian Order – Brihadeeswara Temple, Thanjavur - Evolution and form of Gopuram - Complexity in temple plan due to complexity in Ritual - Meenakshi temple, Madurai. Suggested Reading: <i>Introduction to Indian Architecture By BindiaThapar</i>						
MODULE 5 – INDO ARYAN STYLE						
Salient features of an Indo Aryan temple - Lingaraja Temple, Bhuvaneshwar - Sun temple, Konarak. - Kunds and Vavs – Sabalikuldvav - Adalaj - Surya kund, Modhera. Note: Practical observation in the form of study visit to a chosen place of interest is preferable to						

understand the scale and proportion of built up structures.	
Suggested Reading: https://www.scribd.com/presentation/358970878/4-2-indo-aryan	
TEXT BOOKS	
1	Satish Grover, “Buddhist and Hindu architecture in India”, CBS, New Delhi, 2008
2	The History of Architecture in India from the Dawn of civilization to the End of the Raj, Phaidon, London, 2002
3	Percy Brown, “Indian Architecture (Buddhist and Hindu Period)”- TaraporeVala and Sons Bombay, 2014.
REFERENCE BOOKS	
1	Yatin Pandya, “Concepts of Space in Traditional Indian Arch”, Mapin, 2005.
2	Mitchell, George “The Hindu Temple, University of Chicago Press, 1996
3	Spiro Kostof, “A History of Architecture: Setting and Rituals”, Oxford University Press, London, 2005 (digitized – 2007).
4	Christopher Tadgell, The History of Architecture in India, Penguin Books (India) Ltd, New Delhi, 1990
E BOOKS	
1	http://library.advanced.org/10098
2	http://www.encyclopedia.com/articles/05371.html
MOOC	
1	http://www.cup.org/Titles/09/0521094526.html

COURSE TITLE	THEORY OF ARCHITECTURE - I			CREDITS	3
COURSE CODE	ARB4102	COURSE CATEGORY	PC	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-4				
CO	COURSE OUTCOMES				PO
1	The students shall relate and apply the elements of architecture drawing inspiration from nature.				1,4,6
2	The student shall generate form analogy by applying the various principles of architecture				1,4,6
3	Draw and perceive scaled drawings and proportioning system				1,4,6
4	Perceive and apply qualities of space through conceptual massing models				1,4,6
5	Perceive spatial organisations through building examples				1,4,6
Prerequisites : Nil					
MODULE 1 - INTRODUCTION TO ARCHITECTURE					
Definition of Architecture - Elements of Architecture backed by need and followed by fulfilment of need. Presence of the elements in nature – architectural building examples inspired by nature.					
MODULE 2 - AESTHETIC COMPONENTS OF DESIGN					

Principles of Architecture - Balance, Rhythm, Symmetry, Hierarchy, Pattern, Chaos, Order and Axis with building examples, including historic. Analysis and form generating exercises – Colour Theory – Texture - Importance of graphics in architecture	
MODULE 3 – INTRODUCTION TO PROPORTIONING SYSTEM	
Various proportioning systems and the order it creates in design - Golden ratio Proportions, Classical proportions, Vitruvian Theory, Ken and Modular proportions, with building examples of Inigo Jones, Le Corbusier- Scale in architecture -Study of plans at various scales.	
MODULE 4 – COMPOSITION OF MASS/FORM/SHAPES	
Unity, harmony, dominance, punctuating effect, dramatic effect, fluidity, climax, accentuation and contrast with building examples. -Mass and space, visual and emotional effects of geometric forms and their derivatives -The sphere, the cube, the pyramid, the cylinder and cone. Model making exercise on massing.	
MODULE 5 – SPATIAL ORGANISATION	
Spatial Relationships: i) Space within space, ii) Interlocking spaces, iii) Adjacent spaces, iv) Space linked by a common space b) Spatial Organization: influencing factors and their types i) Centralized, ii) Linear, iii) Radial, iv) Clustered, v) Grid c) Articulation of forms and spaces types: i) Edges and corners, ii) Surface. A Project on Creation of forms & spaces using the principles learnt. Building examples exhibiting distinct spatial relationships. Study of 2D to 3D transformation and vice versa – Organization of spaces - Form generating exercises	
TEXT BOOKS	
1	Francis D.K.Ching, “Architecture-Form, Space and Order”, 3rd ed. John Wiley, 2007
REFERENCE BOOKS	
1	V.S.Pramar, “Design Fundamentals in Architecture”, Samaiya Publications Private Ltd., New Delhi.
2	Paul Alan Johnson – “The Theory of Architecture - Concepts and themes, Van Nostrand Reinhold Co., New York, 1994
3	Forms and functions of 20th century Architecture - Talbot. Hamlin.
4	The four elements of Architecture - SennerGoltfried - Cambridge University press London. U.K.
E BOOKS	
1	https://www.elsevier.com/books/architecturaltheory/ching/9780851390666
2	https://www.dtcc.edu/document.info-theoryarch
3	www.cs.brown.theory.edu
MOOC	
1	https://online-learning.harvard.edu/course/architectural-imagination

COURSE TITLE		APPLIED MECHANICS		CREDITS	3
COURSE CODE	ARA4103	COURSE CATEGORY	BS	L-T-P-S	2- 2- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-3				
CO	COURSE OUTCOMES				PO
1	Understand action of forces on a body				4, 10
2	Analyze different types of trusses				4, 9, 11
3	Calculate centroid, moment of inertia, section modulus and radius of gyration for a given section				4, 5
4	Solve problems on stress – strain behaviours of steel and concrete due to axial loads and to determine the stresses and strains developed in solids due to external action				4, 10
5	Understand the relationship between elastic constants				4, 9
Prerequisites : Nil					
MODULE 1 - FORCES AND STRUCTURAL SYSTEMS					
Types of force systems - Resultant of parallel forces - principle of moments - principle of equilibrium - simple problems.					
MODULE 2 - ANALYSIS OF PLANE TRUSSES					
Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilever trusses by Method of joints and Method of sections.					
MODULE 3 – PROPERTIES OF SECTION					
Centroid- Moment of Inertia - Section modulus – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis					
MODULE 4 – ELASTIC PROPERTIES OF SOLIDS					
Stress strain diagram for mild steel, High tensile steel and concrete - Concept of axial and volumetric stresses and strains.					
MODULE 5 – ELASTIC CONSTANTS					
Elastic constants - Relation between elastic constants - Application to problems.					
TEXT BOOKS					
1	R.K.Bansal, “A textbook on Engineering Mechanics”. Lakshmi Publications, Delhi 2013.				
2	R.K.Bansal, “A textbook on Strength of Materials” Lakshmi Publications, Delhi 2012				
REFERENCE BOOKS					

1	P.C.Punmia, “Strength of Materials” and “Theory of Structures” Vol. I, Laxmi publications, Delhi, 2005.
2	S.Ramamrutham, “Strength of materials”, Dhanpatrai& Sons, Delhi, 2011.
3	W.A.Nash, “Strength of Materials” Schaums Series – McGraw-Hill Book Company, 2010.
4	R.K. Rajput “Strength of Materials”, S. Chand & Company Ltd., New Delhi 2012
MOOC	
1	http://nptel.ac.in/courses/122102004
2	https://nptel.ac.in/noc/courses/noc19/SEM2/noc19-ce18/

COURSE TITLE		VISUAL ARTS AND APPRECIATION		CREDITS	2	
COURSE CODE		ARB4111	COURSE CATEGORY	PC	L-T-P-S	1- 0- 2- 0
CIA		50%		ESE	50%	
LEARNING LEVEL		BTL-3				
CO	COURSE OUTCOMES				PO	
1	To identify, understand and appreciate –Art in Architecture.				2,4,6,9	
2	To create built forms incorporating them judiciously.				2,4,6	
3	To understand appropriate indigenous art elements.				2,4,6	
4	Appreciate the social and cultural identity achieved through art forms				2,4,6,9	
5	Understand the periodical transformations in art forms				2,4,6,9	
Prerequisites : Nil						
MODULE 1 - UNDERSTANDING ARTS						
The definition of art – the need and meaning of works of art – Concept of beauty and aesthetics - Appreciation of art forms – Importance of visual perception – Design elements in Nature						
MODULE 2 - ART AND DESIGN – A HISTORIC PERSPECTIVE						
Drawing – architecture – sculpture – painting - printing minor arts (glass wave stain glass, lithographic prints, etc.) – Industrial art (Art Nouveau, Bauhaus) – Art through ages – Egyptian, Greek, Roman, Modern arts, Cubism, Constructivism, Modernism, Post modernism - Evolution of Art and Design. Works of Raja Ravi Varma, SatishGujral, Nek Chand -Tanjore paintings , Madhubani paintings of Bihar, Kalamkari of Andhrapradesh						
MODULE 3 – UNDERSTANDING ART AND ITS EXPRESSION						
Relationship between Art and Design with man – Space and environment – Concept of Space – Articulation of Form – Sense of enclosure – Organization of Forms and Spaces –Abstract art – Expressionism – Surrealism – Recent Developments in Indian Arts and Architecture.						
MODULE 4 – BUILDING AS ART FORM						

Appreciating building as art form through works of – B.V.Doshi, Charles Correa, ZahaHadid, Antonio Gaudi - Expression of Colour in Building – Jaipur	
MODULE 5 – ART FORMS IN PUBLIC SPACES	
Public art as a means to define a place and create a sense of cultural and community identity- Types of Art forms found in public spaces- Applied art ;painting, tapestry,mural- Integrated art-integrated into built space such as ceilings, walls, glazing, screens and floors.-Installation where artwork and the site are integral- Ephemeral : temporary installations, performance art, dance, or exhibitions	
TEXT BOOKS	
1	Helen Gardner, Fred S. Kleiner, Christin J. Mamiya, “Art Through the Ages: The Western Perspective”, Cengage Learning, 2005
2	Form Space & Order by Francis D.K.Ching, 3 rd Edition, 2007, John Wiley & Sons
REFERENCE BOOKS	
1	Gardener’s Art through Ages by Fred S.Kleiner, 12 th Edition, 2005, Wadsworth,Inc.
2	Frank O Gehry: Selected Works by Casey Mathewson, 2007, Firefly book.ltd.,
3	Bauhaus by Jeannine Fiedler, 2006,Könemann.
MOOC	
1	https://www.mooc-list.com/course/art-appreciation-and-techniques-saylororg

COURSE TITLE	ARCHITECTURAL GRAPHICS - I			CREDITS	3
COURSE CODE	ARB4112	COURSE CATEGORY	PC	L-T-P-S	1- 0- 4- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-3				
CO	COURSE OUTCOMES				PO
1	Have a comprehensive knowledge about the sketching and the usage of color media.				1,5,6
2	Handle the instruments T square, set square et al manually to draw plan, elevation and section of an object.				1,5,6
3	Understand the relationship between elevation, plan and section of the objects.				1,5,6
4	Present architectural drawings professionally.				1,5,6
Prerequisites : Nil					
MODULE 1 - FREE HAND DRAWING					
Free hand drawing of object human figures and natural elements – part of building environment, plants, trees, flowers, etc. Outdoor sketching: study of form, their combination balance, etc. Sketching of simple building forms and their relations, simple three-dimensional compositions.					

Study of colour, composition, colour rendering of object, plants, interior and exterior spaces. Rendering of objects, built and natural environment with advance presentation skill, surface finishes (human figures, street furniture's, etc.) to communicate meaningfully and effectively.

MODULE 2 - GEOMETRICAL DRAWING

Plane Geometry - scales and angle construction of planes, curves, circles tangent and regular polygon area construction. Solid geometry - simple projections, projection and development of the solid, section of solids, interpenetration of solids and true shape of sections.

MODULE 3 – PRESENTATION TECHNIQUES

Introduction to the importance of presentation techniques in working drawings in architectural practice – Working drawing sample – Plan, elevation, section, details to the scale – Format of the sheet with respect to architectural practice.

MODULE 4 - ORTHOGRAPHIC PROJECTION

Introduction to orthographic projections - isometric and axonometric projections. Drawing of lines, basic shapes in different positions. Orthographic projections of planar surface - geometrical shapes like square, circle, hexagon, etc. and combination of shapes. Orthographic projection of 3D object - construction of plan, elevation and section of 3D objects and projections in various positions.

TEXT BOOKS

1	I.H.Morris , “Geometrical drawing for Art Students”, Orient Longman,Kolkata 2004.
2	Albert. O. Halse , “Architectural Rendering: The Techniques of Contemporary Presentation”, Literary Licensing, LLC, USA, 2011

REFERENCE BOOKS

1	Julie Collins, Colour Mixing Guide: Watercolour, Search Press, 2015.
2	Francis D.K. Ching, “Architectural Graphics” 5 th Ed., Wiley Publications, 2009.
3	Alejandro Bahamon “Sketch Houses”, Loft Publications, 2008.
4	Jonathan Andrews, ‘Architectural Visions”, Brown Publishing AG, 2010
5	Bhatt N.D. Engineering drawing 53 rd Edition, Charotar publishing house, 2014.

E BOOKS

1	https://www.elsevier.com/book/architectural-graphics/ching/9780731290555
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MOOC

1	https://www.youtube.com/watch?v=R7jOgES07CE
2	https://dtcc.edu/project.inco.arch.dwg

COURSE TITLE	BASIC DESIGN			CREDITS	8
COURSE CODE	ARB4131	COURSE CATEGORY	PC	L-T-P-S	0-0-12-0
CIA	60%			ESE	40%
LEARNING LEVEL	BTL-6				
CO	COURSE OUTCOMES				PO
1	To theoretically understand the various elements of basic design relationship, principles and demonstrate the same through drawing exercises.				2, 3, 5, 6
2	Students should learn to develop abstract and real compositions in drawings				2, 3, 5, 6
3	To generate concepts and translate them into real and abstract physical models.				2, 3, 5, 6
Prerequisites : Nil					
MODULE 1 - BASIC DESIGN I					
Introduction to Architectural Design through Basic Design. Introduction to elements of design, Properties, qualities, and characteristics of (i) line, (ii) direction, (iii) shape, (iv) size,(v)texture, (vi) value and (vii) colour exercises involving the same including use of the computer. The principles of design relationships -Repetition, Harmony, Contrast. Transformations - Rotation, Reflection, Translation (mirror), Resizing. Symmetry - Reflection symmetry, Rotational symmetry, Point symmetry, Lines of symmetry of plane shapes. Exercises involving the same. The analysis of design elements - Exercises involving the same. Conceptualization: Generation and translation of concepts as two dimensional drawings and three dimensional models pertaining to above exercises.					
MODULE 2 - WORKSHOP					
Use of hand tools and materials in carpentry, masonry and model making. Making mount board models employing cubes, cuboids, square pyramid, cylinder and cones. Space frame models using match sticks, straw, steel wires, bamboo splits. Texture applicability to murals and interior decoration.					
TEXT BOOKS					
1	Maitland Graves – The Art of Colour and Design McGraw-Hill Book company Inc. 1951				
REFERENCE BOOKS					
1	Francis D.K.Ching, “A Visual Dictionary of Architecture”, John wiley& Sons, Inc. 1997				
2	Professor Miles Lewis, “Architecture – Elements of Architectural Style”, Global Book Publishing Pvt. Ltd. 2008.				
3	Archiworld Co., Ltd., “Object-Creative Idea & Unique Design” Choseok Publishing 2010				
4	Edward D.Mills“ Planning -The Architects Hand Book” - Butterworth-Heinemann Ltd, London, 1985.				
5	V.S.Pramar, “Design fundamentals in Architecture”, Somaiya Publications Pvt. Ltd., New Nelhi, 1990.				
6	Francis D.K.Ching , “Architecture - Form Space and Order”, Van Nostrand Reinhold Co., (Canaa), 1980.				

COURSE TITLE		COMMUNICATION SKILLS		CREDITS	2
COURSE CODE	ELA4102	COURSE CATEGORY	H	L-T-P-S	2- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-4				
CO	COURSE OUTCOMES				PO
1	Enhance the communicative competence with focus on syntax and fluency				2,6,7,10
2	Excel in oral and written medium and prepare them for employability				1,2,4,5,10
Prerequisites : Plus Two Level English					
MODULE 1 – IMPORTANCE OF COMMUNICATION				(5)	
Communication: Importance of Communication; Elements of good individual communication; organizing oneself; different types of communication; Barriers in the path of Communication Suggested Reading: <i>Daily Newspaper, E newspaper</i>					
MODULE 2 – LISTENING SKILLS				(5)	
Listening skills: Listening to conversation and speeches (Formal and Informal) Reading: Techniques of reading, skimming, Scanning, SQ3R technique Suggested Reading: <i>Daily Newspaper, E newspapers</i>					
MODULE 3 – CREATIVE WRITING SKILLS				(5)	
Creative Writing: Scope of creative writing; Report Writing, Paragraph, Letter Writing (formal and Informal), Memo, Circular, Preparation of Agenda, Minutes of the meeting, Notice, Description of projects and features Suggested Reading: <i>Daily Newspaper, E newspapers</i>					
MODULE 4 – SPEAKING SKILLS				(5)	
Speaking: How to converse with people, how to communicate effectively; Pronunciation drills, Phonetics, vowels, Diphthongs, consonants, Dialogue and Conversational skills, Role play, Telephone etiquette. Interview technique, preparing for interviews (HR questions) Mock Interviews Suggested Reading: <i>Daily Newspaper, E newspapers</i>					
MODULE 5 – DIGITAL COMMUNICATION				(5)	
Impact of internet on communication; communication through computers; voice mail; broadcast messages; e-mail auto response; etc. Video conference; Tele conference Suggested Reading: <i>Daily Newspaper, E newspapers</i>					

TEXT BOOKS	
1	Professional Speaking Skills by ArunaKoneru, Oxford University Press, 2017
2	Krishna Mohan &MeeraBanerji: Developing Communication Skills Macmillan India ,2nd edition,2009
REFERENCE BOOKS	
1	K. Ashwathappa: Organizational Behavior, Himalaya Publishing House
2	Daniel Colman: Emotional Intelligence, Bloomsburry publication India,2010
E BOOKS	
1	English Language – TN College Text Book - http://www.textbooksonline.tn.nic.in/books/dted/dted1-english.pdf
MOOC	
1	https://www.mooc-list.com/course/business-english-basics-coursera

SEMESTER – II

COURSE TITLE	HISTORY OF ARCHITECTURE –II			CREDITS	3
COURSE CODE	ARB4116	COURSE CATEGORY	PC	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-3				
CO	COURSE OUTCOMES				PO
1	An understanding about the spatial and stylistic qualities associated with architecture.				1,4,6, 8, 9
2	An Understanding of architecture as an outcome of various social, political and economic upheavals				1,2, 4, 6, 10,11, 12
3	An Understanding of architecture as a response to the cultural and context.				1,2,4,6,10, 12
Prerequisites : Nil					
MODULE 1 - ANCIENT RIVER VALLEY CIVILIZATIONS					
Culture and context in building shelter in the Neolithic period - Architecture of Egypt including River Nile and relevant examples – Urban form in the Tigris and Euphrates basin and relevant examples of architecture.					
MODULE 2 - CLASSICAL ARCHITECTURE					
Landscape and culture of Greece –Greek character – Greek polis and democracy – Domestic architecture– Evolution of the Greek temple and the building of the Acropolis –Public architecture: Theatre and Agora- optical illusions in architecture- City Planning. Roman history: Republic and Empire –Religion, culture, lifestyle - Roman character – Roman urban planning –architecture as imperial propaganda: forums and basilicas – structural forms: materials and techniques of construction spanning large spaces with relevant examples - domestic architecture.					
MODULE 3 - RISE OF CHRISTIANITY AND MEDEIVAL EUROPE					
Birth and spread of Christianity – transformation of the Roman Empire – early Christian worship and burial. Church planning – Basilica concept and Centralized plan concept with relevant examples in the West and in the Byzantine. The Carolingian Renaissance – Feudalism and rural manorial life – Papacy – Monasticism – Craft and merchant guilds. Medieval domestic architecture – Romanesque churches with relevant examples in Europe – Development of vaulting					
MODULE 4 - GOTHIC ARCHITECTURE					
Development of Gothic architecture Church plan, structural developments in France and England with using relevant examples of church architecture in Europe – wooden roofed churches.					

MODULE 5 - REVIVAL AND RENAISSANCE IN EUROPE	
Idea of rebirth and revival – Humanism –Development of thought – Reformation- the Renaissance patron – Urbanism Renaissance architecture: Brunelleschi and rationally ordered space – ideal form and the centrally planned church using relevant examples– palace and villa architecture with relevant examples – Mannerist architecture- The Renaissance in transition – works of Michelangelo; Sir Christopher Wren, Andrea Palladio, Inigo Jones- Baroque and palace building in France.	
TEXT BOOKS	
1	Sir Banister Fletcher, A History of Architecture, CBS Publications (Indian Edition), 20th Edition 2002.
2	Spiro Kostof – A History of Architecture – Setting and Rituals, Oxford University Press, London, 1986.
REFERENCE BOOKS	
1	Richard Ingersoll, World Architecture: A Cross-Cultural History, Oxford University Press; 2 edition 2018
2	Michael Fazio, Marian Moffett, Lawrence Wodehouse, Buildings across Time: An Introduction to World Architecture, McGraw-Hill Education, 3rd Edition, 2008
E BOOKS	
1	https://www.sophia.org/tutorials/gothic-architecture--2
MOOC	
1	https://www.mooc-list.com/course/gothic-revival-1700-1850-interdisciplinary-perspectives-univ-stirling
2	https://www.mooc-list.com/course/age-cathedrals-coursera

COURSE TITLE	THEORY OF ARCHITECTURE II			CREDITS	3
COURSE CODE	ARB4117	COURSE CATEGORY	PC	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-4				
CO	COURSE OUTCOMES				PO
1	Identify and apply the vocabulary of organizing form and spaces				1,4,6
2	Identify the various styles in architecture and understands the driving forces involved in architectural changes.				1,4,6
3	Aware of various principles of composition and can apply them in design				1,4,6
4	Understands the aspects of circulation and the need for circulation diagrams and their influence/importance in the design for specialized buildings.				1,4,6
5	Understands concepts and theories behind contemporary architecture.				1,4,6
6	Aware that architecture with lasting impact has a theoretical background.				1,4,6

Prerequisites : Nil	
MODULE 1 - CIRCULATION	
Components of building circulation – approach to building, building entrance, configuration of the path, path space relationship, form of circulation space relating with building examples. Simple circulation diagram for buildings. Figure/ ground relationship / circulation – approach to site planning at various scales.	
MODULE 2 - DESIGN INTERPRETATION	
Context based Design- Concept drawings, Interpreting architect’s conceptual sketches – communicating the concept of design of famous buildings of Tadao Ando, Frank Gehry, I.M.Pei.	
MODULE 3 - SCOPE OF ARCHITECTURAL DESIGN	
Detailed Architectural works of Eero Saarinen, Le Corbusier, Laurie Baker, - An analysis - Integration of aesthetic and function – concept – types – ideologies of architects – exercise of a small scale project	
MODULE 4 - SYMBOLISM IN DESIGN	
Expression of cultural and identity through Built form - Colour symbolism – A case study on colour theory in any famous architectural buildings and Cities, Pink City Jaipur –Symbolism through built form – Sydney Opera House, Australia and the Lotus Temple, New Delhi- Structure as symbolic representation.	
MODULE 5 - WORKS OF CONTEMPORARY ARCHITECTS	
Critical Appraisal on works of architects and their ideologies and philosophies - Louis Sullivan, F.L.Wright, Louis Khan, Le Corbusier, Philip Johnson, Charles Correa, and Michael Graves.	
TEXT BOOKS	
1	Francis D.K.Ching, “Architecture-Form, Space and Order”, 3rd ed. John Wiley, 2007
2	Simon Unwin, Analysing Architecture, Routledge, London, 2003.
3	V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1997.
REFERENCE BOOKS	
1	Leland M. Roth - Understanding Architecture, its experience history and meaning, Craftsman house, 1994.
2	Nikos A.Salingaros – Unified Architectural Theory: Form, Language , Complexity, Sustasis Press , 2013
3	Peter von Meiss -Elements of architecture - from form to place, Spon Press 1992.
4	Rudolf Arnheim- The dynamics of architectural form, University of California Press 2009.
5	Paul Alan Johnson - The Theory of Architecture - Concepts and themes, Van Nostrand Reinhold Co., New York, 1994.

6	James F. Eckler - The language of space and form, John Wiley and sons, New Jersey, 2012.
7	The four elements of Architecture - Semper Goltfried - Cambridge University press, London, 2011
E BOOKS	
1	https://www.dtcc.edu/document.info-theoryarch
2	www.cs.brown.theory.edu
MOOC	
1	https://www.coursera.org/learn/making-architecture

COURSE TITLE	MECHANICS OF STRUCTURES			CREDITS	3
COURSE CODE	ARA4118	COURSE CATEGORY	BS	L-T-P-S	2- 2- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-4				
CO	COURSE OUTCOMES				PO
1	Impart knowledge on shear force and bending moment.				3, 10
2	Learn shear stress distribution and bending moment distribution				3, 4
3	Learn to find slope and deflection of beams				3, 5
4	Understand the behaviour of long and short columns				3, 5, 10
5	Learn the behaviour of continuous, fixed beams				1, 7
Prerequisites : Applied Mechanics					
MODULE 1 - SHEAR FORCE AND BENDING MOMENT					
Concept of shearing forces and bending moments - shear force and bending moment diagrams for cantilever and simply supported beams subjected to point load, uniformly distributed loads and their combinations					
MODULE 2 - STRESSES IN BEAMS					
Theory of simple bending -bending stresses in beams, shear stresses in beams - examples on simple sections. Stress distribution diagrams.					
MODULE 3 - DEFLECTION OF BEAMS					
Slope and deflection at a section - Double Integration method for calculation of deflection for simply supported and cantilever beams for concentrated loads and uniformly distributed loads.					
MODULE 4 – THEORY OF COLUMNS					
Short and long columns - Euler's theory and its limitations - Derivations of Euler's formula (for different end conditions) – Rankine’s formula for columns (No derivations) – Application to simple problems.					

MODULE 5 – INTRODUCTION TO INDETERMINATE STRUCTURES	
Concept in Analysis of continuous beams, fixed beams, and partial frames (No analysis problems).	
TEXT BOOKS	
1	R.S.Khurmi, N. Khurmi, “Strength of Materials”, S.Chand& Company Ltd., New Delhi. 2015
2	M.M.Ratwani& V.N.Vazirani, “Analysis of Structure”, Vol.1, Khanna Publishers – Delhi, 2008
REFERENCE BOOKS	
1	Timoshenko, S.P., and D.H. Young, “Elements of Strength of Materials”, Fifth edition, East West Press, 2015
2	B. C. Punmia Ashok Kr. Jain Arun Kumar Jain, “Strength of Materials and Theory of Structures”, Vol. 1, Laxmi publications, New Delhi 2017.
3	R.K. Rajput “Strength of Materials”, S.Chand& Company Ltd., New Delhi. 2012.
MOOC	
1	http://nptel.ac.in/courses/112107147/23
2	https://nptel.ac.in/courses/105/105/105105108/

COURSE TITLE	MATERIALS AND CONSTRUCTION-I			CREDITS	3
COURSE CODE	ARB4126	COURSE CATEGORY	BS	L-T-P-S	1- 0- 4- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-4				
CO	COURSE OUTCOMES				PO
1	To differentiate and understand the various building components.				1,3,5,7
2	To develop plan section and elevation of simple load bearing structures				1,3,5,12
3	To select appropriate building material (stone, brick) for different situations				1,3,5,12
Prerequisites : Nil					
MODULE 1 - INTRODUCTION					
Basic structural system- load bearing and framed structures. Building components like substructure and super structure. Building elements in substructure like foundation, plinth damp proof course. Building elements in super structure such as floor, wall, column, beam, sill, lintel, arch and fenestrations such as door, window, ventilator, plastering, shading devices, stairs, balcony, roof, parapet, coping, weathering course.					
MODULE 2 - DEVELOPMENT OF PLAN SECTION AND ELEVATION					
Types of lines and their application. Principles of Dimensioning. Conventional signs- Materials in section. Development of plan, section and elevation. Drawings of plan section and elevation of single and double storey building.					

Drafting plates	
<ol style="list-style-type: none"> 1. Development of plan section and elevation of single room 2. Dimensioning of plan and section 3. Detailed section through a load bearing wall 4. development of plan section and elevation of a double storey building 	
MODULE 3 – BRICKS AND CLAY PRODUCTS	
Bricks - brief study on manufacture of bricks - properties – uses - suitability - types of bricks - modular, conventional bricks, special purpose bricks and brick bats. Brick bonds- English and Flemish. rat trap bond Sketching- English and Flemish bond- wall- 1 and 1 1/2 brick thick and piers	
MODULE 4 – STONE	
Classification of rocks - Building stones - their uses –physical properties - brief study of tests for stone – deterioration - preservation of stone - various stone finishes and stone masonry Drafting	
<ol style="list-style-type: none"> 1. Random Rubble Stone foundation 2. Stone masonry – random rubble- coursed , uncoursed and/Ashlar 3. Stone Arches- flat, segmental and semicircular 	
TEXT BOOKS	
1	Dr. P.C.Vergheze, "Building Materials "Prentice Hall India 2015
2	S.C.Rangwala , "Engineering Materials", Charotar Publishing House – Anand 2007
3	Dr.BalaGopal, "Building Design and Civil Engineering Drawing", Spades Publishers Distributors, 2016
4	A.K.Jain&.B.C.Punmia, "Building Construction" Laxmi Publications, 2008.
REFERENCE BOOKS	
1	W.B.Mckay , "Building Construction", Vol. 1,2,3- Longmans U.K 1992.
2	Don A.Watson, "Construction Materials and Processes", McGraw Hill Co., 1972.
3	Alanwerth, "Materials", The Mitchell Pub. Co. Ltd., London, 1986.
4	R.Chudleu, & R Greeno, "Building Construction Handbook", Butterworth-Heinemann Ltd; 7th Revised edition, Elsevier 2008.
E BOOKS	
1	http://www.aboutcivil.org/stone-mortars.html
2	http://theconstructor.org
3	https://www.thebalancesmb.com/bricks-types-uses-and-advantages-844819
4	https://www.thebalancesmb.com/bricks-types-uses-and-advantages-844819
MOOC	
1	https://www.acseduonline.com/courses/self-sufficiency-19/mud-brick-construction-ass103-430.aspx
2	https://bestbricky.com/free-bricklaying-course-videos-onlne/

COURSE TITLE	ARCHITECTURAL GRAPHICS - II			CREDITS	3
COURSE CODE	ARB4127	COURSE CATEGORY	PC	L-T-P-S	1- 0- 4- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-3				
CO	COURSE OUTCOMES				PO
1	Articulate knowledge on composition and detailing in measured drawing.				1,4,6
2	Identify and understand the perspective.				1,4,6
3	Understand the casting of shade and shadow on any object.				1,4,6
Prerequisites : Nil					
MODULE 1 - MEASURED DRAWING					
Principle of basic architectural drafting - line value lettering basic, multi view projections and sections - presentation formats. Measured drawing of simple objects (like furniture, entrance gates, etc.) and building components (like columns, cornice, door, window, etc.) Detailed measured drawing/documentation of historic and architectural monument or building.					
Suggested Reading:					
MODULE 2 - PERSPECTIVE					
Characteristics of Perspective Drawings, Perspective systems and methods, Two point perspective of simple objects, outdoor and indoor view of a building, etc. One point and three point perspective of interiors Perspective theory and practice					
Suggested Reading:					
MODULE 3 – SCIOGRAPHY					
Principles of shades and shadows - Shadows of lines and circles, Shadows of architectural elements, circular solids, buildings, etc.					
Suggested Reading:					
TEXT BOOKS					
1	T.Jeyapooan "Engineering Drawing and Graphics Using Autocad" Vikas Publishing House, Pvt. Ltd., 2010.				
2	K. V. Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2006)				
REFERENCE BOOKS					
1	Francis D K Ching "Design Drawing", Wiley India Pvt Ltd, 2012				
2	Jonathan Andrews "Architectural Visions: Contemporary Sketches, Perspectives, Drawings", Thames & Hudson, 2010.				
3	Francis D.K. Ching, "Architectural Graphics" 5 th Ed., Wiley Publications, 2009				
4	Bhatt N.D. Engineering drawing 53 rd Edition, Charotar publishing house, 2014.				
5	Rendow Yee, Architectural Drawing: A Visual Compendium of Types and Methods, John Wiley & Sons; 4th Edition, New Jersey, 2013.				
E BOOKS					

1	https://www.elsevier.com/book/architectural-graphics/ching/9780731290555
2	https://dtcc.edu/project.inco.arch.dwg
MOOC	
1	https://www.youtube.com/watch?v=R7jOgES07CE

COURSE TITLE	ARCHITECTURAL DESIGN – I			CREDITS	6
COURSE CODE	ARB4141	COURSE CATEGORY	PC	L-T-P-S	0- 0- 9- 0
CIA	60%			ESE	40%
LEARNING LEVEL	BTL-6				
CO	COURSE OUTCOMES				PO
1	To develop abstract and real compositions in drawings				2,3,5,6
2	Generate concepts and translate them into real and abstract physical models.				2,3,5,6
Prerequisites : Nil					
MODULE 1 - DESIGN STUDIO					
<p>The problems involve simple space organization starting with single space single use -small span Horizontal movement - single bay - passive energy type spaces. The study of space standards and anthropometrics related to each problem is stressed upon. Anthropometry as related to physically handicapped and elderly persons are required to be studied.</p> <p>Examples of exercises include Design of toilet for a physically handicapped person, hostel room, bedroom, kitchen, Shop, pavilions, snack bar, Residence, petrol bunk, fire station, police station.</p>					
MODULE 2 - WORKSHOP II					
<p>Elementary models indicating wall surfaces floral designs, ceilings, glass areas, lawn, water bodies, etc. Block models of small campuses using wood, thermacol, mount board, soap, cork board, etc.</p> <p>Detailed model of a small buildings like branch bank, small residences, bus shelter, snack bar, including landscape details.</p>					
TEXT BOOKS					
1	De. Chiara and Callender, "Time-saver Standards for Building Types", McGraw-Hill Co., New York, 1973.				
2	The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.				
3	Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series (1998).				
4	Ed.By.Quentin Pickard RIBA "The Architects' Hand Book", Bladewell Science Ltd., 2002				
REFERENCE BOOKS					
1	Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi, 1997.				
2	National Building book of India 2005, Bureau of Indian Standards, New Delhi				

3	Macmillan Encyclopedia architects, Vol II, The free press, London, 1982
4	A visual dictionary of Architecture, Francis D.K.Ching, John wiley& Sons, Inc. 1997
E BOOKS	
1	Christopher W. Totten, 2014, An Architectural Approach to Level Design 1st Edition, Kindle Edition, CRC Press
MOOC	
1	https://swayam.gov.in/courses/5183-understanding-design

COURSE TITLE		WORKSHOP (MODEL MAKING)		CREDITS	2	
COURSE CODE		ARB4142	COURSE CATEGORY	PC	L-T-P-S	0- 0- 4- 0
CIA		60%		ESE	40%	
LEARNING LEVEL		BTL-5				
CO	COURSE OUTCOMES				PO	
1	To Develop knowledge about model making.				1,2,5,7	
2	To Use the laws of physics for molding stabilized models.				2,5,7	
3	To Use different materials and techniques.				2,5,7	
4	To Use conventional as well as contemporary materials and their usage techniques.				2,5,7	
Prerequisites : Nil						
MODULE 1 - MATERIALS AND TECHNIQUES (Carpentry)						
Introduction to tools and equipment - Materials such as Timber, Plywood, System formwork components: their classification, identification, selection, properties - Site tidiness and Safety measures - Techniques used for Cutting and Joining - Different Joineries.						
MODULE 2 - DESIGN (Carpentry)						
Model Making – Building Construction models - Conceptual Derivations in terms of innovations brought in the material’s usage – Timber Joineries – Furniture Making						
MODULE 3 – MATERIALS AND TECHNIQUES (Modeling)						
Introduction on Sculpture making - Nature study, study of Human Body limbs, study of Animals and Birds Body - Brief understanding on history of Sculpture making - Different Materials introduction- P.O.P, Thermocol, Clay, Wires - Introduction to tools and methods of using – Water – Material ratios - Safe usage of tools and Site tidiness						
MODULE 4 – DESIGN (Modeling)						
Model Making - Thermocol Model, Furniture model, Sculpture making - Conceptual Derivations in terms of innovations brought in the material’s usage – Understanding Physical Properties of materials by their usage.						

MODULE 5 – MATERIALS AND TECHNIQUES (Fabrication)	
Introduction on conventional installations done in an around world using contemporary materials - Different materials introduction – Tensile materials, Dry leaves, repetition of fundamental material - Preparation techniques and smart tricks to make the material’s use efficient - Techniques for load bearing and self-stabilized fabrications - Safe usage of tools and Site tidiness	
MODULE 6 - DESIGN (Fabrication)	
Model Making – Tallest model with Lightest Material, Tin Boxes, Tensile/Dry leaves canopy, Abstract installations - Conceptual Derivations in terms of innovations brought in the material’s usage - Understanding Physical Properties of materials by their usage	
TEXT BOOKS	
1	Model making: Materials & Methods by David Neat, 2008, Crowood.
REFERENCE BOOKS	
1	Timber Construction Manual by Herzog, Schweitzer, Volz, Winter 4 th Edition, 2005, Birkhauser
2	Architectural Origami: Create models of the World’s great buildings by Ingrid Siliakus, Apple 2009
3	“Fun with paper folding” by Atsuko Nakata, Kazuo Kobayashi Publisher: Froebel-KanCo.Ltd.,
4	Carpentry by Floyd Vogt, 6 th Edition, 2014, Delmar Learning.
E BOOKS	
1	Matt Driscoll, 2013, Model Making for Architects Kindle Edition, Crowood

COURSE TITLE	SUMMER INTERNSHIP			CREDITS	1
COURSE CODE	ARB4236	COURSE CATEGORY	PAECC	L-T-P-S	0- 0- 0- 0
CIA				ESE	100%
LEARNING LEVEL	BTL-6				
CO	COURSE OUTCOMES				PO
1	To familiarise students with local arts and crafts				1,2,3,5,6,7
2	To make students acquaint with local materials				1,2,3,5,6,7
3	To make students gain hands on experience				1,2,3,5,6,7
4	To enable students to understand the process and techniques employed by artisans				1,2,3,5,6,7
5	To make students understand the social and economic context of evolution of arts and crafts				1,2,3,5,6,7
Prerequisites : Nil					
•Every student must work with, artisans, for a minimum of 2 weeks after identification of the					

consultants and discussion with the concerned faculty.

- The student should involve in the work of these people and observe and document the materials, tools, techniques and process used by them in the projects.
- After the summer vacation, every student will have to submit a detailed report with drawings, photographs of the work in which the student was involved with the consultants.

SEMESTER III

COURSE TITLE	HISTORY OF ARCHITECTURE - III			CREDITS	3
COURSE CODE	ARB4201	COURSE CATEGORY	PC	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-3				
CO	COURSE OUTCOMES				PO
1	Identify and discuss the finer points and nuances of Islamic architecture and its influence on the development of Architectural sciences and styles.				1,2,5,7,9
2	Provide an understanding on the various styles and the ruler patrons who influenced the development of this style of architecture.				1,2,5
3	Realize the techniques and wonders behind various Islamic architectural and landscaping elements and principles and re- interpret them in today's context.				1,2,5,9
4	Discuss the impact of colonialism and the wealth of architectural legacy the period introduced in India				1,2,5,9
Prerequisites : Nil					
MODULE 1 - INTRODUCTION TO ISLAMIC ARCHITECTURE					
Influences on Islamic Architecture – a Brief study on the Islamic Architectural Character: the mosque, the tomb, and minaret, the madarasa, the palace, the caravanserai, vernacular architecture, the market - important principles, elements and character of Islamic architecture in terms of structure materials and methods of construction, elements of decoration, color, geometry, light.					
MODULE 2 - DELHI OR IMPERIAL STYLE					
Development of architectural style during the rule of the slave, Khalji, Tuqlaq, Sayyid and Lodhi Dynasties - important examples for each period.					
MODULE 3 - PROVINCIAL STYLE					
Development of the provincial styles in different regions - Punjab, Jaunpur, Bengal, Gujarat, Malwa, the Deccan (Bijapur, Golconda, Bidar and Gulbarga) - important examples for each style.					
MODULE 4 - CONTRIBUTION OF RULERS OF ISLAMIC INDIA					
Development of the Mughal style under the different rulers - Babur, Shershah, Humayun, Akbar, Jahangir, Shahjahan, Aurangzeb - important examples - development of the Mughal garden - important examples.					
MODULE 5 - ARCHITECTURE IN COLONIAL INDIA					
Colonialism and its impact - Early British Neo-classical Architecture - Indo-Sarcenic Architecture and the works of Chisholm - P.W.D. and the Institutionalization of Architecture - Building New Delhi.					

TEXT BOOKS	
1	Sir Banister Fletcher, “A History of Architecture”, University of London, The Athlone, Press 1996,
2	Percy Brown, “Indian Architecture (Islamic Period.)”- TaraporeVala and Sons Bombay 1996.
3	Satish Grover, “Islamic Architecture In India”, CBS Pub., 2003
REFERENCE BOOKS	
1	Sir H.M. Elliot. K.C. B “The History of India, by its own historians, The Muhammadan Period”.
2	Dr. G. Venkataraman “History of Historical Building and Monuments in and around Chennai”.
3	Thomas. R. Metcalf - “An Imperial Vision”.
4	J Duncan M Derrett, 2007“Indian Islamic Architecture: Forms and Typologies, Sites and Monuments”.
5	Bianca Maria Alfierie, - “ Islamic Architecture of the Indian Sub Continent”
6	The History of Architecture in India from the Dawn of civilization to the End of the Raj, Phaidon, London, 2002
7	Christopher Tadgell, The History of Architecture in India, Penguin Books (India) Ltd, New Delhi 1990.
E BOOKS	
1	http://libraries.mit.edu/rvc/aka/agakhan/index.html
2	https://academy.gktoday.in/article/architecture-of-delhi-sultanate
3	http://www.ets.uidaho.edu/arch499/nonwest/Islam1.html
MOOC	
1	https://www.udemy.com/course/mughal-architecture-and-design-of-ancient-india/
2	https://swayam.gov.in/nd1_noc20_ar02/preview

COURSE TITLE	DESIGN OF RCC STRUCTURES			CREDITS	3
COURSE CODE	ARA4202	COURSE CATEGORY	BS	L-T-P-S	2- 2- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-5				
CO	COURSE OUTCOMES				PO
1	Develop knowledge about of limit state design methods for Reinforced cement concrete structures.				3,7
2	Use the limit state design methods to design RCC beam.				3,4,7
3	Use the limit state method to design R.C.C slabs.				3,4,7
4	Use the limit state methods to design RCC column.				3,4,7

5	Use the limit state method to design footing for foundation.	3,4,7
Prerequisites : Nil		
MODULE 1 - INTRODUCTION TO LIMIT STATE METHOD		
Limit state - characteristic load and characteristic strength of materials - partial safety factor – stress-strain relationship of concrete - safety and serviceability requirements, Loads on structure & Load transfer mechanism.		
MODULE 2 - LIMIT STATE DESIGN OF RCC SLAB		
Design of one-way and two-way slabs using IS Code co-efficient for various edge conditions.		
MODULE 3 - LIMIT STATE DESIGN OF BEAMS		
Design of rectangular sections for bending - singly reinforced, doubly reinforced and flanged sections		
MODULE 4 - LIMIT STATE DESIGN OF RCC COLUMN		
Behaviour of Columns - Code provisions - Design of axially loaded short columns of rectangular and circular sections - ties and spiral reinforcements. Concept of Long columns (No Design calculations).		
MODULE 5 - LIMIT STATE DESIGN OF RCC FOUNDATION		
Types of foundations - Isolated pad footings for simple design problems –Structural Concept of combined footings (No Design calculations)		
NOTE: Reference to IS codes and tables be permitted in the examination.		
TEXT BOOKS		
1	P.C.Varghese, “Limit state Design of Reinforced Concrete”, Prentice Hall of India , 2010.	
2	Limit State Design of Reinforced Concrete, B.C Punmia, A.K Jain, 2010	
3	Reinforced Concrete Design, N.Krishnaraju& R.N. Pranesh, New Age International Publications, 2010.	
4	S.Unnikrishnan Pillai &DevadosMenon, “Reinforced Concrete Design”, Tata Mc.Graw Hill 2016.	
REFERENCE BOOKS		
1	S.N. Sinha, “Reinforced Concrete Design”, Tata McGraw-Hill, New Delhi 2011.	
2	Dr.B.C.Punmia, Reinforced Concrete Structures, Laxmi publication, Delhi, 2004.	
3	P.Dayaratnam, “Design of Reinforced Concrete Structures”, Oxford and IBH Publishing Co., 2002.	
4	N.C.Sinha and S.K.Roy, “Fundamentals of Reinforced Concrete”, S.Chand& Co., New Delhi, 2013.	
MOOC		
1	https://nptel.ac.in/noc/courses/noc19/SEM2/noc19-ce22/	

COURSE TITLE	BUILDING SERVICES – I (WATER SUPPLY& SANITATION)			CREDITS	3
COURSE CODE	ARA4203	COURSE CATEGORY	BS	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-4				
CO	COURSE OUTCOMES				PO
1	Able to identify the various water sources, impurities in water and their treatment and regulations, standards				1, 4,
2	To be able to know about Rain water collection, conservation and treatment.				5, 6, 8
3	To be able to know the various sewage treatment systems of a buildings of all scale and the methods involved.				3, 8, 9,
4	To be able to know the sewage and storm water collection, conservation and treatment at city level				2, 9,
5	To be able to identify the various pumps as available in the market and know the process involved to install and maintain the pumps				4, 10, 11, 12
Prerequisites : Nil					
MODULE 1 - WATER QUALITIES, PURIFICATION, TREATMENT AND DISTRIBUTION					(12)
Surface and ground water sources - quality/quantity - nature of impurities - treatments - water supply systems - treatment systems - centralized treatment - user and treatment - Desalination - ozonisation - reverse osmosis etc. - Distribution system in small towns - Types of pipes used - Laying, jointing, testing internal water supply in buildings - Municipal byelaws, regulations, standards.					
MODULE 2 - RAIN WATER MANAGEMENT AND CONSERVATION OF RAW AND WASTE WATER					(6)
Water conservation, rainwater collection - methods of harvesting - storm water drains in layouts, towns and cities - Waste water recycling.					
MODULE 3 - FUNDAMENTALS, SEWAGE TREATMENT AND SEWERAGE SYSTEMS					(12)
Environmental sanitation - Sanitation in buildings. Primary and secondary treatment - Activated sludge - Intermittent and trickling sand filters - Arrangement of sewerage systems in Housing, large factories, shopping centers - sewage pumping station, sewage disposal, construction details of sewers and connections.					
MODULE 4 - CITY LEVEL SERVICES AND DISPOSAL					(6)
Collection, conveyance, recycling and disposal of town refuse system - sanitation in unsewered areas of cities - alignment of storm water drains in residential areas and cities.					
MODULE 5 - PUMPS AND MOTORS, SANITARY FIXTURES AND FITTING - PRODUCT RANGE					(9)
Pumps including reciprocating, centrifugal, deep well, submersible, sewage pumps - their selection and choice, installation and Maintenance.					
TEXT BOOKS					

1	K.N.Duggal, “Elements of Environmental Engineering”, Chand & Co.,2010
2	P.C.Punmia, “Environmental Engineering 1” Vol I – Water Supply, Vol II Waste water, Laxmi Publication,2016.
3	S.K.Garg, “Environmental Engineering” Vol I, Khanna Publishers,2001
REFERENCE BOOKS	
1	S.C.Rangwala, “Water Supply and Sanitary Engineering, Charotar Publishing House, Anand 388 601, 2010.
2	G.M.Fair, J.C.Geyer and D.Okun, “Water and Waste Water Technology”, Vol. II, John Wiley & Sons, Inc., New York, 2010.
3	“Manual of Water supply and Treatment”, Second Edition, CPHEEO, Ministry of Works and Housing, New Delhi
4	“Manual on Sewerage and Sewage Treatment”, CPHEEO, Ministry of Works and Housing, New Delhi
E BOOKS	
1	https://www.iwapublishing.com/sites/default/files/ebooks/9781843395140.pdf
MOOC	
1	https://www.mooc-list.com/course/planning-design-sanitation-systems-and-technologies-coursera

COURSE TITLE	ENVIRONMENTAL SCIENCE FOR ARCHITECTURE			CREDITS	3
COURSE CODE	ARA4204	COURSE CATEGORY	BS	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-3				
CO	COURSE OUTCOMES				PO
1	Select and use necessary actions, plans and policies to be formulated for environmental protection				2,3,7
2	Provide appropriate remedies and changes after assessing any damage in any environmental conditions to uplift the surroundings.				1,2,3
3	Design and construct buildings with all the concerns towards the surrounding environment.				2,8,10
4	Select and provide proper practicing techniques with sustainable development.				8,9,10
5	Select and use right type of materials, practicing techniques and frameworks for executing sustainable development.				2,8
Prerequisites : Nil					
MODULE 1 - ARCHITECTURE AND NATURE					(7)
Types of ecosystems, characteristics features, structure and functions of Ecosystems – Forest, Grassland, Desert, Aquatic (lakes, rivers and estuaries). Land, Forest, Water and Energy as environmental resources Strategies to transform the built environment to meet the risks of climate change - BIOMIMICRY – an approach to innovation that seeks sustainable solutions to human challenges by emulating nature’s time-tested patterns and strategies - Exercises / workshops /					

Creative studios – to come out with innovative ideas by the students aiming to solve the existing climatic and environmental problems	
MODULE 2 - ENVIRONMENTAL PROBLEMS IN INDIA (6)	
Definition – Causes, effects and control measures of: - Air pollution - Water pollution - Soil pollution - Marine pollution - Noise pollution - Thermal pollution - Nuclear pollution -Solid waste Management– Role of an individual in prevention of pollution - global warming-Acid rain-Ozone layer depletion	
MODULE 3 - ENVIRONMENTAL SUSTAINABILITY (6)	
Introduction to Biodiversity – India as a mega-diversity nation - Threats to biodiversity-hotspots, habitat loss, poaching of wild life, loss of species - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity - Natural Calamities floods, earthquake, cyclone and landslides – Settlement and built forms in Disaster prone regions - Threats to cultural heritage sites -Initiatives by Government, Private sector and Local Community to achieve environmental sustainability	
MODULE 4 - SOCIAL ISSUES AND ENVIRONMENTS (5)	
Social issues and the environment, from unsustainable to sustainable development-urban problems related to energy-human population and environment- population explosion, resource exploitation and depletion, loss of wet lands, mangroves, increasing desert areas, recycling	
MODULE 5 - ENVIRONMENTAL LEGISLATIONS, CODES AND POLICIES (6)	
Introduction to Environmental Acts, - Water (Prevention and Control of Pollution) Act,-Air Prevention and Control of pollution act- Environmental Protection Act, Wild life protection Act, Forest Conservation Act, etc Environmental aspects in Accessibility laws; ECBC, EIA, ASHRAE, NBC, permitted activities in coastal Regulation zone. Sustainable Practices in India and World.	
TEXT BOOKS	
1	S.V.S. Rana, “Essentials of Ecology and Environmental Science”, PHI publications, 5th edition.
2	R S Kholyangbam, Navindu Gupta, “Introduction to Environmental sciences”, The Energy and Resource institute, 2012
3	Walter Leal Filho& Paul Pace, “Teaching Education for Sustainable development at University Level”, Springer Publications, 2015
4	Jeffrey D. Sachs, “The age of Sustainable Development”, Oxford press, 2011
REFERENCE BOOKS	
1	Simon, Jilian, “The Ultimate Resource”, Princeton University press, N.J, 1981
2	Brown, Lester, “Building a sustainable society”, Norton, 1981
3	Neville Nicholls, “A Letter to Nature”, Australian Bureau of Meteorology Research Center, 1997

4	Adams, W.M. and Jean Renaud, “Transition to Sustainability: Towards a Humane and diverse world”, Gland, Switzerland
5	Agarwal, K. C. (2001). Environmental Biology. Bikaner :Nidhi Publications Ltd
E BOOKS	
1	David Lee Smith , 2011, Environmental Issues for Architecture 1st Edition, Kindle Edition, Wiley
MOOC	
1	https://www.edx.org/course/natural-resources-for-sustainable-development

COURSE TITLE	DESIGN COMMUNICATION			CREDITS	3
COURSE CODE	ARB4205	COURSE CATEGORY	SEC	L-T-P-S	3-0-0-0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-4				
CO	COURSE OUTCOMES				PO
1	To understand the relevance of Context in Design Process				1,8,9
2	To understand the approach and development of Content in Design Process				2,8,9
3	To understand evolution and development of design through design process				1,8,9
4	To understand various 2D Design Presentations				1,11,12
5	To understand various tools in Digital Design Presentations				4,11,12
Prerequisites : Nil					
MODULE 1: UNDERSTANDING THE CONTEXT					(8)
Architectural Context, Understanding Site, Neighbourhood Context, Place and Space, Landscape Context, Climate, Regional architectural characteristics, technology, local craftsmen, Architectural programming- user requirements, needs, aspirations, socio cultural factors, economic factors, Understanding relevance and collecting data for Literature and Case study, Methods of Group work					
MODULE 2: DESIGN PROCESS					(8)
Presentation of Literature Study, Case study, Illustration Techniques - Preparing Flow Charts, Tables & Diagrams, Importance Of Sketching, Architectural Photography, Exterior And Interior Photography, Photo Documentation Of Buildings Highlighting Quality Of Architectural Spaces, Analysis of Literature Study& Case study, Importance of Relevant Core/ Special study					
MODULE	3	-	GRAPHICAL	REPRESENTATION	
(12)					
Presenting Case Studies, Literature Reviews, Analysis And Inference, Experiencing Architecture: Circulation- Approach And Entry, Path Configuration And Access, Sequence Of Spaces, Proximity Analysis, Legal Restraints, User Activity Spatial Analysis, Site Analysis, Parameters to be considered in Site Analysis, Setting up Goals and Objectives for the Project, Concept Development and analysis, Form And Function, Development Of Form From Concept					
MODULE 4 - PRESENTATION METHOD (2D)					(8)

Understanding Composition Of Sheet, Layout And Presentation, Story Boarding, Portfolio Presentation, Verbal Presentation	
MODULE 5 - DIGITAL PRESENTATION (9)	
Multi-media presentation, Audio-visual projection and Computer based presentations, Movie making Flash movies, animation graphics, and walkthroughs.	
TEXT BOOKS	
1	Farrelly. Lorraine, The Fundamentals of Architecture, AVA Publishing, Switzerland (2007)
REFERENCE BOOKS	
1	Sam F. Miller, Design Process A Primer for Architectural and Interior Designers
2	YatinPandya, "Elements of Space making", Mapin 2007.
3	Dinsmore, G. A. (1968). Analytical Graphics. Canada : D. VanNostrand, Company Inc.
E BOOKS	
1	Elizabeth Resnick, 2009, Design for Communication: Conceptual Graphic Design Basics 1st Edition, Kindle Edition, Wiley
MOOC	
1	https://ocw.mit.edu/courses/architecture/4-110j-design-across-scales-disciplines-and-problem-contexts-spring-2013/

COURSE TITLE	MATERIALS AND CONSTRUCTION II			CREDITS	3
COURSE CODE	ARA4211	COURSE CATEGORY	BS	L-T-P-S	1- 0- 4- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL - 4				
CO	COURSE OUTCOMES				PO
1	To differentiate and understand the various applications of PCC and RCC in building construction				1,12
2	To develop the plan section of a medium span low rise RCC framed structure with column layout.				1,3,6,9,10,12
3	To design a timber paneled door				1,3,9,10,12
4	To read a soil test report and structural drawing				4,6,9,10,11,12
Prerequisites : Nil					
MODULE 1 - PLAIN CEMENT CONCRETE AND CEMENT MORTAR (20)					
Cement- outline of manufacture process, Types of cement produced in India, Grades of cement, Storage of cement, Setting action of cement, Fine aggregates cement Mortar-. Preparation of cement mortar, Plastering guidelines requirements of mortar and plaster for various works. Ingredients of plain cement concrete – Water cement ratio, Specification for concrete, Bleeding of concrete, Types of concrete – No fines concrete, self-compaction concrete, high strength concrete, high performance concrete, light weight, fibre reinforced, RMC.					

<ul style="list-style-type: none"> ➤ Market survey of cement steel ➤ Construction site visit 	
MODULE 2 - REINFORCED CEMENT CONCRETE AND RCC BUILDING COMPONENTS (30)	
<p>Types of steel reinforcement – MS bars, TMT bars, Torsteel bars. Standard sizes of reinforcement bars. Need for Cover blocks. Scaffolding and Formwork. R.C.C building components- foundation – Isolated footing, Raft foundation Combined footing; R.C.C column – Reinforcement details for square, rectangular and circular columns, General column spacing., R.C.C roof slabs, Cantilever slabs, , R.C.C lintel, R.C.C sunshade,.</p> <ul style="list-style-type: none"> ➤ Model of column footing, lintel sunshade and slab. ➤ Sketching on site ➤ Drafting of Building (Architectural Design Project) plan with column grid. 	
MODULE 3 - TIMBER AND ALLIED PRODUCTS (15)	
<p>Hardwood Vs Softwood, Primary & Secondary timber, Seasoning & conversion of timber, Preservation and cure of decay of timber. Market forms of timber, Industrial timber – Plywood, Block board, Laminates, Particle board.</p> <p>Timber – Roof Truss, Types of doors & windows, Parts of a door and window. Timber door – Paneled & flush door, window and ventilator- casement, louvered. Door and window accessories, UPVC Windows</p> <ul style="list-style-type: none"> ➤ Drafting of <ol style="list-style-type: none"> 1. Timber paneled door 2. Window & ventilator ➤ Market survey – Industrial timber / Door and Window Fittings 	
MODULE 4 - PRACTICAL APPLICATION (10)	
<ul style="list-style-type: none"> ➤ Reading a soil report ➤ Industrial visit- RMC plant visit ➤ Industrial visit- Flush door manufacture 	
TEXT BOOKS	
1	Dr. P.C.Vergheese, "Building Materials "Prentice Hall India 2015
2	Dr.BalaGopal, "Building Design and Civil Engineering Drawing", Spades Publishers & Distributors, 2008
3	Dr.B.C.Punmia, "Building Construction" Laxmi Publications, 2008.
REFERENCE BOOKS	
1	W.B.Mckay , "Building Construction", Vol. 1,2,3- Longmans U.K 1992.
2	Don A.Watson, "Construction Materials and Processes", McGraw Hill Co., 1972.
3	Alanwerth, "Materials", The Mitchell Pub. Co. Ltd., London, 1986.
4	R.Chudley, "Building Construction Handbook", Butterworth-Heinemann Ltd; 4th Revised edition, 2001.

5	Stephen Emmit, Christopher A.Gorse, “Barry’s Introduction to Construction of Buildings”- Second edition, Wiley – Blackwell, 2013.
6	Stephen Emmit, Christopher A.Gorse, “Barry’s Advanced Construction of Buildings”- Second edition, Wiley – Blackwell, 2014.
E BOOKS	
1	https://theconstructor.org/
2	https://www.jsw.in/cement/product-related-faqs
3	https://www.ultratechcement.com/solutions/masons/basic-checks.php
4	https://www.nbmcmw.com/tech-articles/concrete/28675-use-of-manufactured-sand-in-concrete-and-construction-an-alternate-to-river-sand.html

COURSE TITLE	ARCHITECTURAL DESIGN – II			CREDITS	8
COURSE CODE	ARB4231	COURSE CATEGORY	PC	L-T-P-S	0- 0- 12- 0
CIA	60%			ESE	40%
LEARNING LEVEL	BTL-6				
CO	COURSE OUTCOMES				PO
1	To train students to solve design problems and give solutions based on simple typologies.				1,2,4,8,9
2	Research, analyse, understand and present case studies				4,5,6,7,8,10
3	Apply anthropometric and behavioural understanding on space dimensions and quality of spaces.				2,8,10
4	Present design solutions in the form of drawings				4,5,6,11
Prerequisites : Nil					
MODULE 1 - DESIGN STUDIO					(100)
<p>The problems involve simple space organization starting with single space single use -small span Horizontal movement - single bay - passive energy type spaces. The study of space standards and anthropometrics related to each problem is stressed upon. Anthropometry as related to physically handicapped and elderly persons are required to be studied.</p> <p>Examples of exercises include Design of toilet for a physically handicapped person, hostel room, bedroom, kitchen, Shop, pavilions, snack bar, Residence, petrol bunk, fire station, police station.</p>					
MODULE 2 - WORKSHOP II					(80)
<p>Elementary models indicating wall surfaces floral designs, ceilings, glass areas, lawn, water bodies, etc. Block models of small campuses using wood, thermacol mount board, soap, cork board, etc.</p> <p>Detailed model of a small buildings like branch bank, small residences, bus shelter, snack bar, including landscape details.</p>					
TEXT BOOKS					

1	De. Chiara and Callender, “Time-saver Standards for Building Types”, McGraw-Hill Co., New York, 1973.
2	The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.
3	Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series (1998)
4	Ed.By.Quentin Pickard RIBA “The Architects’ Hand Book”, Bladewell Science Ltd., 2002
REFERENCE BOOKS	
1	Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi, 1997
2	National Building book of India 2005, Bureau of Indian Standards, New Delhi
3	Macmillan Encyclopedia architects, Vol II, The free press, London, 1982
4	A visual dictionary of Architecture, Francis D.K.Ching, John wiley& Sons, Inc. 1997
E BOOKS	
1	www.design basics.com/ -(on house type –Americans)
2	http://www.geosystems.gatech.edu/ - (on detail designmethod)
3	http://www.c.s.berkely.edu/ - (on bubble diagram builder withinteraction)
4	http://www.plannet.com/resources.htm - (on resource info)

SEMESTER IV

COURSE TITLE	HISTORY OF ARCHITECTURE IV			CREDITS	3
COURSE CODE	ARB4216	COURSE CATEGORY	PC	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL-3				
CO	COURSE OUTCOMES				PO
1	To understand the architecture of Pre-war Europe				1,4,5,8,9
2	To understand the urban transformations in Early Europe				1,4,5,8
3	To analyse the various movements in architecture				1,5,8,9
4	To analyse the works of modern masters in architecture and their influence				1,5,8,9
5	To analyse the evolution and works of modern masters in architecture				1,4,5,8,9
Prerequisites : Nil					
MODULE 1 - ARCHITECTURE OF PRE-WAR EUROPE					(8)
Evolution of Modernity along social, cultural, technological, economic and political changes, Neo Classical architecture, Andrea Palladio, English Gothic revival, Brief on Neo-Classicism - Enlightenment Architects: Boullée and Ledoux, Vienna Secession					
MODULE 2 - URBAN TRANSFORMATIONS IN EARLY EUROPE					(8)
Art Nouveau and the works of Gaudí, Horta, Macintosh, Beaux Arts, Art Deco, Otto Wagner, Adolf Loos, Industrialization, Urban transformations in Europe and America. Housing projects. New building types and spaces, new industrialized materials and building techniques					
MODULE 3 - MOVEMENTS IN ARCHITECTURE					(8)
Peter Behrens, International style, Futurists Movement Manifestos and the works of Sant'Elia – Expressionism and the works of Mendelsohn, Taut, Polzeig - Cubism and Constructivism and its influence on Architecture - Destijl: Ideas and works					
MODULE 4	-	ARCHITECTURE	OF	MODERN	MASTERS -1
(12)					
Study of modern masters, responses to mechanisation and new space conceptions, organic architecture and architectural system of Frank Lloyd Wright, Walter Gropius and Bauhaus movement, Second phase of Industrial Revolution (development of automobiles and elevator technologies, rise of mass-production paradigm); Emergence of Modern Architecture, Chicago School, skyscraper development and Louis Sullivan					
MODULE 5 - ARCHITECTURE OF MODERN MASTERS -2					(9)
CIAM Congresses and Declarations, Le Corbusier's quest for ideal form and points of a new architecture, Mies, minimalism and international style, Works and Ideas - Later Works of Wright - Alvar Alto					
TEXT BOOKS					

1	Banister Fletcher, "A History of Architecture", University of London, 20 edition (1999)
REFERENCE BOOKS	
1	Kenneth Frampton, 'Modern Architecture: A Critical History', Thames & Hudson, London, 2007.
2	William J. Curtis, 'Modern Architecture since 1900', Phaidon Press, 1996.
3	ManfredoTafari, 'Modern Architecture', Harry N. Abrams Inc, 1980.
E BOOKS	
1	Alan Colquhoun, 2002, Modern Architecture, Oxford Press
MOOC	
1	https://ocw.mit.edu/courses/architecture/4-205-analysis-of-contemporary-architecture-fall-2009/

COURSE TITLE		BUILDING SERVICES –II (LIGHTING AND ILLUMINATION)		CREDITS	3
COURSE CODE	ARA4217	COURSE CATEGORY	BS	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL- 4				
CO	COURSE OUTCOMES				PO
1	Create comfortable living and workingcondition inside thebuilding.				1,2,4
2	To design buildings with good and satisfactory lighting.				3,8,9
3	To design a low energy building with passive methods to reduce our dependency onartificial energy based lighting.				3,8,9
4	To learn on interior lighting, exterior and landscape				5,10,11
5	Introduction of simulation software to know lighting and its effect in design				6,7,12
Prerequisites : Nil					
MODULE 1 - INTRODUCTION AND PHYSICS OF LIGHTING (7)					
Introduction to Eye & vision, Ambient Illumination, Refractive index values, Reflective index value, Luminous efficient Function, irradiance and illuminance. Luminous intensity. Inverse square law. Lambert’s Cosine Law. Colour Temperature, Lamps Efficacy. Radiometric and photometric standards					
MODULE 2 - DAYLIGHTING (12)					
General introduction to daylighting, benefits Daylighting, design issues, thermal aspects, built examples. Daylight design: Principles of day-lighting, architectural integration in different building types; daylight quality; sky view factor and Daylight factor calculations: Sky models CIE and perez, Split-Flux method, LEED/ GRIHA spreadsheet method. Building bye-laws related to day-lighting and natural ventilation. Standards and design requirements, Nomenclature and Norms Daylight design software.					
MODULE 3 - LAMPS, FITTINGS AND CONTROL (12)					

Types of Lamps. incandescents light, halogen lamps, Discharge Lamps (High Pressure mercury Vapour lamp, Metal Halide Lamp, High Pressure Sodium Lamps, Xenon Lamps), Fluorescent Lamp, CFL, LED.) Luminaries, Types of lens, Cove Lighting, Valance Lighting, Cornice Lighting, Track Lighting, Light Strip, Troffer, Wall Washer, Flood Light, Down Light, Spot light, spill, point and Area source	
Wiring, switching & control circuits Lighting control strategies, techniques & equipment, sensors and timers, switches versus dimming control algorithm, harmonics, from lighting equipment – its measurement and LPD (Lighting Power Density) Glare Index system	
MODULE 4 - LIGHTING IN THE INTERIOR SPACE, EXTERIOR AND LANDSCAPE (7)	
Interior lighting – Room surface inter-reflection, industrial, residential, office departmental stores, indoor stadium, theatre and hospitals, Flood Light, street light, transport lighting, lighting for displays - neon signs, LED - LCD displays beacons and lighting for surveillance	
MODULE 5 - INTRODUCTION TO SIMULATION SOFTWARE & FIELD MEASUREMENTS (7)	
Introduction to simulation software: Introduction to computer simulation for Daylight factor simulation, software like radiance in blender Daylight design software.	
Exercises: Optical design- reflector system, refractor system. Principal of lighting design Indoor lighting design by lumen method, by point method, Designing problem and solution and designing documentation	
TEXT BOOKS	
1	Physics of Light and Optics -Justin Peatross Michael Ware Brigham Young University
2	An Introduction to Interior Lighting Design - J. Paul Guyer, P.E., R.A.
3	Exterior lighting guide, by Federal Energy Management Program Handbook of Industrial Lighting- Stanley L. Lyons, Publisher - Butterworth-Heinemann
REFERENCE BOOKS	
1	National Building Code – Latest Version under Lighting design.
2	Energy Efficient Buildings in India- Published by TERI –2001
E BOOKS	
1	Fuller Moore, “Environmental Control Systems”,McGraw-Hill,Inc., New Delhi, 2003
MOOC	
1	https://www.udemy.com/course/introduction-sustainable-lighting-design/

COURSE TITLE	SURVEYING, LEVELLING AND SITE PLANNING			CREDITS	3
COURSE CODE	ARB4218	COURSE CATEGORY	BS	L-T-P-S	3- 0- 0- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL- 4				
CO	COURSE OUTCOMES				PO
1	Gain the knowledge about the usage and principles of various surveying instruments with proper care and adjustments.				3,7,10

2	Describe the bearing systems and the instruments used in chain surveying and plane table surveying	3,7,10
3	Use the instruments of levelling for levelling and contouring purposes.	3,7,10
4	Do the temporary and permanent adjustments of Vernier transit, measurement of horizontal and vertical angles using theodolite.	3,7,10
5	Know the various uses of total station, GIS and GPS instrument.	3,7,10
Prerequisites : Nil		
MODULE 1 - CHAIN SURVEY AND LEVELLING		(10)
Chain survey- Principles, classification - Instruments used - ranging, reciprocal ranging leveling- methods of leveling - booking and reduction of levels- longitudinal leveling, cross sectioning- errors in leveling, problems in leveling- contouring		
MODULE 2 - THEODOLITE SURVEY		(8)
Understand Theodolite survey- measurement of horizontal and vertical angles - problems tackled like center line of building- setting out angles, etc.		
MODULE 3 - CONTOUR SURVEY		(9)
Contouring methods- Characteristics and uses of contours- Understand and learn to survey sloping site making of contour plan and section		
MODULE 4 - ADVANCED SURVEYING		(9)
Introduction and fundamental concepts of electronic measuring instruments – EMD, Total station, Geographic Information System (GIS) and Global Positioning System (GPS)		
MODULE 5 - SITE PREPARATION AND BUILDING LAYOUT		(9)
Making site fit to start construction activities - Barricading the site, making arrangements for site office, stores, temporary accommodation of workers etc. with necessary power and water connections- Marking and plotting roads, pathways, buildings and other facilities on site with center/grid lines.		
Practical Exposure in using surveying equipment to be given to the students.		
TEXT BOOKS		
1	Punmia B.C., "Surveying", Laxmi Publications Private Limited, 2005.	
2	Venkataramaiah, "Text book of Surveying", University Press, 2006.	
3	Kevin Lynch, Site Planning, MIT Press Cambridge, 2008	
REFERENCE BOOKS		
1	Joseph De. Chiara and Lee Copleman, Planning Design Criteria Van Nostrand Reinhold Co., New York.	
2	Beer R, Environmental Planning for Site development, Turner, Landscape Planning and Environmental Impact Design.	

3	T.P.Kanetkar, S.V.Kulkarni, “Surveying and Levelling”, Vol I, Pune VidyarthiGriha Prakashan,2004
4	Arora.K.R. “Surveying”, Vol I, Standard Book, New Delhi,2009
5	Kanetkar T.P., and Kulkarni.S.V., “ Surveying and Levelling (Part-1)” , Pune, VidyarthiGrihaPrakashan.
6	P.B. Sahani, “Modem Surveying”, Nemichand& Bros., Roorkee,UP.
E BOOKS	
1	https://civilmentor.com/levelling/
2	https://theconstructor.org/surveying/types-of-leveling-methods/14679/
3	http://www.civileblog.com/levelling/

COURSE TITLE		CLIMATE AND BUILT ENVIRONMENT			CREDITS	3
COURSE CODE		ARB4219	COURSE CATEGORY	BS	L-T-P-S	3- 0- 0- 0
CIA		50%			ESE	50%
LEARNING LEVEL		BTL- 4				
CO	COURSE OUTCOMES					PO
1	To Control heat flow through buildings and apply principles of thermal design in built environment to control thermal radiation of different buildingfacades androof.					1, 8, 9
2	To Create comfortable living and workingcondition inside thebuilding.					2, 7, 12
3	To design buildings with good and satisfactory acoustics.					2, 3,10
4	To learn on the principles to design buildings based on various climatic zones.					4, 5, 10
5	To design a low energy building with passive methods to reduce our dependency onartificial energy based lighting, cooling and heating of buildings.					4, 6, 11
Prerequisites : Nil						
MODULE 1 - ELEMENTS OF CLIMATE						(12)
Introduction to climate and weather, atmosphere, Tilt in earth’s axis and Earth-sun relationship - Elements of climate-temperature, humidity, vapor pressure, precipitation, driving rain, sky conditions, solar radiations, wind and vegetation, climatic data and its measurement, methods of representing climatic data in the form of tables, graphics etc., five useful values - Introduction to Global climate, earth thermal balance, solar radiation-quality and quantity, spectrum of solar radiation, passage of radiation through atmosphere global wind pattern, classification of tropical climate, climatic zones, tropical climate, warm humid climate, warm humid island climate, hot- dry desert climate, hot- dry maritime desert climate, composite or monsoon climate, tropical upland climate - Site climate/micro climate- effect of site conditions on various climatic elements, variation from climate of the region.						
MODULE 2 - COMFORT AND THERMAL COMFORT INDICES						(9)

<p>Introduction to thermal comfort factors - Heat production of human body - Thermal balance of human body and effect of prolonged exposure to extreme climatic conditions - Thermal comfort indices, comfort scale, Effective Temperature, Corrected Effective Temperature, Resultant temperature and other indices with special emphasis on tropical thermal index, bio climatic and Psychro-metric chart - Effective temperature and its use - Revisions of ET scale, Mean radiant temperature, Finding the CET, Kata thermometer, Comfort zone, Use of CET, Climate analysis with CET, Effective Temperature histogram, ET isopleths</p>	
<p>MODULE 3 - MEANS OF THERMAL CONTROL (8)</p>	
<p>Introduction to thermal control, passive and active methods, potential of climatic control, objectives of thermal control - Structural, constructional or architectural controls- need for architectural control, thermal insulation and solar control - Cooling by ventilation, earth tunnel, evaporative cooling, cooling by other passive methods - Building orientation, four principle orientations, climatic elements influencing orientation - Openings and fenestrations, effect of shading devices, accessories, blinds and curtains.- Introduction to different types of shading devices – horizontal shading devices, vertical shading devices, egg- crate shading devices, adjustable and moveable shading devices - Shadow angles, Sun path diagrams/Solar chart for different latitudes, design and calculation of projection of shading devices.</p>	
<p>MODULE 4 - PRINCIPLES OF CLIMATIC DESIGN AND SHELTERS IN DIFFERENT CLIMATIC ZONES (8)</p>	
<p>Introduction to climatic design - Climatic design at settlement planning and urban design stage - Climatic design at architectural design and construction stage Nature of the climate - Major climatic issues involved affecting design of the shelters in Hot- Dry and Maritime desert climates, Warm-humid climates, Composite climates and Tropical Upland climates with emphasis on - Functional and climatic requirements, Shape and form of the shelters - planning, outdoor / Semi out door spaces - External surfaces and finish, Openings/fenestration and shading devices - Ventilation and Air movement.- Vernacular architecture in the above climatic zones.</p>	
<p>MODULE 5 - INTRODUCTION TO SIMULATION SOFTWARE & FIELD MEASUREMENTS (8)</p>	
<p>Introduction to simulation software: simulation for shading device design, extracting and analyzing climatic data. software like Ecotect software, Wind flow analysis, Online Tools of Dr. Andrew Marsh for sun path diagram, Exercises: field measurement of a site using the available physical apparatus and design solution.</p>	
<p>TEXT BOOKS</p>	
1	O.H. Koenigsberger and others, “Manual of tropical housing and building climatic design”, University press, Chennai,2010.
2	A.Konya, Design Primer for Hot Climates, Architectural Press,London,2002
3	Energy Efficient Buildings in India- Published by TERI –2001
<p>REFERENCE BOOKS</p>	
1	Arvind Krishnan, “Climate Responsive Architecture- A Design Handbook for Energy Efficient Buildings”, Tata Mc.Graw Hill publications Co.,Ltd,NewDelhi,2004
2	Energy Efficient Buildings in India- Published by TERI –2001

3	M.Evans, “Housing, Climate and Comfort” , Architectural Press,London,2002
4	Joseph de Chiarra and Le Copplemann, “Planning and Design Criteria”,Mc.Graw-Hill, New York2006
5	B.Givoni, Man, “Climate and Architecture, Applied Science”, Banking Essex,2004
6	Ms.Sudha, N.K.Bansal and M.A.S.Malik, “Solar Passive Building “, PergamonPress.
E BOOKS	
1	https://akmedia.press/med-67280/00711272401 . Fuller Moore, “Environmental Control Systems”,McGraw-Hill,Inc., New Delhi, 2003
MOOC	
1	https://www.pok.polimi.it/courses/course-v1:Polimi+SustArch102+2019_M6/about

COURSE TITLE		DESIGN OF STEEL AND COMPOSITE STRUCTURES		CREDITS	3	
COURSE CODE		ARA4220	COURSE CATEGORY	BS	L-T-P-S	3- 0- 0- 0
CIA		50%			ESE	50%
LEARNING LEVEL		BTL- 4				
CO	COURSE OUTCOMES				PO	
1	Understand the need for steel structure, and the concept of abstract and detailed Design of steel Structure.				3,7,8	
2	Understand importance and contribution of Bolt Connections , Weld connections				3,4,7	
3	Design steel beams for simply Support Condition.				3,4,7	
4	Design steel column for the various Support Condition.				3,4,7	
5	Understand the concept of composites				3,4,7,8	
Prerequisites : Nil						
MODULE 1 - PROPERTIES OF STEEL & INTRODUCTION TO LIMIT STATE DESIGN					(10)	
Structural properties of steel – codal provisions and design requirements of steel - Limit state - characteristic load and characteristic strength of materials - partial safety factor - stress-strain relationship of steel – yielding, plastic hinge, plastic section modulus, plastic moments-safety and serviceability requirements.						
MODULE 2 - STEEL CONNECTIONS					(12)	
Types of Connections - Bolted joints - arrangement of bolts –Welding -Types of Welding.						
MODULE 3 - STEEL BEAMS					(14)	
Allowable stresses, General specifications, Design of laterally supported beams-check for deflection.						
MODULE 4 - STEEL COLUMNS					(12)	
Allowable stresses, various shapes, built - up sections, Design of columns –simple cross sections only.						
MODULE 5 - COMPOSITE SECTIONS					(12)	

Introduction to steel concrete composite structures - concepts and Theory-Advantages of Composite sections.	
NOTE: Reference to IS codes and tables be permitted in the examination.	
TEXT BOOKS	
1	Comprehensive Design of Steel Structures, Purnia, A.K Jain, Lakshmi Publications, Delhi 2009
2	Ramachandra S., "Design of Steel Structures", Standard Book House, Delhi, 2006.
3	Composite Structures of Steel & Concrete: Beams, Slabs, Columns & Frames for buildings, Volume-1, R.P Johnson,2013
REFERENCE BOOKS	
1	IS 800:2007 General Condition in Steel – Code of practice
2	Johnson R.P., Composite Structures of Steel and Concrete, Blackwell Scientific Publications (Second Edition), UK, 2012.
MOOC	
1	https://nptel.ac.in/courses/105/105/105105162/
2	https://nptel.ac.in/noc/courses/noc19/SEM2/noc19-ce25/

COURSE TITLE	MATERIAL AND CONSTRUCTION III			CREDITS	3
COURSE CODE	ARA4226	COURSE CATEGORY	BS	L-T-P-S	1- 0- 4- 0
CIA	50%			ESE	50%
LEARNING LEVEL	BTL- 4				
CO	COURSE OUTCOMES				PO
1	To Understand the progressive achievements of cast iron to steel, types of steel. Its properties, application in construction industry and present developments.				1,3,9
2	To Understand the steel in foundation, columns, beams and roofs. Details on steel stair cases, doors, windows.				1,2,5
3	To Understand and learn construction of steel frame structure building.				3,4,9
4	To Understand properties and use of ferrous and non- ferrous metals in building industry.				1,3,9
5	To Understand in detail how aluminum, its alloys and its products are used in construction industry.				3,4,9
Prerequisites : Nil					
MODULE 1 - IRON AND STEEL					(10)
Brief study on manufacture, properties and uses of cast iron, wrought iron, pig iron and steel anticorrosive measures for steel, mechanical and heat treatment of steel, market forms of steel, structural steel, stainless steel, steel alloys, properties and uses of current developments .- Steel rolled sections.					
MODULE 2 - STEEL TRUSSES AND STEEL FRAME BUILDING					(28)

Understand different types of steel trusses supported by brick pier, RCC column and steel structures with MS sections, load transfer, tensile & compressive members, terminology used, joints in trusses. - Roof covering sheets, G.I. and cement corrugated sheets, P.V.C and F.R.P Sheets, Aluminum and coated steel profiled sheets etc, fixing details - Types of connections and joints in steel, steel frame building, steel foundations, columns/ stanchons / and beams/girders .- Joints between different steel structural members in different locations and detailing.	
MODULE 3 - STEEL STAIRS AND OPENINGS	(14)
Steel staircases and handrails, balusters, standard doors and windows, collapsible gates, rolling shutters.	
MODULE 4 - NONFERROUS METALS	(8)
Aluminum and aluminum alloys, brief study on properties and uses, aluminum products extrusions, foils, castings, sheets, etc. - Brief study of other non- ferrous metals like copper, bronze, brass, tin and lead, properties and uses - Current developments.	
MODULE 5 - ALUMINUM DOORS, WINDOWS AND FIXED GLAZING	(15)
Aluminum openable, sliding, sliding and folding glazed/panelled doors - Aluminum openable, sliding windows and fixed glazing - Aluminum fixed glazing for showrooms, shops, showcases, etc.	
STUDIO PRACTICALS / SESSIONAL WORKS AND ASSIGNMENTS	
Manual drafting of Construction drawing sheets/plates, of selected topics in standard format - Periodic visits to the construction sites- Notes /sketches and Site visit reports. Note: Drawing sheets/plates will be evaluated continuously.	
TEXT BOOKS	
1	S.C.Rangwala , “Engineering Materials”, Charotar Publishing House, India, 2007.
2	W.B.Mckay, “Building Construction”, Vol. 1, 2,3- Longmans U.K 2010.
3	Dr.B.C.Punmia, “Building Construction”, Laxmi Publications Pvt. Ltd., New Delhi, 2005.
4	Arthur Lyons, “Materials for Architects and Builders an Introduction” Arnold, London, 2004.
REFERENCE BOOKS	
1	W.B.Mckay , “Building Construction”, Vol. 1,2,3- Longmans U.K 1992.
2	Don A.Watson, “Construction Materials and Processes”, McGraw Hill Co., 1972.
3	Alanwerth, “Materials”, The Mitchell Pub. Co. Ltd., London, 1986.
4	R.Chudleu, & R Greeno, “Building Construction Handbook”, Butterworth-Heinemann Ltd; 7th Revised edition, Elsevier 2008.

COURSE TITLE	ARCHITECTURAL DESIGN IV			CREDITS	10
COURSE CODE	ARB4241	COURSE CATEGORY	PC	L-T-P-S	0-0-15-0
CIA	60%			ESE	40%
LEARNING LEVEL	BTL- 6				
CO	COURSE OUTCOMES				PO

1	Understand more about rural materials, construction techniques and design details	2,3,5,6
2	To learn about Rural environment and document it using various parameters	2,3,5,6
3	To analyse a living environment using visual, socio economic, physical, infrastructure and housing details	2,3,5,6
Prerequisites : Nil		
MODULE 1 - DESIGN STUDIO		(60)
Problem related to multi room, single use, and small span - multiple story, Horizontal and vertical movement, Active cum passive energy, conventional and frame type buildings. Examples: Departmental store, Library, higher secondary school, campus student's center, etc. The projects will consciously provide for movement and use by the physically handicapped and elderly.		
MODULE 2 - DESIGN STUDIO - RURAL STUDY		(120)
Problems related to Rural Housing - Visits to selected village - surveys on socio-economic, physical, housing and surveys, etc. to study existing conditions - analysis of survey data - preparation of report, documentation and presentation in a seminar - preparation of design brief solutions for housing and community facilities.		
TEXT BOOKS		
1	De. Chiara and Callender, "Time-saver Standards for Building Types", McGraw-Hill Co., New York,1973.	
2	The Handbook of Building Types., NEUFERT ARCHITECTS DATA, New International edition, second international edition. BSP Professional Books. Oxford (1980) Blackwell scientific Publications.	
3	Time – Saver Standards for Architectural Design Data, seventh edition. The reference of architectural fundamentals McGraw hill international edition, architectural series(1998).	
4	Ed.By.Quentin Pickard RIBA "The Architects' Hand Book", Bladewell ScienceLtd., 2002	
REFERENCE BOOKS		
1	Handbook on Building Construction Practices (Excluding Electrical Work). Bureau of Indian Standards, New Delhi,1997	
2	National Building book of India 2005, Bureau of Indian Standards, NewDelhi	
3	Macmillan Encyclopedia architects, Vol II, The free press, London,1982	
4	A visual dictionary of Architecture, Francis D.K.Ching, John wiley& Sons, Inc.1997	
E BOOKS		
1	http://www.focusnet.co.uk/cib/library/physdishous94.htm	
2	http://www.ourvirtualmall.com/cloth.htm	
3	http://www.ddimagazine.com/	
4	http://www.atlasmagazine.com/photo/lande6	

SEMESTER V

COURSE TITLE	CONTEMPORARY ARCHITECTURE			CREDITS	3
Course Code	ARB4301	Course Category	PC	L-T-P-C	3-0-0-3
CIA	50 %			ESE	50%
LEARNING LEVEL	BTL			ASSESSMENT MODEL	
Prerequisites : Nil					
CO	COURSE OUTCOMES				PO
1.	The course indulges on Late Modern movement and its impact on architecture				
2.	Outline the emergence of post modern architecture- Ideas, philosophies from the pioneers of the movement.				
3	Detail understanding of Changes in Architectural approaches in late 20th and early 21st century. Influence of digital process in developing complex designs.				
4.	Outline the Modern movements happened post independent. Influence of urbanism cited with the works of Modern masters of Indian Architecture.				
5.	Understanding and transformation happened in in Late 1990 which led to the development of contemporary architecture.				
MODULE 1: LATE MODERN ARCHITECTURE					(9)
The factors which contributed to late modern architecture- Principles & Philosophy world view. Work of architects - Louis Khan, Oscar Niemeyer, Eero Saarinen, Richard Rogers, and Philip Johnson.					
MODULE 2: POST MODERN ARCHITECTURE					(12)
Emergence of Post modernity outlines the changes which include the realms of Economics, Technology, Culture, Society and Environment. Ideas and works of –Michel Graves – Peter Eisenman , I.M.Pei , Kenzo Tange , Arata Isozaki. Critical regionalism, works and ideas of Hassan Fathy, Geoffrey Bawa , Tada Ando, Laurie Baker					
MODULE 3: CONTEMPORARY ARCHITECTURE					(9)
Overview of larger changes in society from late 20th century and their influence. Outline of architecture related to Deconstructivism , Globalization, Advanced technology, Modern building materials, Complex designs with digital phenomenology. Works of Frank Gehry –Sir Norman Foster-Zaha Hadid - Bjarke Ingels – Cesar Pelli.					
MODULE 4: MODERN ARCHITECTURE OF INDIA					(9)
Nehruvian nation building initiatives; Works of Le Corbusier and Louis Kahn in India and their influences on Indian architects; New capital cities (e.g. Bhubaneswar, Chandigarh and Gandhinagar); Architecture and urbanism- by great Indian masters: A. Kanvinde, Raj Rewal ,B.V Doshi, Charles Correa.					
MODULE 5: CONTEMPORARY INDIAN ARCHITECTURE					(6)
Change in architecture trends from late 1990, influence of globalization and its impacts. Works of contemporary masters Hafeez Contractor, Christopher Benninger, Sanjay Moha, Sonali and Mani Rastogi. Architects practicing Sustainability – Chitra K. Vishwanath, Sanjay Prakash Varnashi, G.Shankar, Dr. Benny Kuraikose.					

Reference Books	
1	Kenneth Frampton, 'Modern Architecture: A Critical History', Thames & Hudson, London,2007.
2	Banister Fletcher, “A History of Architecture”, University of London, 20 edition (1999)
3	Morphogenesis – The Indian Context
4	Christopher Benninger – Architecture of Modern India

COURSE TITLE	BUILDING SERVICES III (HVAC)			CREDITS	3
Course Code	ARB4302	Course Category	BS	L-T-P-C	3-0-0-3
CIA	50 %			ESE	50%
LEARNING LEVEL	BTL			ASSESSMENT MODEL	

Prerequisites : Nil

CO	COURSE OUTCOMES	PO
1.	To understand the basics of air conditioning and the physics behind the same.	1, 8
2.	To be able to understand the options available in the market for choosing the correct air conditioning for the buildings.	2, 12
3	To understand the various application air conditioning in various building typology.	2, 3,10
4.	To understand and appropriately suggest the air conditioning with optimal energy use.	3, 8, 10
5.	To be able to understand sizing and spatial requirements of the air conditioning equipments.	2, 6, 11

UNIT 1 INTRODUCTION TO AIR CONDITIONING

9

Thermodynamics, modes of heat transfer conduction, convection and radiation. Sensible heat, Latent heat, terms & units for measurement for A/C system “TON”. British units and SI units. Basic of refrigeration systems - components of refrigeration system - Vapour compression cycle, Concepts of cooling, transmission heat load - internal heat gain - concepts of zoning - room air distribution

UNIT 2 AIR CONDITIONING SYSTEMS

9

Air conditioning system for small buildings - window types, evaporative cooler, packaged terminal units and through the wall units split system, Systems for large building - Chilled water plant - All Air system, All water system Configuring/ sizing of mechanical equipment, equipment spaces and sizes for chiller plant, cooling tower, Fan room, Circulation Pumps, Pipes, ducts.

UNIT 3 COMPONENTS OF SMALL AND LARGE CONDITIONING SYSTEMS

9

Cooling Tower Cooling Tower Fan & Motor, Air Cooled Chiller, Water Cooled Chiller, Fan Coil Units, Air Handling Units, 1) Indoor air loop 2) Chilled water loop 3) Refrigerant loop 4) Condenser water loop 5) Cooling water loop. VRV Systems, VRF Systems, VSD, VAV system

UNIT 4 ENERGY EFFICIENT & SPECIAL FEATURES

7

Industrial heat pumps, Air conditioning systems Cold storages, Typical Thermal Storage, Choice of Refrigerants, GWP and ODP. Various protocols and industrial practices

UNIT 5 SIZING OF AIR-CONDITIONING

11

Mechanical equipments and rating, basic heat load calculation of a residential building, choosing of equipments. Architectural detailing, spatial layout. Eg. Working out a A/C load and laying out of spatial

planning for building types like residence or Small office building or super market.

TEXT BOOKS & REFERENCES

1. Bureau of Indian Standards.
2. Design Guide for Heating, Ventilating, and Air Conditioning Systems - Shan K. Wang
3. ISHRAE HVAC-HANDBOOK
4. Bureau of Energy Efficiency
5. Sawhney, G. S. (2006). Fundamentals of Mechanical Engineering: Thermodynamics, Mechanics & Strength of Materials. New Delhi : Prentice Hall of India.
6. Willim, J. McG. (1971). Mechanical & Electrical Equipment for Buildings

WEBSITES:

<https://beeindia.gov.in/>
<https://ishrae.in/>

COURSE TITLE		MATERIAL AND CONSTRUCTION IV		CREDITS	3	
COURSE CODE		ARB4304	COURSE CATEGORY	BS	L-T-P-S	1-0-4-0
CIA		50%		ESE	50%	
LEARNING LEVEL		BTL-5				
CO	COURSE OUTCOMES				PO	
1	To understand the different modes of vertical transportations in building and its spatial requirements and construction methodology and to be able to design the same for various building types.				1,8,9	
2	To understand and apply the fire safety norms for various building types. To design fire safety layout in connection to the Architectural design studio.				2,8,9	
3	To understand various				1,8,9	
4	To understand in detail damp and waterproofing for various parts of the building.				1,11,12	
5	To understand the importance of electrical and plumbing in architectural design. Electrical and plumbing layouts to be designed in connection to the architectural design studio.				4,11,12	
Prerequisites : Nil						
MODULE 1: VERTICAL TRANSPORTATION					(15)	
NBC guidelines - lifts, stairways, ramp design, fire escapes routes, accessibility for disabled: Drawings of Architectural details: details of Lifts, Staircase, ramp details, escalators, dump-waiter						
MODULE 2: FIRE SAFETY: DESIGN AND GENERAL GUIDELINES					(15)	
Fire safety design principles _ NBC Planning considerations in buildings - Non Combustible materials, egress systems, Exit Access - Distance between exits, exterior corridors - Doors, Smoke proof enclosures. General guidelines for egress design for Auditoriums, concert halls, theatres, other building types, window egress .Drawings of Architectural details Locations, spacing and other considerations for the fire extinguishers & cabinets, wet risers, Dry rises, fire hose reels, sprinklers spacing in the office, Fire alarm position. Exit fire rated Door details (including the ironmongery), Smoke stop lobbies, other smoke barrier between floors.						
MODULE 3 - AIR CONDITIONING AND THERMAL PROTECTION					(15)	

<p>Thermal insulation - Heat transfer and heat gain by materials - vapour barrier- Commonly used insulation materials in buildings - Drawings of architectural details and material applications of floors, walls and roofs in various situations - e.g. Cold storage, Air conditioned office spaces, insulation for ducts, AHU rooms, Layout of Chiller plant, AHU, Cooling towers .</p>	
MODULE 4 - DAMP AND WATERPROOFING (15)	
<p>Damp proofing hot applied and cold applied emulsified asphalt, bentonite clays, butyl rubber, silicon, vinyl's, Epoxy resins and metallic waterproofing materials properties. Waterproofing membranes such as rag, asbestos, glass, felt plastic and synthetic rubber, vinyl, butyl rubber, neoprene polyvinyl chloride (PVC) prefabricated membranes sheet lead, asphalt properties and uses. Application of the above under various situations and tanking for basements, swimming pool, terraces, etc.</p>	
MODULE 5 - PLUMBING AND ELECTRICAL (15)	
<p>Drawings of construction details. Plumbing: Domestic water supply, hot water supply, Gray water, soil pipes, Dual water supply flushing and domestic water supply. Spatial requirements for shafts. Electrical: Location and sizes of transformers, RMG/ Panel room, Electrical room, Room DB, Spatial requirements for shafts.</p>	
TEXT BOOKS	
1	William Barr McKay, McKay's Building Construction, 2015.
REFERENCE BOOKS	
1	National building codes of India, Bureau of Indian standards, 2017
2	Robert Brown Butler, Architectural Engineering Design:Mechanical System, 2004
3	Frederick S. Merritt & Jonathan T. Ricketts, BUILDING DESIGN AND CONSTRUCTION HANDBOOK , 6th Edition
E BOOKS	
1	Frederick S. Merritt & Jonathan T. Ricketts, BUILDING DESIGN AND CONSTRUCTION HANDBOOK , 6th Edition

**ELECTIVES
SEMESTER V**

COURSE TITLE	VISUAL COMMUNICATION AND ARCHITECTURE			CREDITS	3
Course Code	ARB4205	Course Category	DE	L-T-P-C	3-0-0-3
CIA	50 %			ESE	50%
LEARNING LEVEL	BTL 5			ASSESSMENT MODEL	
Prerequisites : Nil					
CO	COURSE OUTCOMES				PO
1.	To identify the apt visual communication tool for any presentation				1,3,7,10,12
2.	To be able to design graphic details for presentation content digitally and manually				1,3,9,10
3	To incorporate architecture technology in way finding within an area				1,5,9
4.	To design an appropriate installation in indoors and outdoors				1,3,10,12
5.	To be able to take good photographs and also present one's work by this medium				1,3,5,7,8,10,12
MODULE 1:INTRODUCTION TO VISUAL COMMUNICATION					(8)
Need for and the Importance of Human and Visual Communication. Communication an expression, skill and process. Relation between visual communication and architecture. Theories and Philosophies of Visual Communication					
MODULE 2: GRAPHIC DESIGN					(8)
Basics of Graphic Design. Definition, Elements of GD, Design process-research, a source of concept, the process of developing ideas-verbal, visual, combination & thematic, visual thinking. Problem associated with editing and manipulation of image/pictures using PhotoShop/Corel Draw. Associative techniques, materials, tools (precision instruments etc.) design execution, and presentation					
MODULE 2:WAY FINDING IN ARCHITECTURE					(12)
Basics of Way finding in complex built environments. Study of semiotic theory. Study of signs and signages and their application in built environment. Use of advanced computer applications such as mobile augmented reality and RFID tagging in process of way finding in indoor environment. Use of GPRS and GPS for way finding in outdoor environment.					
MODULE 4: INSTALLATION ART AND ARCHITECTURE					(8)
Introduction to Digital sculpture and installation art and their association to architecture. Integration of Open spaces and public spaces with installations. Study of works of Contemporary Installation artist. Conceptual design of Installation for place architecture.					
MODULE 5: ARCHITECTURAL PHOTOGRAPHY					(9)
Human Eye and Camera. Basics of Camera and its operations. Types of Camera. Visual Perception. Perception of Colour, depth, lighting, foreground, mid ground, and background in architectural photography. Visual Documentation of Architectural projects. Image processing, Editing/Post production. Preparation of port folio					

Reference Books	
1	Overlooking the Visual: Demystifying the Art of Design Paperback – Import (2009) by Kathryn Moore
2	Louis Smith, Kenneth (2005) Handbook of Visual Communication: Theory, Methods and Media, Lawrence Erlbaum Associates.
3	Lester, Paul Martin, (2010) Visual Communication: Images with Messages, Thompson Wadsworth, USA
4	Hembree, Ryan (2008) The complete graphic designer : a guide to understanding graphics and visual communication, Beverly, Mass. : Rockport Publishers
WEBSITES	
1.	https://www.ripublication.com/irph/ijert_spl17/ijertv10n1spl_20.pdf
2.	https://arch.usc.edu/courses/420
3.	https://archinect.com/umsoa

COURSE TITLE	SITE PLANNING AND LANDSCAPE			CREDITS	3
Course Code	ARC 4354	Course Category	DE	L-T-P-C	2-0-0-2
CIA	50 %			ESE	50%
LEARNING LEVEL	BTL			ASSESSMENT MODEL	

Prerequisites : Nil

CO	COURSE OUTCOMES	PO
1.	Understand the factors on and off around a site and investigate the approaches for influencing space design.	
2.	Outline the importance of natural features on site and how it interprets each other in developing a site – Terrain and vegetation	
3.	Analyzing the site with the existing land conditions.	
4.	Outline the hydrological features and its impact in site planning	
5.	Understand the principles through which effective site planning and landscape can be undertaken.	

MODULE 1:INTRODUCTION -: SITE INTERPRETATION (7)

Approach towards planning open spaces – Typology of open spaces - open spaces with respect to buildings - roads, play areas, water bodies, etc. – factors at site and around site influencing open space design – Neighbourhood factors influencing site – Vegetation – Soil study – Slope study – Hydrology

MODULE 2: PRESERVATION & PROTECTION (6)

Natural Site Design - Preservation of Natural Vegetation - Riparian Buffer Zones -Wetlands - Floodplains - Steep Slopes - Vegetation mapping – Understanding the different strata of vegetation – ground cover, shrubs, trees, vines and climbers – Fauna of region - appreciating their unique and intrinsic characteristics of site and its surroundings and learning to decide nature of engaging with each.

MODULE 3:LAND AND SITE UTILIZATION (4)

Soil Properties - Reduce Limits of Clearing & Grading - Fit the Design to the Existing Terrain - Utilize Undisturbed Areas & Natural Buffers – Erosion due to run off

MODULE 4: SURFACE DRAINAGE / HYDROLOGY (5)

Natural Drainageways vs. Storm Sewers - The carrying capacity - the watershed study - surface hydrology – Swales – Vegetated waterways – Erosion – sedimentation in reservoirs – check dams, dykes	
MODULE 5: PLANNING PRINCIPLES (8)	
Creative Development Design -Roadway Design -Building Footprints -Parking Lot -footprints -Setbacks & Frontages – Comprehensive study of all factors – Erosion control – Retention ponds	
Reference Books	
1	Site Analysis Diagramming Information For Architectural Design – Edward T. White
2	Site planning by Kevin Lynch and Gary Hack
3	“Landscape Architect’s Portable Handbook”, Nicholas T Dines& Kyle D Brown, 2001 by McGraw Hill Companies, Inc.
4	The Living Landscape –An Ecological approach to Landscape Planning”, Frederick Steiner, 2001, by McGraw Hill Companies, Inc.
5	Landscape Architecture Theory: An Ecological Approach, 2016 by Michael Murphy, Island Press
WEBSITES :	
https://www.wbdg.org › design-disciplines	
https://www.buildinggreen.com › feature	
www.rri.wvu.edu › mcbride › section3	
https://pubs.usgs.gov › circ1139 › htdocs	