

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**YEAR I**

**SEMESTER I**

**THEORY**

S.No.	Code No.	Subjects	L	T/S	Exam. Hrs.	20% Mid Term Ass.	80% End Term Ass.	Total Marks
1.	1AR1	English	1	0	2	10	40	50
2.	1AR2	Mathematics	2	1	3	20	80	100
3.	1AR3	Construction Materials- I	2	1	3	20	80	100
4.	1AR4	Architectural Structures-I	2	1	3	20	80	100
		<b>Sub Total</b>	<b>7</b>	<b>3</b>		<b>70</b>	<b>280</b>	<b>350</b>

**SESSIONAL**

S.No.	Code No.	Subjects	L	T/S	60% Mid Term Ass.	40% End Term Ass.	Total Marks
5.	1AR5	Architectural Drawing- I	2	4	150	100	250
6.	1AR6	Arts & Graphics- I	1	3	60	40	100
7.	1AR7	Building Construction- I	1	3	60	40	100
8.	1AR8	Introduction to Computers-I	1	2	30	20	50
9.	1AR9	Workshop Practice (Photography, Carpentry & Model Making)	1	2	60	40	100
10.	1AR10	Discipline & Extra Curricular Activities	0	0	30	20	50
		<b>Sub Total</b>	<b>6</b>	<b>14</b>	<b>390</b>	<b>260</b>	<b>650</b>
		<b>Grand Total</b>	<b>30 Periods/Week</b>				<b>1000</b>

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**YEAR I**

**SEMESTER II**

**THEORY**

S.No.	Code No.	Subjects	L	T/S	Exam. Hrs.	20% Mid Term Ass.	80% End Term Ass.	Total Marks
1.	2AR1	Ecology & Environment	2	1	3	20	80	100
2.	2AR2	Construction Materials II	2	1	3	20	80	100
3.	2AR3	Architectural Structures-II	2	1	3	20	80	100
4.	2AR4	Introduction to Architecture	1	1	2	10	40	50
		<b>Sub Total</b>	<b>7</b>	<b>4</b>		<b>70</b>	<b>280</b>	<b>350</b>

**SESSIONAL**

S.No.	Code No.	Subjects	L	T/S	60% Mid Term Ass.	40% End Term Ass.	Total Marks
5.	2AR5	Architectural Drawing- II	2	4	150	100	250
6.	2AR6	Basic Design & Field Trip	1	3	60	40	100
7.	2AR7	Arts & Graphics- II	1	3	60	40	100
8.	2AR8	Building Construction II	1	3	60	40	100
9.	2AR9	Introduction to Computers- II	1	2	30	20	50
10.	2AR10	Discipline & Extra Curricular Activities	0	0	30	20	50
		<b>Sub Total</b>	<b>6</b>	<b>15</b>	<b>390</b>	<b>260</b>	<b>650</b>
		<b>Grand Total</b>	<b>32 Periods/Week</b>				<b>1000</b>

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**YEAR II**

**SEMESTER III**

**THEORY**

S.No.	Code No.	Subject	L	T/S	Exam Hrs	20% Mid-Term Assessment	80% End-Term Exam	Total Marks
1	3AR1	History of Architecture-I	2	1	3	20	80	100
2	3AR2	Building Science-I (Climatology)	1	1	3	20	80	100
3	3AR3	Construction Materials-III	1	1	3	20	80	100
4	3AR4	Architectural Structures-III	1	1	2	10	40	50
<b>Sub.Total</b>			<b>5</b>	<b>4</b>		<b>70</b>	<b>280</b>	<b>350</b>

**SESSIONALS**

S.No.	Code No.	Subject	L	T/S	60% Mid-Term Assessment	40% End-Term Asses.	Total Marks
5	3AR5	Architectural Design-I (Including Measured Drawing camp)	0	9	150	100	250
6	3AR6	Theory of Design-I	1	1	60	40	100
7	3AR7	Arts & Graphics-III	1	2	30	20	50
8	3AR8	Building Construction-III	1	3	60	40	100
9	3AR9	Structure Lab-I	0	2	30	20	50
10	3AR10	Computer Application in Architecture-I	0	2	30	20	50
11	3AR11	Discipline & Extra Curricular Activities	0	0	30	20	50
<b>Sub.Total</b>			<b>3</b>	<b>19</b>	<b>390</b>	<b>260</b>	<b>650</b>
<b>Grand Total</b>				<b>31 Periods/week</b>			<b>1000</b>

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**YEAR II**

**SEMESTER IV**

**THEORY**

S.No.	Code No.	Subject	L	T/S	Exam Hrs	20% Mid-Term Assessment	80% End-Term Exam	Total Marks
1	4AR1	History of Architecture-II	2	1	3	20	80	100
2	4AR2	Surveying	1	1	3	20	80	100
3	4AR3	Construction Materials-IV	1	1	3	20	80	100
4	4AR4	Architectural Structures-IV	1	1	2	10	40	50
<b>Sub. Total</b>			<b>5</b>	<b>4</b>		<b>70</b>	<b>280</b>	<b>350</b>

**SESSIONALS**

S.No.	Code No.	Subject	L	T/S	60% Mid-Term Assessment	40% End-Term Asses.	Total Marks
5	4AR5	Architectural Design-II	0	9	150	100	250
6	4AR6	Theory of Design-II	1	1	60	40	100
7	4AR7	Arts & Graphics-IV	1	2	30	20	50
8	4AR8	Building Construction-IV	1	3	60	40	100
9	4AR9	Computer Application in Architecture-II	0	2	30	20	50
10	4AR10	Surveying Lab.	0	2	30	20	50
11	4AR11	Discipline & Extra Curricular Activities	0	0	30	20	50
<b>Sub. Total</b>			<b>3</b>	<b>19</b>	<b>390</b>	<b>260</b>	<b>650</b>
<b>Grand Total</b>				<b>31 Periods/week</b>			<b>1000</b>

## THEORY

S.No.	Code No.	Subject	L	T/S	Exam Hrs	20% Mid-Term Assessment	80% End-Term Assess.	Total Marks
1	5AR1	History of Architecture-III	2	1	3	20	80	100
2	5AR2	Building Services-I (Water supply & sanitation)	1	1	3	20	80	100
3	5AR3	Construction Materials-V	1	1	3	20	80	100
4	5AR4	Architectural Structures-V	1	1	2	10	40	50
<b>Sub.Total</b>			<b>5</b>	<b>4</b>		<b>70</b>	<b>280</b>	<b>350</b>

## SESSIONAL

S.No.	Code No.	Subject	L	T/S	60% Mid-Term Assessment	40% End-Term Exam	Total Marks
5	5AR5	Architectural Design-III (Including Educational Tour)	0	9	150	100	250
6	5AR6	Quantity Surveying & specification	1	2	60	40	100
7	5AR7	Sociology	1	1	30	20	50
8	5AR8	Building Construction-V	1	3	60	40	100
9	5AR9	Computer Application in Architecture-III	0	2	30	20	50
10	5AR10 5AR10.1 5AR10.2	Elective – I History of Interior Design History of Rajasthan Art	1	1	30	20	50
11	5AR11	Discipline & Extra Curricular Activities	0	0	30	20	50
<b>Sub.Total</b>			<b>4</b>	<b>18</b>	<b>390</b>	<b>260</b>	<b>650</b>
<b>Grand Total</b>				<b>31 periods/week</b>			<b>1000</b>

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**Year III**

**Semester VI**

**THEORY**

S.No.	Code No.	Subject	L	T/S	Exam Hrs	20% Mid-Term Assessment	80% End-Term Exam	Total Marks
1	6AR1	History of Architecture-IV	2	1	3	20	80	100
2	6AR2	Building Services-II (Electrical Services)	1	1	3	20	80	100
3	6AR3	Construction Materials-VI	1	1	3	20	80	100
4	6AR4	Architectural Structures-VI	1	1	2	10	40	50
<b>Sub.Total</b>			<b>5</b>	<b>4</b>		<b>70</b>	<b>280</b>	<b>350</b>

**SESSIONALS**

S.No.	Code No.	Subject	L	T/S	60% Mid-Term Assessment	40% End-Term Asses.	Total Marks
5	6AR5	Architectural Design-IV	0	9	150	100	250
6	6AR6	Working Drawings	0	3	60	40	100
7	6AR7	Building Economics	1	1	30	20	50
8	6AR8	Building Construction-VI	1	3	60	40	100
9	6AR9 6AR9.1 6AR9.2 6AR9.3	Elective-II Real Estate & Redevelopment Product Design Design for Disabled	1	1	30	20	50
10	6AR10	Computer Application in Architecture-IV	0	2	30	20	50
11	6AR11	Discipline & Extra Curricular Activities	0	0	30	20	50
<b>Sub.Total</b>			<b>3</b>	<b>19</b>	<b>390</b>	<b>260</b>	<b>650</b>
<b>Grand Total</b>				<b>31 Hrs/week</b>			<b>1000</b>

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**Year IV**

**Semester VII**

**THEORY**

S.No.	Code No.	Subject	L	T/S	Exam Hrs	20% Mid-Term Assessment	80% End-Term Exam	Total Marks
1	7AR1	Contract Documents & Byelaws	2	1	3	20	80	100
2	7AR2	Building Services-III (Mechanical Services)	1	1	3	20	80	100
3	7AR3	Building Science-II (Acoustics & Illumination)	1	1	3	20	80	100
4	7AR4	Architectural Structures-VII	1	1	2	10	40	50
<b>Sub.Total</b>			<b>5</b>	<b>4</b>		<b>70</b>	<b>280</b>	<b>350</b>

**SESSIONALS**

S.No.	Code No.	Subject	L	T/S	60% Mid-Term Assessment	40% End-Term Asses.	Total Marks
5	7AR5	Architectural Design-V & Field Trip	0	9	150	100	250
6	7AR6	Landscape & Site Planning	2	3	90	60	150
7	7AR7	Advance Building Construction	2	3	60	40	100
8	7AR8 7AR8.1 7AR8.2	Elective-III Alternate Energy systems in Architecture Vernacular Architecture	1	2	60	40	100
9	7AR9	Discipline & Extra Curricular Activities	0	0	30	20	50
<b>Sub.Total</b>			<b>5</b>	<b>17</b>	<b>390</b>	<b>260</b>	<b>650</b>
<b>Grand Total</b>			<b>31 Periods/week</b>				<b>1000</b>

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**Year IV**

**Semester VIII**

S.No.	Code No.	Subject	Duration
	8AR1	Practical Training	140 days
1		Monthly work report from architect's office	
2		Critical appraisal of built projects	
3		Field documentation of architectural details	
4		Site supervision of built projects	
5		Training report	

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**Year V**

**Semester IX**

**THEORY**

S.No.	Code No.	Subject	L	T/S	Exam Hrs	20% Mid-Term Assesment	80% End-Term Asses.	Total Marks
1	9AR1	Professional Practice & Management	2	1	3	20	80	100
2	9AR2	Introduction to Settlement Planning	1	1	2	10	40	50
3	9AR3	Housing	2	1	3	20	80	100
<b>Sub.Total</b>			<b>5</b>	<b>3</b>		<b>50</b>	<b>200</b>	<b>250</b>

**SESSIONALS**

S.No.	Code No.	Subject	L	T/S	60% Mid-Term Assesment	40% End-Term Exam	Total Marks
4	9AR4	Architectural Design-VI & Field Trip	0	10	150	100	250
5	9AR5	Introduction to Settlement Planning Studio	0	3	60	40	100
6	9AR6	Practical Training & Presentation	0	2	150	100	250
7.	9AR7	Dissertation	0	5	150	100	250
8	9AR8 9AR8.1 9AR8.2	Elective-IV Urban Conservation Urban Design	1	2	60	40	100
9	9AR9	Discipline & Extra Curricular Activities	0	0	30	20	50
<b>Sub.Total</b>			<b>1</b>	<b>22</b>	<b>600</b>	<b>400</b>	<b>1000</b>
<b>Grand Total</b>			<b>31 Periods/week</b>				<b>1250</b>

**Teaching and Examination Scheme for B.Arch. (5 Year Course)**

**Year V**

**Semester X**

**SESSIONALS**

S.No.	Code No.	Subject	L	T/S	60% Mid-Term Assesment	40% End-Term Asses.	Total Marks
1	10AR1	Thesis Project	0	12	300	200	500
2	10AR2	Elective-V Advance study related to Thesis Project	0	3	60	40	100
3	10AR3 10AR3.1 10AR3.2	Elective-VI Disaster Resistant Structures Architecture Development and Legislation	2	3	60	40	100
4	10AR4	Discipline & Extra Curricular Activities	0	0	30	20	50
<b>Sub. Total</b>			<b>2</b>	<b>18</b>	<b>450</b>	<b>300</b>	<b>750</b>
<b>Grand Total</b>			<b>20 Periods/week</b>				<b>750</b>



**SYLLABUS FOR B.ARCH. (5 YEAR COURSE)**

**YEAR I**

**SEMESTER I**

**1L** **1AR1.ENGLISH** **EX. HRS.: 2**

**M.M.: 50**

**OBJECTIVE:** Improvement of comprehension, expression and usage of the language. Stress to be laid on coherence of expression and structuring of contents In Speech and Writing work.

**CONTENTS:**

- 1) Direct and Reported Speech, Active and Passive,
- 2) Tenses,
- 3) Prepositions,
- 4) Conditional Sentences,
- 5) Précis Writing, Business and Professional Letter Writing.

Lectures to be followed by Practice Session in Class.

**Reference Books:**

- (1) Grammar & Composition for Communication by Sagar Mal & Alpana Gupta – Orient Blackswan (P) Limited, New Delhi - 2009
- (2) English for Engineers by Nanny Tripathi – Jaipur Publishing House, Jaipur - 2003
- (3) English Grammar & Composition by Martin

**2L + 1T** **1AR2. MATHEMATICS** **EX. HRS.: 3**

**M.M.: 100**

**CONTENTS:**

1. **Statistics:**Mathematical expression, moments and M.G.F., probability – simple problems; Binomial, Poisson and normal distributions – simple applications. Correlation and regression, coefficient of correlation, lines of regression – simple applications.
2. **Differential Equations:** First order and first degree – variables separable, homogeneous form, reducible to homogeneous form, linear differential equation, reducible to Linear form, exact equations, second order ODE with constant coefficients.
3. **Matrices:**Rank of a matrix, solution of linear simultaneous equation, inverse of matrix by elementary transformations, Eigen values, Eigen vectors, Cayley Hamilton Theorem (without proof).
4. **Linear Programming:** Standard, Augmented, Duality, Algorithms, Unknown Integers, Dynamic programming, Simplex Algorithm, Shadow Price, LP Example, Job Shop Problem
5. **Coordinate Geometry of Three Dimensions:** Sphere, Cylinder, Cone, Equation of Sphere, Tangent, Plane, Line, Cylinder, Equation of Cylinder, Right Circular Cylinder, Cone, Equation of Cone, Right Circular Cone.

**Reference Books:**

- (1) Higher Engineering Mathematics by Dr. B.S.Grewal – Khanna Publishers, Delhi - 2005
- (2) Engineering Mathematics-1 by Dr. K.C.Jain, Dr. M.C.Rawat – College Book Depot Jaipur - 2002
- (3) Engineering Mathematics by Y.N.Gaur & C.L.Koul – Jaipur Publishing House Jaipur - 2003

**2L+ 1T** **1AR3. CONSTRUCTION MATERIALS- I** **EX. HRS.: 3**

**M.M.: 100**

**OBJECTIVE:** The understanding and application of basic building materials.

**CONTENTS:** In the context of materials like Stone, Brick and Timber, study of

- 1) The Nature of Materials,
- 2) The Manufacturing Process,
- 3) Structural, Visual and Textural Properties,
- 4) Identification and Selection,
- 5) Their Application in buildings.

**EXERCISES:** Identification and Study of Relevant I.S. Codes. Seminars and Preparation of Reports. Visits to Manufacturing Units are desirable. Field Studies should preferably form an Integral part of Tutorial Work.

**Reference Books;**

- (1) Building Construction, S.C.Rangwala – Charota Publishing House Pvt. Ltd. Anand (Gujrat) 2009
- (2) Building Construction, Sushil Kumar – M/s. Standard Publishers & Distributors, Delhi - 2003
- (3) The Construction of Buildings by R.Barry – Affiliated East West Press Pvt. Ltd. New Delhi - 1999

- (4) Building Construction, J.C.Macay – Orient Wasman Mumbai - 2005
- (5) Building Construction, B.C. Punmia – Laxmi Publication Pvt. Ltd., New Delhi - 2006

2L+ 1T

**1AR4. ARCHITECTURAL STRUCTURES I**

**EX. HRS.: 3**

**M.M. 100**

**CONTENTS:**

1. Concept of Force, Graphical Presentation of Force, Coplanar and Ten Coplanar Forces, Concurrent and Non Concurrent Forces, Composition and Resolution of Coplanar Forces by Graphical and Analytical Methods.
2. Built up Steel Sections, Centre of Gravity And Moments of Inertia, Parallel Axes Theorems, Product of Inertia, Use of Steel Methods.
3. Stress and Strain, Concept Units, Tensile, Compressive and Shear Stresses, Module of Elasticity and their Relationship, Linear and Lateral Strains, Poisson's Ratio, Stress Strain Curve, Elastic Limit, Yield Point, Breaking Stress, Factor of Safety, Safe Stress Values for Timber, Cast Iron, Mild Steel and for Steel in Tension Compression, Shear and bending as per IS-Codes
4. Types of Loads- Dead, Live, Wind, Impact, Earthquake, Concentrated, Uniformly Distributed and Varying Loads
5. Couple and its Moment, Conditions of Statical Equilibrium of Forces, Concept of Beams and Various Support Conditions, Determination of Support Reactions, both analytically and Graphically.

**Reference Books:**

- (1) Strength of Materials of Structure, B.C.Punmia – Laxmi Publications (P) Ltd., New Delhi – 2006
- (2) Structure Mechanics & Theory of Structures, Arya
- (3) Elementary Strength of Materials, U.C.Jindal
- (4) Mechanics of Solids, D.K.Singh

2L + 4S

**1AR5. ARCHITECTURAL DRAWING I**

**M.M.: 250**

**OBJECTIVE:**

To develop drawing skills as tools to Thinking, Visualization, and Representation of Design.

**CONTENTS:**

Familiarization with Drawing Materials and Equipments. Free Hand Drawing of Lines, Curves, Objects, Human Figures and Vegetation. Lettering and Fonts. Principles of Plane Geometry, Scale, Orthographic Projections of a Point, Line, Planes and Solids. Section of Solids, Intersection of Solids.

**EXERCISES:**

Studio assignments based on above topics.

**Reference Books:**

- (1) Engineering Drawing (Plain and Solid Geometry), N.D.Bhatt, V.M.Panchal – Charter Publishing House Pvt. Ltd.
- (2) Architectural Drawing, Rendow Yee – John Willey & Sons, New York – 1997
- (3) Engineering Drawing, P.S.Gill – S.K.Kataria & Sons, New Delhi – 2006

1L + 3S

**1AR6. ARTS AND GRAPHICS I**

**M.M.: 100**

**OBJECTIVE:**

Development of Graphic Skills, Ability and Comprehension.

Establishing Significance of Art.

**CONTENTS:**

To Learn the Utility of Pencil as a Powerful tool of Graphic Communication. To appreciate the Role of different colours in Presentation and Rendering Techniques.

**EXERCISES:**

Pencil Sketching- Human Figures, Vegetation, Automobiles, Buildings, Still Life, Etc. Pen And Ink Sketching. Use of Water Colours, Poster Colours, Pencil Colours, Crayons, Oil Pastels, Etc. In Rendering Drawings And Sketches. Colour Wheel Study of Primary, Secondary and Tertiary Colours.

**Reference Books:**

- (1) Drawing for 3D Designs, Alan Pipes – Thaws & Hudson London - 1990
- (2) Pastels Book, Russell Dale – North light books Cincinnati, OHW - 1990
- (3) Graphic Illustration in Black and White by Jacqueline – Design Press, New York - 1991
- (4) Architectural Rendering, Crowe Philip – Rofovision S.A. Switzerland - 1991
- (5) Rendering with Pen & Ink, Robert W. Gill – Thames & Hudson London – 2008

1L + 3S

**1AR7. BUILDING CONSTRUCTION I**

**M.M.: 100**

**OBJECTIVE:** The Construction Studio Work should Demonstrate the Inter Dependence of the Building Materials and Elements and their Understanding to form Complete Building Envelop.

**CONTENTS:** Details of Construction, Laying, Fixing of Stone and Brick. Study of Various Basic and Simple Elements of Buildings in the Aforesaid Materials- Foundations, Walls, Openings, Roofings, and Floorings, Their types along with their Principles of Construction and architectural details

**EXERCISES:** Preparation of Drawings, Site reports and other Exercises Covering the above.

**Reference Books:**

- (1) A Text Book of Building Construction, S.P.Bindra, S.P.Arora – Dhanpat Rai Publication, New Delhi 2010
- (2) A Text Book of Building Construction, Dr. B.C.Punmia – Laxmi Publication (P) Ltd. Delhi - 2006
- (3) Building Construction and Material, Gurucharan Singh – M/s. Standard Publications Delhi - 2003
- (4) Building Construction Vol. I, II, III, IV, W.B.Macay – Orient Longman, Mumbai - 2005
- (5) The Construction of Building, R. Barry – Affiliated East West Press New Delhi – 1999

1L + 2T

**1AR8. INTRODUCTION TO COMPUTERS I**

**M.M.: 50**

**OBJECTIVE:** Develop awareness of computer and Its environment.

**CONTENTS:** Computer as a tool for Architects.

Introduction to Computer and Its Peripherals. Hardware Brief (Useful For Architects) Viz. CPU, Keyboard, Mouse, Printer, Plotter, Scanner, Digitizer, Etc. Introduction to various softwares relevant to Architects Viz. Ms Word, Excel, Powerpoint, Introduction to Basic Internet Applications.

**EXERCISES:** Assignments related to various applications of these softwares.

**Reference Books:**

- (1) Google sketch up & Pro Bible, Kelly L. Murdok
- (2) Photoshop Elements for Dummies, Obermities & Teb Podara
- (3) Corel Draw for Dummies, Beke Mecclelland
- (4) AutoCAD for Dummies – David Byrner

1L+2T

**1AR9. WORKSHOP PRACTICE**

**(PHOTOGRAPHY, CARPENTRY, METAL & MODEL MAKING)**

**M.M.: 100**

**OBJECTIVE:** To develop Photographic skills, to understand simple Architectural forms, Joinery and construction details through field exercises and Model Making.

**CONTENTS:** To provide technical know how about cameras, Its accessories and their applications including the following: Camera- Definition, History, types and usage, Aperture, Shutter Speed, types of lenses and accessories. Film Rolls, types and usages. Flash, Types and usage. Film processing description and method (Colour and B/W). Composition-settings with respect to view finder, Weather, Place, Colour, Mood and purpose. Architectural-exterior and interiors with respect to Scale, Composition, Texture, Colour, Skyline, Light and Shade, exploration and usage of various materials used in Building Construction and Model Making. Types of Joints in Wood and Metals.

**EXERCISES:** Shooting Pictures of Landscape, Portraits, Interiors and Buildings. Developing and Printing of Pictures In Laboratory, Making Scaled Models with different Materials, Workshop/ Assignments based on Construction Joints in wood and metals.

**Reference Books:**

- (1) Workshop Practice Manual by K.V. Reddy, K.L.Narayan – MacMillan India, Jaipur - 1991
- (2) Theory of Moulding, O. Howard Walker
- (3) Hillier V M & EG, Sculpture – Thomas Nelson and Sons Ltd. Trinidad

**SYLLABUS FOR B.ARCH. (5 YEAR COURSE)**

**YEAR I**

**SEMESTER II**

**2L + 1T** **2AR 1. ECOLOGY & ENVIRONMENT** **EX. HRS.: 3**  
**M.M.: 100**

**OBJECTIVE:** The understanding and application of basic Ecology and Ecological Systems into the built environment.

**CONTENTS:**

- 1) Fundamentals of Ecosystem, Our Earth's Environment,
- 2) Resource and Environment, Management of Environment,
- 3) Environmental Legislation, Environmental Quality and Indicators,
- 4) Environmental Planning and Design Guidelines,
- 5) Human Impact on Environment, Environmental pollution.

**EXERCISES:** Study of relevant Ecosystems, Botanical & Zoological Specimens at both Micro & Macro levels, Effects of Pollution and Prevention, and control of both Natural & Manmade Hazards.

**Reference Books:**

- (1) The Environment – Principles & Applications, Charis Park
- (2) Dictionary of Ecology and Environment, P.H.Collin
- (3) Ecology, M. Begon et al
- (4) Theoretical Ecology, R.May & A.McLean

**2L + 1T** **2AR 2. CONSTRUCTION MATERIALS II** **EX. HRS.: 3**  
**M.M.: 100**

**OBJECTIVE:** The understanding and application of Basic Building Materials.

**CONTENTS:** In the context of materials like Mud, Lime and Cement, study of

- 1) The Nature Of Materials,
- 2) The Manufacturing Process,
- 3) Structural, Visual And Textural Properties,
- 4) Identification And Selection,
- 5) Their Application in Buildings.

**EXERCISES:** Identification and Study of relevant I.S. Codes. Seminars and preparation of reports. Visits to manufacturing units are desirable. Field studies should preferably form an integral part of tutorial work.

**Reference Books:**

- (1) Building Materials, S.C.Rangwala – Chartar Publishing House, Anand (Gujarat) - 2007
- (2) Building Construction Vol. I, W.B.Mckay – Orient Longman Mumbai - 2005
- (3) Building Construction, Sushil Kumar – Standard Publisher & Distributors, Delhi - 2003
- (4) The Construction of Building Construction, R. Berry – Affiliated East West Press New Delhi – 2005

**2L + 1L** **2AR3. ARCHITECTURAL STRUCTURES II** **EX. HRS.: 3**  
**M.M. 100**

**Contents:**

1. Shear Force and Bending Moment Diagrams in case of simply supported Beams, Cantilevers and beams with overhangs due to Concentrated Loads and Distributed Loads.
2. Theory of Simple Bending,  $M/I = F/Y = E/R$  Equation and Its Derivation, Section Modulus, Distribution of Normal Stress due to Bending.
3. Composite Beams, Shear Stress Distribution In Rectangular, Circular, T And I Sections.
4. Prejointed Plane Frames, Determination of Forces in the members by Method of Joints, Method of Sections and Graphical Methods.
5. Lifting Machines: Mechanical Advantage, Velocity Ratio and Efficiency, Law of Machine, Pulleys and Pulley Blocks.

**Reference Books:**

- (1) Strength of Materials & Mechanics of Structure, B.C.Punmia – Standard Book House Delhi - 2005
- (2) Structure Mechanics & Theory of Structure, Arya
- (3) Elementary Strength of Materials, U.C.Jindal
- (4) Mechanics of Solids, D.K.Singh

1L + 1S

**2AR4. INTRODUCTION TO ARCHITECTURE**

EX. HRS.: 2

**M.M.: 50**

- OBJECTIVE:** To orient the student to study of Architecture as a Profession and Design Discipline.
- CONTENTS:**
- 1) Role of an Architect in an Architectural Project and in Society Through History;
  - 2) Disciplines and Skills to be Learnt by an Architect;
  - 3) Factors Influencing Architecture of a Place, Climate, Materials, Socio Cultural, Technological, Etc.;
  - 4) Introduction to Old And New Architectural Works;
  - 5) Understanding The Terms Such As Vernacular, Traditional, Classical, Modern, Post Modern And Neo Modern Renaissance, European, Oriental.
- EXERCISES:** Presentation of observation at the respective Native Places of students. During Educational Trips/ Site Visits. Visits to buildings of Architectural significance.
- Reference Books:**
- (1) Built to meet Needs – Cultural issues in Vernacular Architecture, Paul Oliver (Elsevier Publications)
  - (2) 6 thousand years of Housing by Norbert Schuenauer – WW Norton & Lo. New York - 2000
  - (3) Architects Handbook – Blackwech Science Ltd., Oxford - 2002

2L + 4S

**2AR5. ARCHITECTURAL DRAWING II**

**M.M.: 250**

- OBJECTIVE:** To develop drawing skills as tools to Thinking, Visualization, and Representation of Design.
- CONTENTS:** Development of surfaces of solids, Isometric, axonometric of solids. Sciography of Simple Geometric Forms Leading to Sciography of Architectural Forms. Perspective-One Point, Two Point and Three Points. Exercises From Simple Geometrical Forms Leading To Perspective Of Building Forms. Plotting of Sciography On Perspective Drawings. Graphical Presentation And Rendering In Pen And Ink of Architectural Drawings And Materials.
- EXERCISES:** Studio assignments based on above Topics.
- Reference Books:**
- (1) Engineering Drawing, N.D.Bhatt – Charter Publishing House, Anand (Gujarat) - 2010
  - (2) Rendering with Pen & Ink, Robert W. Gill – Thams & Hudson London - 2007
  - (3) Engineering Drawing, P.S.Gill – S.K.Katari's & Sons, New Delhi - 2006

1L+3S

**2AR6. BASIC DESIGN AND FIELD TRIP**

**M.M.: 100**

- OBJECTIVE:** To familiarize students with theoretical basis and Design Process through observation' Comparison, Analysis with the Help of Prototypes, Model and Drawings.
- CONTENTS:** Design In Everyday Life, Basic Art Form, Elements of Design, Space, Form Line, Texture, Colour, Etc. Principles of Design, Scale, Balance, Proportion, Rhythm, Harmony, Etc. Objectives of Design, Beauty, Order, Efficiency and Economy. Forms and Shapes in Everyday Life. Scale in Architecture. Study of Anthropometrics. Introduction to Design Methodologies.
- EXERCISES:** Exercise in 2 And 3 dimensional composition to Achieve Harmony, Balance, Contrast, Rhythm, Etc. Geometrical Analysis of forms and Patterns in Architecture, Objects of everyday use and other forms. Study Of Anthropometrics And Its Application In Design Exercises. Simple Imaginative Problems For Example Pedestal, Basic Shelter, Street Furniture, Memorials, Etc.
- Reference Books:**
- (1) Architecture – Form, Space & Order, Francis D.K. Ching
  - (2) The Principles of architecture, Michael Foster
  - (3) Words & Buildings A vocabulary of Modern Architecture, Adrian Forty
  - (4) A visual dictionary of Architecture, Francis D.K. Ching
  - (5) Principles of Form & Design, Welcius Wong

1L + 3S

**2AR7. ARTS AND GRAPHICS II**

**M.M.: 100**

- OBJECTIVE:** Development of Graphic Skills, Ability and Comprehension. Establishing Significance of Art.
- CONTENTS:** 3 D Compositions In Different Mediums. Introduction to History of Art, Artistic Tradition and Theories.
- EXERCISES:** 2 D Compositions In Various Colour Mediums, Textures. 3 D Compositions In Plaster of Paris, Clay, Paper, Cardboard, Etc.

- Reference Books:**
- (1) Drawing Basic, Jackly St. Auby
  - (2) Drawing a creative process – The source book of Artists, D.K.Ching – John Willey & Sons Inc., New York - 1990
  - (3) Visual Imagination, Bruce D. Kurtz – Sons Inc. New York - 1990

**1L + 3S**

**2AR8. BUILDING CONSTRUCTION II**

**M.M.: 100**

- OBJECTIVE:** The Construction Studio work should Demonstrate the inter dependence of the Building Materials and Elements and their understanding to form Complete Building Envelop.
- CONTENTS:** Details of Joinery in Timber and study of various basic elements like foundation, walls, roofs/floors and openings along with their principles of construction and Architectural details. Introduction to Construction, Machinery and Equipments. Site Visits should form an Integral Part of the Studio Work.
- EXERCISES:** Preparation of Drawings, Site Reports and other Exercises Covering the above.
- Reference Books:**
- (1) Building Construction, Sushil Kumar – M/s. Standard Publisher Distributor, New Delhi
  - (2) Civil Engg. Drawing, J.S.Loyal – Satya Prakashan New Delhi – 2010
  - (3) A Text book of building construction, S.P.Arora, S.P.Bindra – Dhanpat Rai Publications, New Delhi – 2010
  - (4) Building Construction, S.C. Rangwala – Charter Publishing House, Anand (Gujarat) – 2007
  - (5) Building Construction, W.B.Mackay – Orient Longman Mumbai – 2005

**1L + 2S**

**2AR9. INTRODUCTION TO COMPUTER II**

**M.M.: 50**

- OBJECTIVE:** Develop awareness of computer and its environment.
- CONTENTS:** Computer as a tool for Architects. Introduction to various software's Relevant to Architects Viz. Auto CAD, 3DS Max, Corel draw, Adobe Photoshop, PageMaker, Etc. Advanced Internet Applications.
- EXERCISES:** Assignments related to various applications of these Software's.
- Reference Books:**
- (1) Google Sketchup and Sketchup Pro7 (Bible), Kelly L. Murdock
  - (2) Autocad 2010 and Autocad Lt 2010 Bible, Ellen Finkelstein

**SYLLABUS FOR B.ARCH. (5 YEAR COURSE)**

**YEAR II**

**SEMESTER III**

<b>2L + 1T</b>	<b>3AR1. History of Architecture – I</b> <b>M.M. 100</b>	<b>Ex. Hrs. 3</b>
<b>Objective:</b>	To develop understanding of social cultural, material and structural attributes, that shaped and architecture in different periods, also to study how interaction and communication with different cultures influenced and reshaped architecture of India.	
<b>Contents:</b>	Architecture of: <b>1) Indus valley,</b> <b>2) Buddhist era,</b> <b>3) Hindu empires,</b> <b>4) Islamic rule,</b> <b>5) Mughal era</b>  in terms of design parameters such as cross cultural theories relating to art and architecture construction methods etc.	
<b>Exercises:</b>	Analytical and illustrative exercises related to above topics such as papers seminars etc.	
<b>Reference Books:</b>	(1) Indian Architecture (Hindu and Buddhist), Percy Brown – D.B.Taraporvala Sons & Co., Mumbai-1997 (2) Indian Architecture (Islamic Period), Percy Brown - D.B.Taraporvala Sons & Co., Mumbai-1997 (3) The Great Ages of World Architecture, G.R.Hiraskar – Dhanpat Rai & Sons Delhi - 2005 (4) Islamic Architecture in India, Satish Grover – CBS Publisers & Distributors New Delhi – 2002-03 (5) Buddhist and Hindu Architecture, Satish Grover – Taschen London 1998	

<b>1L + 1T</b>	<b>3AR2. Building Science– I (Climatology)</b> <b>M.M. 100</b>	<b>Ex. Hrs. 3</b>
<b>Objective:</b>	Understanding of inter relation of built environment with material environment also issues of climatic balance in traditional and contemporary built environments.	
<b>Contents:</b>	<b>1) Elements of climate :</b> Solar radiation, terrestrial radiation, temperature, humidity, wind, cloud, precipitation etc. Factors affecting climate of macro and micro-level.  Measurement and quantification.  <b>2) Effect of climate on man :</b> body heat balances, thermal indices, thermal comfort, solar chart, psychometric chart and its application.  <b>3) Analysis of climate data,</b> climatological site analysis and its application in site planning and design evolution.  <b>4) Effect of climate on building envelope :</b> heat flow, heat transfer, heat storage and time lag of various building materials and elements.  Day lighting, air movement and ventilation  <b>5) Passive means of thermal control</b>  Solar movement and sun shading devices.	
<b>Exercises:</b>	Analytical and illustrative exercises, related to above topics.	
<b>Reference Books:</b>	(1) Manual of Tropical Housing and Building, Koenigsberger – Orient Longman N. Delhi - 2003 (2) Energy Efficient Building in India, Mili Majumdar – Tata Energy Research Institute Delhi - 2002 (3) The Climatic Data Hand Book, Ishwar Chand. P.K.Bhargava – Tata Mcgraw Hills Pulications, New Delhi - 2004 (4) Environmental Science in Building, Randall McMullan – Palgrave Hounlays Hampshire, NewYork - 2002 (5) Climate Responsive Architecture, Arvind Krishnan – Tata McGra Hills Publishing Company, New Delhi – 2004	

**3AR3. Construction Materials - III**  
**M.M. 100**

1L + 1T

Ex. Hrs. 3

**Objective:** To introduce and familiar student with/to composite and multiple application of materials.

**Contents:** **Study** of physical, chemical, visual and textural properties of materials their application and use in building and building components as applied in buildings:

1) **Cement products:** Mortars, concrete and R.C.C. preparation, application techniques, tests concreting under special conditions, special varieties of concretes,

2) **Plastics,**

3) **Polymers,**

4) **Glass** and

5) **Wood and its derivatives, plys and boards.**

**Exercise:** The course may be conducted as core lectures, case studies, site visits and market surveys. Interaction with field personal and demonstration sessions.

Assignments will include.

Site visit report, seminars and reports of survey and case studies. Emphasis should be on application techniques.

**Reference Books:**(1) Engineering Material, S.C. Rangwala – Chartar Publishing House, Anand (Gujarat) - 2007

(2) Building Materials, Gurucharan Singh – M/s. Standard Publication Distributors Delhi - 2007

(3) Building Construction, W.B.Mackey – Orient Longman, Mumbai – 2005

**3AR4. Architectural Structures– III**  
**M.M. 50**

1L + 1T

Ex. Hrs. 2

**Contents:** 1. **Relations** between load, shear force, bending moment, slope and deflection; slopes and deflections in determinate beams using double integration method, moment area method and the conjugate beam method.

2. **The long and short columns or struts;** slenderness ratio; buckling load; various end- conditions; equivalent length of a strut; strut with eccentric load; with initial curvature, limitations of Euler's theory; Rankine- Gordon formula.

3. **Soil and soil mass constituents;** water content, specific gravity, voids ratio, porosity, degree of saturation, air voids and air content; unit weights, density index etc., inter-relationships of the above.

4. **Determination** of water content, specific gravity; particle size distribution sieve and sedimentation analysis; consistency limits; voids ratio and density index; classification of soil for general engineering purposes; particle size textural, H.R.B and Unified and I.S. classification systems.

5. **Bearing capacity of soils;** shallow foundation; Terzaghi's and Meyerhoff's formula for bearing capacity; plate loading test, standard penetration test.

**Reference Books:** (1) Strength of Materials & Mechanics of Structure (VOL. II), B.C.Punmia – Standard Book House, Delhi 2005

(2) Structural Mechanics & Analysis, V.S.Prasad

(3) Basic Structural Analysis, C.S.Reddy

**3AR5. Architectural Design– I (Including Measured Drawing Camp)**

9 Studios

M.M. 250

**Objective** - Analysis of activities and spaces in a given predominant function. Its representation in graphic form. Design exercise evolving out of single functions such as ticket counters/reception offices, security offices, Kiosks, booths, Information cells etc. Multiple function such as primary health centers, convenient shopping etc.

At least one design problem to concentrate on comprehensive graphic representation to form a prelude to measure drawing.

Measure drawing camp to include study of a building/group of buildings/settlements of architectural importance, involving detailed drawings, constructional details, material used giving due importance to the given context.

**Reference Books:** (1) The Thames and Hudson Manual of Rendering with Pen & Ink

(2) Bio Architecture an imprint of eleaserver, Javiour Senosiain

(3) Architecture Design, M. Pratap Rao

(4) Time Saver standards for Building Types, H.De. Chiara

(5) Newferts Architects Data, New Fert



### 3AR6. Theory of Design– I

1L + 1T

M.M. 100

**Objective:** To Introduce the elements; principles and objectives in orientation to Architectural Design.

**Contents:** Formulation of design concepts through elements and principles of Architectural design.

Study of space usage and its implications.

Architectural scale as manifestation of functional requirements.

Appreciating Architecture through important building examples.

Space as architectural raw material.

Classification of spaces

Inter dependence of Form, Structure, Function and space.

Relationship of Plan, Section and Elevation.

Structure and Form

Architectural Programming

**Reference Books:** (1) Form, Space and Architecture, Francis D.K.Ching

(2) Interior Design, Francis D.K.Ching

### 3AR7. Arts & Graphics– III

1L + 2S

M.M. 50

**Contents:** Emphasis is to be laid on graphic skills/presentation techniques/model making etc.

Indoors and outdoors sketching in pencil/crayons/color/charcoal/ink of objects/buildings/automobiles/vegetation/human figures etc.

Sculpture/mural exercises in clay/POP/ceramics/metal/junk & scrap materials etc.

Study of 3D forms and spaces with basic principles of design like repetition, symmetry, rotation and rhythm.

Study of various color scales.

**Reference Books:** (1) Introduction to Painting with Acrylics, Alfred Daniels – Quantum Publishing Co. Ltd., London - 2002

(2) Introduction to Painting with Water Colours, Sarah Buckley – Eagle Editions Ltd., Royston - 2002

(3) Introduction to Painting Landscapes, Ted Gould – Eagle Editions Ltd., Royston - 2002

(4) Drawing for 3D Designs, Alan Pipes – Thames & Hudson London, 1990

(5) Pastels Book, Russe Dale – North light books Cincinnati Ohio - 1990

### 3AR8. Building Construction - III

1L + 3S

M.M. 100

**Objective:** Emphasis should be laid on understanding of constructions in R.C.C. in different parts of building through basic building elements.

**Contents:** **Foundation :** R.C.C. footings, isolated, with their connections with superstructure along with Damp proof course.

**Structure :** Simple R.C.C. frame with beams and columns.

**Roof :** Flat R.C.C. roof with water proofing details study of different R.C.C. roof forms and its connection with structure.

**Flooring :** R.C.C. flooring, mosaic flooring & cement tile flooring, interlocking paving blocks in ground and upper floors.

**Staircases :** Staircases in R.C.C. with different types.

**Reference Books:** (1) A Text Book of Building Construction, S.P.Bindra, S.P.Arora – Dhanpat Rai Publications, New Delhi - 2010

(2) A Text Book of Building Construction, Dr. B.C.Punmia – M/s. Laxmi Publication (P) Ltd. Delhi - 2006

(3) Fundamentals of Building Construction, Prof. T.D.Ahuja, G.S.Bedi – Dhanpat Rai Publications, New Delhi - 2010

- (4) Building Construction Vol. I, II, III, J.K.Mckay – Orient Longman, Mumbai – 2005
- (5) Building Construction Illustrated, Francis D.K.Ching – John Willey & Sons Inc., New York.

2T/S	<b>3AR9. Structure Lab - I</b>	<b>M.M. 50</b>
<b>Objective:</b>	To understanding the properties of concrete construction through laboratory testing and site visit.	
<b>Contents:</b>	Performing laboratory testing of concrete and studying execution of the structural elements at the site in building construction.	
<b>Exercise:</b>	Preparation of report. Visit to site to study concrete constructions.	
<b>Reference Books:</b>	<ol style="list-style-type: none"><li>(1) Engineering Materials, Material Science, S.C.Rangwala – M/s.Chartar Publishing House, Anand (Gujarat) – 2007</li><li>(2) Building Construction and Material, Gurucharan Singh – M/s. Standard Publications &amp; Distributors, Delhi - 2007</li><li>(3) Engineering Materials, S.C. &amp; K.S.Rangwala – M/s.Chartar Publishing House, Anand (Gujarat) – 2007</li></ol>	

2 T	<b>3AR10. Computer Application in Architecture - I</b>	<b>M.M. 50</b>
<b>Objective:</b>	To apprise the students of the existing Presentation related softwares like word processors, drawing tools and photo editors etc.	
<b>Contents:</b>	Application of Word processors. Available contents and tools in the latest versions of popular softwares like MS Word, Lotus, Pagemaker etc. Special emphasis on drawing tools in the softwares. Introduction to various presentation linked softwares like MS Power point, Corel Draw and Photoshop and their usage. Usage and understanding of Peripheral Hardware like Printers and Scanner.	
<b>Exercises:</b>	Drafting letters, reports on MS Word, Drawing basic geometrical objects and coloring them. Making simple presentation and animations in MS Power Point. Scanning images and modifying them in Photoshop and transferring in different allied softwares.	
<b>Reference Books:</b>	<ol style="list-style-type: none"><li>(1) Mastering Autodesk Revit building by Autodesk – M/s. Chartar Publishing House, Anand (Gujarat) – 2007</li><li>(2) Mastering Revit Architecture by Paul F. Aubin's</li><li>(3) Revit Architecture 2010 by Eric Wing</li></ol>	

**SYLLABUS FOR B.ARCH. (5 YEAR COURSE)**

**YEAR II**

**SEMESTER IV**

<b>2L + 1T</b>	<b>4AR1. History of Architecture – II</b> <b>M.M. 100</b>	<b>Ex. Hrs. 3</b>
<b>Objective:</b>	To develop understanding of architecture as society's primary response to simple needs and problems related to shelter and complete problems related to natural and man made environment both in qualitative and quantitative terms, also to understand evolution of Architectural styles' as response to prevalent socio-cultural, technological and intellectual complexities of societies.	
<b>Contents:</b>	Study of evolution of design concepts, philosophy construction techniques, materials and structural solutions with the help of selected examples, with reference to social, cultural, geographical political and intellectual climate of the place and period, as styles of Architecture like: 1) Egyptian, 2) West Asiatic, 3) Greek, Roman, 4) Early Christian, Romanesque, 5) Byzantine and Gothic.	
<b>Assignments:</b>	Analytical and illustrative exercises, as tests, seminars or papers.	
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>(1) Traditions in Architecture, Dora Crouch – Oxford University Press, N. York – 2001</li> <li>(2) History of Architecture, Bamister Fletcher – SBS Publishers &amp; Distributors, Delhi – 1997</li> <li>(3) History of Architecture, Spiro Kostof – Oxford University Press, N. York - 1995</li> <li>(4) History of western architecture, David Watkin – Lawrence King Publishing London – 2005</li> <li>(5) High Gothic, Guthor Binding – Taschen London – 1999</li> </ol>	
<b>1L + 1T</b>	<b>4AR2. Surveying</b> <b>M.M. 100</b>	<b>Ex. Hrs. 3</b>
<b>Contents:</b>	<ol style="list-style-type: none"> <li>1) <b>Introduction</b> : Principles and classification of survey, Basic measurements in surveying, Basic methods of surveying, Different types of transverse.</li> <li>2) <b>Chain survey</b> : Introduction, Instruments, Types of chains and tapes, their uses and construction details.</li> <li>3) <b>Compass survey</b> : Introduction, Different type of compass, Meridians, Bearings, Dip, Declination, Local attraction, Adjustment of angles, Loose needle and fast needle method, Compass transverse.</li> <li>4) <b>Theodolite survey</b> : Introduction, Basic definitions, Construction details, Temporary adjustment, Measurement of vertical and horizontal angle, Area computations by planimeter.</li> <li>5) <b>Plane Table surveying</b> : Elements of plane table survey, Plane table transverse.</li> <li>6) <b>Leveling</b> : Basic definitions, Types of leveling, sources of errors, Computations &amp; Permanent adjustment of levels,</li> <li>7) <b>Contouring</b>: Contouring and Earth work calculation.</li> <li>8) <b>Setting out work for buildings</b> : Introduction, Controls for setting out, horizontal control, vertical control, setting out in vertical direction, Positioning of structure, Setting out of foundation trenches.</li> </ol>	
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>(1) Surveying, Arora</li> <li>(2) Surveying &amp; Levelling, S.C.Rangwala – Chartar Publishing House, Anand (Gujarat) - 2005</li> <li>(3) Surveying, Dr. B.C.Punmia – Laxmi Publication (P) Ltd., New Delhi – 2002</li> <li>(4) Surveying for Construction 4<sup>th</sup> Edition, William Irvine – McGraw Hills Book Co., New Delhi – 1995</li> <li>(5) Site Surveying &amp; Levelling, John Clancy – Arnold London – 1991</li> </ol>	
<b>1L + 1T</b>	<b>4AR3. Construction Materials - IV</b> <b>M.M. 100</b>	<b>Ex. Hrs. 3</b>
<b>Objective:</b>	To introduce and familiar student with application of metal and alloys.	
<b>Contents:</b>	of physical, chemical, visual and textural properties of metals and alloys; 1) <b>Application</b> of metals and alloys in buildings, structural and non-structural applications; 2) <b>Metals</b> like iron, aluminium, copper and 3) <b>Alloys</b> like steel, brass, and are to be studied; 4) <b>Protective finishes</b> on metals; 5) <b>Study</b> of metal applications in hardwares.	
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>(1) Engineering Material, S.C. &amp; K.S.Rangwala, Chartar Publishing House, Anand - 2005</li> <li>(2) Construction Materials their nature &amp; behaviour, J.M.Illston &amp; P.L.J. Momone–Spn Press London – 2001</li> <li>(3) Building Const. &amp; Material, Gurucharan Singh – Standard book House, Delhi – 2003</li> <li>(4) Building Construction, W.B.Mckay-Ii &amp; III – Orient Longman, New Delhi – 2005</li> </ol>	

**4AR4. Architectural Structures - IV****1L + 1T****M.M. 50****Ex. Hrs. 2**

- Contents:**
1. Materials for cement concrete; cement-properties of the various types of cements. ISS tests, storage; Aggregate properties of fine and coarse aggregates, natural and artificial aggregates. ISS tests, grading of aggregates, fineness modulus impurities; brief introduction to admixtures.
  2. Concrete Mixing – ordinary and controlled mixes design of mix-trial and error minimum void ratio, fineness modulus method; tests for workability of fresh concrete; effect of water/cement ratio on strength; properties of hardened concrete; strength tests on hardened concrete
  3. Necessity of reinforcement; characteristics of reinforcing material; elastic theory for reinforced concrete design; assumptions made.
  4. Requirements of good structures, safety, stability, economy, Design concept of factor of safety and limit state; failure modes of a structure, permissible stresses and permissible deflections, loads system, critical combination of loads, earthquake forces, wind loads on tall building.
  5. Mild steel and high tensile steel; working stresses, factors of safety; live loads on various types of floor and roofs; introduction and use of Design codes. IS 875, IS456 and IS 800.

**Reference Books:** (1) Design of RCC Structures (Limit State), Dayaratnam  
 (2) Design of R.C.C. Structures (Limit State), Dr. A.K.Jain  
 (3) IS Codes – Bureau of Indian Standards, New Delhi

**4AR5. Architectural Design - II****9 Studios****M.M. 250**

**Objective:** Introduction to basic design methodologies including emphasis on case studies, time activities studies, anthropometrics and their presentation as a prelude to design solution. Due emphasis is to be given on concurrent subjects like Climatology, construction techniques etc. Incorporation of building materials in design solution to be emphasized.

Design exercise may include buildings with multiple use such as clubs, clinics, motels, secondary schools, community center.

**Reference Books:** (1) Time Saver Standard  
 (2) Newfirts Standards, Architect's Data By Newfert Ernst  
 (3) Architectural Standards, Chiranjeet Shah

**4AR6. Theory of Design - II****1L + 1T****M.M. 100**

**Objective:** To appreciate the guiding principles in the words and philosophies of Master Architects.

- Contents:**
- Study of time, life, works and philosophies of Louis Sullivan, Frank Lloyd Wright, Walter Gropius, and Mies Vander – Rohe, L e Corbusier.
  - Introductory note on the Chicago school and ultimately more stress should be given on development of concepts of their individual work as entity in itself.
  - Louis Sullivan : Guaranty Building, Wainwright building, Auditorium building etc.
  - Walter Groplus : Bauhaus, Fagus Shoe Last Factory etc.
  - Meis Vander Rohe : Farnsworth Houses, Lake Share Apartment, Seagram Building etc.
  - Frank Lloyd Wright : Prarie Houses organic Architecture etc.
  - Le Corbusier : Early and later works as well as specific study of Chandigarh.

**Reference Books:** (1) Architecture – Form, Space & Order, D.K.Ching – Van Nostrant Reinhold, New York  
 (2) Words & Buildings A vocabulary of Modern Architecture, Adrian Forty  
 (3) History of Architecture, Bahnister Fletcher  
 (4) Space, Time & Architecture, Sigfried Giedion  
 (5) World – Architecture 1900-2000 Vol. 8, Kenneth Frompton

**4AR7. Arts & Graphics - IV****1L + 2 S****M.M. 50**

**Objective:** Emphasis is to be laid on various presentation techniques and renderings of drawings.

Perspectives of building and Interior views.

Rendering in different mediums like pencil, ink, water colors etc.

Study of light and shade with reference to objects, buildings etc.

Making collages, murals, sculptures at a bigger scale leading to a art project, using different materials like metals, clay, plaster of paris, wood, paper ceramics, glass etc.

History of art, artists & their works, various movements and schools of thought like cubism, fauvism, impressionism etc.

**Reference Books:** (1) Visual imagination, Bruce D. Kurtz  
 (2) Interior Design, Arts of 20<sup>th</sup> Century, John F. Pille  
 (3) Drawing Basics, Jackly St. Auby  
 (4) Arts of 20<sup>th</sup> century

**4AR8. Building Construction - IV****1L + 3 S****M.M. 100****Objective:** Emphasis is to be laid on understanding of construction in steel in different parts of buildings.

Foundation : Grillage foundation, Structure : Steel columns and beams structure, Structural floor & steel trusses structures, with riveted and welded joints. Roof Covering in G.I., Asbestos and Fiber sheets etc. Flooring : Industrial flooring. Staircase : Metal staircase.

**Reference Books:** (1) Building Construction (Vol. 1-4), W.B.Mackay – Orient Longman Mumbai – 2005  
 (2) The Const. of Building (Vol. 1-5), R.Barry – Affiliated East West Press New Delhi – 2005  
 (3) Bldg. Const. Illustrated, D.K.Ching – John Willey & Sons Inc., New York – 2006  
 (4) Building Construction, Sushil Kumar – John Willey & Sons Inc. New York - 2006  
 (5) Building Construction Illustrated, Francis D.K.Ching - John Willey & Sons Inc. New York - 2006

**4AR9. Computer Application in Architecture - II****2 T****M.M. 50****Objective:** Introduction of drafting software and management of Data in related software.

**Contents:** 2D drafting in any popular architectural software e.g. ACAD (latest version). Management of Data Processing Software e.g. MS Excel, Tools related to Bar Charts, Pie Charts and Tables to be introduced. Simple calculation functions like addition, average and sorting to be learnt.

**Exercises:** Drafting simple geometrical object in 2 dimension. Creation of double line Plans of simple building types. Creation of Data tables, Pie charts and Bar charts, Simple mathematical exercises using the same data.

**Reference Books:**(1) Archi CAD Help  
 (2) Virtual tour for ArchiCAD  
 (3) Professional Rendering with ArchiCAD  
 (4) Virtual Tour for ArchiCAD

**4AR10. Surveying Lab****2 T****M.M. 50****Objective:** Introduction to field applications of surveying techniques.

**Contents:** Chanin Survey, Compass survey, Theodolite survey, plane table surveying.

**Exercises:** Practical applications based on theory-chain survey, compall survey, plane table survey, plane table survey etc.

**Reference Books:** (1) Surveying, Arora  
 (2) Surveying & Levelling, S.C. Rangwala  
 (3) Surveying, Dr. B.C. Punmia  
 (4) Surveying for Construction 4<sup>th</sup> Edition, William Irvine  
 (5) Site Surveing & Levlling, John Clancy

## CURRICULUM FOR B.ARCH. (5 YEAR COURSE)

YEAR III

SEMESTER V

### 5AR1. History of Architecture – III

2L + 1T

M.M. 100

Ex. Hrs. 3

- Objective:** To study the styles, form and method of construction of the Renaissance to Modern period in Architecture.
- Contents:**
- 1) Renaissance and Baroque Architecture – The works of Brunelleschi, Bernini, Michel Angelo, Raphael, Andrea Palladio and Christopher Wren.
  - 2) British–Colonial Architecture in India, Indo–Gothic, Indo–Saracenic and Indo–Renaissance Architecture.  
Planning and Design of New Delhi by Sir Edwin Lutyens.
  - 3) Modern Architecture and its development during Industrial revolution and its influence thereby.  
The great international exhibitions.
  - 4) Development of various Movements, Thoughts and Philosophies during 19<sup>th</sup> Century such as Neo-classicism, Arts & Crafts movement, Art Nouveau and The Viennese Secession.
  - 5) Development of various Movements, Thoughts and Philosophies during 20<sup>th</sup> Century such as Deutscher Werkbund, Futurism, Constructivism, Expressionism, Art Deco, Cubism and De Stijl.
- Exercises:** Analytical and illustrative exercises of above topics in the form of papers and seminars.
- Reference Books:**
- (1) History of Architecture, Sir Banister Fletcher – SBS Publisher & Distributor, Delhi - 1987
  - (2) Egypt Architecture, Henri Sterlin
  - (3) History of Western Architecture, David Walker – Laurance King Publishing London – 2005
  - (4) The Roman Ampire, Henri Sterlin – Tuscan London

### 5AR2. Building Services – I

(Water Supply & Sanitation)

1L + 1T

M.M. 100

Ex. Hrs. 3

- Objective:** To study water supply and sanitation in building design.
- Contents:**
- 1) **Supply of water** to different types of buildings; Sources of water, modes and methods of conveyance of water, fixtures and appliances.
  - 2) **Distribution** of water, methods of distribution, different distribution systems, and their principles of layout, Design of water distribution system in a campus, and in a building, overhead and underground water storage tanks.
  - 3) **Refuse**; different forms of refuse, garbage, sludge, toilet waste and storm water collection and disposal system, Requirements for various building types.
  - 4) **Sanitation**; manholes, grease chambers, etc. Traps, ventilation of drains and sewers, Principles of design of drainage lines, drainage layouts for building premises, Longitudinal sections of drains. Drainage in non municipal area – soak wells, septic tanks.
  - 5) **Sanitation, Fittings & Fixtures**; water closets, flushing valves, flushing tanks, basins and its accessories, rain water, drainage pipes, spouts, sizing of rain water pipes, disposal system of rain water at ground level, storm water drainage.
- Exercises:** Study of IS Codes. Preparation of reports, visit to construction site and documentation. Market survey to study water supply and drainage products.
- Reference Books:**
- (1) Water Supply & Sanitary Engg., S.C.Ranwala – Chartar Publishing House, Anand (Gujarat)
  - (2) Water Supply & Engg., Santosh Kumar Garg
  - (3) Water Supply & Sanitation, Charanjeet Shah – Galgotia Publishing Co., New Delhi – 2002

### 5AR3. Construction Materials – V

1L + 1T

M.M. 100

Ex. Hrs. 3

- Objective:** Understanding properties and use of decorative and protective finishes.
- Contents:**
- 1) Decorative finishes; wooden flooring, wooden staircase, wooden paneling, glazed floor wall finishes, ceramic tile finish;
  - 2) Damp proof materials,
  - 3) Thermal insulation,
  - 4) Sound insulation,
  - 5) Fire proof finish.
- Exercise:** Study of I.S. Codes, Seminars and preparation of reports. Visit to construction site.
- Reference Books :**
- (1) Building Conctruction, S.C.Rangwala – Chartar Publishing House, Anand (Gujarat) – 2009
  - (2) Construction Material, S.C.Rangwala – Chartar Publishing House, Anand (Gujarat) – 2009
  - (3) Barry's Building construction Part-1,2,3,4,5, Barry – Affiliated East West Press, Delhi – 2005
  - (4) Building construction, J.C.Macay – Orient Longman Mumbai – 2005
  - (5) Building Construction, B.C.Punmia – Laxmi Publications (P) Ltd., New Delhi – 2006

**5AR4. Architectural Structures – V****1L + 1T****M.M. 50****Ex. Hrs. 2**

**Objective:** Design of R.C.C. construction. (The teaching program should lay relatively greater emphasis on the conceptual understanding rather than design calculations.

**Contents:**

- 1) Design of spread footing, combined footing, simple raft foundation
- 2) R.C.C. Design – T beams, L beams, Columns and Isolated column footing
- 3) R.C.C. wall, retaining wall
- 4) Design of one way and two way slabs
- 5) Design of RCC cantilevers

**Reference Books:**

- (1) Design of RCC Structures (Limit State), Dayarathnam, Oxford & IBH Publishing Co. P. Ltd., New Delhi – 2004
- (2) Design of R.C.C. Structures (Limit State), Dr. A.K.Jain
- (3) IS Codes – Bureau of Indian Standard, New Delhi

**5AR5. Architectural Design – III (Including Educational Tour)****9 S****M.M. 250**

**Objective:** To understand multiuse institutional and public building at community level.

**Contents:** Design of an Institution or public building at the community scale of infill scale, Understanding essential character of an Institution or Public building. Influence of culture, land, climate, technology and finance on the building design, Part details of the project to understand design resolution.

**Projects:** Community Hall, Neighborhood school, Bank building, Religious Institution, Shopping Plaza.

**Reference Books:**

- (1) Time Saver Standards
- (2) Newfert's Architect's Data
- (3) Architecture – Form, Space & Order, Francis D.K.Ching

**5AR6. Quantity Surveying & Specification****1L + 2 T****M.M. 100**

**Objective:** Basic understanding of preparing estimates and tender document for design of building.

**Contents:** Introduction to procedure of estimating, data require for framing an estimate, type of estimates. Approximate and detailed estimate, Abstract of Estimates, bills of quantities, Contingencies. Taking off quantities for principal building works, electrical works. Analysis of Rate for Principal civil works, item rate considering current market rate for building materials and labor wages as well as P.W.D. scheduled of rates. Composition of rate – percentage – distribution for materials, labor, tools plant and Contractor's Profit.

Preparation of tender document, notice inviting tender and advising the client regarding selection of contractor. Mode of measurement. Signification of specification in building construction. General and detailed specification for all kind of principal building works and building materials.

**Exercises:** Preparing estimate and tender document for a building. Studying tender document of Government projects and private projects.

**Reference Books:**

- (1) Estimating, Costing and Valuation, S.C.Rangwala–Chartar Publishing House, Anand (Gujarat) - 2005
- (2) Estimating & Costing engineering Theory and Practice, B.N.Dutta – UBS Publishers, New Delhi
- (3) Handbook of method of measurement of Bldg. Work, Bureau of Indian Standards – Distributor Pvt. Ltd. New Delhi – 2005

**5AR7. Sociology****1L + 1 T****M.M. 50**

**Objective:** To develop a sociological base for Architecture.

**Contents:** Man, environment and society. Rural society, traditional patterns and trends of change. The concept of social stratification, urbanization and modernization. Concept of social structure, cultural and social institutions, relation between social structure and special structure, Social aspects of housing and problems of slums. Social theories of Gandhi and Nehru and Contemporary India. Community development and panchayati Raj.

**Exercises:** Seminars and preparing paper.

**Reference Books:**

- (1) Sociology – Primary Principles, C.N.Shankar Rao
- (2) An introduction to Sociology, Vidya Bhushan and Sachdeva
- (3) Introduction to Sociology Part I&II, C..Shankar Rao
- (4) Sociology – A systematic introduction, Harry M Johnson

**5AR8. Building Construction - V****1L + 3 S****M.M. 100**

- Objective:** To study construction of different protective finishes in building design.
- Contents:** Wall finishes, Floor finishes, Terrace water proofing, Basement damp proof construction, Cavity wall construction, Wood Paneling, Stone paneling, Flase Ceiling, partitions and sliding folding doors in wood.
- Exercises:** Preparing Construction drawings bases on above topics. Preparing report of a building selected from site and presentation.
- Reference Books:** (1) Architectural Graphic Standards, Ramsay Sleeper – John Willey & Sons, New Jersey - 2007  
 (2) Building Construction, W.B.Mackay – Orient Longman Mumbai - 2005  
 (3) Hand Book son Building Construction Practices, Bureau of Indian Standards, New Delhi - 2004

**5AR9. Computer Application in Architecture - III****2 T****M.M. 50**

- Objective:** Developing Computer application skills for building drawings and presentations.
- Contents:** Drawing plan, section, elevation of a building in AutoCAD. Drawing Construction drawing and details. Architectural rendering and coloring in AutoCAD. Plotting of drawing.
- Exercises:** Preparing drawings based on above topics for selected buildings.
- Reference Books:** (1) Autodesk Official Training Course ware  
 (2) REVIT Help  
 (3) 3D Studio Max

**5AR10. Elective - I****1L + 1 T/S****M.M. 50**

- Objective:** To Development sensitivity to other related dimension of Architecture.
- Contents:** 1. History of Interior Design  
 2. History of Rajasthan Art.
- Reference Books:** (1) An introduction to Art, Craft, Technique, Science & Profession of Interior Design, Ahmed A Kasu  
 (2) Interior Design, John F. Pile  
 (3) Laura Ashley Windows, Elizabeth Wilhide  
 (4) Interior Design Principles and Practice, M. Pratap Rao  
 (5) The Fundamentals of Interior Architecture, John Coles & Naomi House



## CURRICULUM FOR B.ARCH. (5 YEAR COURSE)

YEAR III

SEMESTER VI

### 6AR1. History of Architecture – IV M.M. 100

2L + 1T

Ex. Hrs. 3

**Objective:** Understanding the works and philosophy of Contemporary Architects.

**Contents:**

- 1) **Modern Architecture after the great masters** : Alvar Aalto, Eero Saarinen, Jorn Utzon and Louis I Kahn.
- 2) **Post – Modern Architecture** : Robert Venturi, Philip Johnson, Charles Moore and Michael Graves.
- 3) **High Tech Architecture** : James Sterling, Renzo Piano, Richard Rogers and Norman Foster.
- 4) **Deconstruction Architecture** : Peter Eisenman, Frank Gehry, Bernard Stumi and Zaha Hadid.
- 5) **Post Independence Architecture in India** : Le-Corbusier, Louis I Kahn, Kanvinde, B.V. Doshi, Stien, Charles Correa, Uttam Jain, Raj Rewal and A.D. Raje.

**Exercises:** Analytical and Illustrative exercises of above topics in the form of papers and seminars.

**Reference Books:**

- (1) Building across time – An introduction to world architecture, Marian, Michael Larence
- (2) History of Architecture – Stone Henge to Skyscrapers, Dora P. Crouch
- (3) Architecture Today, James Steel
- (4) Space, Time & Architecture, Sigfried Giedion
- (5) World – Architecture 1900-2000 Vol. 8, Keeneth Frompton

### 6AR2. Building Services – II (Electrical Services) M.M. 100

1L + 1T

Ex. Hrs. 3

**Objective:** To Study electrical services in building design.

**Contents:**

- 1) **Electrical distribution** systems in buildings.
- 2) **Mains and sub distribution**, switches and controls,
- 3) Layout system for lighting, fans, telephones.
- 4) **Service systems:** Lifts, pumps, air-conditioning system, computer systems, etc.
- 5) Earthing and lightning **protection** in building.

**Exercises:** Preparation of reports, visit to construction site and documentation. Market survey to study electrical products.

**Reference Books:**

- (1) Electrical Wiring, Estimation, S.L.Uppal – Khanna Publishers New Delhi – 2005
- (2) Electrical illustration, Estimation & costing, J.B.Gupta – S.K.Kataria & Sons Delhi - 2005
- (3) House Wiring Hand Book, International Copper Promotion Council (India), Powai
- (4) Guide for Electrical Layout in Residential Building, IS4648–1968, Bureau of Indian Standards, Delhi

### 6AR3. Construction Materials - VI M.M. 100

1L + 1T

Ex. Hrs. 3

**Objective:** Prefabrication Technology and cost effective building material.

**Contents:**

- 1) Ferrocement,
- 2) Precast construction,
- 3) Pre-stressed construction,
- 4) Structural steel roofing and steel construction,
- 5) Cost effective building material.

**Exercise :** Study of IS codes, seminars and preparation of reports and visit to construction site.

**Reference Books:**

- (1) Handbook on Building Construction Practices, Bureau of Indian Standards, New Delhi
- (2) Practical Handbook on Building Construction, M.K.Gupta
- (3) Hand Book on Conc. Reinforcement & Detailing, Bureau of Indian Standards, New Delhi
- (4) Building Construction, J.C.Mackay – Orient Longman Mumbai – 2005
- (5) The Construction of Building, R. Barry – Affiliated East & West Press, New Delhi – 2004

### 6AR4. Architectural Structures – VI M.M. 50

1L + 1T

Ex. Hrs. 2

**Objective:** Design of Steel Structure.

**Contents:**

1. Introduction to Design of steel structures
2. Foundation-Grillage foundation
3. Steel Design-Columns and beams under ordinary loading condition
4. Steel stresses
5. Plate and gantry girders

**Reference Books:**

- (1) Design of Steel Structure (Vol.I), Prof. R. Chandra – Standard Publisher & Distributors, Delhi – 2005
- (2) Design of Steel Structure, Negi – Tata McGraw Hills Publishing Co. Ltd., New Delhi – 2004
- (3) Design of Steel Structure, S.K.Duggal - Tata McGraw Hills Publishing Co. Ltd., New Delhi – 2004

#### 6AR5. Architectural Design – IV

9S

M.M. 250

- Objective:** Understanding correlation between function, structure, material, construction and services.
- Contents:** Design of a building to understand the relation between function and structure. The idea of form follows function and vice versa. The structural system as a design element. This design concept is to be constructed with the understanding of materials and construction techniques and various services needed for the functions of the building.
- Project:** Design of public buildings such as multistory apartment, commercial building, multiplex, etc.
- Reference Books:**
- (1) Town Planning, Abir Bandopadhyay
  - (2) Urban Housing Forms, Architectural Press
  - (3) Architecture – Form, Space & Order, Francis D.K.Ching
  - (4) Forms En Formations, Christian Darles

#### 6AR6. Working Drawings

3 T/S

M.M. 100

- Objective:** Architectural detailing and execution drawings.
- Contents:** Preparing Construction drawings – plan, section, elevations, details, electrical, plumbing, finishes, flooring etc. Drawings for the municipal approval. Preliminary estimates.
- Project:** Multistory apartment building or commercial building in urban context.
- Reference Books:**
- (1) Residential Const. Prob. Solver, Brat John
  - (2) Working Drawing Handbook, Keith Styles – Architectural Press Oxford - 1998
  - (3) Building with large clay blocks, Theodor Hugues, Klaus Greilich, Christine Peter
  - (4) Arch. Drawing and light construction, Edward J. Muller, James G. Gaussett Philip A. Grav – Prentice Hall, New Jersey - 1999

#### 6AR7. Building Economics

1L + 1T

M.M. 50

- Objective:** To develop a Economic base for Architecture.
- Contents:** General economic concepts, demand and supply consumption, production distribution and its relevance to economics, Money, banking and bank credits, cost and cost indices. Inflation and inflationary pressures, Mixed economy, Economics of private and public housing development, financing of projects, economic feasibility report etc. with special reference to India. Relationship of world economy, national economy, regional economy to a project
- Exercises:** Seminars and preparing paper.
- Reference Books:**
- (1) Money, Banking, M.L.Seth
  - (2) Advanced Eco., H.L.Ahige
  - (3) Money & Banking, J.K.Tandon

#### 6AR8. Building Construction - VI

1L + 3 S

M.M. 100

- Objective:** To study application of steel and aluminum sections and precast technology in buildings.
- Contents:** Sky light, north light, curtain wall, structural glazing, metal cladding, section windows, aluminum windows and pre-cast construction.
- Exercises:** Preparing construction drawings based on above topics. Preparing report of a building selected from site and presentation.
- Reference Books:**
- (1) Architectural Alluminium Extrusions, Jindal Aluminium Ltd., Bangalore
  - (2) Metal Doors, Windows & Ventilator (Steel & Al.), Bureau of Indian Standard, New Delhi
  - (3) Specification for Al. Doors, Windows & Ventilators, Bureau of Indian Standard, New Delhi
  - (4) Guide Book on steel doors & windows for domestic use, INSDAG, Kolkata
  - (5) The Construction of Building, R. Barry – Affiliated East West Press, New Delhi

#### 6AR9. Elective - II

1L + 1 T

M.M. 50

- Objective:** To develop understanding of other related dimensions of Architecture.
- Contents:**
1. Real Estate & Redevelopment
  2. Product Design
  3. Design for Disabled.
- Reference Books:**
- (1) Universal Design Handbook, Wolfgang, Preiser
  - (2) Building for a lifetime, Wylde, Robbins
  - (3) Accessible Home Design, Steven Winner
  - (4) The ABC's of Real Estate Industry, Ken Mc Elloy

**Objective:** Three dimensional explorations and presentations

**Contents:** Making drawings in 3-D studio and rendering, digitizing maps, Creative explorations on computers.

**Exercises:** Preparing drawings based on above topics for selected building

**Reference Books:** 1) REVIT Help  
2) 3D Studio Max  
3) AutoCAD

**7AR1. Contract Documents & Byelaws**  
**M.M. 100**

2L + 1T

Ex. Hrs. 3

**Objective:** Architectural practice and building regulations.

**Contents:**

- 1) **Nature** of building contracts; types; Condition of contract; obligations and responsibilities of clients, contractors and architects.
- 2) **Tenders** – calling, scrutiny and recommendations, open and selective tender systems; two stage tender scrutiny process, Pre-tender qualifications and registrations of contractors.
- 3) **Deposits, labor laws and obligations** : disputes and settlement of disputes.
- 4) **Building bylaws** : ground coverage, FSI calculations, building height regulations, building use regulation, NA – NOC, BU certificate.
- 5) Buildings services approvals and completion certificate procedure.

**Reference Books:**

- (1) Professional Practice & Management, K.V.Kuppu
- (2) An introduction to Practical Aspect of J., K.A.N.Talpasi
- (3) Contract-I & Specific Relief Act, Dr. S.S.Singh & A.K.Srivastava
- (4) National Building Code – Bureau of Indian Standards, New Delhi – 2005

**7AR2. Building Services-III**  
**(Mechanical Services)**

1L + 1T

M.M. 100

Ex. Hrs. 3

**Objective:** Understanding mechanical services for building design.

**Contents:**

- 1) Basic principles of refrigeration, refrigeration cycle and system components.
- 2) Air cooling and air conditioning, planning and design considerations, psychometric chart and its use.
- 3) Lifts, grouping of lifts, return time, design of lift banks for carrying capacity and travel time, installation requirements, escalators.
- 4) Fire extinguishing systems, warning systems, fire resistant doors, planning of buildings for fire escapes,
- 5) Solar water heating systems.

**Exercises:** Preparation of reports, visit to construction site and documentation. Market survey to study mechanical products.

**Reference Books:**

- (1) Principles of Air conditioning on Refrigeration, S.L.Gupte
- (2) National Building Codes, Bureau of Indian Standards – 2005
- (3) NBC Part-VIII – Building Services, Bureau of Indian Standards – 2005
- (4) NBC Section-II – Electrical Services, Bureau of Indian Standards – 2005

**7AR3. Building Science-II**  
**(Acoustics & Illumination)**

1L + 1T

M.M. 100

Ex. Hrs. 3

**Objective:** Understanding Acoustics and Illumination in building designs.

**Contents:**

- 1) Basic Terminology and definitions. Physics of sound. Behaviour of sound in an enclosed space. Criteria for acoustic environment-location of building, geometry and shape, echo, reverberation time, sound absorption coefficient, noise rating curves.
- 2) Predictions of acoustical conditions and approach to designing enclosure for predetermined acoustical responses, corrective of existing deficient enclosures. Introduction to sound reinforcing system-amplification and distribution. Selection of acoustic materials, construction details and fixing.
- 3) Noise – physiological and psychological effects, transmission loss, flanking of sound, structure borne sound and noise from different mechanical equipments. Noise control techniques and their applications.
- 4) Introduction to illumination. Laws of illumination.
- 5) Design for lighting, classification of lighting system – direct, diffused, indirect etc. Artificial light sources, types and their use limitations. Use of artificial lighting as an element in architectural scheme particularly exhibitions, theatres, offices and stores etc., lighting for road traffic, decorative and flood lighting.

**Exercises:** Medium size acoustical design supplemented with drawing and calculations. Qualitative and quantitative aspects of lighting supported by actual exercises.

**Reference Books:**

- (1) Heating, Cooling, Lighting – Design, Methods for Architects, Norbert Lachner – JohnWiley & Sons, New York - 2001
- (2) Handbook of Lighting Design, Rudiger Ganslandt, Harold Hofmann
- (3) Auditorium Acoustics and Architectural Design, Michael Brown – E&FW Spon London - 1993
- (4) Detailing for Acoustics, Peter Lord/Duncan temp – E&FN Spon London - 1996
- (5) Concepts in Architectural Acoustics, M. David Egan/McGraw Hill, New Delhi

**7AR4. Architectural Structures - VII****1L + 1T****M.M. 50****Ex. Hrs. 2**

- Objective:** Conceptual study of Advance Frame construction structures with reference to high rise buildings and surface structure.
- Contents:**
- 1) Definition of determinate and indeterminate structures, redundant frames, static and kinematic indeterminacy of beam only. Cylindrical, parabolic and flat arches, advantages and limitations.
  - 2) Beams and columns and various types of supporting systems cantilever and propped cantilever. Continuous and fixed beams and their behavior under load. Slope deflection and Kneill's method for analysis of continuous beams and simple portal frames.
  - 3) Simple framed structures and trusses-advantages and limitations. Conceptualizing and understanding of surface structures – shells, domes and folded plates.
  - 4) Pile and raft foundations
  - 5) **Pre-stressing** – Method and losses in pre-stressing, comparison of RCC and pre-stressing. Pre-stressing systems.
- Reference Books:**
- (1) Structural Mechanics & Analysis, V.S.Prasad
  - (2) Strength of Material & Mechanics of Structure (Vol. II), B.C.Punmia – M/s. Lax Publications, New Delhi - 2010
  - (3) Basic Structural Analysis, C.S.Reddy

**7AR5. Architectural Design-V & Field Trip****9 T/S****M.M. 250**

- Objective:** Understanding building in urban context.
- Contents:** To understand the issue of building and context, building bylaws, urban design. The design of building will look into aspects of commercial feasibility and building program. Architectural dimension with issues of services.
- Project:** Designing a urban insert – commercial building, institutional building with a auditorium, public building.
- Reference Books:**
- (1) Small Pods, Famy Tagavi, 2001
  - (2) Tropical Resorts, Tank I look Beng'95
  - (3) Housing Architectural Details, Joglekar'91
  - (4) The Architecture of Parking, Tamus & Hudson
  - (5) New Restaurant Design, Betham Ryder'07

**7AR6. Landscape and site planning****2L + 3T/S****M.M. 150**

- Objective:** Understanding theory and design of landscape and site plan.
- Contents:** Introduction to landscape architecture. Elements of landscape design and their relation to built environment. Plant characteristics – The structure, color, form and foliage of various trees and shrubs and climbers and ground covers. Study and identification of Indian plants and trees etc. Plant propagation. Study of landscape in historical perspective Indian, Persian, Mughal, Japanese, Chinese etc. Landscape designing – site analysis and development. Designing and presentation of landscape schemes for building projects, gardens/parks, historical monuments and places of tourist interest etc. contemporary attitudes to landscape design. Design of road layouts, parking and campus planning.
- Exercises:** Design of landscape for building projects and public spaces.
- Reference Books:**
- (1) Landscape Construction & Detailing, Alan Blanc
  - (2) The Landscape of Man, Geoffery and Susan Jellicoe
  - (3) Designing the New Landscape, Sutherland Lyall
  - (4) Redesigning City Squares and Plazas, Francisco Ajensio Cerver
  - (5) Trees of Chandigarh, Chatter Singh – B.R.Publishing Corp. Delhi - 1998

**7AR7. Advance Building Construction****2L + 3T/S****M.M. 100**

- Objective:** Study of advance construction systems in architecture.
- Contents:** Advanced Foundations – Pile and raft foundations. Advanced methods of multistory building construction – Lift slab construction, slipform construction etc. Space frames, unconventional buildings like TV towers etc. Geodesic domes – principles and construction. Disaster resistant construction system.
- Exercises:** Preparing Construction drawings based on above topics. Preparing report of a building selected from site and presentation.
- Reference Books:**
- (1) Building Construction and Material, Gurucharan Singh – Standard Book House, Delhi - 2010
  - (2) R. Barry's Advanced Construction of Buildings, Stephen Emmittand, Christopher George – Black Well Publishing Oxford – 2006
  - (3) The Construction of Building, Vol-1, IV, R. Barry – Affiliated East West Press, New Delhi - 2004
  - (4) Foundation Design and Construction, M.J.Tomilson – Educational Low Priced Books Scheme with Longman London - 1995
  - (5) Building Construction Illustrated, Francis D.K.Ching – VAN Nostrand Reinhold, New York – 2010

**7AR8. Elective-III**

**1L + 2T/S**

**M.M. 100**

**Objective:** To understand other related dimensions of Architecture.

**7AR8.1. Alternate Energy Systems in Architecture**  
**7AR8.2. Vernacular Architecture**

**Reference Books:** (1) Heating, Cooling, Lighting – Design, Methods for Architects, Norbert Lechner  
(2) Sustainable Facilities – Green Design, Construction and Operation, Keith Moskow  
(3) Tropical Sustainable Architecture – Social and Environmental Dimensions, Joo-Hwa Bay & Boon Lay Ong

**YEAR – IV**

**SEMESTER-VIII**

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**8AR1. Practical Training**

**140 days**

**Objective:** To expose student to Architectural practice, construction and execution.

**Contents:** Student shall work for a period of 140 days in an office of Architect approved by the institution. He shall be submitting monthly work report, critical appraisal of built projects, field documentation of architectural details and site supervision of built projects.

	<b>9AR1. Professional Practice &amp; Management</b>	
<b>2L + 1T/S</b>	<b>M.M. 100</b>	<b>Ex. Hrs. 3</b>
<b>Objective:</b>	Understanding architectural practice.	
<b>Contents:</b>	<ol style="list-style-type: none"> <li>1) <b>The architect and his office</b>, relationship with clients, consultants, contractors, legal responsibilities of architects, code of professional practice, fees</li> <li>2) <b>Architectural Competitions And Architects Registration Act 1972.</b></li> <li>3) Tender and tendering procedures, principle of contract and agreements. Control of constructional operations. Arbitration and its proceedings and awards.</li> <li>4) Introduction to principles of business management, project programming and monitoring PERT and CPM network and their analysis.</li> <li>5) Human relation and personnel management. Brief idea about accounting and book keeping, business correspondence, information storage and retrieval systems.</li> </ol>	
<b>Exercises:</b>	Preparing a report of a study of an Architects office.	
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>(1) Pert and CPM, Dr. P.N.Modi, Rajan Modi, Sanjeev – Standard Book House, Delhi - 1997</li> <li>(2) Construction Planning &amp; Ag., Dr. H.K.Srivastava</li> <li>(3) Hand Book of Professional Documents, Council of Architecture, New Delhi - 2007</li> </ol>	
	<b>9AR2. Introduction to Settlement Planning</b>	
<b>1L + 1T/S</b>	<b>M.M. 50</b>	<b>Ex.Hrs.2</b>
<b>Objective:</b>	To Understand architecture as an integrated fabric of settlement.	
<b>Contents:</b>	<ol style="list-style-type: none"> <li>1) Definition, planning as an architectural expression and form of developing a human settlement; History of city planning.</li> <li>2) Theories of city planning, new towns and cities, urban and rural housing;</li> <li>3) Concepts of urban space, survey, techniques;</li> <li>4) Zoning and land use, neighborhood concepts, central business district, site planning;</li> <li>5) Urban transportation, urban renewal and redevelopment, present day planning in India.</li> </ol>	
<b>Exercises:</b>	Paper presentation; Site visit to various areas of the city.	
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>(1) The City Reader, Richard T. Legate Federic Start-Raut Ledge,London-1997</li> <li>(2) Town &amp; Square, Paul Zocker</li> <li>(3) Chandigarh, Ravi Kala-Oxford University Press,New Delhi-2002</li> <li>(4) Ancient Cities &amp; Sacred Skies, J.Mckin Malville &amp; Lalit Gural</li> <li>(5) The City in History, Wis Mumford</li> </ol>	
	<b>9AR3. Housing</b>	
<b>2L + 1T/S</b>	<b>M.M. 100</b>	<b>Ex.Hrs.3</b>
<b>Objective:</b>	Understanding housing as a major element of architecture.	
<b>Content:</b>	<ol style="list-style-type: none"> <li>1) Housing systems – housing need and options available, National Housing policy.</li> <li>2) Housing Agencies and their contribution to housing development, housing finance.</li> <li>3) Social factors influencing design, affordability, economics factors and housing concepts, slum up-gradation, site and services, housing surveys and neighborhood analysis.</li> <li>4) Different type of housing and housing standards, methodology of formulation standards, relevance of standard in housing development, services efficiency and user satisfaction.</li> <li>5) Housing Design process – different stages in project development – layout design including utilities and common facilities, design as a result of bye-laws. Development of Technology and community interest.</li> </ol>	
<b>Exercise:</b>	Paper presentation. Site visit to housing areas.	
<b>Reference Books:</b>	<ol style="list-style-type: none"> <li>(1) ITPI Reader volume on Housing, Thomas K. Pullose-Institute of Town Planers India, New Delhi 2002</li> <li>(2) Housing &amp; Urbanisation by Charles Correa-Urban Design Institute-1999</li> <li>(3) Population and Housing Problems in India Vol. I &amp; II, S.D.Maurya</li> </ol>	
	<b>9AR4. Architecture Design – VI &amp; Field Trip</b>	
<b>10 T/S</b>		<b>M.M. 250</b>
<b>Objective:</b>	Resolution of project to integrate complexity of urban dimensions and architectural language.	
<b>Contents:</b>	Design of complex and large scale projects in urban context. Design must establish linkages with urban structure, urban continuity, movement structure, landscaping, people and vehicular movements system design, economics, architectural aesthetics and details.	
<b>Project:</b>	Railway Station, Inter State Bus Terminus, Airport or Sports Stadium.	
<b>Reference Books:</b>	Not applicable	

**9AR5. Introduction to Settlement Planning (Studio)**

**3 T/S**

**M.M. 100**

**Objective:** To study design of settlements.

**Contents:** Designing a settlement layout showing notion of urban space, neighborhood, typology, unit type, land use, zoning, transportation, density etc.

**Project:** Neighborhood design. Site visits to Govt. housing and private development.

**Reference Books:** (1) Indus Civilization, ADP Agarwal  
(2) The City Reader, Richard T. Legate Federic Start  
(3) Indian Cities, Akshat Kumar Kaushik  
(4) Town Planning Theory & Pract., M. Pratap Rao

**9AR6. Practical Training Presentation**

**2 T/S**

**M.M. 250**

**Objective:** To expose student to Architectural practice and construction technology methods, materials and execution.

**Contents:** Student shall work for a period of 140 days in an office of Architect or Builder approved by the department. He shall be submitting monthly work report, critical appraisal of built projects, field documentation of architectural details and site supervision of built projects.

**Reference Books:** Not applicable

**9AR7. Dissertation**

**5 T/S**

**M.M. 250**

**Objective:** Research study.

**Contents:** Each student is required to conduct a non-design study on topic selected by the student and approved by the department. The study shall be conducted under the guidance of teacher or external expert in the department. This Dissertation should lead to a design problem to be taken up as a Thesis Topic.

**Reference Books:** Not applicable

**9AR8. Elective-IV**

**1L + 2 T/S**

**M.M. 100**

**Objective:** To understand other related dimensions of Architecture.

**9AR8.1. Urban Conservation**

**9AR8.2. Urban Design**

**Reference Books:** (1) Conservation Guidelines, Bernard Fielden  
(2) 4 Books on Architecture, Andrae Palladio  
(3) City Shaped, Speiro Kostof  
(4) History of Architecture, Speiro Kostof



**10AR1. Thesis Project**

12 T/S

M.M. 500

**Objective:** Individual design project approved by department.

**Contents:** Large scale project having complexity of urban and architectural resolutions. Culmination of all the skills acquired of architecture. Individual understanding of architectural theory, philosophy and architectural style. Student shall engage in study, documentation, analysis and design process of the project. The theoretical part to be put together in the form of a report and the design solution to be presented in hard/soft copy with a model.

**Project:** Selected by student and approved by department.

**Reference Books:** Not applicable

**10AR2. Elective –V**  
(Advance Study related to Thesis Project)

3 T/S

M.M. 100

**Objective:** To study in detail subject area of the thesis topic.

**Contents:** The student will undertake study guided by thesis guide in subject area of the topic selected for the thesis project.

**Reference Books:** Not applicable

**10AR3. Elective - VI**

2L + 3 T/S

M.M. 100

**Objective:** To understand other related dimensions of architecture.

**10AR3.1 Disaster resistant structures.**

**10AR3.2 Architectural development and legislation.**

**Reference Books:** (1) Earthquake tips earthquake design & const., C.V.R. Murti  
(2) Construction Technology, R. Chudley  
(3) Construction Technology, E. Flemming