BACHELOR OF ARCHITECTURE

New Course Curriculum
(Under Credit Scheme)

For all batches from 2015 batch onwards
(Except 2011-16 batch)

Objectives
Examination Scheme
Syllabus

DEPARTMENT OF ARCHITECTURE
National Institute of Technology,
Hamirpur (HP) - 177 005

DEPARTMENT OF ARCHITECTURE
National Institute of Technology, Hamirpur (HP) - 177 005

OBJECTIVE OF B. ARCH. FIVE YEAR PROGRAM

The Bachelor of Architecture (Five year Degree Program) has a broad scope, not only of self-employment but creating job opportunities for a large number of people who will be working with the Architects. There are ample opportunities for employment in Central, State & Private Sector Organization, where the positions of Architects & Town Planners remain vacant for lack of qualified persons. Program is intended to prepare students for professional practice in the field of Architecture. There is an increasing recognition today of Architecture as an intellectual discipline, both as an Art and as a Profession. In India, where we have further complexities of different social, cultural and geographical, economical and technical domains, which are unique and typical of every region of our country, architects make a vital contribution in the shaping of our environment and society.

This program has started with an idea to provide qualified professionals, in the field of Architecture, to the country and to the Himachal region in particular. The emphasis will be on the development personality of students with the aid of both the objective information and subjective attitude, based on reasons.

An Architect supposed to act as a team leader and coordinator of the inputs of the various specific disciplines. The need to possess a sound knowledge of all aspects of modem building, technology, technological and Engineering aspects have been remarkably incorporated in the curriculum to make the student able to keep pace with fast changing world of technology, where the meaning of a house has been changed from

'A shelter to protect us from extreme weather' to 'A machine to live in'. The program aims at attaining a high level of excellence in Architectural Education. However, the program is intended to reinforce intellectual capabilities and develop proficiency in professional scheme to enable graduates to completely pursue alternative career with in the broad spectrum of Architecture.

COURSE STRUCTURE

The course consists of five years out of which 41/2 years will be of formal contact instructions 'and six months will be devoted to professional training in a recognized professional office/ industry. Basic course areas are scheduled as:

1. Architectural Design
2. Building Construction & Materials
3. Building, Structures- Analysis & Designs

In addition to these the other courses such as Building Sciences, Services, Architectural Drawing and Presentation, Computers, Humanities, History & Management have been suitably incorporated in the curriculum. Some elective courses have been introduced to impart specialized training for some of the subjects in 4 th year teaching scheme.
Workshop exercises are the backbone of practical knowledge and exposure.

National Institute of Technology Hamirpur
Department of Architecture

FIRST YEAR																
First Semester								**Second Semester**								
S. No.	**Code**	**Subject**	**L**	**T**	**P/ D**	**Type of Course**	**Credits**	**To be taught by Deptt. of**	**S. No.**	**Code**	**Subject**	**L**	**T**	**P/D**	**Credits**	**Type of Course**	**To be taught by Deptt. of**
1	ARD- 111	Basic & Visual Design	2	0	4	Lab	4	Architecture	1	ARD- 121	Architectural Design-II	2	0	6	5	Lab	Architecture
2	ARD- 112	Bldg. Const. & Mat.-I	2	0	4	Lab	4	Architecture	2	ARD-122	Bldg. Const. & Mat.-II	2	0	4	4	Lab	Architecture
3	ARD- 113	History of Arch-I	2	1	0	Theory	3	Architecture	3	ARD-123	History of Arch-II	2	1	0	3	Theory	Architecture
4	ARD- 114	Architectural Drawing & Graphics -I	2	0	4	Lab	4	Architecture	4	ARD-124	Architectural Drawing & Graphics -II	2	0	4	4	Lab	Architecture
5	ARS- 115	Architecture Mathematics	3	1	0	Theory	3	Mathematics	5	ARD- 125	Mechanics of Structures	2	1	0	3	Theory	Civil Engg
6	ARH- 116	Communication Skills	2	1	0	Theory	3	Humanities	6	ARW-126	Workshop Practice	1	0	3	2	Lab	Institute Workshop
7	ARH- 117	Communication Skills Lab	0	0	2	Lab	1	Humanities									
			H = 30				22					H = 30			21		

Note:-

a) Workshop practice will include Machine shop, Welding, and Sheet metal shops only.
b) Site Visits/Tours may be conducted within the semester as per requirement of the subject.
c) **Laboratory Courses**:
   i. The viva voce of 30% component of continuous assessment is to be conducted by subject incharge.
   ii. The viva voce of 20% component of End term is to be conducted jointly by the subject incharge and one expert to be appointed from within the department.
   iii. The end semester examination will be conducted for 20% weightage of end semester evaluation (as per UG manual) for **ARD-111, ARD-112, ARD-114 ARD- 121, ARD-122, ARD-124**

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Department of Architecture

SECOND YEAR																	
Third Semester									**Fourth Semester**								
S. No.	**Code**	**Subject**	**L**	**T**	**P/ D**	**Credits**	**Type of Course**	**To be taught by Deptt. of**	**S. No.**	**Code**	**Subject**	**L**	**T**	**P/D**	**Credits**	**Type of Course**	**To be taught by Deptt. of**
1	ARD- 211	Architectural Design-III	2	0	8	6	Lab	Architecture	1	ARD- 221	Architectural Design-IV	2	0	8	6	Lab	Architecture
2	ARD- 212	Bldg. Const. & Mat.-III	2	0	4	4	Lab	Architecture	2	ARD-222	Bldg. Const. & Mat.-IV	2	0	4	4	Lab	Architecture
3	ARD- 213	History of Arch-III	2	1	0	3	Theory	Architecture	3	ARD-223	Theory of Design-1	2	1	0	3	Theory	Architecture
4	ARD- 214	Architectural Drawing & Graphics -III	2	0	4	4	Lab	Architecture	4	ARD- 224	Building Services-I	2	1	0	3	Theory	Architecture
5	ARD- 215	Analysis of Structures	2	1	0	3	Theory	Civil Engg	5	ARD-225	Design of RCC Structures	2	1	0	3	Theory	Civil Engg
6	ARD- 216	Climate and Built Environment	2	1	0	3	Theory	Architecture	6	ARD-226	Computer Applications in Architecture	2	0	4	4	Lab	Architecture
7	ARD-217	Geomatics and Measure Drawing	2	0	2	3	Theory	Architecture	7	ARD-227	Disaster Management	2	1	0	3	Theory	Architecture
			H = 35			26						H = 34			26		

Note:-

a) Measured Drawing tour to be conducted at the end of fourth semester during Summer Vacations.
b) Site Visits/Tours may be conducted within the semester as per requirement of the subject.
c) **Laboratory Courses**:
   i. The viva voce of 30% component of continuous assessment is to be conducted by subject incharge.
   ii. The viva voce of 20% component of End term is to be conducted jointly by the subject incharge and one expert to be appointed from within the department.
   iii. The end semester examination will be conducted for 20% weightage of end semester evaluation (as per UG manual) for **ARD-211, ARD-212, ARD-214 ARD- 221, ARD-222.**

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THIRD YEAR																	
Fifth Semester								**Sixth Semester**									
S. No.	**Code**	**Subject**	**L**	**T**	**P/D**	**Credits**	**Type of Course**	**To be taught by Deptt. of**	S. No.	**Code**	**Subject**	**L**	**T**	**P/D**	**Credits**	**Type of Course**	**To be taught by Deptt. of**
1	ARD- 311	Architectural Design-V	2	0	10	7	Lab	Architecture	1	ARD- 321	Architectural Design-VI	2	0	10	7	Lab	Architecture
2	ARD- 312	Bldg. Const. & Mat.-V	2	0	4	4	Lab	Architecture	2	ARD-322	Bldg. Const. & Mat.-VI	2	0	4	4	Lab	Architecture
3	ARD- 313	Theory of Design-II	2	1	0	3	Theory	Architecture	3	ARD-323	Ekistics	2	1	0	3	Theory	Architecture
4	ARD - 314	Building Services-II	2	1	0	3	Theory	Architecture	4	ARD-324	Building Services-III	2	1	0	3	Theory	Architecture
5	ARD- 315	Design of Steel Structures	2	1	0	3	Theory	Civil Engg	5	ARD- 325	Hill Architecture	2	1	0	3	Theory	Architecture
6	ARD- 316	Building Estimation, Costing & Specification	2	1	0	3	Theory	Architecture	6	ARD-326	Building Economics and Sociology	2	1	0	3	Theory	Architecture
7	**	Institute Elective	2	2	0	3	Theory	Other Department	7	ARD-327	Earthquake Resistant Building Design	2	1	0	3	Theory	Architecture
8	ARO-317	Auto CAD	1	0	3	3	Lab	Architecture									
			H = 34			26						H = 33			26		

Note:-

a) ARD-417 Professional Training: The students will undergo 06 – 08 weeks training with CoA registered/Affiliated Architect during Summer Vacations.
b) Site Visits/Tours may be conducted within the semester as per requirement of the subject.
d) **Laboratory Courses**:
   i. The viva voce of 30% component of continuous assessment is to be conducted by subject incharge.
   ii. The viva voce of 20% component of End term is to be conducted jointly by the subject incharge and one expert to be appointed from within the department.
   iii. The end semester examination will be conducted for 20% weightage of end semester evaluation (Laboratory courses as per UG manual) for **ARD-311, ARD-312, ARO-317 ARD- 321, ARD-322.**

National Institute of Technology Hamirpur
Department of Architecture

FOURTH YEAR																	
Seventh Semester								**Eighth Semester**									
S. No.	**Code**	**Subject**	**L**	**T**	**P/D**	**Credits**	**Type of Course**	**To be taught by Deptt. of**	**S. No.**	**Code**	**Subject**	**L**	**T**	**P/D**	**Credits**	**Type of Course**	**To be taught by Deptt. of**
1	ARD- 411	Architectural Design-VII	2	0	10	7	Lab	Architecture	1	ARD- 421	Architectural Design-VIII	2	0	10	7	Lab	Architecture
2	ARD- 412	Advanced Construction Techniques	2	0	4	4	Lab	Architecture	2	ARD-422	Interior Design	2	0	4	4	Lab	Architecture
3	ARD- 413	Landscape Design	2	1	0	3	Theory	Architecture	3	ARD-423	Research Methodology	2	1	0	3	Theory	Architecture
4	ARD- 414	Low Cost Building	2	1	0	3	Theory	Architecture	4	ARD- 424	Urban Design	2	1	0	3	Theory	Architecture
5	ARD- 415	Energy Efficient Architecture	2	1	0	3	Theory	Architecture	5	ARD-425	Project Management	2	1	0	3	Theory	Architecture
6	ARD-416	Elective- I	2	1	0	3	Theory	Architecture	6	ARD-426	Elective- II	2	1	0	3	Theory	Architecture
7	ARD-417	Professional Training	-	-	-	2		Architecture	7	ARD-427	Dissertation	2	0	0	2	Lab	Architecture
			H=30			25						H=32			25		

Note:-

a) ARD-417 Professional Training will be evaluated as per UG Manual Clause 6.3 (B)
b) ARD-416 List of Elective-I: (i) Art and Architecture (ii) Architectural Photography & Journalism (iii) Futuristic Architecture
c) ARD-426 List of Elective-II: (i) Architectural Conservation (ii) Housing (iii) Building Maintenance
d) Site Visits/Tours may be conducted within the semester as per requirement of the subject.
e) **Laboratory Courses**:
   i. The viva voce of 30% component of continuous assessment is to be conducted by subject incharge.
   ii. The viva voce of 20% component of End term is to be conducted jointly by the subject incharge and one expert to be appointed from within the department.
   iii. The end semester examination will be conducted for 20% weightage of end semester evaluation (Laboratory courses as per UG manual) for **ARD-411, ARD-412, ARD- 421, ARD-422.**

National Institute of Technology, Hamirpur
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FIFTH YEAR																	
Ninth Semester									**Tenth Semester**								
S. No.	**Code**	**Subject**	**L**	**T**	**P/ D**	Credits	Type of Course	To be taught by Deptt. of	S. No.	**Code**	**Subject**	**L**	**T**	**P/D**	Credits	Type of Course	To be taught by Deptt. of
1	ARD- 511	Architecture Design Thesis	0	0	20	10	Major Project	Architecture	1	ARD- 521	Office Training	-	-	-	10	Lab	Industry
2	ARD-512	Professional Practice & Ethics	2	1	0	3	Theory	Architecture									
3	ARD-513	Building Bye-Laws Regulations	2	1	0	3	Theory	Architecture									
			H=26			16									10		

Note:-

a) The student will undergo Office Training with CoA Registered/Affiliated Architect.
b) Site Visits/Case studies may be conducted within the semester by individual student as per the advice of concerned guide.

ARD – 111 BASIC AND VISUAL DESIGN – I

B.Arch. 1st year (1st Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE

To Train the students in visual compositions by using various elements of Design and to make them familiar with the meaning and purpose of Architectural design.

CONTENTS

UNIT I (Time- three weeks)

- Study of distinctive aspects of Architecture, inter-linkages between Architecture, Nature and Culture, unique aspects of Architectural profession, Requirements and qualities of a student of architecture.

UNIT II (Time-five weeks)

- Introduction to the Concept of design in everyday life, Objectives of design, Elements of design such as point- Line- Form- Space- Texture- Colour etc. Detailed study of color theory and its applications through geometric compositions.
- Principles of design such as Scale- Balance- Proportion- Rhythm- Harmony- Contrast- etc. Application of the same through exercises in two and three dimensional compositions; using single and multiple types of elements.

UNIT III (Time- four weeks)

- Introduction to Anthropology, Anthropometric data for adults& children: Standing position front & side- Arms extended- various seating positions-various working positions.

UNIT IV (Time- four weeks)

- Designing of Habitable space for the units; Living Room, Dining Room, Bedroom, Kitchen &Toilet with furniture layout.

NOTE:

- The time mentioned at the end of each of the above units indicates the tentative time taken to complete each.

REFERENCE:

- "Design through Discovery", M.E. Bevlin, Holt, Rinehart, and Winston, 1984.
- "Drawing and Perceiving", Douglas Cooper, John Wiley & Sons, 2007.
- "Principles of Design in Architecture", K.W. Smithies, Van Nostrand Reinhold, 1981.
- "Architectural Drawing Masterclass", Tom Porter, Charles Scribner's, 1993.
- "Time-saver Standards for Architectural Design Data: The Reference of Architectural Fundamentals", Donald Watson, McGraw-Hill, 1997.
- "Time Saver Standards for Building Types", John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York, 1983.
- "Architectural Graphic Standards", Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons, 2008.
- "Form Space & Order", 4th Ed., Francis DK Ching, John Wiley & Sons, New Jersey, 2015.

ARD – 112 BUILDING CONSTRUCTION & MATERIALS – I B.Arch. 1st year (1st Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE
To familiarize the students with basic building materials and their construction details.
CONTENTS

UNIT I (Time-Four weeks)
- Basic building materials- brick, stone, lime, cement, sand: Application, properties and defects.
- Building components- wall, floor, roof and foundation; construction terminology through typical section.

UNIT II (Time-Four weeks)
- Process of rock formation. Various kinds of stones used for Building Construction, their properties, applications etc.
- Bricks – Constituents and properties of soil, Manufacturing, Types, Sizes, Properties and Uses.

UNIT III (Time-Eight weeks)
- Brick Masonry, Various types of bonding in walls such as Stretcher bond-English bond-Single & Double Flemish bond etc. These bonds are to be explained with respect to varying wall thickness such as ½ brick-1 brick- 1½ brick etc. and various types of junctions such as L junction- T junction- Cross junction etc.
- Stone masonry of various types such as Rubble walling, Polygonal walling, Flint walling, Ashlars walling, Masonry joints, Maintenance etc.

NOTE:
- Site Visits to ongoing related construction projects.

REFERENCE BOOKS

- "Building Construction", Sushil Kumar, Standard Publishers Distributors, New Delhi, 2006.
- "Building Construction Metric" Vol. 1-2, W.B.Mckay, Orient Longman Private Limited, Mumbai, 2006.
- "Building Construction Illustrated", Francis D.K. Ching, John Wiley & Sons, 2007, 2011.
- "Construction Technology", Vol. 1,Roy Chudley, Roger Greeno,Prentice Hall (UK), 2005.
- "Appropriate building Materials", Roland Stulz, Kiran Mukerji, SKAT, 1993.
- "A Textbook of Building Construction", S.P. Arora and S.P.Bindra, 4thEdition, Dhanpat Rai, Delhi, 1996.

ARD – 113 HISTORY OF ARCHITECTURE – I

B.Arch. 1st year (1st Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand evolution and development of architectural and urban built environment in context to geophysical, social and technological factors.

CONTENTS

UNIT I (Time-three weeks)

- Introduction to Indus Valley civilization. Study of architectural characteristics.
- Introduction to the Vedic village. Study of its building typology and construction.

UNIT II (Time-three weeks)

- Introduction to Buddhist settlement in India.
- Detailed studies of Architectural characteristics of various building types such as Stupas, Chaityas and Viharas through suitable examples from each geographical context to Illustrate differences in Form, Construction methods and Ornamentation.

UNIT III (Time-five weeks)

- Study of evolution of Hindu architecture, Rock-cut and structural forms and comparison of Temple forms in various regions of India.
- Study of various styles of temples such as Dravidian, Indo-Aryan Orissan, Jain with respect to functional components, architectural Form, construction and ornamentation.

UNIT IV (Time-five weeks)

- Delhi or Imperial Style :Slave, Khilji, Tughlaq, Sayyed, Lodhi
- Provincial Style Bengal , Jaunpur, Deccan, Malwa, Bijapur
- Moghul Architecture in North India under : Humayun, Jehangir, Akbar, Shahjehan

NOTE:

- Analysis of architectural style/building typology must include functional, constructional and Architectural, ornamental aspects.

REFERENCE BOOKS

- "Architecture in India", Marilia Albanese, Sandeep Prakashan, 2001.
- "Hindu India", Henri Stierlin, Taschen, 1998.
- "Ancient Indian Architecture", Sanjeev Maheshwari and Rajeev Garg, CBS Publishers & Distributors, 2001.
- "The Hindu Temple", R. Champakalakshmi and Usha Kris, Roli Books, 2000.
- "The Architecture of India: Buddhist and Hindu, Volume 2", Satish Grover, Vikas, 1980.
- "Islamic Architecture in India", Satish Grover, Galgotia Publishing Company, 1996.

ARD – 114 ARCHITECTURAL DRAWING & GRAPHICS – I B.Arch. 1st year (1st Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE

To familiarize the student with basic knowledge of drafting, lettering techniques and visualization of geometric forms.

CONTENTS

UNIT I (Time-three week) : Introduction

- Significance and Scope, Usage of Drawing Instruments, Dimensions, Scales, Free hand Lettering, Line types such as Elevation lines- Construction lines – Section lines – Hidden lines – Centre lines
- Introduction to pencils with different grades such as F, H, HB, 2B, 4B and 6B. Representation of the different lines created by the different pencils by varying thick-Ness and pressure. Representation of various textures with thick, thin and flat pencils Strokes. Illustrative examples to be followed explaining the various techniques.

UNIT II (Time-nine weeks): Projections

- Introduction to Orthographic projections, First angle projection
- Projection of line parallel to both reference planes / parallel to one and inclined to other reference plane / inclined to both the reference planes followed by illustrative examples in each case
- Projection of plane parallel to VP / parallel to HP / perpendicular to VP and inclined to HP / perpendicular to HP and inclined to VP / inclined to both HP and VP followed by illustrative examples in each case.
- Introduction to solids bounded by plane surfaces such as prisms / pyramids and solids of revolution such as cylinders / cones, Projection of solids having axis perpendicular to one of the reference planes / axis parallel to either of the reference plane and incline to other reference plane / axis inclined to both the reference planes followed by illustrative examples in each case.

UNIT III Sciography:- (Time-four weeks)

- Introduction and Importance, Method of drawing, Sciography of points, lines, planes and solids followed by illustrative example in each case.

REFERENCE BOOKS

- "A Textbook of Engineering Drawing", Prof. P.J. Shah, S. Chand Publishing, 2008.
- "Engineering Drawing with an Introduction to AutoCAD", Dhananjay A. Jolhe, Tata McGraw Hill, 2007.
- "Architectural Graphics", Francis D. K. Ching, Wiley; 5th Edition, 2009.
- "Architectural Shades and Shadows", Henry McGoodwin, Nabu Press, 2010.
- "Rendering with Pen and Ink", Robert W. Gill, Thames & Hudson Ltd., 1984.
- "Architectural Drawing", Tom Porter, Hamlyn, 1990.

ARS – 115 ARCHITECTURE MATHEMATICS

B.Arch. 1st year (1st Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 1 - -	4	20%	10%	10%	60%		

CONTENTS

1. MATRICES

Matrices, Related matrices, Complex matrices (Hermitian and skew-Hermitian matrices, Unitary matrix), Solution of linear system of equations, Rank of a matrix, Gauss-Jordan method, Normal form of a matrix, Vectors, Linear dependence, Consistency of a linear system of equations, Rouche's theorem, System of linear homogeneous equations, Linear and orthogonal transformations, Characteristic equation, Eigen values, Eigen vectors, Properties of eigen values, Cayley-Hamilton theorem.

2. DIFFERENTIAL CALCULUS

Indeterminate forms, Partial Differentiation and its geometrical interpretation, Homogeneous functions, Euler's theorem and its extension, Total differentials, Composite function, Jacobian, Errors and increments, Maxima and minima of functions of two variables, Method of undetermined multipliers, Curvature, radius of curvature, Centre & Circle of curvature.

3. CURVE TRACING

Asymptotes**,** Curves in Cartesian and Polar form, Standard curves- Cartesian & Polar curves, Parametric curves, standard Parametric curves.

4. THREE DIMENSIONAL GEOMETRY

Review: Line, plane, sphere, vectors.

Tangent plane to sphere, cone, cylinder, Quadric surfaces-(Ellipsoids, Hyperboloid of one and two sheets, cone, elliptic paraboloid, hyperbolic paraboloid, cylinder) , surface of revolution, some standard surfaces of revolution.

5. SPHERICAL TRIGONOMETRY

Sections of spheres, great circles, spherical triangle and its properties, relations in angles and sides of spherical triangle, spherical right triangle.

6. INTEGRAL CALCULUS

Quadrature, Rectification, Surface and Volume of revolution for simple curves, Double integrals and their applications, Change of order of integration, Change of variables, Triple integrals and their applications, Change of variables. Numerical Integration-(Simpson's and Trapezoidal rule)

7. VECTOR CALCULUS

Differentiation of vectors, Curves in space, Velocity and acceleration, Relative velocity and acceleration, Scalar and vector point functions, Vector operator del, gradient, divergence and curl with their physical interpretations, Formulae involving gradient, divergence and curl. Line, surface and volume integrals, Theorems of Green, Stokes and Gauss (without proofs) and their verifications and applications,

Text BOOKS

1. Advanced Engineering Mathematics: by Erwin Kreyszig, John Wiley and Sons, NC, New York.
2. Advanced Engineering Mathematics: by R. K. Jain & S. R. K Iyengar, Narosa Pub. House.
3. Spherical Trigonometry: Kishana Publications, Meerut.

REFERENCE BOOKS

1. Advanced Engineering Mathematics: by C. R. Wylie & L. C. Barrett, McGraw Hill
2. Differential & Integral Calculus: by N. Piskunov, MIR Publications.

ARH – 116 COMMUNICATION SKILLS

B.Arch. 1st year (1st Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 1 2 -	5	20%	10%	10%	60%		

CONTENTS

Unit 1- The Process of communication
Introduction, What is ”Communication” Barriers to Communication, Different Types of Communication Writer vs Oral Communication. Different Types of Face to Face Interaction, Characteristics and Conventions of Conversation, Conversational Problems of Second, Foreign Language Users, Difference Between Conversation and Other Speech Events.

Unit 2- Telephone Techniques
Speaking and Listening Commonly Used Phrases in Telephone Conversation, Reading: Conference Calls, Vocabulary, Writing and Listening, Leaving a Message, Grammar and Usage: The Perfect Tenses, Pronunciation: Contracted Forms.

Unit 3- Job Applications and Interviews
Reading, Vocabulary, Apply for a job, Curriculum Vitae, Language Focus, Some Useful Words, Study Skills: Preparing for an Interview, Listening, Speaking, Writing.

Unit 4- Group Discussions
Reading. Writing Skills, Listening: How to be Successful in a Group Discussion, Study Skills, Language Focus, Vocabulary, Speaking, Grammar, Connectives, and Pronunciation

Unit 5: Managing Organizational Structure
Warm up, values to Influence and lead, Reading: The Role of a Manager, Vocabulary, Leadership, Speaking and listing language focus Degree of Probability Grammar: Modals, Writing, Reports. Pronunciation.

Unit 6: Meetings
Reading, Successful Meeting, Speaking, One to One Meetings, Language Focus: Opening, Middle and Close, Study Skills, Editing. Listening Criteria for Successful Meetings, Vocabulary, Grammar: Reporting Verbs. Writing: Memos, Pronunciation: Stress According to part of Speech.

Unit 7: Taking Notes and Preparing Minutes
Taking Notes. The note-taking Skill: the Essential Components, The Note-taking Skill: An Example Preparing Minutes. Format of Minutes. Language and Style of Minutes, Grammar: Using the Passive Voice.

Unit 8: Presentation Skills-I
Reading Presentation Skills. Grammar: Verbs often required in Presentations. Language Focus, Listening: Importance of body Language in Presentation. Speaking: Preparing an Outline of a Presentation, Pronunciation.

Unit 9: Presentation Skills-II
Reading Structure of Presentation. Study Skills: Visual Aids, Ending the Presentation, Language Focus: taking about Increase and Decrease. Grammar: Prepositions. Listening: Podium Panic, Speaking, Pronunciation: Emphasizing the important Words in Context.

Unit 10: Negotiation Skills
Language Focus Idiomatic Expressions. Study Skills: Process of Negotiations. Grammar: Phrasal Verbs. Listening: Effective Negotiation, Speaking Writing

REFERENCE BOOKS

1. Effective technical Communication by M. Ashraf Rizvi Pub: Tata McGrrow Hill (2009)
2. Developing Communication Skills by Krishna Mohan Pub: Mac Millan India Limited (2009)
3. An approach to Communication Skills by Indrajit Bhattacharya Pub: Dhanpat Rai Co.Pvt.Lt New Delhi(2007)
4. Handbook of practical Comm. Skills by Wright, Chrissie, Pub: Jaico Publishing house. Mumbai (2007)
5. the skill of Communicating by Bill Scott. Jaico Publishing House, Mumbai (2009).

ARD – 121 ARCHITECTURAL DESIGN – II

B.Arch. 1st year (2nd Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	05
2 - - 6	08	30%	30%	20%	20%		

OBJECTIVE

To train the students in understanding the interdependence of form, function and structure in the process of Architectural design.

CONTENTS

UNIT I (Time-sixteen weeks)

- Design of a Single storied load bearing structure such as Check Post, Post-Office, Crèche, Dispensary etc. The student should be guided to achieve necessary relationship between indoor and outdoor spaces and to understand the role of elements of structure in a built form.

- Summer Vacation Assignment: To study the local architecture of their respective native places and detail study of any important building/ architectural monument of study area.

NOTE

Two design problems and one time problem of 01 week is to be completed in the semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem with reference to the above contents.

REFERENCE BOOKS

- "Building drawing with an integrated approach to Built Environment", M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002.
- "Site Design Graphics", Micheal S. Kendall, Van Nostrand Reinhold, 1989.
- "Architectural Graphics", 6th Ed., Francis D. K. Ching, John Wiley & Sons, 2015.
- "Time-saver Standards for Architectural Design Data: The Reference of Architectural Fundamentals", Donald Watson, McGraw-Hill, 1997.
- "Time Saver Standards for Building Types", John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York, 1983.
- "Architectural Graphic Standards", Charles George Ramsey, Harold Reeve Sleeper, John Wiley & Sons, 13-Jan-2011.

ARD – 122 BUILDING CONSTRUCTION & MATERIALS – II B.Arch. 1st year (2nd Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE

To familiarize the students with use of timber in building construction.

CONTENTS

UNIT I (Time- three weeks)

- Timber: Variety of Indian timbers, characteristics and suitability for different uses, defects and decay, seasoning and preservation; manufactured timber products and their applications.

UNIT II (Time-five weeks)

- Introduction to joinery in timber.
- Detailed drawings and construction details of Battened-Ledged-Braced doors, Battened-Braced-Framed doors, Flush doors etc.
- Introduction to various types of windows in Timber. Detailed drawings and construction details of Casement windows and Bay windows in Timber.
- Workshop practice for carpentry joints used in “2” and “3”.

UNIT III (Time- three weeks)

- Introduction to the nature and characteristics of wood floors at ground and first floor level, its advantages & Limitations.

UNIT IV (Time- five weeks)

- Introduction to the nature and characteristics of wood construction-roofs, its advantages and Limitations.
- Detailed drawings and construction details of flat roof batten & tile and various types of sloping roofs in timber such as Lean to roofs, King Post truss and Queen Post truss using AC/CGI, Mangalore tiles & slates roof coverings.

NOTE

- **Site Visits** to ongoing related construction projects.

REFERENCE BOOKS

- “The Construction of Buildings”, Vol. 1-2, R Barry, Wiley, 2001.
- “Building Construction Metric” Vol. 3, W.B.Mckay, Orient Longman Private Limited, Mumbai, 2006.
- “Building Construction Illustrated”, Francis D.K. Ching, John Wiley & Sons, 2011.
- “Construction Technology” Vol. 1-4,Roy Chudley, Roger Greeno,Prentice Hall (UK), 2005.
- “Workshop Practice” 2nd Ed., H.S.Bawa, Tata McGraw-Hill Education, 2009.
- “Carpentry and Joinery”, George Mitchell, Cengage Learning EMEA, 1995.
- “Arco's complete woodworking handbook”, Jeannette T. Adams, Arco Pub., 1981.

ARD – 123 HISTORY OF ARCHITECTURE – II

B.Arch. 1st year (2nd Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand evolution and development of architectural and urban built environment in context to geophysical, social and technological factors.

CONTENTS

UNIT-I (Time five weeks)

- Introduction to examples of early shelter, Stone Age as an expression of man's physical and spiritual needs.
- Introduction to Egyptian civilization. Study of local context and architectural characteristics of public buildings such as mastabas, pyramids and temples to be explained with examples.

UNIT-II (Time five weeks)

- Introduction to Mesopotamian civilization. Study of urban context and architecture of Public buildings such as Ziggurat of Ur city and Palace of Khorsabad.
- Introduction to Greek civilization. Architectural characteristics of typical civic spaces such as Agora, Acropolis, theatres.
- Systems of proportioning, Greek orders, optical corrections etc. through illustrative examples such as Parthenon etc.

UNIT-III (Time six weeks)

- Study of Roman town with respect to location, Architectural characteristics of typical civic spaces such as Forum, theatres etc.
- Detailed studies of monuments/temples of Roman period with reference to materials, construction systems, Roman orders through illustrative examples.

NOTE

- In each period given below, the architectural characteristics and minimum one example may be highlighted.
- The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.
- Analysis of architectural style/building typology must include functional, constructional/structural and ornamental aspects.

REFERENCE BOOKS

- "The World of Architecture", Paul Holberton, Chancellor Press, 1997.
- "A History of Architecture", Sir Banister Fletcher, CBS Publisher, 1999.
- "A History of Architecture", Spiro Kostof, Oxford University Press, 1995.
- "Encyclopedia of World Architecture", James Ferguson.
- "A Global History of Architecture", Mark M. Jarzombek, Vikramaditya Prakash and Francis D. K. Ching, John Wiley & Sons; 2nd Edition, 2011.

ARD – 124 ARCHITECTURAL DRAWING & GRAPHICS – II

B.Arch. 1st year (2nd Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE To enable the students to have a better visualization/understanding of a three dimensional entity through Drawings: Sections- Metric views-Sciography and Sketching: Indoor-Outdoor

CONTENTS

UNIT I (Time-three weeks): Sections of Solids

- Introduction and Importance of Sections, Method of drawing Sections in which Section plane parallel to VP and perpendicular to HP / parallel to HP and perpendicular to VP / perpendicular to VP and inclined to HP / perpendicular to HP and inclined to VP / inclined to both HP and VP followed by illustrative examples in each case, True shape of section / Virtual sections / Auxiliary inclined view followed by illustrative examples.

UNIT II (Time-three weeks): Intersection of Solids

- Introduction to Lines of intersection / Curves of intersection, Method of drawing intersection of prisms /pyramids / cylinders followed by illustrative examples, making presentation drawings of these intersecting solids through Sciography.

UNIT III (Time-three weeks): Development of Surfaces

- Introduction and Importance of Surface development, Method of drawing surface development for Tetrahedron / Cube / Octahedron / Dodecahedron / Icosahedrons / Truncated Tetrahedron / Truncated Cube followed by model making of each of these examples.

UNIT IV (Time-two weeks): Metric Projections

- Introduction and Importance of Metric projections, Method of drawing Isometric projection / Axonometric projection / Elevation oblique projections followed by illustrative examples, Uses of these Metric Projections

UNIT V (Time- five weeks): Sketching

- Introduction to Object drawing / Indoor sketching and its importance, Method of sketching simple objects / composition of objects freehand in proportion using pencils of different grades / water colors showing light / shade / shadow followed by situational exercises.
- Introduction to outdoor sketching through basic exercises like sketching of trees and shrubs, sketching of simple buildings with special emphasis on background and foreground and sketching of human figures using pencil of different grades/ water colors showing light / shade / shadow followed by situational exercises.

REFERENCE BOOKS

- "A Textbook of Engineering Drawing", Prof. P.J. Shah, S. Chand Publishing, 2008.
- "Engineering Drawing", Dhananjay A. Jolhe,Tata McGraw Hill, 2007.
- "Architectural Shades and Shadows", Henry McGoodwin, Nabu Press, 2010.
- "Rendering with Pen and Ink", Robert W. Gill, Thames & Hudson Ltd., 1984.
- "Architectural Drawing", Tom Porter, Hamlyn, 1990.
- "Sketching the Concept", Harold Linton and Scott Sutton, Design Press, 1993.
- "Drawing the Landscape", Chip Sullivan, John Wiley & Sons; 4th Edition, 2014.

ARD – 125 MECHANICS OF STRUCTURES

B.Arch. 1st year (2nd Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand the basic principles of Structural Mechanics, so that it forms the basis for study of Structural Design

CONTENTS

UNIT I (Time- five weeks)

- Study of Force-definition, cause, effect and units. Understanding Force through vector
- Study of Coplanar, Concurrent, Non-concurrent forces, Triangle of forces, Parallelogram of forces and Conditions of Equilibrium – analytical methods.
- Study of Moments, Moment of forces, Moment of couples and Static equilibrium of rigid bodies.

UNIT II (Time-six weeks)

- Introduction to types of loads and supports.
- Study of Structural system design such as Fundamental characteristics, Strength, Stability, Ability, Rigidity, Economy and Aesthetics.
- Determination of Center of gravity, Moment of Inertia of square, rectangle, and I shaped cross-sections.

UNIT III (Time- five weeks)

- Stress, strain, Hooke's Law, stress-strain curve, stressed streams in simple and composite sections, temperature stresses, Poisson's ratio, state of simple shear, shear strain.
- Basic concepts of Bending moment and shear force , bending moment and shear force diagram for simple beams and frames for various types of loadings and support conditions

NOTE:

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Basic Structural Analysis (SI Units)", C.S. Reddy, Tata McGraw-Hill, 1981.
- "Analysis of Structures", V.N.Vazirani, M.M.Ratwani and S.K.Duggal, Khanna Publishers, 2003.
- "A Textbook of Engineering Mechanics", R.S.Khurmi, S. Chand Publishing, 2011.
- "Mechanics of Structure", S.B. Junnarkar, Charotar Publishing House Pvt. Ltd., 2011.

ARW – 126 WORKSHOP PRACTICE B.Arch. 1st year (2nd Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%	Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Viva Voce	-	02
1 - - 3	04	30%	30%			

OBJECTIVE

To introduce the students to basic fabrication processes

UNIT I (Eight Weeks)

- Welding-definition, industrial importance, application; welding vs. other fabrication processes. Classification of welding and allied processes. Hazards associated with gas and arc welding processes, protection against electric shock, flame/arc radiation, fumes and dust, compressed gasses, fire and explosions. Welding Joints & Symbols. Practice job on Arc welding preparation of various joints, practice job on Gas welding. Practice job on Soldering & brazing. Practice job on advance welding.

UNIT II (Eight Weeks)

- Introduction to various fasteners, industrial importance and application. Definition of nut & bolt and their types. Introduction and classification of tools and machines used in steel fabrication. Tapping & Dieing operations. Safety precautions. Operation practice like; filing, sawing, marking, drilling, tapping, dieing with conventional and power operated tools.
- Dress Code; khaki with close shoes.

REFERENCE BOOKS

- "Elements of Workshop Technology, Vol. I", Hajra Choudhury, Hazra Choudhary and Nirjhar Roy, Media promoters and Publishers Pvt. Ltd., 2007.
- "Workshop Technology", W. A. J. Chapman,1st South Asian Edition, Viva Book Pvt Ltd., 1998.
- "Manufacturing Technology, Vol.1, 3rd Ed.", P.N. Rao,Tata McGraw Hill Publishing Company, 2009.

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ARD – 211 ARCHITECTURAL DESIGN – lll B.Arch. 2nd year (3rd Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	6 Hours	06
2 - - 8	10	30%	30%	20%	20%		

OBJECTIVE

To train the students to understand the various issues which arise while designing a double storied RCC building.

CONTENTS

UNIT l (Time-one week)

- Summer Vacations Assignment report evaluation

UNIT ll (Time-Seven weeks)

- Design of a double storied structure such as Residence/Duplex House, Primary School etc.

UNIT lll (Time-Eight weeks)

- Design of a Primary Health center, Cyber Café, Restaurant, etc.

NOTE:

Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem in context to the above contents.

REFERENCE BOOKS

- "Building drawing with an integrated approach to Built Environment", M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002.
- "Site Design Graphics", Micheal S. Kendall, Van Nostrand Reinhold, 1989.
- "Architectural Graphics", 6th Ed., Francis D. K. Ching, John Wiley & Sons, 2015.
- "Time-saver Standards for Architectural Design Data: The Reference of Architectural Fundamentals", Donald Watson, McGraw-Hill, 1997.
- "Time Saver Standards for Building Types", John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York, 1983.
- "Architectural Graphic Standards", Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons, 2008.

ARD – 212 BUILDING CONSTRUCTION & MATERIALS – III B.Arch. 2nd year (3rd Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE

To introduce construction details of various elements of single storied building of load-bearing masonry and foundations.

CONTENTS

UNIT I (Time-four weeks)

- Introduction to Mortars and plasters such as Cement and Lime, types of pointing.
- Detailed study of infill wall of bricks and various cement concrete products.

UNIT II (Time- three weeks)

- Introduction to paints and varnishes. Detailed studies such as manufacturing, types and application of the same. Introduction to popular brand names.

UNIT III (Time-five weeks)

- Foundation- Types- stepped, isolated and combined footing Construction of foundations in brick and stone masonry for load-bearing and toe walls.
- Introduction to Lintels- Arches- Window sills and their methods of construction.
- Introduction to various types of staircases with respect to material and shapes. Detailed Drawings and construction details to be made for Dog-leg staircase in timber.

UNIT III (Time-five weeks)

- Introduction to Damp-Proof course, detailing of Horizontal and Vertical DPC.
- Introduction to different types of floors; Construction of Plain Cement Concrete and Terrazzo floors.
- Introduction to various types of floor finishes such as P.V.C. sheets, Tiles, Carpets, Veneers etc. Detailed drawings of their fixing details.

NOTE:

- **Site Visits** to ongoing related construction projects.

REFERENCE BOOKS

- "The Construction of Buildings", Vol. 1-2-4, R Barry, Wiley, 2001.
- "Building Construction Metric" Vol. 3, W.B.Mckay, Orient Longman Private Limited, Mumbai, 2006.
- "Building Construction Illustrated", Francis D.K. Ching, John Wiley & Sons, 2011.
- "Construction Technology" Vol. 1-2-3,Roy Chudley, Roger Greeno,Prentice Hall (UK), 2005.
- "Architectural Graphic Standards", Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons, 2008.
- "Building Construction", 10th Ed., B.C. Punmia, Ashok Kr. Jain, Arun Kr. Jain, Laxmi Publications Pvt Limited, 2008.

ARD – 213 HISTORY OF ARCHITECTURE– III B.Arch. 2nd year (3rd Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

- To understand the role of geo-physical, societal, political and technological factors in the evolution of Architectural and to develop a holistic approach to Architecture as an integral component of the built environment.

CONTENTS

UNIT I (Time- four weeks)

- Study of Early Christian Architecture- evaluation of church architecture.
- Study of development of Church plans during the early Christian period with respect to architectural character.
- Study of Byzantine churches with respect to architectural forms, structural systems, techniques of construction etc- Hagia Sophia.
- Study of evolution of Romanesque architecture with respect to changes in church plans, Elevation features, techniques of construction and structural systems-Pisa cathedral complex.
- Study of architectural characteristics of Romanesque churches in Italy, France and Germany.

UNIT II (Time- four weeks)

- Detailed studies of Gothic Cathedral of Medieval European towns with reference to Architectural characteristics and their comparison to Romanesque period- Notre Dame.
- Comparison of Architectural characteristics of Gothic churches in France and England.

UNIT III (Time-four weeks)

- Introduction to the basis of Renaissance Movement and its effect on the built environment.
- Study of the works of Architects of Early Renaissance and High Renaissance.
- Study of Cathedral- St. Peter and St. Paul.

UNIT IV (Time-four weeks)

- Introduction to the basis of Baroque or Rococo Movement and its effect on the built environment.
- Detailed studies of Baroque Architecture such as its Development, Characteristics of Baroque Architecture-Piazza of St. Peter.
- Study of works Architects of Baroque period such as Bernini and Borromini.

NOTE

Analysis of architectural style/building typology must include functional, constructional /structural and ornamental aspects.

REFERENCE BOOKS

- "The World of Architecture", Paul Holberton, Chancellor Press, 1997.
- "Baroque India", Jose Pereira, Aryan Books International, New Delhi, 1990.
- "Renaissance Architecture", Jose Pereira,
- "A History of Architecture", Sir Banister Fletcher, CBS Publisher, 1999.
- "A History of Architecture", Spiro Kostof, Oxford University Press, 1995.
- "Encyclopedia of World Architecture", James Ferguson.

ARD – 214 ARCHITECTURAL DRAWING & GRAPHICS – III

B.Arch. 2nd year (3rd Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE

To enable the students to have a better visualization/understanding of a three dimensional entity through Perspective Drawings

CONTENTS

UNIT I (Time-two weeks): Introduction to Perspective drawings

- Introduction, Concept, Terminologies: Cone of Vision – Centre line of Vision – Horizon line – Distortion - Station Point – Visual rays - Picture plane – Ground line – Height line – Vanishing Points , Types of Perspective projection: One Point Perspective – Two Point Perspective – Three Point Perspective – Box Method – Centre line Method

UNIT II (Time-two weeks): Setting up One Point Perspective Projection

- Detailed Method: Obtain the required dimensions through orthographic projection - Location of Station Point and Centre line of Vision – Checking Station Point with Cone of Vision – Location of Picture Plane – Location of Vanishing Point – Location of Horizon line – Location of Ground line – Location of True Elevation on the Picture Plane – Location of Perspective lines through points on the True Elevation – Location of Visual rays to locate the various faces of the object in perspective view , Illustrative practice examples.

UNIT III (Time-four weeks): Setting up Two Point Perspective Projection

- Detailed Method: Obtain the required dimensions through orthographic projection - Location of Station Point and Centre line of Vision – Alignment of Centre line of Vision - Checking Station Point with Cone of Vision - Location of Picture Plane - Location of Vanishing Points – Location of Height line – Location of Horizon line and transferring Vanishing points on them –Location of Ground line – Location of height of object on Height line and top and bottom lines of sides in perspective view – Location of Visual rays to locate end points of side of the object in perspective view – Using Visual rays and Perspective lines for plotting the perspective view of the object, Illustrative practice examples

UNIT IV (Time-four weeks): Setting up Three Point Perspective Projection

- Detailed Method: Obtain the required dimensions through orthographic projection- Location of Station Point and Centre line of Vision – Preparing elevation at right angles to Centre line of vision (plan position) – Location Profile view of the plan position – Modify the plan position w.r.t Profile view – Location of Picture plane in both Plan & Profile view – Location of Vanishing points in both Plan & Profile view – Locating the Horizon line & Ground line – Extending the Ground plane to meet the Ground line – Extending the plan of Centre line of Vision – Locate V.P.1, V.P.2 & V.P.3 in perspective view – Locate line at 450 from intersection of Ground line & Ground plane for transferring points from the profile view to intersect the points from plan projections through Visual rays – Using Visual rays, Vertical & Horizontal projections and Perspective lines complete the perspective view of the object, Illustrative practice examples.

UNIT V (Time-four weeks): Shadow projection in Perspective drawing

- Introduction, Location of Sun w.r.t. the spectator, Terminologies: Vanishing Point Plan – Vanishing Point Actual – Plan of light rays – Method of obtaining true inclination of light ray with ground plane
- Detailed method of constructing shadows in Two point Perspective projection: Location of Sight line - Plan location of Vanishing points – Locating Sight lines for obtaining true angle of inclination of the light ray – Locating vanishing point for the actual light rays – Locating shadow of the object through intersection of light rays joining the vanishing point for the plans of light rays to light rays joining the vanishing point for actual light rays, Illustrative practice examples.

REFERENCE BOOKS

- "Rendering with Pen and Ink", Robert W. Gill, Thames & Hudson Ltd., 1984.
- "Creative Perspective", Robert W. Gill, Thames & Hudson Ltd., 1975.

ARD – 215 ANALYSIS OF STRUCTURES

B.Arch. 2nd year (3rd Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand the principles of Structural Analysis, so that it forms the basis for Structural design.

CONTENTS

UNIT I (Time-four weeks)

- Bending Stress in Beams, Theory of simple bending, section modulus, design criterion, bending stresses in symmetrical and unsymmetrical sections, strength of sections.
- Shear Stress In Beams and Torsion, Shear stress in beams and torsion in symmetrical and unsymmetrical sections,

UNIT II (Time-four weeks)

- Fixed And Continuous Beams, Review of shear force and Bending Moment diagram for simply supported beam, Effect of continuity, its advantages and disadvantages.
- Analysis of Continuous beams for two to four spans, conceptual idea about full and partial loading and fixed end moment using moment distribution method and Theorem of three moments.

UNIT III (Time-six weeks)

- Trusses, Definition of Truss, Perfect Truss, Imperfect truss, Types of Trusses and Suitability, Analysis of simple Trusses by Analytical method.
- Arches, Types and behavior of arches with history. Introduction to three hinged arches.
- Frames, Indeterminacy of frames with different end conditions, Analysis of frame by portal & cantilever method.

UNIT III (Time-two weeks)

- Introduction of basic structural systems in architecture- Tensile structures, Compressive structures, Trusses, Shear structures, Bending structures

NOTE

The time mentioned at the end of each of the above unit indicates the tentative time taken to complete each. The marks for sessional works may be divided accordingly.

REFERENCE BOOKS

- "Strength of Materials", B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, 2011.
- "Theory of Structures SMTS - II: SI Units", B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, 2011.
- "Elements of Strength of Materials", Stephen P. Timoshenko and Donovan H. Young, East West, 2003.
- "Strength of Materials", Ramamrutham S., Dhanpat Rai Publications, 2011.
- Relevant Design Codes and Design Aids

ARD – 216 CLIMATE AND BUILT ENVIRONMENT

B.Arch. 2nd year (3rd Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVES

- To acquaint students with the concept of climate as a significant determinant of built form.
- Familiarization with climate controlling devices.

CONTENTS

UNIT I (Time-four weeks)

- **Climatology:** Role of climate with respect to shelter and importance of Building climatology, Tropics, climatic zones, macro and micro-climate, Elements of climate and climatology data needed for planning of buildings, change of seasons, distribution of global pressure belts & wind movements..
- **Human Comfort:** Human heat balance and thermal comfort, Thermal stress index, effective temperature and bio climatic analysis, Interrelationship of climatic elements and psychometric chart

UNIT II (Time-six weeks)

- **Air Temperature:** Factors that influence air-temperature – latitude, altitude, seasons, water, trees, areas etc.; thermal conductivity and heat exchange between building and environment, thermal properties of material.
- **Solar Radiation:** Calculation of solar radiation on building surfaces, solar charts; Design and application of shading devices, sun machines and their uses; Opaque building elements and heat transfer through this elements, solar gain factor and sol-air temperature.
- **Wind:** study of diurnal and seasonal variations, heating and cooling, effect of topography: effect of wind on location of industrial areas, airports and other land-uses and road patterns, Air movement in and around buildings, wind eddies, size and position, effect of wind on design and siting of buildings.
- **Precipitation:** Water-vapor. Relative-humidity, condensation, rain, fog, snow and architectural responses.

UNIT III (Time-three weeks)

- **Day-light:** glare, amount of light, sky as a source of light and day-light factor, effect of size and shape of openings in different planes with and without obstructions.
- **Orientation and Application of Climatic Principles:** Siting of buildings with respect of sun, wind and view; Climatic design of indigenous shelters in response to different climatic zones in India; Use of landscape elements, evaporative cooling, ground cooling, cavity walls, topography; Ventilation of roof spaces and controlled ventilation.

UNIT IV (Time-three weeks)

- Example of climate-responsive building-projects from India and abroad.
- Introduction to climatic design analysis and building simulation software.

REFERENCE BOOKS

- "Manual of Tropical Housing and Building: Climate Design", O.H. Koenigsberger et.al., Madras: Orient Longman, 1984.
- "Environmental Design", Randall Thomas, Taylor & Francis; 3rd edition, 2006.
- "Microclimatic Landscape Design", Robert D. Brown and Terry J. Gillespie, John Wiley & Sons, 1995.
- "Energy-efficient Buildings in India", Mili Majumdar, TERI Press,
- "Sustainable Building-Design Manual- Volume I&II", TERI Press,
- "Thermal control in passive solar buildings", S.C. Kaushik, G.N. Tiwari and J.K. Nayak, IBT Publishers & Distributors, 1988.

ARD – 217 GEOMATICS AND MEASURE DRAWING B.Arch. 2nd year (3rd Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 - - 2	4	20%	10%	10%	60%		

OBJECTIVE
To bring about awareness of role of Geomatics in architectural and planning projects.

CONTENT

UNIT I (Time-three weeks)
- Importance of Geomatics, Data Collection techniques- Field surveying.
- Definition of surveying, Basic principles, Types of maps, their scales, and uses, Surveying equipment namely Levels, Compass, Theodolitee, Total Station and Laser based equipments.

UNIT II (Time-four weeks)
- Measurements of distance, Angles, Directions and Heights: Principles and components of Theodolites, Magnetic Compass, IOP Levels, Auto Levels, Total Station.
- Contouring: Technical terms used in contouring, Characteristics of contours, Methods of contouring, Tracing the contour, Gradient for alignment of a roads and paths, Uses of contours.

UNIT III (Time-three weeks)
- Plane table surveying: Plane table and its accessories, Setting and orienting the plane table, Methods of plane tabling, Advantages and disadvantages of Plane table survey.

UNIT IV (Time-six weeks)
- Measure drawing of any vernacular settlement.

NOTE
- Minimum one practical from each unit to be conducted.

REFERENCE BOOKS

- "Surveying- Vol.1", Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi; Sixteenth edition, 2005.
- "Textbook of Surveying", C. Venkatramaiah, Orient Blackswan; Second edition, 2011.
- "A Textbook of Advanced Surveying", R. Agor, Khanna Publishsers, 2002.
- "Surveying and Levelling", S. C. Rangwala and P. S. Rangwala, Charotar Book Stall, 6th edition, 2011.
- "Advanced Surveying", P. B. Shahani, 2nd edition; Oxford & IBH Publishers Co., 1992.

ARD – 221 ARCHITECTURAL DESIGN – IV B.Arch. 2nd year (4th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	6 Hours	06
2 - - 8	10	30%	30%	20%	20%		

OBJECTIVE
To learn various aspects of design on hill terrains.

CONTENTS
UNIT I (Time-seven weeks)

- Design of a frame structure: Guest house, Hostel/ Old age home etc. with due emphasis to contextual issues such as climate, topography, local architectural character etc.

UNIT II (Time-eight weeks)

- Design of Tourist resort, Small Hotel/ Motel etc. Emphasis should be given on climatically and environmentally responsive architecture. Site may be chosen in different climatic conditions of India.

UNIT III (One week)

- Introduction to Measured Drawings

NOTE

- Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem introduced with reference to the above contents.
- Measured Drawing tour to be conducted in summer Vacations

REFERENCE BOOKS

- "Building drawing with an integrated approach to Built Environment", M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002.
- "Planning and Design of Library buildings", Godfrey Thompson, Butterworth Architecture, 1995.
- "Shopping centers", Nadine Beddington, Butterworth Architecture, 1991
- "School Buildings: Planning-Design-Management", A.K.Jain, Management Publishing Company, 1998.
- "Buildings for the Performing Arts: Design and Development guide", Ian Appleton, Routledge, 2012.
- "Time-saver Standards for Architectural Design Data: The Reference of Architectural Fundamentals", Donald Watson, McGraw-Hill, 1997.
- "Time Saver Standards for Building Types", John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York, 1983.

ARD – 222 BUILDING CONSTRUCTION & MATERIALS – IV B.Arch. 2nd year (4th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVES

To familiarize the students with methods of detailing different parts of building in RCC.

CONTENTS

UNIT I (Time-three weeks)

- Concrete- Composition, properties and uses; Water cement ratio; Grade of concrete; PCC, RCC, light weight concrete and autoclaved aerated concrete etc.

UNIT II (Time-nine weeks)

- Introduction to RCC framed structure.
- Type of RCC Foundations in framed structure – stepped, isolated, combined and cantilevered footing, RCC footing and raft, pile foundation; Selection foundation type; Safe bearing capacity of soils and methods of improvements; Depth and width of foundations; Causes and failure and remedies .
- Different type of RCC roofs such as Flat (one way, two way & continuous), conical & circular slabs.
- Introduction to various types of RCC staircases. Detailed Drawings and construction details to be made for any RCC Stairs.
- Introduction to formwork. Excavation and timbering of trenches with special references to loose soil and sub- soil water. Detailed studies of various types of formwork for concrete, Scaffolding and temporary supports and Shoring & Underpinning.

UNIT III (Time- four weeks)

- Introduction to Cladding materials of Interior and Exterior walls in various materials such as Brick tiles, Stones, Vitreous tiles, Paneling etc. Detailed drawings of their fixing details.
- Introduction to various materials like P.V.C. Fiber based product, etc. Detailed studies such as properties and application of the same in building industry.

NOTE:

- **Site Visits** to ongoing related construction projects.

REFERENCE BOOKS

- "Construction Technology" Vol. 1,Roy Chudley, Roger Greeno,Prentice Hall (UK), 2005.
- "The Construction of Buildings", Vol. 2, R Barry, Wiley, 2001.
- "Handbook of Architectural details for Commercial buildings", Joseph De Chiara, McGraw-Hill, 1979.
- "Time Saver Standards for Building Materials and systems", Donald Watson, McGraw-Hill, 2000.
- "Time Saver Standards for Interior Design and Space Planning", Joseph DeChiara, Julius Panero, Martin Zelnik, McGraw Hill Professional, 2001.
- "Building Design and Construction Handbook", Merrit, Ricketts, McGraw-Hill Prof Med/Tech, 2000.

ARD – 223 THEORY OF DESIGN – I B.Arch. 2nd year (4th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE
To understand the impact of industrial revolution and modern architectural works on architectural practice.

CONTENTS

UNIT I (Time- four weeks)
- Introduction to the beginning of modern architecture through Neoclassicism in the 18th century.
- Introduction to Industrial revolution and its impact on new towns.
- Study of Eclecticism and the architectural predicament in the 19th century.
- Introduction to Colonial architecture in India: New Delhi, Calcutta & Madras.
- Role of Louis Sullivan and Peter Behrene.

UNIT II (Time-four weeks)
- Emergence of different Architectural movement after industrial revolution such as Art Nouveau-reaction against Eclecticism, morphed form, Plastic treatment of plans and Chicago School-evolution of the high rise office buildings.

UNIT III (Time- four weeks)
- Study of the works of Master Architects to understand the trends in post modern Architecture.
- Study of Walter Gropius and Bauhaus, Frank Llyod Wright and Organic Architecture, Le Corbusier-The Domino System and point of new architecture, Mies Van der Rohe –Minimalism, long span and Tall buildingsin steel and Glass.

UNIT IV (Time- four weeks)
- Role of Adolf Loos-Internationalism, G.T.Reitveld-De Stijl Architecture andAlvarAalto-Scandinavian Regionalism.

NOTE
Analysis of architectural style/building typology must include functional, constructional Architectural/ Structural and ornamental aspects.

REFERENCE BOOKS

- "The World of Architecture", Paul Holberton, Chancellor Press, 1997.
- "A History of Architecture", Sir Banister Fletcher, CBS Publisher, 1999.
- "Documenting Chandigarh", Kiran Joshi, Mapin Publishing, 1999.
- "Modern Architecture: A Critical History", Kenneth Frampton, Thames & Hudson; 4thEdition, 2007.
- "The Details of Modern Architecture (Volume 1)", Edward R. Ford, The MIT Press, 2003.
- "Architecture of the 19th Century", Claude Mignot, Taschen GmbH, 1994.
- "Twentieth Century Architecture: A Visual History", Dennis Sharp, Images Publishing, 2006.
- "Architecture and Independence: The Search for Identity--India 1880 to 1980",Jon Lang, Madhavi Desai and Miki Desai, Oxford University Press, 1998.
- "After the Masters (Contemporary Indian Architecture)", Vikram Bhatt and Peter Scriver, Grantha Corporation, 1990.
- "Architecture in the Twentieth Century", Peter Gössel and Gabriele Leuthäuser, Taschen, 2001.
- "History of Architecture: From Classic to Contemporary", Barbara Borngasser, Parragon Inc; Reprint edition, 2010.

ARD – 224 BUILDING SERVICES – I

B. Arch. 2nd year (4th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To familiarize the students with fundamentals of water supply and drainage in building services & their integration with architectural design.

CONTENTS

UNIT I (Time-six weeks): Water Supply

- Detailed studies such as Sources and Treatment of water
- Water demand & calculations, Storage & conveyance of water at municipal level
- Water supply systems and various fittings,
- Hot and Cold water supply layouts
- Water supply design of a residence: Connection with water mains, design of Underground & Overhead water tanks, pump capacity, calculations for diameter of pipe
- Introduction to water supply in a multistoried building.

UNIT II (Time-six weeks): Wastewater

- Definition of Refuse, garbage, rubbish, sullage, sub soil water, storm water, night soil, sewage-sanitary, domestic & industrial, sewer, sewerage & waste water
- Various drainage & sanitary fixtures & fittings, traps - role of water seal, sizes, materials and their space requirements, Water efficient and waterless fixtures
- Types of pipes and drains in different materials and their usage, diameter of pipes, slope standards
- Inspection and Intercepting chambers, manholes etc.
- Sewage and Effluent treatment- Innovative and cost effective sanitation concepts e.g. EcoSAN
- Sewage systems for a small project, Wastewater recycling methods e.g. DEWATS etc.
- Introduction to STP's & ETP's, Design calculations of septic tank & soak pit
- Storm water design calculations for roof top & for surface drains, Rainwater Harvesting & Groundwater Recharge
- Exercise: Design a layout for a residence for water supply, drainage, sewage and storm water
- Zero discharge concepts

UNIT III (Time-four week): Solid Waste management:

- Waste production in India and Global,
- Waste management techniques

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Water Supply Engineering", Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, 2003.
- "Design & Practical Handbook on Plumbing", Cr Mohan and Vivekanand, Standard Publishers Distributors, 2014.
- "Wastewater Engineering", Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, 1998.
- "Environmental Education and Solid Waste Management", A. Nag and K. Vizayakumar, New Age International, 2005.
- "Water and Wastewater Calculations Manual", Shun Dar Lin and C. C. Lee, McGraw-Hill Professional; 2nd edition, 2007.
- "Advances in Water Supply Management: Proceedings of the CCWI '03 Conference, London, 15-17 September 2003",Cedo Maksimovic, David Butler and Fayaz Ali Memon, 2003.

ARD – 225 DESIGN OF RCC STRUCTURES

B.Arch. 2nd year (3rd Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand the basic properties of RCC as a building material and principles of design of RCC structures.

CONTENTS

UNIT I (Time-two weeks)

- Introduction:- Materials, basis properties of concrete and steel, Reinforcement, standard loading, characteristics strength, permissible stresses in Concrete and steel as per Indian Standard, Design Philosophies- Working Method, Ultimate Load, Method and Limit state Method.

UNIT II(Time-seven weeks)

- Limit State Design Method: Safety and serviceability requirements, limit states, characteristics material strength and loads and Partial safety factors.
- Design of Beams: Design of singly and doubly reinforced beams including L & T beams for flexure shear, bond and torsion.
- Design of Compression members: Design of short and slender columns.
- Design of RCC one way & two way slab.

UNIT III (Time- five weeks)

- Proportioning of footings: - Square, Rectangular, Circular, Trapezoidal and combined.

UNIT- IV (Time- two weeks)

- Introduction to pre-stressed concrete.

NOTE

The time mentioned at the end of each of the above unit indicates the tentative time taken to complete each. The marks for sessional works may be divided accordingly.

REFERENCE BOOKS

- "R.C.C. Designs (Reinforced Concrete Structures)", Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi; Tenth edition, 2006.
- "Reinforced Concrete, 6th Edition", S.K.Mallick and A.P.Gupta, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi, 1996.
- "Limit State Design of Concrete Structures", Dr. Ramchandra and Virendra Gehlot, Scientific Publishers, 2007.
- "Comprehensive RCC Design", Dr. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi; Tenth edition, 2006.

ARD – 226 COMPUTER APPLICATIONS IN ARCHITECTURE B.Arch. 2nd year (4th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%	Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Comprehensive Viva Voce 40%	-	04
2 - - 4	06	30%	30%			

OBJECTIVE

At the end of this part of the course the students should be able to create three dimensional objects in space, which can also be used for the purpose of presentation as well as visualization using different rendering techniques.

CONTENTS

Unit I(Time-Four weeks)

- Ms Office – creating a document file, viewing editing and formatting a document, using graphics in a text document, etc.
- MS Word: Report writing
- MS Excel: Computation of data
- MS PowerPoint: Presentations

Unit II(Time-Four weeks)

- Introduction to AutoCAD
- 2D tools of AutoCAD
- Creating Drawings & Using text
- Use of Drawing and modify toolbar
- Grouping of Objects

UNIT III (Time - Four weeks)

- Introduction to Revit.
- Introduction to Google sketchup.
- Introduction to Photoshop.

UNIT IV (Time - Four weeks)

- 3D Rendering:-Introduction to 3D Rendering, Simulating the Sunlight angle, Adding shadows, Adding Materials and adjusting its appearance, Adding a background scene, Effects with light, Adding Reflections and details with Ray Tracing, Creating and adjusting Texture maps, Adding Landscape and people and Improving your images and editing.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Mastering Microsoft Office-2007", CADD Centre, India.
- "Mastering AutoCAD 2010 and AutoCAD LT 2010", George Omura, Wiley, 2009.
- Mastering Adobe Photoshop.

ARD – 227 DISASTER MANAGEMENT B.Arch. 2nd year (4th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To let the students understand the type of in natural disasters and its effects on structural and non-structural elements. To understand the mechanism involved in the management of disasters.

CONTENTS

Unit I (Time-four Weeks)

- Introduction to Natural Disasters.
- Introduction to disaster management, Rules and Notification.
- Natural Disasters: Earthquakes, Floods, River Erosion, Cyclones Tsunami Landslides & Avalanches Forest Fires

Unit II (Time-three Weeks)

- Man induced Disasters: Introduction, Nuclear Disaster Chemical, Mine Disaster, Biological Disaster, Cyber Terrorism, and Environmental Disaster.

Unit III (Time-five weeks)

- Planning for Disaster: Guidelines for disaster management of Floods, River Erosion, Cyclones Tsunami Landslides & Avalanches Forest Fires

Unit IV (Time-four weeks)

- Fire Service, Forecasting & Early Warning Communications & IT Co-ord. with Scientific Organizations
- Spatial Data Management, Risk Transfer
- Microfinance, Role of Corporate Role of NGOs
- Community Preparedness and Education Gender Issue Vulnerable Groups
- Urban Development Civil Defense Home Guards NCC,NSS,NYK
- Medical Preparedness , Public Awareness

REFERENCE BOOKS

- “Disaster Management in the Hills”, Dr. Satendra, Concept Publishing Company, 2003.
- “Disaster Management”, Harsh K. Gupta, Universities Press, 2003.
- “Natural Hazards and Disaster Management: Vulnerability and Mitigation”,R. B. Singh, Rawat; Reprint edition, 2006.
- "Proceedings of the National Conference on Disaster & Technology, 1998, Manipal, India", NirmitaMehrotra,1998.
- “Disaster Risk Reduction in South Asia”, Sahni, Pardeep, Ariyabandu and Madhavi Malalgoda, PHI Learning, 2003.

ARD – 311 ARCHITECTURAL DESIGN – V

B.Arch 3rd year (5th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	6 Hours	07
2 - - 10	12	30%	30%	20%	20%		

OBJECTIVE

- The objective of the course is to understand the traditional construction techniques.
- To study design considerations under the broad heading of Barrier Free Environment.

CONTENTS

UNIT – I (Time-eight weeks)

- Completion of the measured drawing of the building studied in the summer vacations.

UNIT – II (Time-eight weeks)

- Design of a small campus such as School, District Library, Museum etc. with emphasis on design with Barrier Free Environment.

NOTE

Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem introduced with reference to the above contents.

REFERENCE BOOKS

- "Building drawing with an integrated approach to Built Environment", M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002.
- "Manual of Tropical Housing & Building",O. H Koenigsberger, T. G Ingersoll, Alan Mayhew, S V Szolay, Universities press, 2000.
- "Campus Architecture: Building in the Groves of Academe", Richard P. Dober, 1996.
- "Campus & Community, Moore Ruble Yudell Architecture and Planning", Rockport Publishers, Inc., 1997.
- "Environmental Design An introduction for architects and engineers", Randall Thomas, Taylor and Francis, 2005.

ARD – 312 BUILDING CONSTRUCTION & MATERIALS – V B.Arch 3rd year (5th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVES

To inculcate awareness of the constructional aspects of structural steel and its application in various building components of an industrial building.

CONTENTS

UNIT I (Time-three week)

- Introduction to structural steel section, grillage foundation and framed construction. Detail studies such as characteristics of structural steel sections, methods of jointing and its applicationas structural members in different parts of building.

UNIT II (Time-three week)

- Types of industrialized doors and windows, sliding, revolving, collapsible, rolling shutters, steel, aluminum and composite sections. Detailed drawings and construction details of various types of Doors and Windows in steel and Aluminum.
- Detailed drawings and construction details of Steel stairs such as Straight flight and Spiral.
- Introduction to the concept of Mezzanine floor.

UNIT III (Time-six week)

- Introduction to Structural steel trusses. Detailed drawings and construction details of North light truss, tubular truss, lattice girder along with roof coverings, valleys, gutters etc

UNIT IV (Time-four week)

- Introduction to false ceiling. Detailed drawings and construction details of the same.
- Introduction to various materials, products and hardware for false ceiling, paneling and partitions.

Note:

- **Site Visits** to ongoing related construction projects.

REFERENCE BOOKS

- "The Construction of Buildings", Vol. 3 4/e PB, R Barry, Wiley, 2001.
- "Building Construction Metric" Vol. 4, W.B.Mckay, Orient Longman Private Limited, Mumbai, 2006.
- "Building Construction Illustrated", Francis D.K. Ching, John Wiley & Sons, 2011.
- "Construction Technology" Vol. 2-3-4 Roy Chudley, Roger Greeno, Prentice Hall (UK), 2005.
- "Architectural Graphic Standards", Charles George Ramsey, Harold Reeve Sleeper, Bruce BasslerJohn Wiley & Sons, 2008.
- "Interior Design", Ahmed A Kasu, Om Books, 2005.
- "Time Saver Standards for Interior Design and Space Planning", Joseph De Chiara, Julius Panero & Martin Zelnik, Mcgraw-Hill, 1991.

ARD – 313 THEORY OF DESIGN – II

B.Arch 3rd year (5th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand the development of Architecture in 20th century.

CONTENTS

UNIT I (Time-four weeks)

- Study of work of the early 20th century architects like Richard Neutra, Philip Johnson, Eero Sarrinen, Oscar Niemeyer, Jorn Utzon, Bruce Goff, P.L. Nervi and other architects.
- Study of Late and Post Modernism through the work of Richard Meier, Arata Isozaki, Michael Graves, Robert Venturi, Norman Foster, Richard Rogers, Renzo Piano etc.

UNIT II (Time-six weeks)

- Introduction to Post Independence (Modern) architecture in India. Contribution of Le Corbusier and Louis Khan
- Study of the works done by the pioneers in Indian Architecture Raj Rewal, Charles Correa, B.V.Doshi, A.P. Kanvinde, Ananth Raje, Louis Kahn, Joseph Allen Stein, U.C Jain, Lauri Baker etc.
- Study of the works done by Dean D Cruze, Hafeez Contractor, Nari Gandhi, Hasmukh Patel, & Chandravarkar & Thacker,

UNIT II (Time-six weeks)

- Study of the works done by Contemporary western architects Norman Foster, Frank-O-Gehry, Zahahadid, Moshe Safdie.

NOTE

Two buildings of each architect should be studied.
The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.
Analysis of architectural style/building typology must include functional, constructional/ Architectural structural and ornamental aspects.

REFERENCE BOOKS

- "A History of Architecture", Sir Banister Fletcher, CBS Publisher, 1999.
- "Housing and Urbanisation: Building Ideas for People and Cities", Charles Correa, Thames & Hudson Ltd., 2000.
- "Documenting Chandigarh", Kiran Joshi, Mapin Publishing, 1999.
- "Modern Architecture: A Critical History", Kenneth Frampton, Thames & Hudson; 4thEdition, 2007.
- "The Details of Modern Architecture (Volume 1)", Edward R. Ford, The MIT Press, 2003.
- "Twentieth Century Architecture: A Visual History", Dennis Sharp, Images Publishing, 2006.
- "Architecture and Independence: The Search for Identity--India 1880 to 1980", Jon Lang, Madhavi Desai and Miki Desai, Oxford University Press, 1998.
- "Architecture in the Twentieth Century", Peter Gössel and Gabriele Leuthäuser, Taschen, 2001.
- "History of Architecture: From Classic to Contemporary", Barbara Borngasser, Parragon Inc; Reprint edition, 2010.

ARD – 314 BUILDING SERVICES – II

B.Arch 3rd year (5th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To familiarize the students with fundamentals of electricity, illumination and acoustics in building services & their integration with architectural design

CONTENTS

UNIT I (Time- five weeks): Electrical services

- Thermal, Mechanical & Electrical energy and its generation
- Electrical distribution systems and safety devices
- Types of wiring systems, advantages and disadvantages, safety and precautions,
- Internal wiring, loads, demand, tariffs and rules
- Types of electrical equipments used in a building such as motors, fuses, switchboards etc.
- Introduction to Indian Electricity rules related to buildings.
- Introduction to wiring system in a multistoried building. Detailed studies of the electrical Fittings such as MCB's, ELCB's, fuse units, control panels etc.
- Standard symbols for various fixtures as per National Building Code 2005
- Exercise: Preparing an electrical layout with all necessary details for a small building/residence.

UNIT II (Time- six weeks): Illumination & Lighting Design

- Introduction to Illumination, studies of the same such as various types of artificial lighting
- Various Terms in lighting, standards of illumination for illumination levels,
- Types of artificial lighting sources, types of lumniaires & fixtures
- Comparitive efficiency of lighting fixtures
- Methods and calculation for lighting design- Inverse Square Law, Cosine Law& Coefficient of Utilization Method

UNIT III (Time-five weeks): Acoustics

- Introduction to general principles of sound such as Reverberation, Absorption, Reflection, etc..
- Introduction to Building acoustics with reference to various building types such as studios, auditoriums etc.
- Detailed studies of various types of Acoustical materials and their application.

REFERENCE BOOKS

- IS 732: 1989 - Code of Practice for Electrical Wiring Installations.
- "Electrical Design &Drawing:with estimation and costing",Surjit Singh, Dhanpat Rai & Co (p) Ltd., 2007.
- "Lighting Design Handbook", Lee Watson, McGraw-Hill Inc.,USA, 1990.
- "Architectural Lighting Design", Gary R. Steffy, Van Nostrand Reinhold, 1990.
- "Fundamentals of Acoustics",Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens and James V. Sanders, John Wiley & Sons; 4th Edition, 2000.
- "Acoustics in the Built Environment: Advice for the Design Team", Peter Mapp, Peter Sacre, David Saunders and Duncan Templeton, Architectural Press, 1993.

ARD – 315 DESIGN OF STEEL STRUCTURES

B.Arch 3rd year (5th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand the principles of design of Steel structures, IS:800-2007

CONTENTS

UNIT I (Time-three weeks)

- Design of connections in steel Structures ;- Bolted and welded connections, assumptions, different types of joints, design of various types of welded connections subjected to direct loads and moments.

UNIT II (Time-four weeks)

- Design of Tension Members: Selection of sections, IS specifications, design of axially loaded tension members, design of members for axial tension & bending, end connections, IS code provisions for Lug angles and tension splices.

UNIT III (Time-three weeks)

- Design of Compression Members: Theory of buckling, design of column cross sections (single & built up sections); design of angle struts, eccentrically loaded columns. IS code provisions for column splices, lacing & battens.

UNIT IV (Time-four weeks)

- Design of Beams: Lateral stability, design of single & built up beams, plated beams and curtailment of flange plates.
- Design of Roof Trusses: Types of trusses, roofs & side coverage, types of loading and load combinations, design of members & connections.

UNIT V (Time-two weeks)

- Case studies of modern steel structures.

NOTE

The time mentioned at the end of each of the above unit indicates the tentative time taken to complete each. The marks for sessional works may be divided accordingly.

REFERENCE OF BOOKS:

- Bureau of Indian Standards, IS:800-2007, New Delhi, 2007.
- “Design of Steel Structures”, Anand S. Arya and J.L. Ajmani, Nem Chand, 2011.
- “Design of Steel Structure Volume 2”, D. Ramachandra and Virendra Gehlot, Scientific Publishers, 2013.
- “Design of Steel Structures”, P. Dayaratnam, S. Chand Publishing; Reprint Edition, 2007.
- “Design of Steel Structure”, Dr. B. C. Punmia, Ashok Kumar Jain and A. K. Jain, Laxmi Publications, 2006.
- “Design and Analysis of Steel Structures”, V.N. Vazirani, Khanna Publishers, Delhi, 2012.

ARD – 316 BUILDING ESTIMATION, COSTING & SPECIFICATION B.Arch. 3rd year (5th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To familiarize the student with the commonly used methods of preparing estimates of Architectural Projects.

CONTENTS

UNIT I (Time-four weeks)

- Introduction to different types of specification and their uses.
- Writing specification for civil works of the design project done during the previous Semester starting with excavation, earth work, foundations, damp proof course, brick masonry work, concreting, flooring, plastering, painting, doors and windows, painting, varnishes, sanitary fixtures, electric fixtures etc.
- Importance of specification as part of contract documents.

UNIT II (Time-nine weeks)

- Introduction to cost estimation and definitions of related to estimate.
- Introduction to the types of Preliminary Estimates and their preparation.
- Introduction to the types of Detail Estimates, methods of details of measurement and their application, item of work , measurement of typical elements, viz., arches, steps, and polygonal rooms.
- Introduction to Bill of Quantities of Materials for RCC work in slab, beam, column, stair cases etc.
- Detailed studies to preparation of estimated cost/bill of quantities use of schedule of rates, analysis of rates and break up of material required.
- Illustrative examples for the same.

UNIT III (Time-three weeks)

- Introduction to Standard rates and their derivation from given rates.
- Case studies/practical expertise in preparing detailed estimates of quantities of materials and analysis of rates of materials and labor for a small residential building.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

Scope of the subject will be limited to preparing detailed estimate and costing of two storied residential building in masonry and reinforced cement concrete.

REFERENCE BOOKS

- "Estimating and Costing in Civil Engineering", B.N.Dutta, UBS Publishers & Distributors Ltd., 2006.
- "Text Book of Estimating and Costing (Civil Engineering)", G.S.Birdie, Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2015.
- "Cost Planning of Buildings", Douglas J. Ferry, Peter S. Brandon and Jonathan D. Ferry, Wiley-Blackwell; 7thediteions, 1999.
- "Building Construction Estimating", Stephen D. Schuette and Roger W. Liska, Mcgraw-Hill College, 1994.

ARO – 317 AUTOCAD (Open Elective) B.Arch 3rd year (5th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%	Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Comprehensive Viva Voce 40%	-	03
1- - 3	04	30%	30%			

OBJECTIVE

The students should be exposed to the potential of computers and Internet. They should understand its working in an elementary way and be able to use it for word processing and communication &making two dimensional drawing in Autocad

CONTENTS

UNIT I (Time-eight weeks)

- The User Interface
- Start, Organize, and Save a Drawing:
- Control the Drawing Views: Display Multiple Views in Model Space
- Drawing and modify toolbar

UNIT II(Time-eight weeks)

- Complete 2d drawing
- Drawing and modify toolbar for 3d drawing
- Work on three dimensional objects

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Computer Today', Suresh K. Basandra, Galgotia, 2009.
- Mastering Microsoft Office-2007, CADD Centre
- Microsoft Office 2000 Complete, CADD Centre.
- "Mastering AUTOCAD 2010", George Omura

ARD – 321 ARCHITECTURAL DESIGN – VI B.Arch 3rd year (6th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	6 Hours	07
2 - - 10	12	30%	30%	20%	20%		

OBJECTIVE
To understand the importance of services and structures in design of building complexes.

CONTENTS

UNIT I (Time-eight weeks)
- Design of Auditorium, Hospital etc. with emphasis on structure and services. (Water supply, Electrification, Acoustics, Air conditioning, Firefighting etc.)

UNIT II (Time-eight weeks)
- Design of a multi-storied office-cum-commercial complex.
- Design involving large spans i.e., exhibition pavilions, industrial buildings etc.

NOTE
- Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem introduced with reference to the above contents.
- Professional training: 06-08 weeks duration in Summer Vacations.

REFERENCE BOOKS

- "Landscape Architecture: A manual of Site planning and design", John Ormsbee Simonds, McGraw Hill Professional, 1998.
- "Public Municipal and Community buildings", Charles K. Hoyt, Mcgraw-Hill Book Company, 1978.
- "Commercial Spaces - Cerver" Franscisco Asensio, Rotovision, 1995.
- "Cinema builders", Edwin Heathcote, Wiley-Academy, 2001.
- "Campus Architecture: Building in the Groves of Academe", Richard P. Dober, 1996.

ARD – 322 BUILDING CONSTRUCTION& MATERIALS – VI

B.Arch 3rd year (6th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVES

- To familiarize the student with the system of making detailed working drawings required for construction on site.

CONTENTS

UNIT I (Time-eight weeks)

- Introduction to methodology of preparing working drawings, Systems of dimensioning, writing specifications, etc.
- Preparation of detailed working drawing for Site Plan, Foundation Plan & Foundation details, Floor plans and Elevations, Sections.

UNIT II (Time-six weeks)

- Preparation of detailed drawings of toilets, modular Kitchen, Built- in furniture, Shop fronts, display units, counter (shops, Bank, hotel etc.) and other furniture items.
  Plans, Elevations Sectionsand working details.

UNIT III (Time-two weeks)

- Introduction to glass as building material. Detailed studies of the same- types, manufacturing and application.

NOTE:

- The students shall bring one of their previous semester's major projects for preparation of working drawing.
- **Site Visits** to ongoing related construction projects.

REFERENCE BOOKS

- "Construction Planning and Management", U.K.Shrivastava, Galgotia Publications, 2009.
- "Building drawing with an integrated approach to Built Environment", M. G. Shah, C. M. Kale, S. Y. Patki, Tata McGraw-Hill Education, 2002.
- "Building Construction Drafting and Design", John Molnar, Van Nostrand Reinhold, 1986.
- "Building Construction Details", Hans Banz, Van Nostrand Reinhold Co., 1983.
- "Building Construction", Sushil Kumar, Standard Publishers Distributors, New Delhi, 2006.

ARD – 323 EKISTICS B.Arch 3rdyear (6thSemester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE
This course intends to develop an understanding the evolution of settlement planning.

CONTENTS

UNIT I (Time-two weeks)
- Introduction: Meaning and Scope in Relation to town planning and architecture.
- Settlement patterns in later periods of history; Changing form and pattern of human settlements in ancient, medieval, colonial and modern India

UNIT II (Time-four weeks)
- Role and contribution of the following towards contemporary town planning thought- Patrick Geddes, Patric Abercrombie, Daniel Burnham, Soria Y Mata, Frederick Olmstead, Ebenezer Howard, Clarence Perry, Clearance stein, CA Doxiadis, Le Corbusier, Frank Lloyd Wright

UNIT III (Time-six weeks)
- Globalization and its impact on cities – Urbanization, emergence of new forms of developments – self sustained communities – SEZ – transit development – integrated townships – case studies.
- Scope and Content of Master plan – planning area, land use plan and Zoning regulations – zonal plan – need, linkage to master plan and land use plan – planned unit development (PUD) – need, applicability and development regulations - Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – JNNURM – case studies.
- Definition and explanation of the concepts of density, FAR, land use and zoning

UNIT IV (Time-four weeks)
- Emergence of the metropolitan phenomenon; Planning problems of cities and Solutions
- Rural and regional Systems: The rural-urban relationships; Problems of rural systems.

REFERENCE BOOKS

- "Ekistics - An Introduction to the Science of Human Settlements", C.L.Doxiadis, Hutchinson, London, 1968.
- "Housing and Urban Renewal", Andrew D. Thomas, George Allen and Unwin, Sydney, 1986.
- "Ministry of Urban Affairs and Employment", Government of India, New Delhi, 1999.
- "Town and Country Planning",Patrick Abercrombie, 3rd Edition, Oxford University Press.
- "Design of Cities",Edmund N. Bacon, Penguin Books; Revised edition, 1976.
- "An Introduction to Town & Country Planning",A.J. Brown andH.H. Sherrard, Angus and Robertson, Sydney, 1969.

ARD – 324 BUILDING SERVICES – III

B.Arch 3rd year (6th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To familiarize the students with fundamentals of air conditioning, firefighting and vertical Transport systems building services & their integration with architectural design.

CONTENTS

UNIT I (Time-six weeks): Air-conditioning

- Detailed studies of Natural and Artificial ventilation.
- Introduction to the concept of Air-conditioning and detailed studies regarding different types of Air-conditioning systems and their working- window, split, Central systems etc.

UNIT II (Time-five weeks) Fire fighting

- Introduction to firefighting systems
- Fire detection, Fire sprinklers, Fire extinguishers and Fire Hydrants system, Their system of working and design calculations

UNIT III (Time-five weeks) Vertical Transport Systems

- Lifts- Types, Parts, Dimensions and design of lift system in a building
- Escalators- Types, Parts, Dimensions and design of lift system in a building

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Heating, Ventilating and Air Conditioning: Analysis and Design, 6th Edition", Faye C. McQuiston, Jerald D. Parker and Jeffrey D. Spitler, John Wiley & Sons, 2004.
- SP 7: 2005 "National Building Code of India"
- IS 3534: 1976 "Outline dimensions of electric lifts"
- IS1860: 1980 "Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts"

ARD – 325 HILL ARCHITECTURE

B.Arch 3rd year (6th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

The objective of this course is to impart a comprehensive knowledge of the vernacular architecture, historical and environmental aspects for building up on the hills.

CONTENTS

UNIT I (Time-five weeks)

- Historical perspective of hill architecture and its unique attributes and concerns.
- Major hill settlements in various regions of the world.
- A broad view of traditional hill architecture of medieval European settlements and other places.

UNIT II (Time-six weeks)

- Traditional hill settlements in India.
- An overview of vernacular hill architecture of Himachal Pradesh.
- Building Types, techniques and materials of vernacular architecture of Himachal Pradesh.
- Lessons from vernacular architecture and their time tested indigenous technology.

UNIT III (Time-five weeks)

- Modern buildings on hills in India.
- Constraints of climate, topography and availability of materials.
- Design factors such as access, circulation, gradients, slope analysis, grading and interpolation of contours.
- Structural aspects of modern buildings and necessary safeguards.
- Environmental and ecological concerns and safeguards.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "The Architectural Heritage of Himachal Pradesh: Origin and Development of Temple Styles", Laxman S. Thakur, Munshiram Manoharlal Publishers, 1996.
- "Environment Protection of Himalaya: A Mountaineer's View", Aamir Ali, Indus Publishing Company, 1998.
- "The Survival of the Himalaya, Eco-systems- A scenario of Unsustainability", Sunder LalBahuguna, Tej Vir Singh and M.L.Sharma
- "Himalayan Ecology, Transhumance and Social Organization Gaddis of Himachal Pradesh", Veena Bhasin, Kamla-Raj Enterprises, 1988.
- "Ecological Hazards in the Himalayas", S.K. Chadha, Pointer Publishers, 1989.
- "Himachal Pradesh:A perspective", Ramesh Chauhan, Menerava Book, 1998.
- "Temples of the Western Himalayas", Penelope Chetwode, The Architectural Review, London.
- ICIMOD,Constraints and Opportunities, International Centre for Integrated Mountain Development, Proceedings of International Symposium on Mountain Environment and Development Kathmandu, Nepal.
- "Environmental Concerns and Strategies", T.N. Khoshoo, South Asia Books; 2nd Sub edition, 1988.
- "Site Engineering for Landscape Architects", Steven Strom, Kurt Nathan and Jake Woland, Wiley; 6th edition, 2013.

ARD – 326 BUILDING ECONOMICS & SOCIOLOGY

B.Arch 3rd year (6th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To create awareness among the students regarding management of physical and human resources pertaining to a business organization in general and specific to construction industry.

CONTENTS

UNIT I - BUILDING ECONOMICS (Time – eight weeks)

- **Nature Of Economics:** Introduction, Evolution of Economics, Definition – wealth, welfare, scarcity, Nature and scope of economics, Division of economics, Economics in relation to engineering and other Social Sciences
- **Demand and Law Of Demand:** Meaning of demand, Kinds of demand, Law of demand, Demand schedule and curve, Limitations of law of demand, Shape of demand curve, Extension Contraction Increase and decrease in demand, Factors affecting demand, Goods and kinds of goods.
- **Elasticity of Demand:** Meaning of elasticity of demand, Degree of elasticity of demand, Types of elasticity of demand, Factors governing elasticity of demand, Importance of elasticity of demand
- **Laws Of Consumption:** Consumption, Forms of Consumption, Importance of utility, Law of diminishing marginal utility, Law of equi-marginal utility.
- **Scale of production:** Supply, Laws of supply, General equilibrium
- Large scale production its advantages and disadvantages, Small scale production its advantages and disadvantages
- Economics Related To Building Construction Industry And Real Estate: Need for economic tools, Concept of Economic efficiency, Economic analysis process, Construction Industry, Nature of construction industry in India, Problems of changes in demand (Sellers' market to Buyers' market), Existing scenario of construction industry/Real estate and Land market in the metro cities of India, Influence of the Government policies on the land Market and the Construction Industry, Methods of controlling the inadequacies in construction industry/real estate.

Unit II - SOCIOLOGY (Time – eight weeks)

- **Indian social structure:** Introduction – Varied religion/cultures –varied languages –– Rural Urban conflict
- **The Indian Village:** Introduction – Village types according to their structure –-Village forms With respect to Order/Cluster – Caste Hierarchy -Caste and Habitation area in a village – Social structure of a village community – Planning of a typical village house
- **The Indian City:** Introduction – Emergence of small family pattern -Urban and Suburban life – Disintegration of Joint family –Emergence of Urban societies City life style – Characteristics Of urban population – Social Psychology of urban life – Varied life styles – Planning of a typical urban dwelling

REFERENCE BOOKS

- "Modern Economic Theory", K.K. Dewett and K.K. Bahl, S Chand; Reprint Edition, 2006.
- "Economics for Engineers", M.L. Gupta, Abhishek Publications, 2000.
- "Microeconomic Theory", Larry Samuelson, Springer Science & Business Media, 1986.
- "Rural Sociology in India", A.R.Desai, Popular Prakashan Ltd.; New edition, 2011.
- "The Urban World", J. John Palen, Oxford University Press; 9thedition, 2011.
- "Models of Urban and Regional Systems in Developing Countries", George F. Chadwick, Pergamon Press, 1987.

ARD – 327 EARTHQUAKE RESISTANT BUILDING DESIGN B.Arch 4th Year (6th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To let the students understand the terminology used in Earthquake and its effects on structural and non-structural elements.

CONTENTS

Unit I (Time- three weeks): Elementary Seismology

- Earthquake occurrence in the world, plate tectonics, faults, earthquake hazard map of India and the states.
- Causes of earthquake, seismic waves, magnitude, intensity, epicenter and energy release, characteristics of strong earthquake ground motion.

Unit II (Time- three weeks): Performance of Ground and Building in Past Earthquakes

- Earthquake effects: On ground, soil ruptures, liquefaction and landslides.
- Behavior of various types of Buildings, structures, power plants, switchyards, equipments, life lines and collapse patterns.
- Behavior of Non-Structural Elements like services, fixtures, mountings.

Unit III (Time- four weeks): Site Planning, building forms and Seismic Design Principles

- Building forms: Horizontal and Vertical eccentricities, mass and stiffness distribution, soft storey, etc.
- Plan and vertical irregularities, redundancy and setbacks.
- Concept of Seismic design, stiffness, strength period, ductility, damping, hysteric energy dissipation, center of mass, center of rigidity, torsion, design eccentricities.
- Ductility based design: Design of energy absorbing devices. Seismic based isolation and seismic active control.
- Contemporary international approaches.

Unit IV (Time- three weeks): Earthquake Resistant Construction Details

- Introduction to various IS codes.
- Various types and construction details of Foundation, Soil stabilization, retaining walls, underground and overhead tanks, staircases and isolation of structures.
- Methodologies for seismic retrofitting.

REFERENCE BOOKS

- “Disaster Management in the Hills”, Dr. Satendra, Concept Publishing Company, 2003.
- “Disaster Management”, Harsh K. Gupta, Universities Press, 2003.
- “Natural Hazards and Disaster Management: Vulnerability and Mitigation”,R. B. Singh, Rawat; Reprint edition, 2006.
- "Proceedings of the National Conference on Disaster & Technology, 1998, Manipal, India", NirmitaMehrotra, 1998.
- “Disaster Risk Reduction in South Asia”, Sahni, Pardeep, Ariyabandu and Madhavi Malalgoda, PHI Learning, 2003.

ARD – 411 ARCHITECTURAL DESIGN – VII B.Arch 4th year (7th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	6 Hours	07
2 - - 10	12	30%	30%	20%	20%		

OBJECTIVE

To make the students aware of design issues related to problems of Housing/ Institutional complex in context to Site Planning.

CONTENTS

UNIT I (Time-eight Weeks)

Designing & planning of Neighborhood Unit in urban area or suburbs with respect to:

- Unit orientation.
- Cluster formation.
- Open space: size, hierarchy &ownership.
- Circulation: Pedestrian, walkway, cycle tracks, hierarchy of roads, road layout system.
- Integrating building services in a unit cluster.

Site may be chosen in different climatic conditions in India.

UNIT II (Time-eight weeks)

- Design of a University Campus and redevelopment projects etc.

NOTE

Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem with reference to the above contents.

REFERENCE BOOKS

- "Mane" A New Initiative in Public Housing, Hudco Publication, New Delhi.
- "Housing and Urbanization", Charles Correa, Thames & Hudson, 2000.
- "Time saver standards for Housing and Residential development", De Chiara, Panero & Zelnik, Tata McGraw-Hill Education, 2009.
- "Time Saver Standards for Building Types", John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York, 1983.
- "Campus Architecture: Building in the Groves of Academe", Richard P. Dober, 1996
- "Campus & Community, Moore Ruble Yudell Architecture and Planning", Rockport Publishers, Inc., 1997.
- "People Places: Design guidelines for urban open spaces", Clare Cooper Marcus, Carolyn Francis (Eds.), John Wiley & Sons, 1998.

ARD – 412 ADVANCED CONSTRUCTION TECHNIQUES

B.Arch 4th Year (7th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE

To make the students learn about all the aspects of advanced building construction techniques.

CONTENTS

UNIT I (Time- six weeks)

- Introduction to new structural forms and methods of their execution such as form work required for execution of shell structures, Pneumatic Structure, geodesic domes, space steel frames etc.
- Introduction to types of special slabs like Filler slab, waffle, coffer and flat slabs.
- Introduction to shell & folded plate.

UNIT II (Time-six weeks)

- Design and Details of roof gardens.
- Detailing of Curtain walls, triple glazing windows.
- Introduction to high tech building materials like structural glazing, vitreous tiles, artificial veneers, aluminum composite panels etc.
- Advanced building finishes.

UNIT III (Time-four weeks)

- Introduction to cost effective and environmentally friendly building materials such as Stabilized mud blocks, Hollow concrete blocks, Aerated concrete blocks, Fly ash bricks, eco boards, husk boards etc.
- Prestressed Concrete Structures: Introduction, method of pre – stressing, losses of prestress designing of rectangular beams.
- Introduction of Prefabrication- Advantages and disadvantages of on-site and off-site prefabrication; Prefabrication in Indian construction industry.
- Emerging trends in building materials and recent advances in concrete technology.

NOTE

- **Site Visits** to ongoing construction project/s and modern buildings.
- **Market survey** of building materials and visits to building materials industries.

REFERENCE BOOKS

- "Steel Structure and Architecture", Arne Petter Eggen, Bjørn Normann Sandaker, Whitney Library of Design, 1995.
- "Structural Analysis and Design of Tall buildings",Bungale S. Taranath, CRC Press, Florida, 2012.
- "Handbook of Designing and Installation of services in Building complex", Highrise Buildings, V.K.Jain, Khanna Tech., 1990.
- "Building Structures", James Ambrose, Patrick Tripeny, John Wiley & Sons, 2011.
- "Handbook of Building Construction" Vol-1&2, MM Goyal, Thomson Press, 2006.

ARD – 413 LANDSCAPE DESIGN

B.Arch 4th year (7th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

This course is aimed at providing a comprehensive knowledge regarding ecological aspects and environmental concerns in landscape design besides the advanced knowledge of basic elements of landscape design.

CONTENTS

UNIT I (Time-two weeks)

- Introduction to the elements of landscape such as Earth form, Water and Vegetation and their effect in relation to the built environment. Plant types, characteristics, structure and color of foliage.

UNIT II (Time-four weeks)

- History, nature and scope Purpose of designed open space.
- Exposure to historical landscape (English, French, Italian, Chinese, Japanese, Mughal, Ancient India) and their relevance in their time, context and social needs.
- Introduction to ecology and its importance to Landscape designers.

UNIT III (Time-five weeks)

- Site analysis and site structure unity.
- Advanced knowledge of basic elements of Landscape Design and their effects in context to the environmental concerns
- Basic knowledge of contour/mapping and various methods of documentation of physical features, topography and landscape elements.

UNIT IV (Time-five weeks)

- Case studies of varied urban situations with typical different landscape characters in Chandigarh, Delhi region to analyze and assess their present landscape status by applying knowledge and techniques acquired as above.
- Landscape design proposal based on above mentioned analysis as a studio exercise.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Time-saver standards for landscape architecture: design and construction data", Nicholas T. Dines, Kyle D. Brown; McGraw-Hill, 1998
- "Landscape design: a practical approach", Leroy G. Hannebaum; Reston Pub. Co., 1981
- "Landscape design: an international survey", Ken Fieldhouse; Overlook Press, 1993
- Landscape Detailing, Micheal Littlewood; Routledge, 2001
- "Planting Design", Theodore D. Walker; John Wiley & Sons, 1991
- "Landscape Architecture Construction", Harlow C. Landphair, Fred Klatt; Prentice Hall PTR, 1999
- "Landscape As Inspiration", Hans Dieter Schaal; Academy Editions, 1994
- "Introduction to Landscape Design", John L. Motloch; John Wiley & Sons, 2000
- "Landscape Architecture: A Manual of Site Planning and Design", John Ormsbee Simonds; McGraw Hill Professional, 1998
- "Trees of Chandigarh", Chhatar Singh, Rajnish Wattas, Harjit Singh Dhillon; B.R. Publishing Corporation, 1998

ARD – 414 LOW COST BUILDING

B.Arch 4th Year (7th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To make the students aware of the use of conventional and non-conventional resources for low cost construction.

CONTENTS

UNIT I (Time-five weeks)

- An introduction to the subject to understand the various building techniques adopted in different climatic zones of the country, which resulting in varied vernacular expressions.
- Use of cost effective technologies through the use of local materials, up gradation of traditional technologies, prefabrication etc.

UNIT II (Time-five weeks)

- Need for low cost construction, both in the rural and the urban sectors.
- Innovations of building techniques for low cost construction.
- Analysis of space norms for low cost buildings.

UNIT III (Time-six weeks)

- Study of usages pattern of low cost buildings by the habitants.
- Comparative analysis of building materials and costing.
- Works of Laurie Baker, Hassan Fathy and other prominent architects.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Building Systems for Low Income Housing", Ashok Kumar Jain; Management Publishing House, 1992
- "Low Cost Housing in Developing Countries", Guru Charan Mathur; For Centre for Science & Technology of the Non-Aligned and Other Developing Countries, Oxford & IBH Publishing Company, 1993

ARD – 415 ENERGY EFFICIENT ARCHITECTURE

B.Arch 4th year (7th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To familiarize the students with role of energy in built environment and for the efficient use of energy in design process.

CONTENTS

UNITI(Time-three weeks)

- Types, availability and reserves of conventional and non-conventional energy sources.
- Energy Conservation, Indian Energy Conservation Act 2001 Features, Energy Star Rating of buildings and Equipments, Bureau of Energy Efficiency.

UNITII(Time-six weeks)

- Energy Conservation Building Code (ECBC).
- Energy Building Code, Guidelines: Thermal Insulation, Heating, Ventilation and Air .
- Conditioning System, Building Lighting Design: Lighting levels, light efficient options, CFL,
- LEDs, Fixtures, Day lighting timers, Building Energy Management.

UNIT III(Time-seven weeks)

- Introduction to Building rating systems in India. Detailed study on LEED and GRIHA (Green Rating for Integrated Habitat Assessment).
- Case study national and international examples.

REFERENCE BOOKS

- "Renewable Energy Sources and Their Environmental Impact", Shahid A. Abbasi, Naseema Abbasi; PHI Learning Pvt. Ltd., 2004
- "Energy efficient buildings: architecture, engineering and environment", Dean Hawkes, Wayne Forster; W.W. Norton & Company, 2002
- Indian Energy Conservation Act 2001, GoI
- Energy Conservation Building Code Manual, GoI
- "GRIHA Manuals", The Energy and Resources Institute (TERI), 2011
- "Energy-efficient Buildings in India"; The Energy and Resources Institute (TERI), 2001

ARD – 416 (Elective – I): (i) ART AND ARCHITECTURE

B.Arch 4th Year (7th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

This course covers topics on in the development of human settlements in relation to infrastructure. The objective of the course is to make students aware about infrastructure as important part in analyzing planning problems.

CONTENTS

UNIT I(Time-one week)

- Introduction to application of art in Architecture, purpose of Applied Art, Principles and nature.

UNIT II (Time-two weeks)

- Paintings, Murals and Sculptures; Materials and techniques study of styles and changing trends in India from ancient times.

UNIT III (Time-two weeks)

- Decorative elements such as Jali Design; Inlay work; Relief art work; Study of changing needs in different periods- Dravidian, Gandhara, Gupta, Mughal, Rajput; Materials and techniques.

UNIT IV (Time-three weeks)

- Application of colors and textures in sculptures, murals, paintings, fountains etc., psychological effects of colors and textures.

UNIT V (Time-two weeks)

- Art expression, appreciation and symbolism; two and three dimensional forms; Aesthetic order; functional Importance.

UNIT VI (Time-three weeks)

- Interior and exterior space organization, graphic techniques of communication, form-space relation.

UNIT VII (Time-three weeks)

- Modern trends in applied art, contribution of science and technology in terms of new materials.
- Styles and techniques of modern masters.

REFERENCE BOOKS

- Architecture/ Art/ Parallels/ Connections- Barry A. Berkus AIA, the Image Publication Group Pvt. Ltd.
- “Design Fundamentals”, Scott R.G.; McGraw Hill, 1951
- “Prebles' Artforms: An Introduction to the Visual Arts”, Patrick Frank, Duane Preble, Sarah Preble; Pearson College Division, 2013
- Architecture: Form, Space, and Order, Francis D. K. Ching; John Wiley & Sons, 2014

ARD – 416 (Elective – I): (ii) ARCHITECTURAL PHOTOGRAPHY & JOURNALISM

B.Arch 4th Year (7th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

This course covers topics on in the photography in relation to Architecture & Journalism. The objective of the course is to make students aware about importance of visually analyzing the architecture and its interpretation through journalism.

CONTENTS

UNIT I (Three Weeks)

- General introduction to the art of photography; concept of color; concepts of lighting, distance, visual angle, Frames; media;

UNIT II (Four Weeks)

- Types of camera, properties and priorities; Exposure, Aperture, Speed; Photographic films, Film processing color, black and white, printing techniques, developing.
-

UNIT III (Nine Weeks)

- Analysis of recent historical and contemporary examples of written and journalistic criticism of architecture, including selected writings by Indian and overseas critics; discursive techniques, analysis of major critical themes, thematic categories in architectural writing over the past three centuries.
- Works of Indian and international writers and critics will be presented and discussed. Seminars on Indian architectural writers, journalists and critics.
- Exercise on integrating photography in architectural journalism.

REFERENCE BOOKS

1. “Professional Secrets of Advertising Photography", Paul Markow; Amherst Media, 1998
2. Encyclopedia of practical photography, Eastman Kodak Company; Amphoto, 1979
3. “The New 35mm Photographer's Handbook: Everything You Need to Get the Most Out of Your Camera”, Julian Calder, John Garrett; Three Rivers Press, 1999
4. Digital Photography for Dummies,Julie Adair King;John Wiley & Sons, 2012

ARD – 416 (Elective – I): (iii) FUTURISTIC ARCHITECTURE

B.Arch 4th Year (7th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

This course covers topics on future trends of architecture and its practice.

CONTENTS

UNIT I (Time-two weeks)

- Future concepts envisioned by earlier theorists and architects like Antonio Saint Elia and F.L. Wright

UNIT II (Time-four weeks)

- Emerging architectural paradigms such as programme generated architecture, dynamic architectural systems, virtuality, Trans architecture, data driven structures and 'glocal' approach through the study of relevant projects.

UNIT III(Time-four weeks)

- Evolution of contemporary architectural concepts-historical revival biomimicry adaptive reuse and low cost buildings; Futuristic building materials: Buildings; Futuristic building materials: Building tectonics and systems

UNIT IV (Time-three weeks)

- Study of specific building types-houses, office spaces, public buildings, skyscrapers and transportation hubs through various projects

UNIT V (Time-three weeks)

- Sustainable buildings including energy efficiency, Zero Energy and Energy Plus buildings and resource conservation

REFERENCE BOOKS

- 21st Century House- Bell ,J, Laurence King Publishing
- Materials for Architectural Design- Bell, Victoria Ballard, Laurence King Publishing
- Building a New Milleneum- Jodidio, P, Vol.1, Taschen
- Architecture Now- Jodidio, P.Vol. 2, Taschen

ARD – 417 PROFESSIONAL TRAINING

B.Arch 4th Year (7th Semester)

Contact Hours per Week		Credit
L T P D	Total	02
- - - -	-	

Evaluation will be based on training completed during summer vacations.

NOTES

- The summer break will be used for Professional Training, which is to be undertaken as per CoA norms.
- The minimum period of training should be 06-08 weeks.
- Comprehensive Viva Voce will be conducted at the starting of semester which will consist of the report and the work done by the trainee and marks will be awarded as per the scheme given above.
- Trainees are required to submit training report duly signed by the employer and his assessment at the end of training period to the departmental course convener.

ARD – 421 ARCHITECTURAL DESIGN – VIII B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	6 Hours	07
2 - - 10	12	30%	30%	20%	20%		

OBJECTIVE

To make the students aware of Urban Design issues.

CONTENTS

UNITI(Time-Eight weeks)

- Design an urban design scheme for any urban problem with emphasis to contextual issues.
- Design & plan of Urban agglomeration, Urban Haat etc.

UNIT III (Time-Eight weeks)

- Design of a Transport Terminal, Convention centre etc.

NOTE

Two design problems and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed program for each of the above design problems and time problem with reference to the above contents.

REFERENCE BOOKS

- "The Image of the City", Kevin Lynch, The MIT Press, First Edition, 1960
- "The Urban Pattern: City Planning and Design", Arthur B. Gallion & Simon Eisner, Van Nostrand, Second Edition, 1963
- "People Places : Design Guidelines for Urban Open Space", Clare Cooper Marcus & Carolyn Francis, Van Nostrand Reinhold Company, First Edition, 1990
- "Urban Design : Green Dimensions", J.C. Moughtin & Peter Shirley, Architectural Press, First Edition, 1996
- "City Planning : Arco colour Urban Architecture (Arco colour collection)", Asensio Cerver& Francisco, Arco Editorial, 1996

ARD – 422 INTERIOR DESIGN B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%		Exam Duration	Credit
L T P D	Total	Record Mark: Assignment/ Quizzes /Projects/Attendance	Viva Voce	Final Exam	Viva Voce	4 Hours	04
2 - - 4	06	30%	30%	20%	20%		

OBJECTIVE

To understand and appreciate the complexities and constraints in the design and execution of architectural interiors.

CONTENTS

UNIT I (Time-five weeks)

- Applications of colour, form and texture in interiors.
- Various material applications in interiors: walls, floors, ceilings and others
- Principles of aesthetic composition in interiors
- Meaning of spatial organizations, perceptual needs, psychological Needs, convenience, maintenance, durability and image in interior design.
- Use of artificial and natural lighting in interiors.

UNIT II(Time-eleven weeks)

- Interior design in terms of retail, hospitality, residential and commercial.
- Interior Design problem with details with focus on corporate interiors:Retail design-Mc-Donalds/KFC/ICICI etc.

NOTE

Appraisal for above mentioned issues through various library case studies or live projects.

REFERENCE BOOKS

- "Interior Design", Ahmed Kasu,Om Books, 2005
- "Time Saver Standards for Interior design and space planning", De Chiara, Panero&Zelnik, McGraw-Hill, 1991
- "Interior Architecture" John Kurtich & Garret Eakin, Wiley,1st Edition, 1995
- "Interior Spaces", Hans DiterSchaal, Wiley, 1995
- "International Interiors", Lucy Bullivant,Laurence King Publishing, 1993

ARD – 423 RESEARCH METHODOLOGY

B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To appreciate the process of research and make the students aware of its potential in the field of architecture.

CONTENTS

UNIT – I (Time-four weeks)

- Research in architecture – its nature, purpose and scope.
- Basic and applied research.
- Technical and behavioral – oriented research.

UNIT – II (Time-four weeks)

- Science and scientific method – various steps in scientific method: hypothesis, research design, data collection & analysis, conclusion and implications with special reference to architectural research.

UNIT – III (Time-eight weeks)

- Methods of conducting research.
- Selection of topics and its relevance.
- Identification and formulation of problem.
- Compiling and analyzing existing research database.
- Research design, research instruments and analysis.
- Presentation of results.
- Evaluation of findings, conclusions and recommendations.
- Techniques of research – report writing.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Research : How to Plan, Speak and Write about it", C. Hawkins & M. Sorgi, Springer-Verlag, 1985
- "Research Methodology" ,Rajagopalan, Mathews and Ramamurthy

ARD – 424 URBAN DESIGN

B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand the principles and applications of urban design.

CONTENTS

UNIT I (Four Weeks)

- Introduction to Urban Design, its Principles and Techniques, Scope of Urban Design. Emergent concepts in urban design, Role of UAC.
- History & Heritage of Urban Design.
- Urban Design vocabulary, Elements of Urban Design.
- Concept of Urban Redevelopment, Urban Renewal and Urban Regeneration.

UNIT II (Eight Weeks)

- Importance of context in Urban design (Context analysis, regional study and project understanding).Impact of Factors such as economy, politics, religion and regional on urban design.
- Gentrification and social Imbalance.
- Concepts to be kept in mind (Gender issue, elderly People and Child) while designing.
- Study of Futuristic city and new urbanism.

UNIT III (Four Weeks)

- Concept of Neighborhood planning. Study of existing urban developments.
- Urban design exercises.

REFERENCE BOOKS

1. "Urban Design: Green Dimensions", J. C. Moughtin & Peter Shirley, Architectural Press, First Edition, 1996
2. "A New Theory of Urban Design (Center for Environmental Structure Series, Vol 6)", Christopher Alexander, Hajo Neis, Artemis Anninou & Ingrid King, Oxford University Press, 1987
3. "The Urban Design Handbook: Techniques and Working Methods" ,Ray Gindroz, Urban Design Associates,2003
4. "Urban Design: Street and Square, J. C. Moughtin, Architectural Press ,Third Edition", 2003
5. " Urban Spaces, No. 4", John Dixon, Visual reference publication, 2006

ARD – 425 PROJECT MANAGEMENT

B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To let the students understand the onsite problems related to building construction and causes of delay in construction, as well as to inculcate the skills as a team manager.

CONTENTS

UNIT I (Time-four weeks)

- Aim, objectives and functions of Construction Management.
- Construction stages, Construction team
- Role of an architect in construction management.
- Management techniques and tools.

UNIT II (Time-six weeks)

- Bar charts and limitations of bar charts.
- Program Evaluation and Review Techniques (PERT)
- Critical Path Method (CPM) for project management
- Development and analysis of CPM net work
- Cost time analysis in network planning
- Scientific methods of construction management

UNIT III (Time-six weeks)

- Project management for repetitive types of buildings. Line of balance method – its working knowledge with exercises.
- Resources scheduling methods through Bar charts, CPM and Line of Balance method.
- Inspection and quality control.
- Safety in Construction.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- Construction Planning and Management – U.K.Shrivastava
- Total Construction Project Management – George J Ritz

ARD – 426 (Elective – II): (i) ARCHITECTURAL CONSERVATION B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To equip students to deal with Architecture conservation, along with the related design issues of existing Architecture, old Monuments, and natural and urban heritage areas.

CONTENTS

UNIT I (Time-five weeks)

- Interactive session of History of heritage Buildings and cities.
- Introduction to conservation of Historic Buildings.
- Concepts and approach's to conservation in India and other countries.

UNIT II (Time-six weeks)

- Institutional Aspects of Conservation
- Conservation related Charters
- World Heritage legislation and Sites
- Conservation Acts & Legislation
- Archaeological Acts

UNIT III (Time-five weeks)

- Conservation Area practice, adaptive reuse, up gradation programs in old areas, infill design.
- Conservation of traditional water systems.
- Upgrading infrastructure, financing and implementation framework for redevelopment and revitalization projects.

REFERENCE BOOKS

- Architecture in Conservation: Managing Development at Historic Sites (Heritage: Care-Preservation-Management) –James Strike
- Protection, Conservation and Preservation of Indian Monuments- Shanti Lal Nagar
- Architectural and urban conservation- Santosh Ghosh, Ranajit Gupta, Sumita Gupta
- History of Architectural Conservation- Jukka Jokilehto

ARD – 426 (Elective – II): (ii) HOUSING B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To equip students to deal with housing, along with the related issues of existing Housing stock and its future requirement.

CONTENTS

UNIT I (Time-Six Weeks)

- Introduction to housing & human settlements, Housing policies and programs, settlements in the development of human civilization, role of Housing in social and economic development of the nation.
- Housing in five year plans & Social Housing plans.
- National housing Policy

UNIT II (Time- four weeks)

- Major elements of housing policy: land, finance, material, technology & legislation. Development concepts and human settlement planning.
- Slum area development.

UNIT II (Time- six weeks)

- Mass housing programs. Housing design and standards. Rural Housing.
- Housing design & standards, units of housing design form and structure of housing as shaped by socio economic and physical parameters, housing systems & sub systems. Partial and integrated environment quality; post occupancy evaluation, housing Satisfaction, housing demand and policy analysis.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- Bennett L. Hecht (1990, "Developing Affordable Housing: A Practical Guide for Nonprofit Organizations" (Wiley Nonprofit Law, Finance and Management Series)
- Thomas Sowell (2009), "The Housing Boom and Bust"
- Sam Davis (1995), "The Architecture of Affordable Housing"
- Barbara Miller Lane (2009), "Housing and Dwelling: Perspectives on Modern Domestic Architecture"
- Barbara Miller Lane (2006), "Housing and Dwelling: Perspectives on Modern Domestic Architecture"
- Affordable Housing and Public Policy : Strategies for Metropolitan Chicago (Assembly Book); Lawrence B. Joseph (Editor)

ARD – 426 (Elective – II): (iii) BUILDING MAINTENANCE

B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

To understand historical building types and their conservation and a thorough knowledge of Building Maintenance can substantially contribute towards adequacy of design and suitability of materials.

CONTENTS

UNIT – I (Time-four weeks)

- Introduction: Maintenance defined. Need and Importance of building maintenance. Its economic and social significance.
- Categories of maintenance: Planned maintenance, preventive maintenance, running caretaker maintenance, PWD patter of maintenance; A/R and S/R, maintenance cycles, maintenance profiles.

UNIT – II (Time-six weeks)

- Maintenance Generators: Climatic conditions; usages, defects in original design/construction, changing standards and tastes.
- Maintenance standards, determinants of maintenance standards, statutory standards, defective premises act, building bylaws & act, legislative controls, building & housing act.
- Organizing Maintenance; Managing maintenance, Financing & Budgeting for maintenance. Understanding technology and techniques involved in maintenance. Execution of maintenance work. Controlling costs. Information systems in maintenance. Inspections: annual, periodical, special, checklist and proformas.

UNIT – III (Time-six weeks)

- Creating database for maintenance, maintaining building registers, inventories, inspection reports, records, User complaints, buildings in danger.
- Understanding building defects & ailments, examining symptoms of various types and patterns of buildings disease and ailments, structural, non-structural finishes, stains, services ailments, leakages & dampness, corrosion protection, Sulphate attacks.
- Diagnosing & determining causes, prescribing effective remedial action.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- Repair and Renovation of Modern Buildings – Ian Chandler
- A Manual of Maintenance Engineering – B. S.Nayak
- Maintenance and Repairs of Buildings – P.K.Guha
- Building Services Handbook - Hall, Fred

ARD – 427 DISSERTATION B.Arch 4th Year (8th Semester)

Contact Hours per Week		Continuous Assessment 60%		End Term (Lab Final) : 40%	Exam Duration	Credit
L T P D	Total	Record Mark: *	Viva Voce	Viva Voce	-	02
2 - - 0	02	30%	30%			

* Marks are to be awarded on the detailed project report and open seminar.

OBJECTIVE

To make the students equip in and Data Collection, Analysis and Research of Architecture and Planning, Urban and Rural development and Socio-Economic conditions.

CONTENTS

UNIT – I (Time-sixteen weeks)

Scope for Design/ Research Dissertation:

- Topics / projects related to architecture and Planning
- Rural and Urban redevelopment projects
- Landscape projects

Contents of report

- Introduction
- Literature study and case study
- Analysis and Inferences
- Conclusion

NOTE

- Design dissertation on a topic (project) shall be approved by the department separately for each student in the end of previous semester. Projects may be based on ongoing, proposed development or new investigation in the related area.
- Students are also required to submit their thesis topics after the Viva-voce.
- Students are required to stay for a week for discussion on thesis topics and guide (External / Internal)
- Students are required to proceed for Case studies and Data collection of their respective approved Thesis topic in consultation with their Thesis Coordinators. This work has to be completed by the students in the summer break at the end of this semester.

ARD – 511 ARCHITECTURE DESIGN THESIS (MAJOR PROJECT) B. Arch. 5th year (9th Sem)

Contact Hours per Week		Credit
L T P D	Total	10
0 - - 20	20	

Evaluation will be based on major project as per details below:

- **Stage I (Synopsis) -** Introduction, Validity, Aims & Objective, Methodology, Site Conditions and tentative space requirement
- **Stage II -** Synopsis, Case Studies, Data Analysis, Library study and Framing of the requirements, Design philosophy.
- **Stage III –**Concept, Pre-Final design proposal and Block Model. Detailed working drawings showing any two of the following services: Air-conditioning, Landscape, Structure, Interior detailing, Water supply & Sanitation or any other detail. Hard Bound report.
- **Stage IV –**Final design proposal along with model/views, to be evaluated by external examiner.

Teaching & Evaluation system

- The thesis studio will be conducted under the overall coordination of the thesis coordinator. In addition, one members of the Visiting/Expert Faculty would also be associated throughout the duration of the studio. Each student will be assigned a Thesis Guide (amongst the faculty), who will supervise the progress of the student's work on a regular basis.
- Approval of the thesis project will be done by the team comprising of the head of the department, the thesis coordinator and the respective thesis guide.
- **All stages of sessional work will be evaluated as per the clause 6.3 A(1 & 2) of UG manual.**
- Each student should have minimum one internal guide. Apart from that student may opt one external guide, from Academic/Research/Architectural Practice (Registered with COA & having experience of 5 yr or more) for which intimation & approval shall be done by DUGC.

ARD – 512 PROFESSIONAL PRACTICE & ETHICS

B.Arch 5th Year (9th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc.:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVE

Introduction to the professional, vocational and legal aspects of architectural practice and profession.

CONTENTS

UNIT I (Time-two weeks)

- Architectural professional association, its role and responsibilities.
- Introduction of Architects Act 1972. Council of Architecture – its role and responsibilities.

UNIT II (Time-two weeks)

- Code of professional conduct.
- Condition of engagement and scale of professional fees.
- Copyright Act as applicable to architectural work.
- Architectural competitions.

UNIT III (Time-Five weeks)

- Contract –Types, Preparation of contract documents general conditions of contract, interim certificates defect liability period, retention amount and virtual completion.
- Duties and liabilities of architects, contractors.
- Articles of agreement, execution of work payment and Arbitration.
- Tenders – types and the process of calling, security and selection system.
- Pre- Tender qualifications and registration of contracts.
- Office organizations and management, Role of design staff and supporting managerial staff; Personal management.

UNIT IV (Time-Seven weeks)

- Human Values: Morals, Values and Ethics, Integrity, Work Ethics, Service Learning, Civic Virtue, Respect For Others, Living Peacefully, Caring, Sharing, Honesty, Courage, Valuing Time, Co-Operation, Commitment, Self Confidence, Spirituality.
- Professional Ethics: Senses of 'Professional Ethics', Variety of model issues, types of inquiry, Moral dilemmas, Moral Autonomy, Kohlberg's theory, Gilligan theory, Consensus and controversy, Profession and Professionalism, Professional Ideals And Virtues, Theories About Right Action, Self-Interest, Customs And Religion, Uses Of Ethical Theories.
- GLOBAL ISSUES: Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors - moral leadership-
- Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the Three Mile Island and Chernobyl case studies.

NOTE

The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

- "Ethic in Engineering", Mark Martin and Roland Schinzinger, Mecgrew hill,1999
- "Architects Handbook, A Ready Reckoner", CharanjitS.Shah, 2000
- "Town Planning", Rangwala, 2001
- "Handbook on Professional Practice". The Indian Institute of Architects.
- "Professional Practice", Roshan Namavati, 2004
- "Estimation, Costing and Valuation (Professional Practice)", Rangwala, 2002
- "Directory of Architects, List of Architects and Professional documents – Council of Architecture
- Architects Handbook", A Ready Reckoner – Charanjit S.Shah

ARD-513 BUILDING BYE-LAWS & REGULATIONS

B.Arch 5th Year (9th Semester)

Contact Hours per Week		Continuous Assessment Examination: 40%			End Semester Exam	Exam Duration	Credit
L T P D	Total	Mid Term	Class Test	Assignment/Quizzes /Projects/Attendance etc:		3 hours	03
2 1 - -	3	20%	10%	10%	60%		

OBJECTIVES

To familiarize the student with the regulatory system of construction on site.

CONTENTS

Unit I

Introduction:

- Legislative process –General Concept of Law: Source of law.
- Meaning of terms of law, legislation, ordinance, Bill, Act, code, standard, guidelines and Regulations and Bye-laws.
- Importance and benefits of building regulations, urban sociology.

Unit II

- Provisions of regulations as per National Building Code 2005
- Standards for residential buildings, Building by–laws of local authority, standards for industrial, public, commercial and institutional buildings.
- Local/regional and global case studies on planning and implementation mechanism- building bye laws, development controls and zoning regulations.

Unit III

- Regulatory types and their advantages and disadvantages
- Role of Regulatory structure, Enforcement criteria and detailed Technical requirements in development of effective regulations.
- Regulatory assessment and revision schedule.

Unit IV

- Various national standards, guidelines and regulations in India

REFERENCE BOOKS

- “Urban Planning”, Anthony James Catanese, James C. Snyder; McGraw-Hill, 1988
- “Introduction to planning practice” Allmendinger, Prentice Hall of Indialip, 2000
- “Town and Country Planning”, Abercombie P, 3rd Edition, Oxford University Press, 2004
- “Urban and Regional Planning in India: A Handbook for Professional Practice”, SK Kulshrestha
- “The Urban Sociology Reader”, Jan Lin, Christopher Mele, 2003
- “National Building Code 2005”, BIS India
- “UDPFI Guidelines”, Ministry of Urban Affairs and Employment, GoI
- “Energy Conservation Building Code (ECBC)”, 2007
- “GRIHA Manuals” (Vol. 1-5), Teripress, New Delhi, 2003
- “Handbook of Energy conscious Buildings of India (HECB)”, MNRE, GoI, 2005

ARD – 521 OFFICE TRAINING B.Arch 5th Year (10th Semester)

Contact Hours per Week		Credit
L T P D	Total	10
- - - -	--	

Evaluation will be based on training performance, to be given by the architect under whom training is undertaken based on report and final evaluation.

NOTES

- The Winter break & entire Even semester will be used for Office Training, which is to be undertaken with an architect registered by the Council of Architecture India having minimum 5 years of practical experience
- The minimum period of training should be 18-20 weeks.
- Students can also pursue for training outside the Country, under any Architect whose degree is approved by Architect Act 1972 under Schedule (11) Section-14.
- Viva Voce(*) will be conducted as per the Academic Calendar, which will consist of the report and the work done by the trainee as per the guide lines & marks will be awarded as per the scheme given above.
- Trainees are required to submit monthly log book duly signed by the employer and his assessment at the end of training period to the Training & Placement Officer. These reports will be assessed by the Training & placement Officer.
- The following work is to be done by each trainee during the Office-Training:

➢ **During Office hours**

  - Drafting, tracing, presentation drawings, perspectives models etc.
  - Working drawings and detailing.
  - Site Visits
  - The trainee is required to prepare a study report on the building/buildings designed by his/her employer. The report is to be based upon site visits and personal observations and will cover aspects of design, structure, use of material, construction methods, services etc.