NOIDA INTERNATIONAL UNIVERSITY

SCHOOL OF ARCHITECTURE

COURSE CURRICULUM

FOR

BACHELOR OF ARCHITECTURE

(5 Year Course)

W.E.F Session 2019-2020 onwards

Course Curriculum

FOR B. ARCHITECTURE COURSE
(Effective from Academic session 2019-2020)

Introduction-The B. Architecture Course is programmed to give an all-round exposure, with subjects delineated in the four streams of Art, Humanities, Science, and Technology. While the arts stream would train the students in creative thinking and skills through subjects such as construction and 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. Thus Basic course areas are structured as:

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

In addition to these major courses the other courses such as Architectural Graphics, Architectural Drawing, etc. The humanities stream covering History of Built Environment, Vernacular Architecture, etc. would acquaint the student with the evolution and philosophy of architecture as well as traditional approach. Subjects in science and technology such as Building Technology, Structure Systems and Design, Building Construction, etc. are incorporated to give sound theoretical and practical knowledge of technical and constructional aspects of building. This is supplemented by field exposure of the acquired theoretical and philosophical information through site visits, tours and practical work. The course aim is to develop a holistic approach whereby a student can comprehend problems of architecture in totality of the societal and environmental context.

Programme educational objectives (PEO)

PEO1- Ability to apply technological knowledge, as well as aesthetical principles in addressing built environment issues through new ideas and knowledge.

PEO2- Ability to engage with other economic activity for the betterment of society and perform standard competencies at national and local practice of architecture with the integration of other disciplines.

PEO3- Ability to apply holistic approach and perceive the context of man and society with environment and also provide sustainable and humane approach for built form development.

Programme specific outcome (PSO)

PSO1- Design built environment and surrounding considering foundational design principles and considering users need, context and environment.

PSO2- Effectively explain the approach verbally, two and three-dimensional graphic representation, and in writing for design process and approach to any built form, spaces throughout all stages in design concept approach, construction phases and completion.

PSO3- Understand the architectural evolution, historical background, cultural background of people of any place and use them appropriately in design approach and related solution.

PSO4- The knowledge and ability to apply appropriate technical, sustainable, aesthetic, cost effective, and social approach in design decision while handling for any project.

PSO5- Demonstrate the ability to integrate other engineering by employing appropriate building materials, building systems, and construction practices and techniques.

PSO6- Understanding role of every individual, authorities, stakeholder in the process of design conceptual to implement and ability to lead the team from different discipline utilizing knowledge of the diverse forms and the dimensions of professional practice.

Programme learning outcome (PLO)

PLO1- Inculcate creative intellectual capability for new ideas.

PLO2- Understand architectural design principles, elements design and process to apply in building design.

PLO3- Inculcate skills to communicate graphically through knowledge of 2d and 3d presentation of ideas and drawings.

PLO4-Understand architectural design approach for various types of buildings like residential, commercial, institutional, healthcare, recreational etc., in plains and hilly terrain.

PLO5- Learn various components of a building and techniques of building construction, with appropriate use of materials; in context of environment and finance.

PLO6- Understand various aspects of environment like climatology, ecology, energy efficiency & alternative methods of energy use and its conservation, integration of renewable energy systems, need and benefits.

PLO7- Apply the knowledge of Architectural Fundamentals and Principles with applicable specialization for the solution of complex architectural challenges,

PLO8- Apply ethical principles and commit to professional ethics and responsibilities and norms of architectural practice.

PLO9- Use research-based methods including surveys, design, analysis and interpretation of data and synthesis of information leading to logical conclusions

PLO10- Understand the impact of architectural solutions in societal and environmental contexts, and demonstrate / apply the knowledge and the need for sustainable developments.

Credit System-Credit requirement for award of B.Arch:

- Every semester shall offer a minimum of **26 credits** and a maximum of **30 credits**.
- Credits for the Architectural Design Project or Thesis can vary from 15 to 18.
- The total number of credits for the B. Arch Degree Course could vary from a **minimum of 260** credits to a **maximum of 300** credits.
- All courses of study put together would engage the students for a **minimum of 26 periods** or hours of study a week and a **maximum of 30 periods** or hours a week.

Under the Choice based credit system, which is a student or learner centric system, the courses of study in the Architecture Degree course shall be as under:
(1) Professional Core (PC) Course: A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
(2) Building Sciences and Applied Engineering (BS and AE) Course: A course which informs the Professional core and should compulsorily be studied.

(3) Elective Course: Generally a course which can be chosen from a pool of courses and are of two types:
(i) Professional Elective (PE) which may be very specific or specialised or advanced or supportive to the discipline or subject of study or which provides an extended scope
(ii) Open Elective (OE) which enables an exposure to some other discipline or subject or domain or nurtures the candidate‘s proficiency or skill
(4) Employability Enhancement Courses (EEC) which may be of two kinds: Employability Enhancement Compulsory Courses (EECC) and Skill Enhancement Courses (SEC)

The Weightage in terms of Credits for each of the above in the prescribed curriculum of the institution shall be as follows:

S.no.	Credit Breakups	Percentage
1	Professional Core Courses	50%
2	Building Sciences and Applied Engineering	20%
3	Elective Courses (i) Professional Electives (ii) Open Electives	 10% 5%
4	Professional Ability Enhancement (i) Professional Ability Enhancement Compulsory Courses (ii) Skill Enhancement Courses	 10% 5%

While calculating credits the following guidelines shall be adopted, namely: -
(i) 1 lecture period or hour shall have 1 credit;
(ii) 1 lab/workshop or studio exercises or seminar periods or hours shall have 1 credit and
(iii) 1 design studio or construction studio or project or thesis period or hour shall have 1 credit.
For Practical training total number of credits shall be specified for one semester only.

Credit distribution in each semester (300 credits to 10 semester)

Semester	Credits
Semester-I	30
Semester-II	30
Semester-III	30
Semester-IV	30
Semester-V	30
Semester-VI	29
Semester -VII	30
Semester-VIII	26
Semester-IX	29
Semester-X	26

Course coding system
Every course coded by Alphanumeric structure has 4 sequential order (SQs) :-
SQ1- UG/PG degree
SQ2- Name of Program
SQ3- No. of semester
SQ4- No. of course in that particular semester
Example : for **BAR101,**

- Course code for 1 course in 1st semester of architecture UG degree course program is **BAR101** (where “1” represents no. of semester, “01” represent the one course)

Scheme of studies

Bachelor of Architecture

SOA/01/UG/001/05

Scheme of studies and examination

B. Arch

FIRST SEMESTER

Duration of Semester : 18 weeks
Periods per week : 34
Duration of each period : 50 minutes

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR101	Architectural Design-I	-	-	6	6	9	External viva	Design assignments, time problems
2.	BAR102	Building Construction-I	1	-	3	4	6	External viva	Notes, sketches, drawings, tests, Assignments
3.	BAR103	Building Material-I	2	-	-	2	2	2	Notes, sketches, tests, Assignments
4.	BAR104	Structure Systems & Design-I	2	-	-	2	2	2	Notes & tests, Assignments
5.	BAR105	Architectural Drawing-I	1	-	5	6	3	4	Drawings, tests, Assignments
6.	BAR106	Architectural Graphics-I	1	-	5	6	3	4	Sketches, Assignments, drawings, tests
7.	BAR107	History of Built Environment-I	2	-	-	2	2	2	Notes, sketches, tests, Assignments
8.	BAR108	Workshop- I	1	-	1	2	1	No External exam	Assignments & Tests
9	BAR109	Theory of Design-I	2	-	-	2	2	2	Notes & tests, Assignments
10.	BAR110	Health Education-I	-	-	2	2	NA	No Exam	Health and fitness, Extra-curricular activities.
		Total	**12**	**-**	**22**	**34**	**30**		

Scheme of studies and examination
B. Arch
SECOND SEMESTER

Duration of Semester : 18weeks
Periods per week : 34
Duration of each period : 50 minutes

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR201	Architectural Design-II	-	-	6	6	9	External viva	Design assignments, time problems
2.	BAR202	Building Construction-II	1	-	3	4	6	External viva	Notes, sketches, drawings, tests, Assignments
3.	BAR203	Building Material-II	2	-	-	2	2	2	Notes, sketches, tests, Assignments
4.	BAR204	Structure Systems & Design-II	2	-	-	2	2	2	Notes & tests, Assignments
5.	BAR205	Architectural Drawing-II	1	-	5	6	3	4	Drawings, tests, Assignments
6.	BAR206	Architectural Graphics-II	1	-	5	6	3	4	Sketches, Assignments, drawings, tests
7.	BAR207	History of Built Environment-II	2	-	-	2	2	2	Notes, sketches, tests, Assignments
8.	BAR208	Workshop- II	1	-	1	2	1	No External exam	Assignments & Tests
9	BAR209	Theory of Design-II	2	-	-	2	2	2	Notes & tests, Assignments
10.	BAR210	Health Education-II	-	-	2	2	NA	No Exam	Health and fitness, Extra-curricular activities.
11.		Educational Tour	-		1 Week Duration				Measured Drawing, Notes, Sketches, Presentation
		Total	**12**	**-**	**22**	**34**	**30**		

Note : The course work and assignments in each subject must be completed as prescribed. All these units will be equally represented in the external examination.

Note :Educational tour assignment should be marked in relevant subject for which tour conducted**.**

Scheme of studies and examination
B. Arch
THIRD SEMESTER

Duration of Semester – 18 Weeks
Periods per Week – 34
Duration of Period – 50 Minutes

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR301	Architectural Design-III	-	-	6	6	9	External viva	Design assignments, time problems
2.	BAR302	Building Construction-III	1	-	3	4	6	External viva	Notes, sketches, drawings, tests, Assignments
3.	BAR303	Building Material -III	2	-	-	2	2	2	Notes, sketches, tests, Assignments
4.	BAR304	Structural System &Design-III	2	-	-	2	2	2	Notes & tests, Assignments
5.	BAR305	Architectural Drawing-III	1	-	5	6	3	4	Drawings, tests, Assignments
6.	BIAR306	Architectural Graphics-III	1	-	5	6	3	4	Sketches, Assignments, drawings, tests
7.	BAR307	History of Built Environment-III	2	-	-	2	2	2	Notes, sketches, tests, Assignments
8.	BAR308	Theory of Design-III	2	-	-	2	2	2	Assignments & Tests
9	BAR309	Computer Application-III	1	-	1	2	1	No External exam	Notes & tests, Assignments
10.	BAR310	Health Education-III	-	-	2	2	NA	No Exam	Health and fitness, Extra-curricular activities.
		Total	**12**	**-**	**22**	**34**	**30**		

Note : The course work and assignments in each subject must be completed as prescribed. All these units will be equally represented in the external examination.

Scheme of studies and examination
B. Arch
FOURTH SEMESTER

Duration of Semester – 18 Weeks
Periods per Week – 34
Duration of Period – 50 Minute

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR401	Architectural Design-IV	-	-	6	6	9	External viva	Design assignments, time problems
2.	BAR402	Building Construction-IV	1	-	3	4	6	External viva	Notes, sketches, drawings, tests, Assignments
3.	BAR403	Building Services-IV	2	-	-	2	2	2	Notes, sketches, tests, Assignments
4.	BAR404	Structural System & Design-III	2	-	-	2	2	2	Notes & tests, Assignments
5.	BAR405	Architectural Drawing-IV	1	-	5	6	3	4	Drawings, tests, Assignments
6.	BAR406	Architectural Graphics-IV	1	-	5	6	3	4	Sketches, Assignments, drawings, tests
7.	BAR407	History of Built Environment -IV	2	-	-	2	2	2	Notes, sketches, tests, Assignments
8.	BAR408	Surveying and Levelling-I	2	-	-	2	2	2	Assignments & Tests
9	BAR409	Computer Application-III	1	-	1	2	1	No External exam	Notes & tests, Assignments
10.	BAR410	Health Education-IV	-	-	2	2	NA	No Exam	Health and fitness, Extra-curricular activities.
11.		Educational Tour	1 Week Duration						Measured Drawing, Notes, Sketches, Presentation
		Total	**12**	**-**	**22**	**34**	**30**		

Note :Educational tour assignment should be marked in relevant subject for which tour conducted**.**

Scheme of studies and examination

B. Arch

FIFTH SEMESTER

Duration of Semester : 18 weeks
Periods per week : 34
Duration of each period : 50 minutes

Note : The course work and assignments in each subject must be completed as prescribed.

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR501	Architectural Design-V	-	-	8	8	12	External viva	Design assignments, time problems
2.	BAR502	Building Construction-V	1	-	3	4	6	External viva	Notes, sketches, drawings, tests, Assignments
3.	BAR503	Building Services-V	2	-	-	2	2	2	Notes, sketches, tests, Assignments
4.	BAR504	Structure System & Design-V	2	-	-	2	2	2	Notes & tests, Assignments
5.	BAR505	History of Built Environment-V	2	-	-	2	2	2	Drawings, tests, Assignments
6.	BAR506	Computer Application-V	1	-	3	4	2	No External exam	Sketches, Assignments, drawings, tests
7.	BAR507	Building By- Laws-V	2	-	-	2	2	2	Notes, sketches, tests, Assignments
8.	BAR508	Climatology-V	2	-	-	2	2	2	Assignments & Tests
		Total	**12**	**-**	**14**	**26**	**30**		

Scheme of studies and examination
B. Arch
SIXTH SEMESTER

Duration of Semester : 18 weeks
Periods per week : 23
Duration of each period : 50 minutes

Note : The course work and assignments in each subject must be completed as prescribed.

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR601	Architectural Design-VI	-	-	8	8	12	External viva	Design assignments, time problems
2.	BAR602	Building Construction-VI	1	-	3	4	6	External viva	Notes, sketches, drawings, tests, Assignments
3.	BAR603	Building Services-VI	2	-	-	2	2	2	Notes, sketches, tests, Assignments
4.	BAR604	Structure Systems & Design - VI	2	-	-	2	2	2	Notes & tests, Assignments
5.	BAR605	Town Planning-VI	2	-	-	2	2	4	Drawings, tests, Assignments
6.	BAR606	Elements of Landscape-VI	1	-	2	3	3	4	Sketches, Assignments, drawings, tests
7.	BAR607	Social Sustainability-VI	2	-	-	2	2	2	Notes, sketches, tests, Assignments
8.		Educational Tour	1 Week Duration						Measured Drawing, Notes, Sketches, Presentation
		Total	**10**	**-**	**13**	**23**	**29**		

Note :Educational tour assignment should be marked in relevant subject for which tour conducted**.**

Scheme of studies and examination
B. Arch
SENENTH SEMESTER

Duration of Semester : 18 weeks
Periods per week : 28
Duration of each period: 50 minutes

Note : The course work and assignments in each subject must be completed as prescribed.

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR701	Architectural Design-VII	-	-	8	8	9	External viva	Design assignments, time problems
2.	BAR702	Building Construction-VII	1	-	3	4	6	External viva	Notes, sketches, drawings, tests, Assignments
3.	BAR703	Estimation Costing and Specification-VII	2	-	-	2	2	2	Notes, sketches, tests, Assignments
4.	BAR704	Professional Practice-VII	2	-	-	2	2	2	Notes & tests, Assignments
5.	BAR705	Research Methodology-VII	2	-	-	2	3	4	Drawings, tests, Assignments
6.	BAR706	Environmental Responsive Building-VII	2	-	-	2	3	4	Sketches, Assignments, drawings, tests
7.	BAR707	CBCS/Arch Elective-VII	2	-	-	2	2	2	Notes, sketches, tests, Assignments
8.	BAR708	CBCS/Arch Elective-VII	2	-	-	2	2	2	Notes, sketches, tests, Assignments
		Total	**13**	**-**	**11**	**24**	**30**		

Scheme of studies and examination
B. Arch
EIGTH SEMESTER

Duration of Semester : 18 weeks
Periods per week : NA
Duration of each period : NA

Note : The course work and assignments in each subject must be completed as prescribed.

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR801	Professional Trainning/Intership	-	-	-	NA	26	External viva	Report And Viva
		Total					**26**		

Scheme of studies and examination
B. Arch
NINTH SEMESTER

Duration of Semester : 18 weeks
Periods per week : 22
Duration of each period : 50 minutes

Note: The course work and assignments in each subject must be completed as prescribed.

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR901	Architectural Design-IX	-	-	8	8	12	External viva	Design assignments, time problems
2.	BAR902	BuildingConstruction-IX	1	-	3	4	6	External viva	Notes, sketches, drawings, tests, Assignments
3.	BAR903	Dissertation-IX	2	-	-	2	3	2	Research and Report Writing
4.	BAR904	Research Methodology-IX	2	-	-	2	2	2	Notes, sketches, tests, Assignments
5.	BAR905	Elective-IX	2	-	-	2	2	2	Notes, sketches, tests, Assignments
6.	BAR906	Elective-IX	2	-	-	2	2	2	Notes, sketches, tests, Assignments
7.	BAR907	Elective-IX	2	-	-	2	2	2	Notes, sketches, tests, Assignments
		Total	**11**	**-**	**11**	**22**	**29**		

Scheme of studies and examination
B. Arch
TENTH SEMESTER

Duration of Semester : 18weeks
Periods per week : 20
Duration of each period : 50 minutes

Note: Confirmation of elective subjects will be discussed.

Sr. no.	Course Code	Course Names	L	T	S/P	Periods Per Week	Credits	Exam Duration	Teaching Methodology
1.	BAR1001	Thesis-X	-	-	12	12	18	External viva	Design assignments, time problems
2.	BAR1002	Career Development & Portfilio	1	-	3	4	4	No External Exam	Report Writing & Assignments
3.	BAR1003	Elective-X	2	-	-	2	2	2	Notes, sketches, tests, Assignments
4.	BAR1004	Elective-X	2	-	-	2	2	2	Notes, sketches, tests, Assignments
		Total	**5**	**-**	**15**	**20**	**26**		

Course code:	BAR101	Course Name:	ARCHITECTURAL DESIGN-I
Total Credit hours:	6	Total contact hours:	108

Course Objective

Introduction to fundamentals of basic design and understanding of form and space in architecture.

Course Description

This studio based course synthesises the knowledge gained from other courses and is central to the learning and practice of architecture. This course will engage in using conventional methods and linear processes of design to more exploratory nonlinear methods.

Course Content

- Exercise with two and three dimensional shapes on composition to understand basic principles of design example, harmony, balance, contrast, rhythm etc.
- Study of interrelationships, use of scales and proportioning for 3-dimensional forms. Compositions with buildings blocks and other architectural applications can be introduced in order to relate to architecture than basic design.
- Understanding form to design a particular environment and space, understanding architectural aesthetics.
- Anthropometric study in difference postures and activities, scale and dimensioning of building components ultimately leading to design of mono cellular unit/structure such as kiosk, bus shelter, entrance design, etc. on a level plane; application of space as basic criterion in architecture

Course Learning Outcome

1. Understand concepts of architecture: space, form, enclosure and quality of space, principles of design like harmony, symmetry etc. and their application.
2. Investigate forms and spaces through exercises in geometry and other methods by experimenting with models.
3. Evaluate the Elements of design and relationships, anthropometrics, human activity and the use of space.
4. Develop the ability to translate abstract principles of design into architectural solutions for simple problems / nonfunctional units.
5. Apply basic design principles of using elements of architecture.

Suggested Teaching Methodology

Conduct of course: Individual studio work, site visit to show facade treatments in Qutub Complex and other buildings of Delhi, Audio-visual lectures on colour, texture, etc., with emphasis on harmony, contrast, and balance in the components highlighted.

Reference Books /Test books

1. Ching, Francis D. K. “Architecture: Form, Space and Order”, John Wiley and Sons
2. Inc.Lidwell, William, Holden, Kestina, Butler, Jill, “Universal Principles of Design”, Rockport – Publications, Massachusetts.
3. Neufert's Architects' Data, Wiley-Blackwell Publishing Ltd, 2012

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
20%	20%	60%		**100**	**100**

Course code:	BAR102	Course Name:	BUILDING CONSTRUCTION-I
Total Credit hours:	4	Total contact hours:	72

Course Objective

To familiarize the students with construction details of various components of a small single - storeyed building.

Course Description

Traditional and conventional knowledge systems that enable construction of a complete building; various structural systems and methods of construction and detailing of buildings of medium complexity using natural and manmade materials including foundation, walls, roofs, staircase, joinery and finishes;

Course Content

UNIT- I

- Introduction to various components of a building (wall, foundation, floor, roof, doors, windows, etc.) and their structural and functional roles.
- Brick Masonry; various types of bonding in walls (English, Flemish & Rat Trap) of varying thickness having various types of junctions.
- Stone masonry of various types.

UNIT- II

- Construction of foundations (brick and stone) for load-bearing and toe walls.
- Damp-proof course, detailing of horizontal & vertical DPC.
- Construction of PCC and terrazzo floors.

UNIT- III

- Construction of flat Roof (Tile & Batten, RBC, RCC), and Concept of water proofing and thermal insulation of roofs.

UNIT- IV

- Lintels and arches. Windowsills
- Types of doors and windows.
- Construction details of single and double-leaf panel doors in timber.

Note: Section through a single storey building covering foundation/DPC/window sill/lintel/roof & wall junction/parapet wall/plinth protection, etc. complete.

Course Learning Outcome

1. Students will be able to understand basic building components and their functions.
2. Learn construction techniques for various building components.
3. Students will be able to understand naturally occurring materials and their properties.
4. Learn application of materials in building construction.
5. Apply appropriate details and material for building construction.

Reference Books/ Text Books

1. McKay, W.B., “Building Construction Volume I, II, III and IV”, Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, “Building Construction Illustrated”, Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, “Construction Technology”, Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., “Building Construction”, Charotar Publishing House, 2007

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
20%	20%	60%		**75**	**75**

Course code:	BAR103	Course Name:	BUILDING MATERIAL-I
Total Credit hours:	2	Total contact hours:	36

Course Objective

To introduce the students the basic building material used for building construction.

Course Description

Properties and behavior of both natural and man-made building materials such as bricks, stones, timber, and finishing materials in contemporary buildings.

Course Content

UNIT- I: STONE

- Various types of stone and their availability in India.
- Stone quarrying, dressing of stones, deterioration of stone, preservation of stone.
- Sizes, application properties and visual text/check for different types of stone (flooring, cladding, masonry)
- Artificial stone, uses and properties.

UNIT-II: CLAY

- Mud including stabilized earth, burnt brick, brick tile, block etc.
- Manufacturing, classification, types, sizes and properties of brick.
- Different types of brick; uses and properties - Fire brick, sand lime brick, coloured brick.
- Cost effective brick and their uses in construction industry,

UNIT-III: TIMBER

- Sources of timber.
- Classification, characteristics, defects in timbers.
- Preservation and treatment of timber.
- Industrial timber products and their applications - plywood, particleboard, laminated board, block board, batten board.

Course Learning Outcome

1. Understand primary building materials (Brick, Stone, Cement & Lime) used in building construction, their properties, classification & types available.
2. Understand the process of using materials in building construction.
3. Gather knowledge of manufacturing and judicial usage of building materials.

Reference books/Text books

1. Building Materials by SC Rangwala: Charotar Pub. House, Anand
2. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill
3. Publishers, New Delhi, 2011.
4. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009
5. National Building Code of India (Latest Edition), Bureau of Indian Standards.
6. Engineering Materials-Deshpande
7. Engineering Material-Roy Chowdary

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR104	Course Name:	STRUCTURE SYSTEM & DESIGN-I
Total Credit hours:	2	Total contact hours:	36

Course Objective:

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

Course Description

Understanding the structural concepts and behaviour of structural elements- types of loads in structures, simple calculations of loads for columns, beams, frames, footings, slabs, walls etc. using various systems and relating the knowledge acquired to architectural design.

Course Content

UNIT- I

- Force, units and characteristics of a force, representation of forces, coplanar
- force systems, resultant force, composition and resolution of force, parallelogram-Triangle - Polygon laws of forces
- Resultant of several coplanar concurrent forces. Lami's theorem.
- Concept of moment, characteristics of a moment, concept of a couple.
- Resultant of several coplanar non-concurrent parallel / non-parallel forces.
- Equilibrium conditions for bodies under coplanar forces.
- Numerical problems based on abovetopics;

UNIT- II

- Types of Loads: Dead load, Live load, Wind Load, Impact and Earthquake load.
- Type of loading: Point load, uniformly distributed load, uniformly varying load.
- Types of supports and their reactions: simple, roller, hinged, fixed supports.
- Types of beams: Simply supported, Cantilever, Over-hanging and Fixed beams.
- Shear force and Bending Moment Diagrams for simply supported, Cantilever and over hanging beams subjected to uniformly distributed load and Point loads only.

UNIT - III

- Concept of centre of gravity and centroid. Determination of centroid of plane geometrical figures by moment methodonly.
- Concept of Moment of inertia (second moment of area), theorem of parallel axis and theorem of perpendicular axis, radius of gyration. Determination moment of inertia of laminae of square, rectangular, L shape, T shape and I shape cross-sections.
- Types of pin jointed frames. Assumptions in computing the forces in members of a perfect frame.
- Analysis of perfect frames by method of joints, method of sections and Graphical method.

Course Learning Outcome

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

Reference Books/ Text Books

1. Nautiyal B. D., "Introduction to Structural Analysis", B.H.U.
2. Punmia P. C., "Strength of Materials & Mechanics of Structures".
3. Khurmi R. S., "Strength of Materials".

4. Senol Utku , “Elementary Structural Analysis”.
5. Rama Armarutham S., “Strength of Materials”.

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR105	Course Name:	ARCHITECTURAL DRAWING-I
Total Credit hours:	6	Total contact hours:	108

Course Objective

To familiarize the students with a basic knowledge of architectural drafting, lettering techniques and visualization of geometrical forms through plan, elevations & sections.

Course Description

Various mediums and techniques of art for artistic expression; free hand drawing; orthogonal projection of geometrical forms and representation; architectural and building representation through two dimensional and three dimensional drawings; measured drawing of building elements and simple building forms.

Course Content

UNIT- I

- Lettering techniques
- Types of lines used in architectural drawing
- Basic geometrical shapes drawings
- Scales

UNIT - II

- Orthographic projections
- Orthographic projection Definition/meaning
- Planes of projection
- First and third angle projection
- Note: First angle projection to be followed for all exercises.
- Projection of points
- Projection of lines
- Projection of planes
- Projection of solids (Prisms, Pyramids, Cones and Cylinders).

UNIT - III

- Section of solids (Prisms, Pyramids, cones & cylinders)
- Intersection of solids:
- Development of surfaces:

UNIT - IV

- Representation of a single room unit (one bed/study room with attached toilet & kitchen) in plans, elevations and sections showing the various building elements and furniture layout.

Course Learning Outcome

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

Reference Books/ Text Books

1. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India
4. George K.Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by AmericanTechnical Society,

1966.
5. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	4hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR106	Course Name:	ARCHITECTURAL GRAPHICS-I
Total Credit hours:	6	Total contact hours:	108

Course Objective

To learn the techniques of drawing and rendering with pencil in architectural design and graphic composition.

Course Description

Presentation in graphic form all elements of design; study of shapes and shapes composition, sketching of natural surrounding and rendering using manual mode; hands on working with various mediums and materials.

Course Content

Effects created by different pencil grades by varying thickness and pressure in the pencil - understanding the language of lines, freedom of lines for design visualisation, drawing lines with the support of wrist and elbow, representation of various textures with thick, thin and flat pencil strokes.

- Exercises with different pencil grades to check varying intensities and create textures with demonstration.
- Composition with coloured paper using the basic principles of design.
- Indoor sketching, rendering of different solids like, sphere, cube, cone, cylinders, etc. with shades and shadows.
- Outdoors sketching to co-relate the shapes in geometry.
- Different kinds of trees, foliage of trees and shrubs with proper light and shade.
- Sketching of hut and its surroundings with special emphasis on foreground and background.
- Outdoor sketching of simple buildings.
- Rendering of stone and brick wall in pencil.
- Representation of human figures.

Workshops

1. To impart the practical aspect of 3-D composition, sculpture workshop in clay modelling will be organized by the concerned teacher.
2. Another workshop in pencil rendering will also be organized, highlighting its technique and styles. The workshop can be organized outdoor or indoor.

Course Learning Outcome

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

Reference Books/ Text Books

1. Arnold Dana, "Art History – A Very Short Introduction" , Oxford University Press.
2. Stallabrass, Julian, "Contemporary Art – A Very Short Introduction" , Oxford University Press.
3. Architectural Graphics, Ching Frank
4. Rendering with pen and ink
5.

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	4hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR107	Course Name:	HISTORY OF BUILT ENVIRONMENT-I
Total Credit hours:	2	Total contact hours:	36

Course Objective

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

Course Description

Architecture as evolving within specific cultural contexts including a aspects of politics, society, religion, climate; geography and geology, etc. through history both in the Western context as well as in the Indian sub-continent; Development of architectural form with reference to Technology, Style and Character- Examples from every historical style illustrating the same.

Course Content

UNIT-I

- Definition and scope of Architecture. Interdependence of various components of the built environment. Need for a holistic approach.
- Man's early/prehistoric attempts to colonise and personalise space. Examples of early shelters, Stonehenge, tumuli, etc. as expression of man's physical and spiritual needs
- Determinants of Built Form - geo-physical, societal, political and technological, etc. Global examples of vernacular architecture.
- Introduction to the River Valley Civilizations. Comparative study of different manifestations with reference to location, materials and techniques, sociocultural influences and other contextual factors

UNIT-II

- Egyptian Civilization: Concept of the Royal Necropolis, locational context and architectural characteristics of public buildings, e.g. *mastabas*, pyramids and temples (rock-cut & structural) - one example of each type to be chosen. Worker's settlement- city of *Kahun*.
- Mesopotamian Civilization; the urban context and architecture of public buildings (ziggurats and
- palaces). Examples of the city and Ziggurat of Ur, city and palace and of *Khorsabad*.

UNIT-III

- Indus Valley Civilization: Form of the Harappan City, location and role of public buildings.
- Architecture of the typical Harappan dwelling Granary and Bath.
- The Vedic Village, Building typology and construction.

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

Course Learning Outcome

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

Reference Books/ Text book

1. Sir Banister Fletcher, A History of Architecture, University of London, The AntholonePress, 1996.
2. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford UniversityPress, London, 1985
3. Gadalla Mustafa, The Ancient Egyptian Metaphysical Architecture, Tehuti Reseach Foundation, 2017

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR108	Course Name:	WORKSHOP-I
Total Credit hours:	2	Total contact hours:	36

Course Objective

To develop skills in understanding the complexities and constraints of brick and stone masonry.

Course Description

Introduction to various masonry tools and used in masonry wall; techniques for preparation of mortar, laying of bricks; detailed model of various brick bonds and brick jalis.etc.

Course Contents

- Introduction to masonry tools, Making proportional sketches of these tools and learning their uses.
- Construction of a low height masonry wall, using either stones or bricks.
- Brick wall junctions in English and Flemish bonds to be attempted also.
- Construction of low height brick *jali*.

Course Learning Outcome

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

Suggested Teaching Methodology

- A demonstration of brick work, stone, timber works, textures and various exterior finished through audio-visual aids, to be presented to the class
- Masonry work shall be attempted in groups.
- Site visits for knowing Brick Bonding and *jali* type and various exterior finishes.

Assessment method : (Continuous Internal Assessment = 100% , Final Examination = -%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	Examination
100%	-	-		**100**	**No Exam**

Course code:	BAR109	Course Name:	THEORY OF DESIGN-I
Total Credit hours:	2	Total contact hours:	36

Course Objective

To establish a need for the basic theory of design with a view to help the student appreciate the difference between an irresponsible opinion and a well-reasoned judgment by looking at design in a deep, critical way as a process grounded into rational.

Course Description

Understanding design and design elements, colours design principles used in design composition scale, proportion etc.; course focus on creativity and techniques to enable creative thinking; creativity in architecture; pattern language and participatory approach to design.

Course Contents

- Design in everyday life, basic art forms, elements of design space, form, line, texture, colour, etc.
- Principles of Design, Scale, Balance, Proportion, Rhythm, etc..
- Objectives of Design, Truth, Beauty order, efficiency and economy.
- Forms and shapes in everyday life.
- Scale-basics
- Proportion, Rhythm, Harmony etc.
- Methodology of Creative Design.
- Theory of colours (Colour wheel)
- Art Appreciation

Suggested Teaching Methodology

- This subject must be taught in coordination to site visits to Mughal Garden, Qutub Minar etc. for topics relating to theory of basic forms.
- Maximum use of audio-visual aides to be made from slides and library books.

Course Learning Outcome

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

Reference Books/ Text Books

1. A Pattern Language, Alexander Christopher
2. Structure in Architecture, Heller Robert and Salvadori Mario
3. Design Fundamental in Architecture, Walter Gropius
4. Pattern of Nature, Peter Streens
5. Elements of Architecture, Meiss Pieree Von
6. Architecture: Form, Space and Order, Francis D.K. Ching
7. Architectural Graphic standards editor, Boaz Joseph

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR110	Course Name:	HEALTH EDUCATION-I
Total Credit hours:	2	Total contact hours:	36

Course Objective

To make the students learn the various aspect of health fitness.

Course Description

Importance of physical health and participation in various physical activity to stay healthy.

Content Content

UNIT-I

- Definition of exercise and physiology and an introduction to human body system.
- Effects of exercise on muscular, circulatory and respiratory systems.
- Phenomena like fatigue, second wind, and oxygen debt.

UNIT-II: Health and Fitness

- Development of physical fitness and its components.
- Sports performance in different games and sports.
- Yogic Activities.
- Adventure Activities.
- S.U.P.W. (Socially Useful ProductiveWork).

Course Learning Outcome

1. Students will know body system and importance of good health.
2. They will learn to participate in physical activity.
3. Learn team sprit and coordination to achieve common goal.

Course code:	BAR201	Course Name:	ARCHITECTURAL DESIGN-II
Total Credit hours:	**6**	Total contact hours:	**108**

Course Objective

The objective of this course is to train students in understanding the interdependence of Form, Function, Structure and Services in the process of architectural design.

Course Description

This studio based course synthesises the knowledge gained from other courses and is central to the learning and practice of architecture. This course will engage in using conventional methods and linear processes of design to more exploratory nonlinear methods.

Content Content

- Concepts of Scale in Architectural Design
- Introduction to basics of Site Planning and designing for human comfort.
- Application of the above in design of single-storeyed buildings such as a residence, nursery/primary school, health centre, clinic/dispensary, etc.

Note:

1. At least 3 projects, of 3-6 weeks duration each, should be completed.
2. Students should be guided to achieve necessary relationship between indoor and outdoor spaces and concept of local bearing structure.
3. Each problem should be attempted in a minimum of three developmental stages incorporating the requirements of Note 2 above.

Course Learning Outcome

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

Reference Books/ Test Books

1. Ching, Francis D. K. "Architecture: Form, Space and Order", John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, "Universal Principles of Design", Rockport – Publications, Massachussets, 2015
3. "Neufert Architect's Data", Blackwell Publishing, 2001
4. Donald Watson and Michael J. Crosbie, "Time – Saver Standards for Architectural Design, Technical Data for Professional Practice", McGRAW - HILL.

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
20%	20%	60%		**100**	**100**

Course code:	BAR202	Course Name:	BUILDING CONSTRUCTION-II
Total Credit hours:	4	Total contact hours:	72

Course Objective

To familiarize the students with traditional construction methods of a single storeyed building in timber with sloping roof.

Course Description

Traditional and conventional knowledge systems that enable construction of a complete building; wooden structural systems and methods of construction and detailing; Technology that informs the construction of contemporary buildings using wooden structural systems and materials.

Course Content

UNIT- I

- Joinery work: Various types of doors in timber
  - Battened, ledged and braced doors; Battened, braced & framed doors; Flush doors, etc.
  - Sliding and sliding folding doors.
- Windows in timber.
- Workshop practice for joints in timber used above.

UNIT-II

- Introduction to the nature and characteristics of wood construction, its advantages and limitations.
- Walls in timber: Various types of timber frame walls, with details of joints and cladding, Dhajji walls construction. Windows and doors in Frame walls.
- Foundations of Timber Posts.

UNIT-III

- Flooring: Various types of timber floors & their construction methods.
  - Floor finishes for timber floors
  - Staircases in timber

UNIT-IV

- Roofing: Types of timber roofs
  - Lean-to roofs
  - King Post and Queen Post trusses.
  - Roof coverings using AC/CGI sheets. Gutters, Ridge and Valley detail.

Course Learning Outcome

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

Reference Books/ Test Books

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Building Construction-Bindra&Arora.

8. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
20%	20%	60%		**75**	**75**

Course code:	BAR203	Course Name:	BUILDING MATERIAL-II
Total Credit hours:	2	Total contact hours:	36

Course Objective

To make the students understand the properties of timber and concrete as used in buildings as also to be aware of the application of services, water supply and drainage in small buildings.

Course Description

Properties and behaviour of both natural and man-made building materials such as, cement concrete, metals, , clay products and finishing materials in contemporary buildings; Application of these materials in construction.

Course Content

UNIT-I

- Cement, sand aggregates: types, properties and uses.
- Properties and various types of concrete.
- Different Grades and their uses.
- Method of preparation, laying and curing of concrete.

UNIT II:

Metals and Metal Products for Building

- Iron: Various types of iron, properties of various types of iron, iron products and their uses in construction.
- Aluminium: Different types of section and uses in construction Copper, Zinc Brass, Stainless steel, tin etc.
    - Properties uses, treatment.
    - Available Section, Products (Hardware)

UNIT-III

- Clay and Clay Product:
    - Different types, manufacturing process and application
    - Terracotta tiles, Pavement tiles, Roofing tiles cladding tiles
    - Stoneware, Porcelain, Refractories : application n in construction
    - Advances Ceramics: Product and application-Vitrified tiles, Glazed tiles.

Course Learning Outcome

1. Become aware of the building materials concrete and metal products and used in construction, their properties, classification & types available.
2. Equip themselves with the knowledge of building materials and their judicial usage.
3. Understand concrete, metal and clay as building component.
4. Analyse modalities and work out / apply appropriate details for building construction.

Reference Books /Text Books

1. Building Materials by SC Rangwala: Charotar Pub. House, Anand
2. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
3. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
4. National Building Code of India (Latest Edition), Bureau of Indian Standards.
5. Engineering Materials-Deshpande.
6. Engineering Material-Roy Chowdary
7. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR204	Course Name:	STRUCTURE SYSTEM & DESIGN – II
Total Credit hours:	2	Total contact hours:	36

Course Objective:
To understand the principles of structural design of Steel Structures.

Course Description
Understanding the structural concepts and behaviour of structural elements- steel structures- - simple calculations for columns, beams, frames, footings, slabs, walls etc. using various systems and relating the knowledge acquired to architectural design.

Course Contents

UNIT- I

- Simple bending theory, Section modulus, Radius of gyration
- Principle of superposition
- Determinate and Indeterminate structures
- Basic Data (IS: 800 and Steel tables) for design of steel structures
- Analysis & Design of Simply supported restrained roof steel beams subjected to uniformly distributed load.
- Purlins, Plate girders and Box girders (Descriptive only).

UNIT- II

Structural steel connections:

- **Riveted Connections:** Types of rivets, permissible stresses in rivets, types of riveted joints, specifications for riveted joints as per IS 800.Failure of a riveted joint. Assumptions in the theory of riveted joints. Strength & efficiency of a riveted joint. Design of riveted joints for axially loaded members. (No Staggered riveting).
- **Welded Connections:** Types of welds & welded joints, advantages & dis-advantages of welded joints design of fillet & butt weld. Plug and slot welds (Descriptive No numerical on Plug & Slot welds).
- Analysis & Design of single/double angle Tension members of a roof truss with riveted and welded connections.
- Analysis & Design of single/double angle Compression members (strut) of a roof truss with riveted and welded connections.

UNIT - III

- Analysis & Design of Single section steel column
- Analysis & Design of Built up steel columns with single lacing.
- Types of Column bases (Descriptive only).

Course Learning Outcome

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

Reference Books/Text Books

1. Nautiyal B. D., “Introduction to Structural Analysis”, B.H.U.
2. Punmia P. C., “Strength of Materials & Mechanics of Structures”.
3. Khurmi R. S., “Strength of Materials”.
4. Senol Utku , “Elementary Structural Analysis”.
5. Rama Armarutham S., “Strength of Materials”.

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR205	Course Name:	ARCHITECTURAL DRAWING -II
Total Credit hours:	6	Total contact hours:	108

Course Objective

To enable the students to have a better understanding of the 3-D through isometric/axonometric views, perspective drawing and Sciography.

Course Description

Various mediums and techniques of art for artistic expression; free hand drawing; orthogonal projection of geometrical forms and representation; architectural and building representation through twodimensional and three-dimensional drawings; measured drawing of building elements and simple building forms; presentation in graphic form all elements of building design; study of shades and shadows etc.;

Course Contents

UNIT-I

- Axonometric/isometric views of compositions/complex forms
- Conversion of Axonometric/isometric views into orthographic projections.

UNIT-II

- Two point Perspectives of simple and complex objects leading to perspectives of building forms using the conventional plan method.

UNIT-III

- One point perspective using plan method of simple and complex objects leading to perspectives of building forms.

UNIT-IV

- Sciography
  1. Sciography of points
  2. Sciography of lines
  3. Sciography of planes of different shapes on H P. and V.P. w.r.t. distance from H.P. and V.P.
  4. Sciography of simple solids
  5. Sciography of building elements like Recesses .
- A projection of different shapes Stairs/ramps, Colonnades, etc.

Course Learning Outcome

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

Reference Books/ Text Books

1. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India
4. George K.Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by AmericanTechnical Society, 1966.
5. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	4 hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR206	Course Name:	ARCHITECTURAL GRAPHICS -II
Total Credit hours:	6	Total contact hours:	108

Course Objective

To appreciate the role of colour in presentation and rendering techniques in architectural design.

Course Description

Presentation in graphic form all elements of building design; study of shades and shadows, textures, tones, colors etc.; rendering using manual mode; hands on working with various mediums and materials.

Course Content

Introduction of transparent water colours, poster colours, pastel colours and their tonal values. Study of primary, secondary and intermediate colours in the form of geometric compositions. Introduction to Colour Theory.

- Outdoor sketching of buildings, huts, group of trees, different kinds of trees and foliage and vegetation in colour.
- Colour rendering of blocks.
- Use of overlapping effects in wafer colour and poster colour in mural composition based on geometric elements.
- Exercises on human figures and vehicles in colour.
- Rendering of stone & brick wall in colour.
- Outdoor sketching with graphite pencil to create monochromatic effect in design.
- Assignments on representation of water bodies, hills etc.

Workshop

1. There will be the sculpture workshops, either in terracotta or in a separate medium.
2. Different techniques in architectural rendering. Rendering of assignments done in the subject of Architectural Design-I

Course Learning Outcome

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

Reference Books/ Text Books

1. Arnold Dana, “Art History – A Very Short Introduction” , Oxford University Press.
2. Stallabrass, Julian, “Contemporary Art – A Very Short Introduction” , Oxford University Press.
3. Rendering with pen and ink
4. Practical Plane and Solid Geometry, H.Joseph and Morris

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	4 hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR207	Course Name:	HISTORY OF BUILT ENVIRONMENT -II
Total Credit hours:	2	Total contact hours:	36

Course Objective

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

Course Description

Architecture as evolving within specific cultural contexts including a aspects of politics, society, religion, climate; geography and geology, etc. through history Indian sub-continent; Development of architectural form with reference to Technology, Style and Character- Examples from every historical style illustrating the same.

Course Content

UNIT-I

- Ashoka and the beginning of the Buddhist school of Architecture in India. Socio-political factors in selection of sites of Buddhist Architecture.
- Building typology - Stupas, Chaityas and Viharas. Suitable examples from each geographical context to illustrate differences in form, construction methods and ornamentation.

UNIT-II

- Hindu Temple Architecture
- Role of Hinduism and decline of Buddhism - Geographical/political states and kinds of movements.
- Rise of Brahmanical thinking
- Evolution of Temple Form -Rock-cut and structural forms.
- Comparison of temple forms in various regions of India.

UNIT III

- Various styles of Hindu Temples - Dravidian, Indo-Aryan (Orissa, Khajuraho, Gujrat and West India). Functional components, architectural form, construction and ornamentation.
- Architecture of Jain Temples in Gujrat and Rajasthan.
- Temple towns of South India (Madurai, Srirangam) and Rajasthan (Osian, Mt.Abu).

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

Course Learning Outcome

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

Referece Books / Text Books

1. Sir Banister Fletcher, A History of Architecture, University of London, The AntholonePress, 1996.
2. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford UniversityPress, London, 1985.
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
4. “Concepts of space in Traditional Indian Architecture” by Yatin Pandya
5. “The History of Architecture” by Sir Bannister Fletcher
6. “Buddist and Hindu Architecture” in India by Satish Grover
7. Traditions in Architecture – Dora Couch

8. History of Architecture – J E Swain

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR208	Course Name:	THEORY OF DESIGN-II
Total Credit hours:	2	Total contact hours:	36

Course Objective

The concept is to delimit the scope of Theory of Design as it specifically applied to -Architectural Design and to bring out such elements of -Architectural Design as distinguish it from other forms of design.

Course Description

Understanding design and design elements; classification of design; Methodologies, approach and models of the design process; Creativity and techniques to enable creative thinking; creativity in architecture; pattern language and participatory approach to design.

Course Contents

- Theory of Architecture and principles of planning.
- Analysis and classification: space usage.
- Inter-relationship of different spaces within a building.
- Inter-dependence of function, structure and form in architectural design.
- Accommodation and circulation.
- Analysis and classification of the elements of circulation, (horizontal and vertical) such as entrance halls, corridors and stairs, ramps, lifts, escalators different types of planning.
- Study of exercises in the relationship of plan, section and elevations of the building.
- Architectural programme: analysis and classifications.
- Architectural scale, Human scale, Monumental scale, true and forced scale.

Course Learning Outcome

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

Referece Books / Text Books

1. Structure in Architecture, Heller Robert and Salvadori Mario
2. Design Fundamental in Architecture, Walter Gropius
3. Pattern of Nature, Peter Streens
4. Elements of Architecture, Meiss Pieree Von
5. Architecture: Form, Space and Order, Francis D.K. Ching
6. Road Form and Transport, J. Mccluskey, Architectural Press, 1979.
7. A.J. Metric Handbook, editors, Jan Bilwa and Leslie Fair weather
8. Architectural Graphic standards editor, Boaz Joseph
9. Planning – the Architect's handbook, E and E.O.
10. Neufert's Architect's data
11. Time Saver standards for building types, editor Joseph D.C. and John Callender.

Assessment method : (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR209	Course Name:	WORKSHOP –II
Total Credit hours:	2	Total contact hours:	36

Course Objective

To understand the constraints and complexities and versatility of joinery in carpentry.

Course Description

Introduction to various carpentry tools and production of simple joints used in joinery; techniques for preparation of block models using various materials; detailed model of a small project using appropriate materials; exploration with plastic material such as clay, plaster of Paris, etc.

Course Content

- Introduction to carpentry tools.
- Sketches of these tools.
- Exercise in sawing, chiselling, planning to learn the use of hand tools joinery.
- Construction of half lap, tongue and groove joints.
- Construction of mortice and tenon joint and dovetail joints.
- Construction of rafter joints intension and compression.
- Varnishing exercise. Varnishing of joints made in the class.
- Making one wooden item or small furniture e.g. a pencil box, a stool bench, miniature door/windows columns.

Suggested Teaching Methodology

1. Audio-visual lectures on types of joinery should be presented.
2. Exercise on furniture items shall be attempted in groups. Site visit to furniture shop to understand carpentry, joinery and varnishing works shall be undertaken.

Course Learning Outcome

1. Inculcate knowledge of joinery details and importance.
2. Prepare models of small furniture to understands joint.
3. Develop skills of understanding behavior of wood and varnishing.

Assessment method : (Continuous Internal Assessment = 100% , Final Examination = 0%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	Examination
100%	-	-		**100**	No Exam

Course code:	BAR210	Course Name:	HEALTH EDUCATION-II
Total Credit hours:	2	Total contact hours:	36

Course Objective

To make the students learn the various aspect of health fitness.

Course Description

Importance of physical health and participation in various physical activity to stay healthy.

Course Content

UNIT-I

- Concept of vital capacity, blood pressure, pulse rate, general and specific conditioning
- Food requirements, and balanced diet
- Physical Fitness arid its components: speed, strength, endurance, agility, etc.

UNIT-II

Health and Fitness

- Development of physical fitness and its components.
- Sports performance in different games and sports.
- Yogic Activities.
- Adventurous Activities.
- S.U.P.W. (Socially Useful Productive Work).

Course Learning Outcome

1. Students will know body system and importance of good health.
2. They will learn to participate in physical activity.
3. Learn team sprit and coordination to achieve common goal.

Course code:	BAR301	Course Name:	ARCHITECTURAL DESIGN-III
Total Credit hours:	6	Total contact hours:	108

Course Objective

Introduction to the concept of vertical circulation. Application of the knowledge of structures, services, vehicular movement and site planning in the design of double- storeyed buildings with multiple functions on site not larger than 5 acres.

Course Description

This studio based course synthesises the knowledge gained from other courses and is central to the learning and practice of architecture. This course will engage in using conventional methods and linear processes of design to more exploratory nonlinear methods.

Course Content

Design of double storeyed, load bearing structures such as Hostel, Guest House, Neighbourhood Shopping, Hotel, Small Office building, etc.

Note:

1. Two major design problems each of 6-7 week duration and a brief sketch design, of 2- week duration, to be completed during the semester.
2. Application of structures, services, vehicular circulation and site planning should be emphasised.
3. Each of the two major problems should be attempted in a minimum of three developmental stages incorporating the requirements of Note 2above.

Course Learning Outcome

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

Reference Books/Test books

1. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.Rasmeussen. E. Experiencing Architecture.
2. Zevi, Bruno. Space Time and Architecture.
3. Pandya, Yatin. Elements of Space-making.
4. Road Form and Transport, J. Mccluskey, Architectural Press, 1979.

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
20%	20%	60%		**100**	**100**

Course code:	BAR302	Course Name:	BUILDING CONSTRUCTION-III
Total Credit hours:	4	Total contact hours:	72

Course Objective

To introduce construction details of 2-4 storeyed buildings of load-bearing masonry frame construction in RCC.

Course Description

Traditional and conventional knowledge systems that enable construction of a complete building; frame RCC structure Technology. The course will combine lecture and studio exercises whose results will be in the form drawings and models, culminating in a studio which will translate an architectural design.

Course Content

UNIT-I

- Introduction to concept of frame - structures in RCC
- Foundations in RCC - Various types of constructions
- RCC frame structure with infill walls of brick and various cement concrete products, such as hollow blocks, light weight concrete blocks, etc.

UNIT-II

- Introduction to various types and vocabulary related to construction details with special emphasis on Dog logged, spiral and

UNIT-III

- Laying of floors - Basic preparation for Ground floor and upper floor
- Flooring: various types of durable and decorative floor finishes such as terrazzo (cast in situ and tiles), stones (marble, Kota stone, granite, etc.), vitreous tiles, etc.
- Cantilevered construction in RCC such as canopies, projections etc.

UN1T-IV

- Types of formwork (shuttering) for concrete, scaffolding, shoring, onduping etc.

Course Learning Outcome

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

Reference Books/Test Book

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
20%	20%	60%		**75**	**75**

Course code:	BAR303	Course Name:	BUILDING MATERIAL-III
Total Credit hours:	2	Total contact hours:	36

Course Objective

To acquaint the student with the role of important materials in Architecture.

Course Description

Properties and behaviour of both natural and man-made building materials such as glass, Paints, insulation materials, PVC,UPVC, and finishing materials in contemporary buildings; Application of these materials in construction.

Course Content

UNIT-1

- Glass: Manufacturing process types and application - products of glass and popular brandin market.
- Paint and Varnishes: Manufacturing, types and applicator popular Brands available in market.
- Materials for thermal Insulations: Properties anduses.

UNIT-11

- PVC -UPVC, Rubber: Products and uses in construction of HDPE andcomposite material.

UNIT-III

- Cost Effective Material: Stabilized mud blocks. Hollow concrete Block. Aerated concrete Block
- Econ Friendly material — Plash Bricks. Eco Boards, hark board etc.
- High tech Material such as structural non-structural glazing, carbon products composite tiles.

Course Learning Outcome

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

Reference Books/Text Book

1. Building Materials by SC Rangwala: Charotar Pub. House, Anand
2. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
3. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR304	Course Name:	STRUCTURE SYSTEM & DESIGN-III
Total Credit hours:	2	Total contact hours:	36

Course Objective:
To understand the principles of design of RCC structures.

Course Description
Understanding the structural concepts and behaviour of structural elements- load bearing structures, framed structures, composite systems, steel structures- - simple calculations for columns, beams, frames, footings, slabs, walls etc. using various systems and relating the knowledge acquired to architectural design.

Course Content

UNIT-I
- Concept of RCC and Introduction to IS: 456
- Working stress method of design for RCC structures
- Theory of Singly Reinforced Section - Neutral Axis, Under reinforced section, Over reinforced section and Moment of Resistance
- Shear, Bond and Development length.
- Analysis and Design of singly reinforced rectangular RCC beam.
- Theory and Design of Doubly reinforced rectangular RCC beam

UNIT-II
- Theory and Design of:-
    - One way RCC slab
    - Cantilever RCC slab
    - Two way RCC slabs

UNIT-III
- Theory and Design of Long and Short, Square, Rectangular and circular RCC columns.

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

Reference Books/Test book

1. Nautiyal B. D., “Introduction to Structural Analysis”, B.H.U.
2. Punmia P. C., “Strength of Materials & Mechanics of Structures”.
3. Khurmi R. S., “Strength of Materials”.
4. Senol Utku , “Elementary Structural Analysis”.
5. Rama Armarutham S., “Strength of Materials”.

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR305	Course Name:	ARCHITECTURAL DRAWING-III
Total Credit hours:	6	Total contact hours:	108

Course Objective

To enable the students to draw perspectives using thumb rules and Sciography in perspective.

Course Description

Various mediums and techniques of art for artistic expression; free hand drawing; Perspective projection of Building and representation; architectural and building representation through perspective drawings; presentation in graphic form all elements of building design; study of shadows, rendering using manual mode as well as digital; hands on working with various mediums and materials.

Course Content

UNIT-1

- Two point perspective
    - To draw a two point perspective of a geometrical composition leading to a building form using grid method and thumb rules.

UNIT-II

- One point perspective
    - To draw one point perspective of geometrical composition leading to building forms using grid method and thumb rules.

UNIT-III

- Sciography in perspectives.

Course Learning Outcome

1. Able to draw two point perspective and represent 2d drawings in 3d.
2. Able to draw two point perspective and represent 2d drawings in 3d.
3. Learn sciography in perspective

Reference Books/Text books

1. Bernard Alkins - 147, Architectural Rendering, Walter Foster Art Books, 1986.
2. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, NY 1975
3. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
4. Architectural Graphics, C. Leslie Martin
5. Perspective for the Architect, Themes and Hudson
6. Perspective and Sciography, Shankar Mulik
7. Architectural Graphics, Ching Frank
8. Engineering Drawing, N.D. Bhatt

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	4 hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR306	Course Name:	ARCHITECTURAL GRAPHICS-III
Total Credit hours:	6	Total contact hours:	108

Course Objective

To learn and apply various rendering techniques in Architectural Design & visual composition.

Course Description

Graphic design elements, principles and applications; Concept of form and space in product design; Relating Form to Materials and Processes of Manufacture.

Course Content

- Use of coloured pencils, pen & ink, in Architectural design assignments.
- Rendering of drawings (plan, elevations, perspectives) in two different medium from a design assignment of previous semester.
- Simple mural designing.
- Representation of texture (in colour) of ply, stone, marble, glass, etc. in colour.
- Black & White rendering of a given sketch in enlarged form. Sketch can be from interior or exterior.

Workshops

1. A workshop on rendering techniques will be organised.
2. A mural or sculpture workshop will be organised in ceramics, plaster of Paris, wrought-iron or terracotta.

Course Learning Outcome

1. Various rendering technique and their role in graphic can be learned.
2. Knowledge of colour, their tint and shade and use.
3. Awareness of various types of colours and techniques to enhance the presentation.
4. Learn mural design and use.

Reference Books/ Text Books

1. Architectural Graphics, C. Leslie Martin
2. Interior Design, Ahmed Kasu
3. Architectural Graphics, Ching Frank
4. A.J. Metric Handbook, editors, Jan Bilwa and Leslie Fair weather
5. Architectural Graphic standards editor, Boaz Joseph
6. Rendering with pen and ink
7. Practical Plane and Solid Geometry, H. Joseph and Morris

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	4 hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR307	Course Name:	HISTORY OF BUILT ENVIRONMENT-III
Total Credit hours:	2	Total contact hours:	36

Course Objective

To understand the role of geo-physical, societal, political and technological factors in the evolution of architectural and urban form and develop a holistic approach to architecture as an integral component of built environment

Course Description

Architecture as evolving within specific cultural contexts including a aspects of politics, society, religion, climate; geography and geology, etc. through history in the Indian sub-continent; Development of architectural form with reference to Technology, Style and Character- Examples from every historical style illustrating the same.

Course Contents

UNIT I

- Advent of Islam and its influence in India leading to the Indo-Islamic Style. Beliefs, tenets of Islam and its expression in architecture in India.
- Evolution of the Mosque & the Tomb design, beginning from the earliest examples of such type in the Indian sub-continent.
- Delhi Sultanate: Mosques, Tombs and secular buildings:
- The Qutb Complex: Quwwat-UI-lslam Mosque, Qutb-Minar, Tomb of Altutmish, extensions and additions byAllaudin Khilji.
- Arhai Din Ka Jhompra, Khirkee Masjid, Jamaat Khana Masjid, Sultan Ghari, Tombs of Ghiyasuddin Tughlaq, Firoz Shah Tughlaq, Balban, Sikander Lodi.
- Firoz Shah Kotla
- Tomb of Sher Shah Suri, Sasaram

UNIT II

- Provincial Styles: Evolution and brief history, and study of the following:
    - Mandu: All key buildings
    - Jaunpur: Atala Masjid, Jami Masjid
    - Gujarat: Jami Masjid, Ahmedabad, Baolis of Ahmedabad, and Jami Masjid at Champaner.
    - Bijapur: Jami Masjid, Ibrahim Rauza, Gol Gumbaz, Mehtas Mahal.

UNIT III

- The Mughals: A brief history and study of the following architectural examples:
    - Humayun's Tomb
    - Fateh Pur Sikri
    - Akbar's Mausoleum
    - Red Fort, Jami Masjid, Delhi
    - Taj Mahal
- Landscaping in Mughal Architecture : Babur to Aurangzeb
- A brief study of elements of Indo-lslamic Architecture like Arches, Domes, Squinches, Minarets, Jaalis, Chajjas and other symbolic expressions, and ornamentation patterns.
- Constructional system adopted by the Slave kings, Bijapur rulers and the Mughals.

Suggested Teaching Methodology

Audio-Video lectures, Site visits, Guest/expert lectures, drawing, sketching and reporting assignments

Course Learning Outcome

1. Understand architectural elements, forms, development trends, construction techniques, materials and technologies used in built environment across civilizations.
2. Understand transformation patterns in architecture during various kingdoms / time periods and

analyse the contributing factors for the design development of different styles.

3. Familiarize themselves with the socio–economic, historical and political influences of time period in architectural development.

Reference Books/ Text Books

1. "Glimpses of World History" by Pt. Jawahar Lal Nehru
2. "The History of Architecture" by Sir Bannister Fletcher
3. Indian Architecture (Islamic Period) – Percy Brown
4. Indian Architecture – Islamic Period – 1192 – 1857 b – Dr. Surinder Bahai
5. Islamic Architecture of the Indian Subcontinent – Bianca Maria Alferia
6. History of Architecture – J E Swain
7. History of Architecture by Dora Couch
8. A study of History – Almond Toynbee
9. Traditions in Architecture – Dora Couch
10. The great age of world architecture –By G K Hiraskar

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR308	Course Name:	THEORY OF DESIGN-III
Total Credit hours:	2	Total contact hours:	36

Course Objective

This concept is to drive deeper into the architectural problems and look for directive principles guiding the philosophy of design used by Makers of Modern architecture and to assess their contribution by their own criteria.

Course Description

Understanding design and design in history; Role of the designer in changing society: classification of design; Methodologies, theories and models of the design process; Creativity and techniques to enable creative thinking; creativity in architecture; pattern language and participatory approach to design.

Course Content

- Foreign Architects
  1. Louis I Kahn
  2. Erro Saarinen
  3. Philip Johnson
  4. Paul Rudolph
  5. Jorn Utzon
  6. Kenzo Tango
  7. James Sterling
  8. Richard Rogers
  9. SOM (Skidmore, Ovell & Merrile)
  10. Renzo Piano
  11. Peter Eiessenmen
  12. Frank Gehry

- Indian Architects
  1. A P Kanvinde
  2. C M Correa
  3. B V Doshi
  4. J A Stein
  5. Uttam C Jain
  6. Raj Rewal
  7. Hafeez Contractor
  8. Lauri Baker
  9. A D Raje
  10. H C Patel

Note: More stress should be laid on seminars so that each student gets a chance to engage in self- teaching.

Course Learning Outcome

1. Understand the relation between various materials, spaces and design principles.
2. Learnt about movements in architecture and the development of design from them.
3. Learnt about various architect's work and their philosophy.

Reference books/Text books

1. "Glimpses of World History" by Pt. Jwahar Lal Nehru
2. "Ubrban Pattern" by A.B. Gallion
3. "The History of Architecture" by Sir Bannister Fletcher
4. Modern Architecture by Curtis W.J.
5. The History of Architecture by Tadgel C.
6. History of Architecture – J E Swain
7. History of Architecture by Dora Couch

8. A study of History – Almond Toynbee
9. Traditions in Architecture – Dora Couch

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR309	Course Name:	COMPUTER APPLICATIONS IN ARCHITECTURE-III
Total Credit hours:	2	Total contact hours:	36

Course Objective

This part of the course has been designed as a primer for the architecture students. At the end of the course they should have some idea of the potential of computers & its applications in Architecture.

Course Description

Computer operation principles and image editing through a graphical Composition; Computer aided 2D drafting and 3D Modeling through simple exercises; Rendering of a building to create a photo realistic image.

Course Content

UNIT I: Presentation software like Power Point

- Creating a simple presentation.
- Viewing
- Editing
- Different types of images
- Use of clipart.

UNIT II: Modelling with Sketch Up software

- Use drawing tools to create lines, surfaces, circles, rectangles, arcs, and polygons.
- Draw shapes on Edge and utilize SketchUp -sticky‖ geometry
- View and orbit models in a 3D space
- Create boxes using drawing tools and inferences.
- Design complex combined shapes with the Push/Pull and Move Tools
- Create and manipulate cylinders and cones
- Use three different modelling techniques to quickly create 3D forms.
- Create concentric surfaces with the Offset tools.
- Arrange an array of duplicated objects.
- Use colours and styles to render detailed surfaces.

UNIT III: 2D in AUTOCAD

- Creating a new drawing
- Commands and option to create drawing entities.
- Layers, blocks, attributes, text, etc.
- Dimensioning.
- Viewing an existing drawing Methods of Selection.
- Commands and options to Zoom, Pan, Snap etc.
- Inquiry Commands Editing an existing drawing System Variables.
- Commands and options for modification Plotting.
- Application in architectural drawings
- Presentation drawings
- Submission drawings. Introduction to working drawings.

Course Learning Outcome

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

Reference books/Text books

1. Introducing AutoCAD and AutoCAD LT – George Omura
2. Mastering AutoCAD – George Omura
3. AutoCAD 2013 and AutoCAD LT 2013 "BIBLE" - Ellen Finkelstein

Assessment methode: (Continuous Internal Assessment = 100% , Final Examination = %)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
100%	-	-		**50**	**No Exam**

Course code:	BAR310	Course Name:	HEALTH EDUCATION-III
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To make the students learn the various aspect of health fitness.

Course Description

Importance of physical health and participation in various physical activity to stay healthy.

Course Content

UNIT-I

- Concept of vital capacity, blood pressure, pulse rate, general and specific conditioning
- Food requirements, and balanced diet
- Physical Fitness arid its components: speed, strength, endurance, agility, etc.

UNIT-II

Health and Fitness

- Development of physical fitness and its components.
- Sports performance in different games and sports.
- Yogic Activities.
- Adventurous Activities.
- S.U.P.W. (Socially Useful Productive Work).

Course Learning Outcome

4. Students will know body system and importance of good health.
5. They will learn to participate in physical activity.
6. Learn team sprit and coordination to achieve common goal.

Course code:	BAR401	Course Name:	ARCHITECTURAL DESIGN-IV
Total Credit hours:	6	Total contact hours:	108

Course Objective

Study of vertical circulation, site planning, building services and structures as related to multifunctional buildings up to four storey high.

Course Description

This studio based course synthesises the knowledge gained from other courses and is central to the learning and practice of architecture. This course will engage in using conventional methods and linear processes of design to more exploratory nonlinear methods.

Course Content

Design or institutional or commercial buildings/group of buildings such as an office complex, shopping mall, residential school/college, etc.

Note:

1. Each of the two problems is to be given equal time and weightage
2. Integration of structures, services and site planning should be emphasised.
3. Each of the two major problems should be attempted in a minimum of three developmental stages to accommodate provisions of Note (2)above.

Course Learning Outcome

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

Reference books/ Text Books

1. Perspective for the Architect: Themes and Hudson
2. A.J. Metric Handbook, editors, Jan Bilwa and Leslie Fair weather
3. Planning – the Architect's handbook, E and E.O.
4. Neufert's Architect's data
5. Time Saver standards for building types, Editor Joseph D.C. and John Callender.

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
20%	20%	60%		**100**	**100**

Course code:	BAR402	Course Name:	BUILDING CONSTRUCTION-IV
Total Credit hours:	4	Total contact hours:	72

Course Objective

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

Course Description

Traditional and conventional knowledge systems that enable construction of a complete building; various structural systems and methods of construction and detailing of buildings of medium complexity using natural and manmade materials including wooden partition, cladding, toilet detail; modular kitchen, word robe design.

Course Content

UNIT I

- Cladding of interior and exterior walls in various materials such as brick tiles, stones, vitreous tiles, panelling, plywood, Board etc.
- Non Load bearing partition in various materials.
- Panelling in wood

UNIT II

- Design, detailing and construction of kitchens including flooring, wall finishes, counter, sinks, cabinets, services, etc.
- Types of kitchens - Residential/commercial
- Concept of Modular kitchen & Construction.

UNIT-III

- Construction Detailing of Toilets including fixing and fixture, tiles (flooring) counter Sink, concrete top basis etc.

UNIT-IV

- Design, detailing and construction of wardrobes and Shop/Bank counters.

Course Learning Outcome

1. Possess knowledge of Cladding, Partition and Wall Finishing building materials used in construction, their properties, classification & types available.
2. Equip themselves with the knowledge of building materials and their judicial usage.
3. Understand construction details of various kitchen & toilet types and construction techniques.

Reference books/Text books

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
20%	20%	60%		**75**	**75**

Course code:	BAR403	Course Name:	BUILDING SERVICES-IV
Total Credit hours:	2	Total contact hours:	36

Course Objective

To make the students aware of various services such as water supply. drainage and electrical required for buildings

Course Description

Study of and design and detailing for water supply, drainage, sewage disposal, garbage disposal, electrification, illumination, air conditioning compliance requirements w.r.t. National Building Code and Energy Conservation Building Code.

Course Content

UNIT-I- Water supply

- Sources and treatment of water, storage and supply systems for buildings various fittings and material used for water supply sanitation
- Drainage System: Lay out for a small neighbourhood
- Storm water disposal, advantages and disadvantages of various materials for pipes and layout of pipes.
- Waste Water disposal: Various types of systems used in buildings.
- Materials used for pipes, layout and jointing of pipes, sewage treatment systems.
- Solid-waste disposal: chutes, ducts, incinerators etc.

UNIT-II- Services of single storeyed residential building and multi-story structures

- Water supply systems: fitting, hot and cold water supply layouts, geysers, and boilers. Water storage and supply systems for domestic use.
- Drainage and Sewerage System: Storm water drainage, waste water disposal- carriage systems, sanitary fittings, types of pipes and drains in different materials and usage. Inspection and intercepting chambers and their details. Cess pools and septic tanks.
- Exercise for incorporating layout of services in a project completed in the Architectural Design Studio.

UNIT-III- Electrical Services

- Types of wires, fittings and conducts
- Various types of wiring systems, advantages and disadvantages, safety and precautions.
- Electrical; equipment used in building; motors, fuses, switchboards etc.
- Introduction to illumination.
- Various types of lamps for artificial lighting - direct and indirect methods of lighting.
- Use of electrical fittings such as MCB‘s, ELCB‘s, fuse units .control panels, etc.
- Preparing an electrical layout for a residential Building incorporating above.

Course Learning Outcome

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

Reference books/Text books

1. Rangwala S.C. Water Supply & Sanitary Engineering [Environmental Engineering].Charotar publishing House Anand, India. (2000)
2. Raju B.S.N., Water Supply & Wastewater Engineer, Tata McGraw-Hill Publishing Company Ltd., New Delhi.
3. S.G. Deolalikar, Plumbing Design & Practice, Tata McGrew Hill Publishing Company Ltd., New Delhi (1994).

4. Panchdhari, A.C., Water Supply and Sanitary Installations, Design Construction and Maintenance, Wiley Eastern Limited 1993

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR404	Course Name:	STRUCTURE SYSTEMS & DESIGN-IV
Total Credit hours:	2	Total contact hours:	36

Course Objective:
To understand the principles of design of RCC structures.

Course Description
Understanding the structural concepts and behavior of structural elements- load bearing structures, framed structures, composite systems, steel structures- - simple calculations for columns, beams, frames, footings, slabs, walls etc. using various systems and relating the knowledge acquired to architectural design.

Course Content

UNIT-I

- Theory and Design of simply supported circular slabs subjected to uniformly distributed load.
- Theory and Design of Dog legged stairs.

UNIT - II

- Fixed Beams: Bending Moment diagrams for a fixed beam subjected to uniformly distributed load and Point Load (Formulate to be stated No derivations).
- Theory and Design of:
  1. Singly and doubly reinforced T beams. Inverted T.Beams and isolated T beams
  2. Singly reinforced L Beams

UNIT - III

- Theory and Design of isolated uniform thickness column footings for Square. Rectangular and circular RCC columns subjected to axial loads.

Course Learning Outcome

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

Reference books/text books

1. Strength of Materials – Khurmi R. S.
2. Applied Mechanics and Strength of Materials – Khurmi R. S.
3. Civil Engineering Handbook – P.N. Khanna
4. R.C.C. Design – Khurmi, Punmia, Sushil Kumar
5. Design of Steel Structure – Negi
6. Structure in Architecture – Salvadori and Heller
7. Mechanics of materials – E. P. Popov

Assessment methode: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR405	Course Name:	ARCHITECTURAL DRAWING-IV
Total Credit hours:	6	Total contact hours:	108

Course Objective
To further increase the understanding of students in architecture drawing.

Course Description
Various mediums and techniques of art for artistic expression; free hand drawing; orthogonal projection of geometrical forms and representation; architectural and building representation through two dimensional and three dimensional drawings: two point and one point.

Course Content
UNIT I
- Review of architectural drawings
- Revision of 1point perspective.
- Use of 2 point perspective to present 3D views.

UNIT II
- Use of perspective in interior design
- Use of perspective to draw views of simple structures along with Sciography.

Course Learning Outcome
1. Able to draw two point perspective and represent 2d drawings in 3d.
2. Able to draw two point perspective and represent 2d drawings in 3d.
3. Learn sciography in perspective
4. One point perspective for interior space.

Reference books/ Text Books

1. Architectural Graphics: C. Leslie Martin
2. Perspective for the Architect: Themes and Hudson
3. Perspective and Sciography, Shankar Mulik
4. Interior Design: Ahmed Kasu
5. Architectural Graphics – Ching Frank
6. Engineering Drawing – N.D. Bhatt
7. Engineering Drawing – P.S. Gill

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	4 hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR406	Course Name:	ARCHITECTURAL GRAPHICS-IV
Total Credit hours:	**6**	Total contact hours:	**108**

Course Objective

To appreciate the role of presentation techniques in Architecture & Graphics.

Course Description

Presentation in graphic form all elements of building design; study of shades and shadows, textures, tones, colors etc.; rendering using manual mode; hands on working with various mediums and materials.

Course Content

Introduction to photo based water colour, markers, mixed media for rendering, charcoal techniques, 3-D composition from waste material, monochromatic colour schemes.

- Rendering of design assignment from previous or current semester.
- Rendering on the given sketch with specified medium (mix media or pastel shades).
- Sketching of buildings with human figures, vehicles etc. in colour & black and white.
- Sketching of old buildings (Fort, Havelis, etc).
- Creation of individual environment around a given building with landscaping and other elements.
- Mural composition for interior or exterior walls with suggestion of materials.

Workshops

1. A sculpture or mural workshop using waste material will be organised.
2. Workshop on rendering techniques.

Course Learning Outcome

1. Learning or the principles and elements of art and design.
2. Graphics understanding of 2D and 3D compositions through colours and by different medium like, clay, wood etc.
3. Inculcate skill of sketching object presentation.
4. Implementation of art by studying the history of art of India.

Reference books/ Text books

1. Architectural Graphics: C. Leslie Martin
2. Perspective and Sciography, Shankar Mulik
3. Architectural Graphics – Ching Frank
4. Rendering with pen and ink
5. Architectural drawing: a visual compendium of types and methods; Rendow Yee; John Wiley and Sons, 2007
6. Mural Art: Large Scale Art from Walls around the World by K. Iosifidis.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	4 hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR407	Course Name:	HISTORY OF BUILT ENVIRONMENT-IV
Total Credit hours:	2	Total contact hours:	36

Course Objective

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

Course Description

Architecture as evolving within specific cultural contexts including a aspects of politics, society, religion, climate; geography and geology, etc. through history both in the Western context as well as in the Indian sub-continent; Development of architectural form with reference to Technology, Style and Character- Examples from every historical style illustrating the same

Course Content

UNIT-1

- Greek Civilization: Historical, geographical, political and cultural context.
- Significant characteristics of Greek Architecture such as Materials, Construction Systems, System of Proportioning, Greek Orders, Optical Corrections, etc. Architecture of Greek temples- Parthenon, Athens.

UNIT II

- Roman Civilization. Historical, geographical, political and cultural context.
- Significant characteristics of Roman Architecture. Concept of Monumentally, Materials & Construction Systems, Roman Orders.
- Building analysis - Colosseum, Thermae, Basilicas, Aquaducts, Pantheon Rome, The Roman Villa-their form, scale and constructional/structural systems.

UNIT-III

- Development of Church plan during the Early Christian period. Functional components, construction and architectural character. Examples of basilican and centralized churches
- Byzantine Churches. Basis of architectural form, structural systems, techniques of construction and ornamentation. Detailed analysis of Santa Sophia. Byzantine Churches in Greece and Russia.

UNIT-IV

- Evolution of Romanesque architecture. Changes in church plan, elevation features and structural systems. Development of Romanesque vaulting.
- Characteristics of Romanesque churches in Italy, France and Germany. Comparative analysis of representative examples.
- Civic Architecture of Romanesque England.
- Characteristics of the Gothic Cathedral. Changes in functional, visual and structural elements as compared to Romanesque period.

NOTE: Analysis of architectural style/building typology must include functional, constructional/structural and ornamentation aspects

Course Learning Outcome

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

Reference books/ Text books

1. “Glimpses of World History” by Pt. Jawahar Lal Nehru
2. “Ubrban Pattern” by A.B. Gallion
3. “The History of Architecture” by Sir Bannister Fletcher
4. History of Architecture – J E Swain
5. The great ages of world architecture by G.D. Hirasker
6. A study of History – Almond Toynbee
7. Traditions in Architecture – Dora Couch
8. Raeburn, Michael, Architecture of the Western World

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR408	Course Name:	SURVEYING & MAPPING-IV
Total Credit hours:	2	Total contact hours:	36

Course Objective

To bring about an awareness of role of surveying in architectural and planning projects and to make the students conversant with the commonly used techniques of surveying

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Course Description

Principles of surveying and levelling, use of various survey and levelling instruments, carrying out surveys of land of medium complexity (field work); preparation of survey plans.

Course Content

UNIT I

- Objectives, divisions and principles of surveying; scales and measurements; types of instruments and their uses.
- Chain Surveying: Principles and instruments. Methods of chaining, errors in measurements and corrections, recording field notes, obstacles inchain surveying
- Prismatic Compass: Its use in the measurement of angles from bearings.

UNIT-II

- Levelling: Terms used, Dumpy level and 1.0.P level, temporary adjustment of a level, levelling staves, reduction of levels, difficulty in levelling, errors and permissible limits of error, classification of levelling.
- Contouring: Technical terms used in contouring, characteristics of contours, methods of contouring, interpretation of contour, tracing the contour gradient for alignment of a roads and paths, uses of contour.

UNIT-III

- Plane Table Surveying: Plane Table and its accessories, setting and orienting the plane table, methods of plane tabling, advantages and disadvantages of Plane table surveying.
- Theodolite Surveying: Transit vermier, Theodolite, basic definitions, temporary adjustment, fundamental lines of theodolite, measurement of horizontal angle and vertical angle, reading a magnetic bearing of a line, prolonging a straight line, techniques of surveying for a large campus. Methods of Computation of area, methods of setting out of a building.
- Introduction to told station and soft wares used in GIS

Course Learning Outcome

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

Reference books/ Text books

1. Surveying and leveling (Vol. 1) by R.N. Arora; Standard Book House, Post Box No. 1074, Delhi - 11006
2. Surveying and leveling by T.P.Kanetkar and Kulkarni, Standard Publishers
3. Surveying vol 1- by B.C. Punmia
4. Surveying vol 1- by S.K. Duggal

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination

20%	20%	60%		**25**	**25**

Course code:	**BAR409**	**Course Name:**	COMPUTER APPLICATIONS IN ARCHITECTURE-IV
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

At the end of this part of the course the student 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

Course Description

Computer operation principles and image editing through a graphical Composition; Computer aided 2D drafting and 3D Modeling through simple exercises; Rendering of a building to create a photo realistic image

Course Contents

UNIT I: Fundamentals of 3-D drafting

- Basic features.
- Coordinate System
- 3D entities and surfaces

UNIT-II: 3D Modelling

- Wire-frame, Surface and Solid modelling
- Viewing 3D models
- Introduction to rendering
- Convention for representation of different materials.
- Importing and expulsary material (importing and exporting material library).

UNIT III: Customisation of CAD Software (suggested software: AutoCAD

- Custom line types, hatch patterns, shapes & fonts.
- Menu-customisation, short-cuts, etc.

UNIT lV: Graphics. Software like Corel Draw

- Creating a new graphics file.
- Viewing existing graphics file.
- Editing
- Making 3-D logo.

Course Learning Outcome

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

Assessment method: (Continuous Internal Assessment = 100% , Final Examination = 0%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	Examination
100%	-	-		**50**	**-**

Course code:	BAR410	Course Name:	HEALTH EDUCATION-IV
Total Credit hours:	2	Total contact hours:	36

Course Objective

To make the students learn the various aspect of health fitness.

Course Description

Importance of physical health and participation in various physical activity to stay healthy.

Course Content

UNIT-I

- Concept of vital capacity, blood pressure, pulse rate, general and specific conditioning
- Food requirements, and balanced diet
- Physical Fitness arid its components: speed, strength, endurance, agility, etc.

UNIT-II

Health and Fitness

- Development of physical fitness and its components.
- Sports performance in different games and sports.
- Yogic Activities.
- Adventurous Activities.
- S.U.P.W. (Socially Useful Productive Work).

Course Learning Outcome

1. Students will know body system and importance of good health.
2. They will learn to participate in physical activity.
3. Learn team sprit and coordination to achieve common goal.

Course code:	BAR501	Course Name:	ARCHITECTURAL DESIGN-V
Total Credit hours:	**8**	Total contact hours:	**144**

Course Objective

To emphasise the significance of contextual factors in architecture through design of climatically and environmentally responsive architecture.

Course Description

This studio based course synthesises the knowledge gained from other courses and is central to the learning and practice of architecture. This course will engage in using conventional methods and linear processes of design to more exploratory nonlinear methods.

Course Content

- Study of a vernacular settlement with emphasis on socio-economic characteristics, climate and other geomorphic factors, local materials, building techniques, building typology, urban form, spatial analysis, etc.
- Design exercise based on the above study of vernacular settlement.
- Documentation of one of the historical building as per NASA Trophy briefs.

Note

1. Problems no. 1 and 2 to be of 5-6 weeks each. The residual time may be given to Problem no.3
2. Each of the two major problems is to be attempted in at least three developmental stages
3. Special lectures on the social & economic aspects of vernacular settlements to be organized.

Course Learning Outcome

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

Reference books/ Text books

1. Architecture of the Indian desert, Kulbushan Jain & Meenakshi Jain, Aadi Centre, Ahmedabad.
2. Encyclopaedia of Vernacular architecture of the World, Cambridge University Press.
3. House, Form & Culture, Amos Rappaport, Prentice Hall Inc, 1969.
4. VISTARA – The architecture of India, Carmen Kagal. Pub: The Festival of India, 1986.
5. Oliver Paul. Built to meet needs. Cultural issues in vernacular architecture. Italy: Routledge 2006.Print.
6. Architecture Without Architects: A Short Introduction to Non-pedigreed Architecture by Bernard Rudofsky
7. Bhatia Gautam, Laurie Baker, Life, Work, Writings, New Delhi, India,1994 Penguin Books,.ISBN 0-14-015460-4

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
20%	20%	60%		**150**	**150**

Course code:	BAR502	Course Name:	BUILDING CONSTRUCTION-V
Total Credit hours:	4	Total contact hours:	72

Course Objective

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

Course Description

Traditional and conventional knowledge systems that enable construction of a complete building; steel structural systems and methods of construction including steel structure, truss, roofs, false ceiling, joinery and finishes; Technology that informs the construction of contemporary buildings using various structural systems and materials.

Course Content

UNIT-1

- Introduction to framed construction in steel, characteristics of steel sections, methods of jointing. Applications in various types of structures and different parts of buildings.

UNIT- II

- Details of floorings in industrial buildings-structure and finishes.
- Mezzanine floors.
- Steel stairs - straight flight and spiral.

UNIT-III

- Trusses in steel. Details of north light truss, tubular truss, lattice girder, etc.
- Fixing details of various roof coverings, valleys, gutters, etc.

UNIT-IV

- False ceilings, incorporating services such as air conditioning, lighting, etc.
- Lightweight partitions in steel and aluminium. Thermal and Acoustic insulation of spaces.

UNIT-V

- Construction of various types of doors & windows in steel & Aluminium.

Course Learning Outcome

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

Reference books/ Text Books

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Punmia, B. C. Jain, A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
20%	20%	60%		**75**	**75**

Course code:	BAR503	Course Name:	BUILDING SERVICES-V
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

Introduction to H.V.A.C systems and acoustical provisions in architecture

Course Description

Study of and design and detailing for, air conditioning, acoustical treatment, etc. in buildings and building premises, etc.; compliance requirements w.r.t. National Building Code and Energy Conservation Building Code.

Course Content

UNIT-I

- Ventilation: Natural and artificial
- Cooling systems: Theory of air conditioning systems,
- Types of Air conditioning systems: window, split, central, packaged.
- Ducts and their insulating techniques, types and location of A.C. Plants.

UNIT-II

- General principles of sound: Reverberation, absorption, reflection, etc.
- Acoustics in Buildings: special requirements for various building types such as Class room .studios, Lecture theatre auditoriums, O.A.T.etc.
- Principles of good acoustical design in buildings.
- Acoustical materials and their applications.

UNIT-III

- Case study of services especially acoustical provision in an existing auditorium/cinema/theatre.
- Incorporating layouts for relevant services in the architectural project taken up for working drawings in Building Construction-VI.

Course Learning Outcome

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

Reference books/ Text Books

1. Chadderton, DV (2000) *Building Services Engineering*. E & FN Spon, London.
2. McQuiston FC, Parker JD & Jeffrey DS (2005) *Heating, Ventilating, and Air Conditioning: Analysis and Design*, Wiley.
3. Building Construction, Materials by M.V. Naik

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR504	Course Name:	STRUCTURE SYSTEMS & DESIGN-V
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To understand the principles of Design of RCC Structures, Analysis of Portal frames, Principles of Bulk - active and Vector active structures.

Course Description

Understanding the structural concepts and behavior of structural elements- load bearing structures, framed structures, composite systems, steel structures- - simple calculations for columns, beams, frames, footings, slabs, walls etc. using various systems and relating the knowledge acquired to architectural design

Course Content

UNIT-I

- Design of singly and doubly reinforced rectangular beams by limit state method.

UNIT-II:

- Moment Method: Introduction, Basic Propositions, Stiffness of a member, the distribution theorem, the carry-over theorem, relative stiffness, Distribution factor (No derivations).
- Analysis of symmetrical single bay, single and two storey portal frames of uniform section with simple symmetrical distributed or point loads by moment distribution method.

UNIT - III: (Theory only)

- Introduction to Structure Systems. Study of structures in nature and human body.
- Bulk Active Structures: Beams - Bending action, bending stresses, internal couple, moment of resistance. Effect of Shape and Orientation of beam cross section, type of loading (udl / point load), type of supports, permissible deflection, on the load carrying capacity of simply supported, Cantilever, Fixed and Continuous beams.
- Rectangular and Skew Grids. Curved Beams, Vierendale girder, Honey combed beams,
- Slabs One - way, Two - way and Cantilever: load dispersion, deflected profile and internal forces / stresses under the action of uniformly distributed load,
- Columns: Effective length, short and slender columns, Buckling load, middle third rule
- Portal Frames: Stiffness of fixed and hinged members, The Distribution Theorem (No proof). Structural action of portal frames under gravity loads & Horizontal forces, Shear walls.
- Vector Active Structures: Trusses: General principles, Types, Concepts of various methods of analysis. Secondary stresses. Various shapes of trusses for different spans. Space truss.
- Folded Plates: Structural action of folded plate roofs.

Course Learning Outcome

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

Reference books/ Text Books

1. Strength of Materials – Khurmi R. S.
2. Applied Mechanics and Strength of Materials – Khurmi R. S.
3. Civil Engineering Handbook – P.N. Khanna
4. R.C.C. Design – Khurmi, Punmia, Sushil Kumar
5. Design of Steel Structure – Negi
6. Structure in Architecture – Salvadori and Heller
7. Mechanics of materials – E. P. Popov
8. Reinforced concrete structures – R. Park and T. Paulay

9. Concrete technology- M.L. Gambhir
10. Design of reinforced concrete structures- N. Krishna Raju
11. IS: 456- 2000
12. SP: 16- 1980

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR505	Course Name:	HISTORY OF BUILT ENVIRONMENT-V
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

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

Course Description

Architecture as evolving within specific cultural contexts including a aspects of politics, society, religion, climate; geography and geology, etc. through history both in the Western context as well as in the Indian sub-continent; Development of architectural form with reference to Technology, Style and Character- Examples from every historical style illustrating the same.

Course Content

UNIT-I

- Basis of the Renaissance Movement. Its effect on the built environment.
- Pattern and form of the Renaissance town. Disposition and character of various urban elements.
- Renaissance Architecture - Phases of development, stylistic characteristics, building typology - definition and examples.
- Architects of Early Renaissance, High renaissance and Mannerism. Principal works of Brunelleschi, Alberti, Bramante, Michelangelo and Palladio.

UNIT-II

- Development of Baroque architecture and civic design.
- Elements of the Baroque town. Interrelation between buildings and urban space. Examples of Campidoglio and St Peters' Piazza, Rome, etc.
- Characteristics of Baroque architecture. Works of Bernini and Borromini.

UNIT III

- Industrial Revolution and its impact on the development of new towns. Tony Gambier's Industrial city.
- Influence of new construction materials, industrial techniques and functional needs on building typology and architectural form.
- Advances in Steel construction. The Great Exhibitions. Development of the high-rise.
- Age of Revivals.

NOTE: Analysis of architectural style/building topology must include functional, constructional/structural and ornamentation aspects

Course Learning Outcome

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

Reference books/ Text books

1. "Glimpses of World History", Pt. Jawahar Lal Nehru
2. "Ubrban Pattern", A.B. Gallion
3. "The History of Architecture", Sir Bannister Fletcher
4. History of Architecture, J E Swain

5. History of Architecture, Dora Couch
6. A study of History, Almond Toynbee
7. Traditions in Architecture, Dora Couch

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR506	Course Name:	COMPUTER APPLICATIONS IN ARCHITECTURE-V
Total Credit hours:	**4**	Total contact hours:	**72**

Course Objective

At the end of this part of the course the students should be able to create three- dimensional objects in space & presentation of 2D/3D drawings, using different rendering techniques.

Course Description

Computer operation principles and image editing through a graphical Composition; Computer aided 2D drafting and 3D Modelling through simple exercises; Rendering of a building to create a photo realistic image.

Course Content

UNIT-I: Photoshop

- Basic Concepts, Bitmaps and Vector, Using the Toolbox, ruler Guides and Grids, Info Palette, Palette Techniques.
- Taking Snapshots, Opening and Saving Files. Opening images of Photoshop, Scanning into Photoshop.
- Opening an EPS File, Placing an EPS File Saving Files, TIFF and JPEG Formats, Photoshop EPS.
- Rotating an Cropping an image, Resizing without Resampling, Image Modes, Duotone mode, Defining Colors, Foreground and Background Colors, Eyedropper and color, Sampler Tools, Color Picker Palette, Selecting Pantone Colors, Color palette
- The Painting Tools, Brushes Palette, Painting Tool Techniques and Settings, The Editing Tools.
- Making Selections, Marquee Options, Feathering Selections, Modifying Selections, Transforming Selections

UNIT-IV: Introduction to Archi-CAD

- Grid & Background, Snap Settings, Preferences & Working Units etc., Interface tools and toolboxes, Work Environment Settings.
- 2 D Module: Lines, Rectangle, Poly line, Rotated rectangle Arcs, Circles, Selection methods, Line type, Editing Options.
- Introduction to Slab tool in Archi CAD, Wall Tool and its construction methods, Relative Construction methods, Introduction to Layer Manager, Dimensioning Tool (Auto dimensioning).
- Documentation & Visualization Module
- Section and Elevation tool, Detail tool, Figure tool, Fill tool and hatches.
- Display options, Creation of Materials/Material Textures, creating perspectives with Camera tool, VR Object and VR Scene, Photo-rendering with light works engine, Rendering through sketch rendering.

UNIT-V: Introduction and Context for 3D Studio Max.

- Types of modelling; modifiers and the modifier stack.
- Modelling/deformation-animation techniques: lathing; displacement, lofting, Booleans.
- Modelling with Lofts; Modelling with Compound Objects; other, techniques, Patch modelling.
- Low-polygon modelling. Edit Poly vs. Edit Mesh; Symmetry modifier; tools and techniques.
- Modelling with combined techniques:
- Textures and texture mapping.
- Animation introduction:
    - Editing animation: key frames,
    - The curve editor/dope sheet;
    - Animation constraints/controllers.
- Introduction to deformation and hierarchical animation, rigging & skinning characters.
    - Lights, Lighting, Cameras and Render Effects.
    - Environments, environment mapping, fogs and atmospheres.

Course Learning Outcome

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

Reference books/ Text Books

1. Adobe: Introduction to photoshop
2. Autodesk: introduction to Archi- cad
3. Introduction to 3D -max

Assessment method: (Continuous Internal Assessment = 100% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	Examination
100%	-	-		**50**	**-**

Course code:	BAR507	Course Name:	BUILDING BYE-LAWS & CODES-V
Total Credit hours:	2	Total contact hours:	36

Course Objective

To familiarize the students with various kinds of building regulations required to control and promote the ordered growth of a city /town, with special reference to Delhi Bye laws .

Course Description

Building bye-laws, Important legislations which have a bearing on the practice of architecture; Arbitration and other legal aspects; Project Management- tender and contract; Implications of globalisation on professional practice with particular reference to World Trade Organisation and General Agreement on Trade in Services.

Course Content

UNIT-I

- Need for controls at various levels of town development.
- Background of controls and regulations.
- An overview of various Building Acts prevailing in independent India.

UNIT-II

- Study of National Building Code in relation to specific definitions, architectural controls, services, fire protection etc.
- Study of Building Bye laws of any metropolitan city of India
- Study of the requirements of submission drawing for approval of the concerned authority.

UNIT- III

- Detailed study of NCR Bye laws with emphasis on zoning, architectural controls, frame control, etc.
- Case study of buildings for example : commercial and public buildings in NCR

Course Learning Outcome

1. Gauge the importance of building regulations and byelaws in development.
2. Apply these to actual building design.
3. Application of bylaws in special economic zones areas.

Reference books/ Text books

1. Delhi Building Bye-Laws – Nabhi Publications
2. D.D.A. – Delhi Master Plan, Noida master plan
3. Various IS Codes
4. National building code

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR508	Course Name:	CLIMATOLOGY-V
Total Credit hours:	2	Total contact hours:	36

Course Objective

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

Course Description

Climatology as a science for the study of weather conditions averaged over a period of time; the elements of climate; study of human comfort; design of solar shading devices; Heat flow through building envelopes; Air movement due to natural and built form; Design strategies in different climate zones; vernacular and contemporary responses to climate through case studies.

Course Content

UNIT-I

- Introduction to climatology, role of climate with respect to shelter, importance of studying Building Climatology.
- Movement of earth around the sun, change of seasons, distribution of global pressure belts and global wind movements, global climatic zones.
- Definition of weather, climate, elements of climate, interrelationship of climatic elements and psychometric chart.
- Study of indigenous shelters in response to the climatic zones in India

UNIT II

- Definition and explanation of thermal comfort, relationship of climatic, elements with thermal comfort, thermal stress index, bio climatic chart, effective temperature and corrected effective temperature histogram.
- Heat exchange between building and environment (qualitative aspect only), thermal properties of materials, thermal properties of building elements, solar gain factor, solar temperature.
- Solar chart and its importance .understanding the movement of sun across; the sky, importance of understanding the optimum orientation and building form in different climatic zones, concept of shading devices.

UNIT-III

- Calculation for the design of horizontal and vertical shading devices.
- Air movement inside buildings
- Microclimate.
- Role of landscape arid other passive devices for climate control

Course Learning Outcome

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

Reference books/ Text Books

1. Koenigsberger, Q. H. (et. al.); Manual of Tropical Housing & Building, Orient Longman, Madras, 1988
2. Arvind Krishan, Climate Responsive Architecture, Tata McGraw- Hill Publishing Company Limited New Delhi, 2001.
3. Harris, Charles W. / Dines, Nicholas T.; Time Savers Standards for Landscap Architecture, Mc

Graw Hill, USA, 1998
4. Solar power, Behling
5. The climatic data handbook, Bhargava and Chand
6. Architecture as response, Greer

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR601	Course Name:	ARCHITECTURAL DESIGN-VI
Total Credit hours:	**8**	Total contact hours:	**144**

Course Objective

To learn various aspects of design on hilly terrains.
To learn design of simple service-and-structure oriented buildings.

Course Description

This studio based course synthesises the knowledge gained from other courses and is central to the learning and practice of architecture. This course will engage in using conventional methods and linear processes of design to more exploratory nonlinear methods.

Course Content

1. Design of a Housing complex (walkup apartments), giving due emphasis to contextual issues such as climate, neighbourhood design, local architectural character, etc.
2. Design of cultural buildings such as theatres, multiplex, auditorium, exhibition halls, museums, places of worship, recreational and cultural complex, etc. with emphasis on structures and services (air-conditioning, acoustics, lighting, fire fighting, etc.)

Note:

1. Equal weightage to be given to each of the above problems.
2. Each of the two problems is to be attempted in at least three developmental stages, gradually incorporating requirements of site planning, services and structures.
3. Special lectures on Site planning/Services for problem No. 1.
4. Services specialists to be involved in the development of Problem No. 2.
5. Provision for physically challenged people should be made in the problem No.2
3. An orientation lecture should be organized for the students.
6. One of the above assignments should be carried out on hilly topography/terrain.

Course Learning Outcome

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

Reference books/Text books

1. Perspective for the Architect: Themes and Hudson
2. A.J. Metric Handbook, editors, Jan Bilwa and Leslie Fair weather
3. Planning – the Architect's handbook, E and E.O.
4. Neufert's Architect's data
5. Time Saver standards for building types, Editor Joseph D.C. and John Callender.
6. Site planning by Kevin A. Lynch

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
20%	20%	60%		**150**	**150**

Course code:	BAR602	Course Name:	BUILDING CONSTRUCTION-VI
Total Credit hours:	4	Total contact hours:	72

Course Objective

To familiarize students with the system of making detailed working drawing required for construction on site.

Course Description

The course will combine lecture and studio exercises whose results will be in the form drawings and models, culminating in a studio which will translate an architectural design into working drawings which are good for construction either in manual/ digital mode.

Course Content

UNIT-I: Theoretical input

- Basics of Construction Management.
- Introduction to methodology of preparing working drawings. Systems of labelling, dimensioning, writing specifications, & co-ordination of Drawings.

UNIT- II: Basic Working Drawings

- Site Plan
- Foundation Plan and foundation details.
- Floor Plans
- Elevations and Sections.

UNIT III: Construction Details

- Joinery details (doors, window, wardrobes, etc.).

UNIT IV: Construction Details

- Detailed drawings of toilets, kitchen, staircases, etc.

NOTE

The students shall bring one of their previous semester's major projects for the preparation of working drawings. Layout of services - water supply, sewerage, electrical, etc. will be taken up as part of the subject of Building Technology-VI.

Course Learning Outcome

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

Reference books/Text books

1. Building Construction – Materials by M.V. Naik
2. Civil Engineering Handbook – P.N. Khanna
3. R.C.C. Design – Khurmi, Punmia, Sushil Kumar
4. Structure in Architecture – Salvadori and Heller
5. Elements of Structure by Morgan
6. Building Construction by Mackay WB Vol. 1-4
7. Construction Technology by Chudley Vol. 1-6
8. Elementary Building Construction by Mitchell
9. Structure and Fabric by Everet

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
20%	20%	60%		**75**	**75**

Course code:	BAR603	Course Name:	BUILDING SERVICES-VI
Total Credit hours:	2	Total contact hours:	36

Course Objective

To familiarise the students with new advances in building services like Transportation system, Fire control system and Automation system for modern building.

Course Description

Study of and design and detailing for fire hazard protection, mechanical transportation in buildings and building premises, intelligent energy conservation systems, electronic security and surveillance systems for buildings, etc.; compliance requirements w.r.t. National Building Code and Energy Conservation Building Code.

Course Content

UNIT-I

- Horizontal and vertical mechanical Transportation system in building
  - Lifts (Elevators), Escalators, Vehicular elevator and walk ways
  - Application and installation.

UNIT-II

- Fire Control System in Buildings
  - Fire detection system
  - Fire fighting system various types
  - Study of fire control practice as NBC (Latest Edition)

UNIT-III

- Building Automation Systems
  - Relevance of Building automation systems to architects
  - Automated services control: Elevators, Air-Conditioning, and Lighting Etc.
  - Communication, Security Etc.

Course Learning Outcome

1. Understand building vertical circulation system with related terminology.
2. Understand lighting requirements as per NBC 2016 and work out Fire fighting for building interiors and exteriors.
3. Understanding automation in buildings and its integration with architectural design and explain different phenomenon and principles related to security propagation and their implications on building design.
4. Summarize common acoustical defects in halls / auditorium and the ways to avoid them.

Reference books/ Text books

1. Chadderton, DV (2000) *Building Services Engineering*. E & FN Spon, London.
2. Jensen, R (ed.) (1975) *Fire Protection for the Design Professional.* Cahners Books, USA.
3. Industrial Fire Hazard Hand Book.
4. BIS Codes.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR604	Course Name:	STRUCTURE SYSTEMS & DESIGN-VI
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To appreciate the complexities in the graphic representation of structural. Information for construction purposes and to understand the structure principles in form active structures. Exam to be conducted only on drawing sheets.

Course Description

To understand the design potential of steel as a material in construction and the inherent structural benefits of the material. To inform the various components of steel as structural and aesthetic design element through various case studies. To familiarise the best practices of steel as a construction material.

Course Content

UNIT-I

RCC STRUCTURES

- Preparation of structural drawings of beams, slabs, Lintels, chajjas, columns, isolated column footings, dog legged stairs for a load bearing structure.
- RCC Frame Structures: - Preparation of structural drawings of Portal frames, Coffer slab, sunken slab, Porch and Rectangular combined column footings.

UNIT-II

STEEL STRUCTURES

- Structural Drawings for Built up column with lacing. Column Bases (slab, Grillage, Gusseted bases). Fink Roof Truss and North Light Truss along with fixing arrangements for purlins, roof covering and ridge pieces. `Seated and Framed Column Beam connections

UNIT – III

STRUCTURE SYSTEMS (Theory only)

- Cable Structures: - Funicular Polygon. Catenary, relation between tension and sag. Suspension bridges - Fan type, Harp Type, Self anchored bridges.
- Cable Roofs - Polygonal cable roof, cable roof with arch rib, Saddle shape, Pre- stressed cable roofs and cable suspended cantilever roof.
- Arch Structures: Basic concepts of rise, horizontal thrust, variation of arch thrust with rise, Roman, Gothic and Arabic arches. Flying buttress, Bridge structures.
- Arched Roofs - Barrel roof, Diagonal arch roof, Radial arch roof, Lamella cylindrical roof.
- Shells and Domes: Membrane action. Curvatures, anticlastic Surfaces, Rotational, Translational & Ruled Surfaces. Membrane action in Circular Domes. Spherical Shells: Types of forces- Meridional, Hoop forces, distribution of forces. Support Conditions - Tension and Compression rings Buckling of thin shells. Structural action of Schwedler and Geodesic domes.
- Pneumatic Structures: Background. Air - Supported Structures. Air- Inflated Structures, Hybrid Pneumatic Structures, Support Conditions and Materials.
- Introduction to software used in structural design.

Course Learning Outcome

1. To understand the concept of stesl and RCC structure design.
2. To design RCC cantilever retaining walls and gravity walls.
3. To understand advanced structural systems such as vierendeel girder, space frame, geodesic dome, etc.

Reference books/ Text Books

1. Barry R (1999) *Construction of Buildings*, East West Press Pvt. Ltd., New Delhi.
2. Mckay WB (1988) *Building Construction* (Vol. I, II, III & IV), Orient Longman, London, 1988.
3. Allen E (1999) *Fundamentals of Building Construction: Materials and Methods*, John Wiley &

Sons, New York.
4. Punamia BC (1993) *Building Construction*, Laxmi Publications (P) Ltd, New Delhi.
5. Chudley R (1988) *Building Construction Handbook*, Butterworth Heinemann, Oxford.
6. Heller R & Mario S (1963) *Structures in Architecture: The Building of Buildings*, Prentice Hall Inc.
7. Krishnaraju N (2004) *Advanced RCC Design*, University Press Pvt. Ltd.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR605	Course Name:	TOWN PLANNING-VI
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective:
To understand the role of planning in evolution of urban form.

Course Description
Elements and characteristics of human settlements; origins; determinants and their evolution through the course of history; Settlements as expression of political aspirations; Various planning concepts in urban, rural and regional level development plans in the context of India; Changing scenario in the context of Globalisation.

Course Content

UNIT-I

- Overview of evolution of settlement design from the River Valley to Pre- Industrial (I7th century) towns with emphasis on the factors that influenced Town Planning principles and theories.
- Classifications of settlements based on form, use, scale, etc.
- Methodology (planning process) for the development of new towns involving
- Various stages like population projection, need and quantitative requirement of infrastructure, distribution of land use, formulation of alternative proposals for a healthy plan having possibilities of phase wise development, economic sustainability, analysis and selection of the optimum plan.

UNIT-II

- Role and contribution of the following towards contemporary town planning thought.
- Patrick Geddes, Patrick Abercrombie, Daniel Burnham, Soria Y Mata, Frederick Olmstead, Ebenezer Howard, Clarence Perry, CA Doxiadias, Le Corbusier.

UNIT-III

- Town Planning Policies in India from the 18th century till present day.
- Issues and strategies of Urban renewal of existing and historical towns - need for renewal, problems involved in urban renewal schemes, surveys to be conducted, methods of collection and analysis of data, rehabilitation and compensation, scope for future growth. Case studies of Urban renewal schemes in Indian and Western towns.

Course Learning Outcome

1. To understand the scope, nature of town planning as a discipline, components of a town planning and types.
2. To analyze the evolution of historic Planning form and space in various national and international context.
3. Understanding evolution of cities and Contemporary Practices in townplanning through examples from world renowned theorists and planners.
4. Analyze qualities of spaces across different town contexts at multiple size.
5. Understanding the concept of town planning schemes from statutory and non- statutory bodies, models by prominent.

Reference books/ Text books

1. Gallion AB & Eisner S (1984) *The Urban Pattern: City Planning and Design*, CBS Publication and Distributors, Delhi.
2. Bandopadhyay A (2000) *The Text Book of Town Planning*, Books and Allied (P) Ltd, Kolkata.
3. Modak & Ambedkar (1971) *Town and Country Planning & Housing*, Orient Longman Ltd.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR606	Course Name:	ELEMENTS OF LANDSCAPE-VI
Total Credit hours:	**3**	Total contact hours:	**54**

Course Objective

To familiarise the students with the attributes, use and importance of basic elements of landscape.

Course Description

Man and Nature; Landscape traditions; Elements and principles of landscape design; Aspects of outdoor design and site planning in enhancing and improving the quality of building environs, functionally and aesthetically.

Course Content

UNIT-I

- Introduction to landscape design and its role in the built environment.
- Introduction to elements of landscape i.e. Earth, rock, water, vegetation.
- Use of landscape elements in site planning.

UNIT- II

- Detailed study of earth and rock elements of landscape in nature and in landscape design.

UNIT- III

- Detailed study of water and vegetation as elements of landscape in nature and in landscape design.

Course Learning Outcome

1. Understand different types of materials, their application in the landscape design
2. Understand role of landscape design in built environment.
3. Understand different types of elements in site planning for landscape.
4. Understand different types of materials, their application in the designing of Exterior /landscape projects.

Reference books/Text books

1. An Introduction to Landscape architecture by M. Laurie.
2. An Introduction to Landscape Design by H. V. Hubbard
3. Fundamentals of Landscaping and Site Planning by James B. Root.
4. History of Garden Design by D. Clifford
5. Tropical Garden Plants in Colour by Bose and Chowdhury
6. Colour and Design for Every Garden by Ortloff and Raymore
7. Design with Nature by I. Mcharg
8. Fundamentals of Ecology by M. C. Dash.
9. Landscape Detailing by Michael Ittlewood.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR607	Course Name:	SOCIAL SUSTAINABILITY-VI
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

The objective is to increase the understanding of social sustainability among the students and responsibility of architecture in this regard.

Course Description

Introduction to Green concepts; Depleting resources and climate change; Sustainable site selection and development sustainable building materials and technologies; Low impact construction – Bio mimicry, Dimensions of sustainable, sustainable community; case studies of eco- cities/ communities

Course Content

UNIT I

- Meaning and approaches to social sustainability.
- Elements of social sustainability

UNIT II

- Implications of psychological issues in design of buildings and townships.
- Concept of Social, Political, Religious and Cultural Structure and their impact in social sustainability.
- Architecture and its relationship with the governance.

Course Learning Outcome

1. Understand social sustainability, its meaning, approach and the importance
2. Understand various element and their role in social sustainability.
3. Analyse various of psychological issues and their solution in build environment.
4. Understand the Concept of Social, Political, Religious and Cultural Structure and their impact in social sustainability.
5. Understand and analyze relation between governance and architecture.

Reference books/Text books

1. Social sustainability in urban area: communities, connectivity and urban fabric: Tony manzi, Karen Lucas, Tony Lloyd jones and Judith Allen.
2. Cradle to cradle: remaking the way we things
3. Concept of environmental management for sustainable development: M.C. dash
4. Alternative Natural Energy Sources in Building Design: Davies and Schubert.
5. Design with nature: I. McHarg
6. The Ecological Context: H. McHale.
7. Human Ecosystems: W. B. Jr. Clapham.
8. Review our dying planet: S. Devi.
9. Energy Conservation Standards: for building design, construction and operation, S. Fred Dubin.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR701	Course Name:	ARCHITECTURAL DESIGN-VII
Total Credit hours:	**8**	Total contact hours:	**144**

Course Objective

To familiarize the students with specialised building design, laying emphasis on advanced structure and service requirements

Course Description

This studio based course synthesises the knowledge gained from other courses and is central to the learning and practice of architecture. This course will engage in using conventional methods and linear processes of design to more exploratory nonlinear methods.

Course Content

- A design involving large spans, viz. exhibition pavilions, industrial buildings, etc.
- Design of multi-storeyed buildings with specialised services, such as hospitals and hotels/Multipurpose/Mixed used Buildings.

Note:

1. Equal weightage to be given to each of the above problems.
2. Each of the two problems is to be attempted in at least three developmental stages with modifications made to suit services and structural requirement, besides other design requirements.
3. Special lectures on structural and services requirements to be organized. Concerned Specialists to be involved in the studio at suitable stages.
4. Each of above projects should be taken up to interior design layout/High level services applicable level.

Course Learning Outcome

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

Reference books/ Text books

1. Perspective for the Architect: Themes and Hudson
2. A.J. Metric Handbook, editors, Jan Bilwa and Leslie Fair weather
3. Planning – the Architect's handbook, E and E.O.
4. Neufert's Architect's data
5. Time Saver standards for building types, Editor Joseph D.C. and John Callender.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
20%	20%	60%		**150**	**150**

Course code:	BAR702	Course Name:	BUILDING CONSTRUCTION-VII
Total Credit hours:	**4**	Total contact hours:	**72**

Course Objective

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

Course Description

Understanding the structural concepts and behaviour of structural elements in high rise building structures. Study of and design and detailing for water supply, drainage, sewage disposal, garbage disposal, electrification, illumination, air conditioning, fire hazard protection, acoustical treatment, rainwater harvesting, etc. in buildings and building premises,

Course Content

UNIT-I

- Various systems of construction of high-rise buildings in RCC and steel.
- Foundations and superstructure.

UNIT-II

- Construction of Vierendeel girder, space steel frames, hinged portal trusses, air frames. Steel structural systems, other systems for large span structures, etc.

UNIT-III

- Details of Vertical Transportation System like lifts & escalators.
- Power supply systems, Fire Fighting Systems, Air conditioning & Garbage disposal, etc. in high-rise buildings.

UNIT-IV

- Installation of solar water heating system in buildings.
- Construction details of passive methods of environment control in buildings.

NOTE:

1. All the units should be equally represent in exam.
2. The question should be set such as answer could be attempted on answer sheets in sketch form.

Course Learning Outcome

1. To understand the concept of high-rise structural system.
2. To design RCC for long span structure.
3. To understand concept services eg. HVAC waste disposable system in high rise building.
4. To understand advanced structural systems such as vierendeel girder, space frame, geodesic dome, etc.

Reference books/ Text books

1. Barry R (1999) *Construction of Buildings*, East West Press Pvt. Ltd., New Delhi.
2. Mckay WB (1988) *Building Construction* (Vol. I, II, III & IV), Orient Longman, London, 1988.
3. Allen E (1999) *Fundamentals of Building Construction: Materials and Methods*, John Wiley & Sons, New York.
4. Punamia BC (1993) *Building Construction*, Laxmi Publications (P) Ltd, New Delhi.
5. Chudley R (1988) *Building Construction Handbook*, Butterworth Heinemann, Oxford.
6. Heller R & Mario S (1963) *Structures in Architecture: The Building of Buildings*, Prentice Hall Inc.
7. Krishnaraju N (2004) *Advanced RCC Design*, University Press Pvt. Ltd.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A	Sessional work	External Viva
20%	20%	60%		**75**	**75**

Course code:	BAR703	Course Name:	ESTIMATION & COSTING AND SPECIFICATION-VII
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To familiarise the student with the commonly used methods of preparing estimates of Architectural Projects, and inculcate an awareness regarding factors effecting cost of buildings.

Course Description

Specifications of various building works as per National Building Code (NBC) and Energy Conservation Building Code (ECBC); Writing specifications for materials and various items of work; Systems of taking out quantities and estimating for all trades involved in construction of medium complexity; preparation of Bill of Quantities (BOQ); Cost estimating for building works (material and labor); valuation report preparation; Budgeting for specific project

Course Content

UNIT-I

- Basic principles of Economics as applied to buildings and factors affecting cost of buildings.
- Types of Estimates in common usage.

UNIT-II

- Bill of Quantities of Materials. Its importance and methods of preparation. Practical examples.

UNIT-III

- Standard rates and their derivation from given rate.
- Case study/practical expertise in preparing detailed estimates of quantities of materials arid analysis of rates of material and labour for a small residential building.

UNIT-IV

- Tender -
    - Types of Tender
    - Process of tender calling
    - Scrutiny & Selection

UNIT-V

- Introduction to the importance of specification and their functions, different types of specifications, revision of specifications of building materials, brick, stone, cement, lime, aggregate, timber and various other finishes.

UNIT-VI

- Writing specifications for civil works of a small building project, starting with excavation, earth work, foundations, damp proof course, brick masonry work, concreting, flooring, plastering, painting, timber doors and windows, steel doors and windows, painting, varnishes etc.

UNIT-VII

- Writing specifications for Building services, such as water supply, plumbing, electrification, fire fighting, etc.

NOTE: Scope of the subject will be limited to preparing detailed estimate and costing of two- storeyed residential buildings in masonry and reinforced cement concrete

Course Learning Outcome

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

4. Learn and apply good practices in writing specifications, preparing building estimates and tender documents for building works.

Reference books/ Text books

1. Dutta BN (1992) *Estimating and Costing in Civil Engineering*, UBS Publishers Distributors Ltd, New Delhi.
2. National Building Code of India 2016
3. CPWD Specification' of Govt of India.

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR704	Course Name:	PROFESSIONAL PRACTICE-VII
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

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

Course Description

The architectural profession and the role of professional bodies and statutory bodies; Code of Conduct and ethics in professional practice and the mandatory provisions of the Architects Act 1972; Building bye-laws, Important legislations which have a bearing on the practice of architecture; Arbitration and other legal aspects; Project Management- tender and contract; Implications of globalisation on professional practice with particular reference to World Trade Organisation and General Agreement on Trade in Services

Course Content

UNIT-I

- Profession - vocation, trade union vis-a-vis professional activities, social obligations of profession, architectural professional association in its role and responsibilities.
- Architects Act 1972/87. Council of Architecture –its role and responsibilities.

UNIT- II

Code of professional conduct.

- Condition of engagement and scale of professional fees.
- Copyright Actas applicable to architectural work.
- Architectural competition.

UNIT- III

- Concept of Contract and Arbitration.
- Duties and liabilities of architects, duties and liabilities of contractors.
- Articles of agreement, execution of works and payments.
- Arbitration, the Act, its application, and its scope.
- Valuation and valuation methods.

UNIT- IV

- Pre-tender qualification and registration of contractors.
- Office organization and management, expense, structure, salaries and overheads. Role of design staff and supporting managerial staff; Personnel management and trainingresponsibilities.
- Expression of Interest.

Course Learning Outcome

1. Understand the architectural profession, and related ethics and associated services
2. Knowledge of various roles and responsibilities of COA and IIA and various Architectural Design competitions.
3. Understand the fee structure and legal legislation in architectural practice.
4. Knowledge and understanding of legal and documentation practices like tender as applicable to the architectural profession.

Reference books/ Text books

1. COA document of Architect's Act 1972
2. Architectural Practice in India – Prof. Madhav Deobhakta
3. Construction Project Management – K.K. Chilkar
4. Construction Planning and Management – M.B. Dhir & S.P. Ghilot
5. Professional Practice in India – S.K. Sahu
6. Code of Architectural Practice – B.M. Basu

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR705	Course Name:	RESEARCH METHODOLOGY-VII
Total Credit hours:	2	Total contact hours:	36

Course Objective

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

Course Description

This is research writing in a thrust area in architecture. Methods of analysis should have a scientific basis and thorough investigative research is required from primary and secondary sources- through library research and literature review; documentation, etc. This can be a prelude to the Architectural Design Thesis.

Course Content

UNIT-I

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

UNIT- II

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

UNIT- III

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

Course Learning Outcome

1. Systematically abstract, analyse, synthesize and interpret existing literature.
2. Develops a specialized knowledge in a subject area which maybe an extension to the prescribed coursework.
3. Builds his his/her capacity to work independently and methodically in a variety of intellectually demanding contexts.

Reference books/ Text books

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

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR706	Course Name:	ENVIRONMENTAL RESPONSIVE BUILDINGS-VII
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To familiarize the students with design and construction that is environmentally responsible and sustainable

Course Description

Passive design considerations; active systems; design for energy efficient building- day lighting and natural ventilation; technologies for alternative sources of energy; Net Zero buildings; software tools for the design of a building and the performance evaluation of a building with respect to energy; Rating systems: IGBC, LEED, GRIHA.

Course Content

UNIT I

- Sustainable built environment, issues and approaches.
- Ecological Architecture / Green Building.
- Alternate or traditional building systems.

UNIT II

- Solar passive design
- Alternative materials and technology
- Intelligent Buildings

Course Learning Outcome

1. Understand sustainable built environment associated issues and remedy.
2. Knowledge of green architecture and approach.
3. Learnt different strategy of natural cooling, heating process alternate techniques for building system.
4. Understand Intelligent Buildings and its components.

Reference books/ Text books

1. Daniel Williams “Sustainable Design: Ecology, Architecture & Planning”, John Wiley & sons,2007
2. Daniel Williams “Sustainable Design: Ecology, Architecture & Planning”, John Wiley & sons,2007
3. Dr Parr, New Directions in sustainable Design, Routledge Press, 2012
4. Elizabeth Baker, The other side of Laurie Baker, DC Books Pvt. Ltd, 2007

Assessment method: (Continuous Internal Assessment = 40% , Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR707	Course Name:	HILL ARCHITECTURE-VII
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

Understand constraints of climate, topography and the local building materials produced rich traditions of Hill architecture. The objectives of this course are to impart a comprehensive knowledge of these historical aspects and present-day concerns.

Course Description

Hill architecture as a process and not a product; Determinants of vernacular form; Overview of the various approaches and concepts to the study of vernacular architecture; Various vernacular architectural forms in the various regions of India; Impact of Colonial rule on the vernacular architecture and settlements in India

Course Content

UNIT-I

- 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

- Traditional hill settlements of 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

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

Course Learning Outcome

1. Understand and appreciate the vernacular architecture of hilly region.
2. Understand of the methods available to analyse and date vernacular houses and spatial arrangement
3. Recognize the style, form, material and period in hilly terrain to which the architecture of a house relates.

Reference books/ Text books

1. "The Architectural Heritage of Himachal Pradesh: Origin and Development of Temple Styles", Laxman S. Thakur, Munshiram Manoharlal Publishers, 1996.
2. "Environment Protection of Himalaya: A Mountaineer's View", Aamir Ali, Indus Publishing Company, 1998.
3. "The Survival of the Himalaya, Eco-systems- A scenario of Unsustainability", Sunder LalBahuguna, Tej Vir Singh and M.L.Sharma
4. "Himalayan Ecology, Transhumance and Social Organization Gaddis of Himachal Pradesh", Veena Bhasin, Kamla-Raj Enterprises, 1988.
5. "Ecological Hazards in the Himalayas", S.K. Chadha, Pointer Publishers, 1989.
6. "Himachal Pradesh:A perspective", Ramesh Chauhan, Menerava Book, 1998.
7. "Temples of the Western Himalayas", Penelope Chetwode, The Architectural Review, London.
8. ICIMOD,Constraints and Opportunities, International Centre for Integrated Mountain Development,

Proceedings of International Symposium on Mountain Environment and Development Kathmandu, Nepal.
9. "Environmental Concerns and Strategies", T.N. Khoshoo, South Asia Books; 2ndSub edition, 1988.

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	External Viva
20%	20%	60%		**25**	**25**

Course code:	BAR708	Course Name:	VERNACULAR ARCHITECTURE-VII
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To understand vernacular architecture as distinct from other historical & modern styles of architecture to appreciate that it is site responsive and an outcome of indigenous techniques and various social, economic and mythical values of the society.

Course Description

Vernacular architecture as a process and not a product; Determinants of vernacular form; Overview of the various approaches and concepts to the study of vernacular architecture; Various vernacular architectural forms in the various regions of India; Impact of Colonial rule on the vernacular architecture and settlements in India

Course Content

UNIT-I

- Vernacular Architecture - Meaning &theories.
- Determinants of vernacular architecture: Role of social, cultural, political, economic symbolic, climatic, technological contest in creation of form.

UNIT-II

- Materials & technology,
- Role of vernacular architecture in disaster management.

UNIT-III

- Illustrated case studies of vernacular settlements/building typology from various regions in India and abroad

Course Learning Outcome

4. Understand and appreciate the vernacular architecture of various region.
5. Understand of the methods available to analyse and date vernacular houses and spatial arrangement
6. Recognize the style, form, material and period to which the architecture of a house relates.

Reference books/ Text books

1. Oliver, Paul, "Encyclopedia of vernacular Architecture of the world (3 Vol. Set)", Cambridge University Press, U.K., 2007
2. Spiro Kostoff, City assembled, City shaped, Phaidon, 2005
3. Charles Correa, A Place in the Shade. Penguin Books, 2010
4. Aranya, Vastu-Shilpa Foundation, Ahmedabad, 2015 (reprint)

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR709	Course Name:	INTERIOR DESIGN-VII
Total Credit hours:	2	Total contact hours:	36

Course Objective

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

Course Description

Vocabulary of interior design; Overview of interior and furniture design and design movements through history; various components of interior space and treatment and finishes; Interior lighting, Interior landscape and furniture.

Course Content

UNIT-I

- Interior design in historical perspective.
- Principles of aesthetic composition in interiors.
- Meaning of spatial organization, perceptual needs, psychological needs, convenience, maintenance, durability and image in interior design.
- Application of colour, form and texture in interiors.
- Use of artificial and natural lighting in interiors.

UNIT- II

- Built-in furniture and movable furniture.
- Interior furnishings.
- Interior design accessories and decorative elements,

UNIT-III

- Traditional and modern building materials for interior finishes.
- Treatments applied to floors, walls, partitions and ceilings for interior design.
- Electrical and mechanical services and their integration into interior design schemes.

Note:

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

Course Learning Outcome

1. To create different design schemes for different spaces.
2. To understand the impact of different elements such as furniture and decorative features and upholstery.
3. To generate character of different spaces according to the function.
4. Understand the intricacies of interior space planning and its historical background.
5. Understand the modern trends in the field

Reference books/ Text books

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

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR710	Course Name:	ART AND ARCHITECTURE-VII
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To understand the symbiotic /interdependent nature of art and architecture and familiarization with various art forms used in architecture.

Course Description

Role of art in history of world architecture; Symbiotic relationship of folk art and architecture; application of different art forms in architecture; Visual communication in architecture and way finding; Works of different artists and architects that reflect the inter relationship.

Course Content

UNIT- I

- Comparison of attributes of ‗Art and Architecture '. Introduction to forms of pure and applied arts.
- Role of art in history of world architecture, including folk and vernacular examples.
- Symbiotic relationship of Art and Architecture at the levels of the single building, the cluster, the city, landscape, etc. (Note: Suitable examples may be drawn from different periods of history as well as of various forms of art /art objects).

UNIT-II

- Detailed study of the following art forms as applied to architecture with reference to techniques of production, visual qualities, application through history and present day trends: Painting, Sculpture, Mosaics, Stained glass, Tapestries, etc.

UNIT-III

- Contribution of artists such as Henri Moore, Alexander Calder, etc. to enrichment of Architecture
- Works of architect-artists such as Le Corbusier, Satish Gujral, Michelangelo, etc.
- Specific examples of interrelation of art and architecture from different contexts, such as Folk Art of Madhubani, Byzantine Murals, Ajanta Wall Paintings, Gothic Churches, Shekhavati Havelis, Chandigarh's Rock Garden, etc.

NOTE:

The case studies may be attempted individually or in groups. Special emphasis may be laid on documenting relatively unknown examples.

Course Learning Outcome

1. Understand relation between art and architecture and their evolution.
2. Knowledge of art forms and its applied to architecture with reference to techniques of production, visual qualities, application through history and present day trends: Painting, Sculpture.
3. Knowledge of prominent artist wok style and their contribution towards the architecture.

Reference books/ Text books

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

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR711	Course Name:	URBAN DESIGN-VII
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To appreciate the nature and role of various facets of Urban Design in the making of the built environment.

Course Description

Urban design as a discipline; Components of a city and their interdependent roles; Determinants of urban form; Evolution of historic urban form.; Theories and illustrations of Urban design and the interpretation of the urban form in different ways and layers; Identity and place 'making; architectural codes and imageability; contemporary urban issues; sustainable urban design; case studies.

Course Content

UNIT-I

- Introduction to the role and scope of Urban Design. Comparison with architecture and town planning.
- Determinants of Urban Form such as landform, climate, symbolism, activity patterns, socio-cultural factors, materials and techniques and other contextual references. Case examples from various periods in history and different parts of the world.
- Vocabulary of Urban Design. Urban Pattern, Grain, Texture, Density, etc.
- Concepts of Imageability. Elements of the city's image. Paths, nodes, landmarks, edges, and districts - their characteristics, role and interrelationship.
- Designing parts of the city: Systems of communication, and utilities, visual expression, accent and contrasts, urban character, landscape features and city extension areas.

UNIT-II

- Types of Urban Spaces - street, square, precinct, piazza, mall, etc.
- Various elements of urban space - their identification, characteristics and role in the shaping of the space.
- Changing role of urban spaces through history. Role of public places in the contemporary city.
- Design principles - Scale and Enclosure
- Case studies of well-known urban spaces from various periods of history to illustrate their design and performance aspects.

UNIT- III

- Role of Legislation and Controls in design of the built environment.
- Types of urban controls: FAR, Incentive Zoning, Density, Planned Unit Development, Building height, Building Bulk etc. Special provisions of Town planning Acts. Analysis of urban legislation in Delhi, Mumbai, etc.
- Aesthetic Legislation - Historical Development and applications. Case example of aesthetic controls of Old Delhi - their basis, characteristics and problems of implementation and enforcement.

Course Learning Outcome

1. Distinct understanding of regulated urban development in cities.
2. The course shall develop understanding about the emergence of human settlements on the basis of complex interaction of determinants, elements and principles over time.
3. Understanding of neighbourhood concepts.

Reference books/ Text books

1. Edmund Bacon, "Design of Cities", Pernguin,2001
2. Gordon Cullen, "The Concise Townscape", The Architectural Press
3. Time Saver Standards for Urban Design", Donald natson, McGraw Hill,2017
4. Kevin Lynch, "The Image of the City", MIT Press

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR801	Course Name:	PROFESSIONAL TRAINING / INTERNSHIP
Total Credit hours:	**N.A.**	Total contact hours:	-

Course Objective

The objective of the 'Professional Training' is to enable the students to gain the various range of practical/field experience which will prepare them for their likely responsibilities, immediately after qualifying B. Arch. Course.

Course Description

Orientation under an architect that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process and to facilitate the understanding of the evolution of an architectural project from design to execution.

NOTE:

1 This entire semester will be used for Practical Training, which is to be undertaken with an architect having a minimum professional experience of 8 years.

2 Trainees are required to submit monthly progress reports of the work done by them in the office. These reports will be monitored by a faculty member designated as the Practical Training Coordinator.

3 A Practical Training Examination will be conducted at the end of the training period, in which the work done by the trainee will be assessed through a viva voce.

4 A detailed Training Programme will be drawn up on the above guidelines by the Practical Training Coordinator and approved by the Principal each year before implementation. The intention is to continually update the programme in view of the changing demands of the profession.

Course Content

The following work is to be done by each trainee during the Practical Training:

- <u>During office hours</u>:
  - Drafting, tracing, presentation drawings, perspectives, models,etc.
  - Working drawings and details.
  - Site visits.

- <u>In extra-office hours</u>:
  The trainee is also required to prepare a study report on building/buildings designed by his/her employer. The report is to be based on site visits and personal observations and will cover aspects of design, structure, use of material, construction methods, services etc.

The total marks assigned to the Practical Training are 500. These shall be distributed as detailed below:

A	Periodical Reports	
	1) Joining Report	
	2) Monthly progress report (6 Nos.) Of 20 marks each	120
B	Work to be presented for Training Examination	
	1) Work done during office hours	150
	2) Building Analysis Report	150
C	Viva Voce	80

NOTE:

1) Detailed guidelines regarding the nature and quantum of work to be presented for the Training Examination and the Periodical Reports will be specified in the Training Schedule.
2) The Training Examination will be conducted by the Principal, the Practical Training Coordinator and two External Examiners appointed by the Principal.

Course Learning Outcome

1. The student gets a real-time exposure of how architectural projects are carried out.
2. Office management and team-work to enhance the employability of the student.
3. To acquaint students with their roles and responsibilities of dealing with various related agencies and the freedom/ limitations as a professional as well as their real status in the society.

Assessment method: (Continuous Internal Assessment =0% , Final Examination =100%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
-	-	100%		-	**500**

Course code:	BAR901	Course Name:	ARCHITECTURAL DESIGN-IX
Total Credit hours:	**8**	Total contact hours:	**144**

Course Objective

To make the students aware of design issues related to problems of urban development, urban renewal and housing.

Course Description

Urban development and its content in architectural creations; Influencing factors which governs the siting of a building or group of buildings in a given site; Topography analysis; Scientific techniques of site analysis-case studies; Methodology of preparing a site analysis diagram and mapping; Codes and building regulations; Site utilities and Infrastructure planning.

Course Content

- Urban Design Studio dealing with issues such as campus planning/designing buildings in Historic context, related to urban development and renewal/design or ecologically sensitive control. This project will be dealt in two parts:
    - Study of an existing urban environment to identify its typical characteristics and problems.
    - Design solution toissues/problems identified above.

- Multi-storeyed Housing project/integrated townships taking into consideration services, site planning, traffic and circulation

NOTE

1. Equal weightage to be given to each of the above problems.
2. Each of the two major problems is to be attempted in at least three development stages.
3. Special lectures to be conducted on urban morphology and issues of urban renewal, as well as social & economic aspects of housing in urban areas. Concerned specialists to be involved in each of the two studio exercises.

Course Learning Outcome

1. Ability to Design, analyse and generate creative alternatives for moderately complex Architectural Design issues.
2. Design a large campus for a specific purpose for a large population of multiple groups of users.
3. Produce a design process and a design solution to an urban design problem

Reference books/ Text books

1. Perspective for the Architect: Themes and Hudson
2. A.J. Metric Handbook, editors, Jan Bilwa and Leslie Fair weather
3. Planning – the Architect's handbook, E and E.O.
4. Neufert's Architect's data
5. Time Saver standards for building types, Editor Joseph D.C. and John Callender.

Assessment method: (Continuous Internal Assessment =100% , Final Examination = 0%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
20%	20%	60%		**150**	**150**

Course code:	BAR902	Course Name:	BUILDING CONSTRUCTION-IX
Total Credit hours:	4	Total contact hours:	72

Course Objective

To prepare a set of working drawings for a high-rise/large span/specialized building project, using advanced constructional and structural building techniques.

Course Description

Traditional and conventional knowledge systems that enable construction of a complete building; various structural systems and methods of construction and detailing of buildings of complexity using natural and manmade materials including deep foundation, long span, thermal and acoustic details; Technology that informs the construction of contemporary buildings using various structural systems and materials.

Course Content

UNIT-I

- Construction of Basement - Construction Details, its treatment.
- Extension & expansion joints in Buildings - their details & treatments.

UNIT-II

- Basic formwork & construction details required for concrete structure such as shell, coffers, waffle roof, folded plates & span frame, etc.

UNIT -III

- Thermal & Acoustical treatment in RCC framed buildings including construction details.

UNIT- IV:

- Study of interior show room/shops, designs & details of Banks, Hotels, Offices, Public buildings, restaurants, etc.

UNIT-V:

- Construction of structural & non-structural cladding & glazing.

NOTE:

1. All units should be equally represented in exam.
2. Question should be set in such a form that the exam should be attempted in the form of drafted drawings on drawings sheets (cartridge/gateway).

Course Learning Outcome

1. Development of construction technology and innovative techniques as tools to address high rise construction.
2. Knowledge of highrise building construction foundation details.
3. Knowledge of thermal and acoustical treatment structure techniques.

Reference books/ Text books

1. Barry R (1999) *Construction of Buildings*, East West Press Pvt. Ltd., New Delhi.
2. Mckay WB (1988) *Building Construction* (Vol. I, II, III & IV), Orient Longman, London, 1988.
3. Allen E (1999) *Fundamentals of Building Construction: Materials and Methods*, John Wiley & Sons, New York.
4. Punamia BC (1993) *Building Construction*, Laxmi Publications (P) Ltd, New Delhi.
5. Chudley R (1988) *Building Construction Handbook*, Butterworth Heinemann, Oxford.
6. Heller R & Mario S (1963) *Structures in Architecture: The Building of Buildings*, Prentice Hall Inc.
7. Krishnaraju N (2004) *Advanced RCC Design*, University Press Pvt. Ltd.

Assessment method: (Continuous Internal Assessment =100% , Final Examination = 0%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
20%	20%	60%		**75**	**75**

Course code:	BAR903	Course Name:	DISSERTATION-IX
Total Credit hours:	**3**	Total contact hours:	**54**

Course Objective

This course is an overview of writing and organizational skills necessary for completion of a dissertation and submission of articles for publication. It includes components of research design.

Course Description

This is research writing in a thrust area in architecture. Methods of analysis should have a scientific basis and thorough investigative research is required from primary and secondary sources- through library research and literature review; documentation, etc. This can be a prelude to the Architectural Design Thesis.

Course Content

- Students are required to choose a topic and conduct research under the guidance of internal teachers. They are required to submit a report to in the given format. The report should include Title and description of the topic.
- Back ground study, Review of related literature, Analysis of terms, Methodology of study (Survey, Case studies, project reviews)
- Findings and analysis based on the methodology Design objectives based upon the findings.

Course Learning Outcome

1. systematically abstract, analyse, synthesize and interpret existing literature.
2. Develops a specialized knowledge in a subject area which maybe an extension to the prescribed coursework.
3. Builds his his/her capacity to work independently and methodically in a variety of intellectually demanding contexts.

Reference books/ Text books

4. McMillan, K. & Weyers, J. (2007) How to write dissertations and project reports. Pearson Prentice Hall.
5. 2. Watson, G. (1987) Writing a thesis: a guide to long essays and dissertations, London: Longman. Specialist bibliography according to the project.

Assessment method: (Continuous Internal Assessment = 40, Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	Examination
20%	20%	60%		**50**	**50**

Course code:	BAR904	Course Name:	RESEARCH METHODOLOGY-IX (ADVANCED)
Total Credit hours:	**3**	Total contact hours:	**54**

Course Objective

To familiarize the students with design and construction that is environmentally responsible and sustainable

Course Description

This is research writing in a thrust area in architecture. Methods of analysis should have a scientific basis and thorough investigative research is required from primary and secondary sources- through library research and literature review; documentation, etc. This can be a prelude to the Architectural Design Thesis.

Course Content

UNIT I

- Research in architecture - its nature, purpose & scope.
- Basic and applied research.
- Technical and behavioural- oriented research
- Methods of conducting research.

UNIT II

- Selection of topic, and its relevance.
- Identification and formulation of problem.
- Research design, research instruments and analysis
- Techniques of research - report writing.

Course Learning Outcome

1. systematically abstract, analyse, synthesize and interpret existing literature.
2. Develops a specialized knowledge in a subject area which maybe an extension to the prescribed coursework.
3. Builds his his/her capacity to work independently and methodically in a variety of intellectually demanding contexts.

Reference books/ Text books

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

Assessment method: (Continuous Internal Assessment = 40, Final Examination = 60%)

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR905	Course Name:	LIGHTING DESIGN-IX
Total Credit hours:	2	Total contact hours:	36

Course Objective

To introduce methods of determining qualitative & quantitative lighting requirements both for interiors and exteriors.

Course Description

Building performance assessment and energy simulation tools, understanding of National Building Code (NBC) and Energy Conservation Building Code (ECBC) of India to provide minimum requirements for energy efficient design and construction of buildings; various compliance approaches; Building Envelope; Comfort Systems; Lighting systems; Electrical and renewable energy systems.

Course Content

UNIT-I

- Basic anatomy and functions of the eye. Adjustments made by the eye, Age- related defects and their design implication.
- Visual arc, Visual acuity, resolution angle, Contrast, Colour Contrast, Colour Adaptation, Visual performance and its relationship to Contrast, Size of task and Illuminance. Central and peripheral vision.
- Photometric terms used in the lighting industry and their interrelationship. Measurement of these terms.
- Colour Specification with Munsel and CIE system, Additive and Subtractive colour mixing.

UNIT-II

- Lamp Properties; Effect of voltage & Temperature fluctuation on functioning of lamps, lamp cost, Lumen Loss, Lamp photometry, etc. Brief history of lamps.
- Lamps - Incandescent, Discharge sources. High intensity discharge sources. Fibre optics, Induction Lamps, LED lamps. Recent developments in lamp technology.
- Luminaire properties like intensity distribution for ceiling luminaries & floodlights, LOR, ULOR, DLOR, IP rating, Glare control methods, Aesthetics and applications.

UNIT-III

- Quantitative lighting design of a simple space manually using lumen methods. Lighting design- using computers.
- Design principles used for lighting of various types of internal spaces. Design principles used for lighting of various external situations.
- Day lighting, Importance and method to calculate illumination due to daylight using daylight factor, day lighting practices. Integration with electric lighting.

Course Learning Outcome

1. Inculcate a general understanding of the importance of lighting in buildings.
2. It will develop an ability to address Architectural Design in terms of space and form for areas of lighting design concerns.
3. Uses and application of lighting principals in interior space
4. Analysing day light and integration of artificial lighting in building interior.

Reference books/ Text books

1. Basic electrical engineering by D.P Kothari, I.J Nagrath
2. Introduction to the design and analysis of building electrical system by John Mathew Electrical design guide for commercial buildings by William H. Clark
3. Handbook of electrical design details by Neil Sclater Building construction illustrated by Dr. D.K. Ching
4. Mechanical and electrical equipment for building by Walter T. Gondzik

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	External Viva
20%	20%	60%		**25**	**25**

Course code:	BAR906	Course Name:	SERVICE CONTROL SYSTEM IN BUILDING-IX
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To make students aware of the capability and limitations of control systems for various building services, gain fundamental knowledge of types of controllers, and prepare basic diagrams required for automatic control systems and implement automated control system in their projects.

Course Description

System and Sub-systems in buildings, relationship and analysis of sub-systems; Building systems for different building typologies, Optimization and sub-system; Control systems for various buildings services, Types of controllers. Preparation of necessary drawings for installing control systems, Integrated building management system, remote monitoring and management, Home automation, Developments in service control systems.

Course Content

UNIT-I

- Sensors & Actuators.
- Pneumatic controls systems, electric control systems.
- Computerized control systems, Direct Digital controls.

UNIT- II

- Control in HAVC (Climate Control), Control of valves, dampers, stair pressurization, temperature, humidity, chillers, VAV boxes, night purging.
- Control in electric supply, electrical power distribution, SB, MDBs, DBs, MCBs, ELCBs, Fuses, Relays, switches, contractors, motor starters, start-to- start timers, delay switches etc.
- Controls systems in vertical transportation, remote elevator monitoring.
- Controls in fire services, fire panels, door and window automation, and fire door operation.
- Lighting controls.
- Access control and security, biometrics.

UNIT- III

- Energy efficiency and services control systems, outside air economy cycle, automated louvers for sun control, electro-chromic.
- Integrated building management systems (BMS), intelligent buildings, and communication protocols used in services control, remote monitoring and management.
- Home automation.
- Appliance control systems.
- Recent developments in services control systems industry.

Course Learning Outcome

1. Understanding of building automation system operator,HVAC automation and controls ,building automation process .
2. understanding of technologies that support the sustainable operation of buildings and ongoing building optimization
3. knowledge and skills to advance in the building technology field.

Reference books/ Text books

1. IS 732: 1989 - Code of Practice for Electrical Wiring Installations.
2. “Electrical Design &Drawing:with estimation and costing”,Surjit Singh, Dhanpat Rai & Co (p) Ltd., 2007.
3. “Lighting Design Handbook”, Lee Watson, McGraw-Hill Inc.,USA, 1990.

4. “Architectural Lighting Design”, Gary R. Steffy, Van Nostrand Reinhold, 1990.
5. “Fundamentals of Acoustics”,Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens and James V. Sanders, John Wiley & Sons; 4th Edition, 2000.
6. “Acoustics in the Built Environment: Advice for the Design Team”, Peter Mapp, Peter Sacre, David Saunders and Duncan Templeton, Architectural Press, 1993.

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR907	Course Name:	RECENT HERITAGE-IX
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To provide a concise overview of the recent built heritage of the 19th .and 20th century and explore the philosophical and technical issues of its conservation.

Course Description

Various issues and practices of Conservation; values and ethics; status of conservation in India and the various agencies involved in the field of conservation worldwide and their policies; various guidelines for the preservation, conservation and restoration of buildings; management of historic sites; study of various charters; character and issues in our heritage towns through case studies; Role of INTACH, UNESCO, ICOMOS and other such Organisation

Course Content

UNIT- I:

Processes and Manifestations

- Definition and scope of ' Recent Heritage'. Need for study.
- Overview of historical development and roots of 'Recent Heritage'. Various social, economic, technological and aesthetic processes that shaped its form.
- Nature of 'Innovations', such as in use of building materials, technology, concepts of production, organization of space, etc.
- Categories and Manifestations (City Planning, Mass Housing, Standardization, Industrial development, Landscapes, etc).

UNIT- II

Technological and Philosophical Issues

- Diversity of expression in geo-cultural regions of the world.
- Problems of Material, Technology, Changing Use Patterns, etc.
- Philosophical questions - Attitudinal and Aesthetical problems; issues of Authenticity; Criteria for valuation, identification and conservation.
- Legal protection; UNESCO AND ICOMOS initiatives.

UNIT- III:

Case Examples

- Literature and/or field studies of various expressions of built Recent Heritage, such as Colonial Heritage, Industrial Heritage, Modem Heritage, etc. Each of these categories can be further analyzed in terms of the cultural and regional nuances of Asian, African, Latin American, American and European perspective.

Course Learning Outcome

1. understand the recent heritage, meaning importance
2. understand the wording of the World Heritage Convention and the World Heritage List
3. understand the relationship between UNESCO and the states parties in the nomination of sites to the World Heritage List
4. understand how recent Heritage is assessed and managed
5. technological and philosophical issues of Heritage.

Reference books/ Text books

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR907	Course Name:	TRAFFIC AND TRANSPORTATION -IX
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To make the students conversant with methods, techniques of traffic & transportation, the socio-economic and environmental issues related to the movement of humans and goods in general and in urban areas in particular.

Course Description

The subject focuses on fundamental principles of transportation systems, introduces transportation systems components and networks, and addresses how one invests in and operates them effectively. The tie between transportation and related systems is emphasized.

Course Content

UNIT-I

- Traffic and urban environment.
- Various kinds of transportation systems with their qualitative analysis.
- Problems encountered in Intra-city transport systems.
- Road accidents: Causes and remedial measures.

UNIT-II

- Traffic control devices.
- Regulation and enforcement.
- Road design elements: Functional classification and alignment.
- Road design elements: Intersections.

UNIT-III

- Traffic surveys: volume, speed & delay, origin & destination.
- Parking surveys.
- Movement of human and goods at the inter-city levels.
- Urban traffic and transport problems.
- Public transport in urban areas.
- Transport policy issues.

Course Learning Outcome

1. Explain key terminologies and principles of traffic management and control in transportation networks.
2. Identify problematic areas in traffic networks and apply analytical techniques to solve traffic management and control problems.
3. Examine the social, environmental and political considerations of traffic management strategies

Reference books/ Text books

1. Traffic Engineering 4th Edition by McShane
2. Principles of Highway Engineering and Traffic Analysis
3. Traffic and highway engineering by garber and hoel

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR909	Course Name:	LOW COST EFFECTIVE BUILDING DESIGN & CONSTRUCTION-IX
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

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

Course Description

Appropriate technologies and cost-effective technologies; technologies as evolved from contexts through the practice of International architects and Indian architects; Systems and techniques developed in research labs, etc.

Course Content

UNIT-I

- An introduction to the subject as also the building processes adopted in different climatic zones of the country, 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

- 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

- Study of usages pattern of low cost buildings by the habitants.
- Comparative analysis of building materials and costing.
- Economy through Planning & Design.

Course Learning Outcome

1. Development of construction technology and innovative techniques as tools to address demand to mass construction.
2. Knowledge of eco-friendly material with their application.
3. Learnt use of locally available material according to their availability and acceptance.

Reference books/ Text books

1. The Invisible Houses: Rethinking and designing low-cost housing in developing countries" by Gonzalo Lizarralde
2. "Practical Yurts: Building and Living in a Low Cost Alternative Structure" by Steven W Hatch
3. Building An Affordable House: A Smart Guide to High-Value, Low-Cost Construction" by Fernando Pages Ruiz

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR910	Course Name:	DISASTER MANAGEMENT FOR BUILDINGS-IX
Total Credit hours:	2	Total contact hours:	36

Course Objective

To make the students understand the various pre & post disaster design and management measures.

Course Description

Disasters, their significance and types; Relationship between vulnerability, disasters, disaster prevention and risk reduction is understood. Inter- relationship between disasters and development; Disaster Risk Reduction (DRR); Disaster Risk Management in India; Disaster Management Act and Policy; Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster; Disaster Damage Assessment; applications and case studies

Course Content

UNIT-I

- Earthquake: Problems & design issues
- General Principles.
- Special Construction techniques.

UNIT- II

- Fire, floods, cyclones, avalanche etc.
- General requirements and principles for building design.
- Special construction techniques.

UNIT- III

- Post disaster problems, issues & management.

Course Learning Outcome

1. Development of understanding of various types of occurrence of disaster and their mitigation through design interventions.
2. To develop understanding of post disaster recovery and rehabilitation.
3. Broad understanding of Disaster Management issues and Awareness related to Disaster issues to be incorporated in Architectural Design.

Reference books/ Text books

1. Natural hazards and disaster management: vulnerability and mitigation" by r b sing
2. "Disaster management and mitigation" by prof r b singh
3. "Disaster mitigation: experiences and reflections" by alka dhameja and pardeep dhameja
4. "Disaster management: disaster management and mitigation approaches in india" by paritosh srivastava

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR1001	Course Name:	THESIS STUDIO-X
Total Credit hours:	**12**	Total contact hours:	**216**

Course Objective

To use and synthesise knowledge of various disciplines in an architectural project of the students 'own choice.

Course Description

This is culmination of undergraduate studies and hence shall display the capability of the candidate to conceive/ formulate a design project and provide solution, aptly demonstrated through supporting research. The main areas of study and research can include advanced architectural design, including contemporary design processes, urban design including urban-infill, environmental design, conservation and heritage precincts, housing etc. However, the specific thrust should be architectural design of built environment. Preparation of presentation drawings, working drawings, detailed drawings and study model are part of the requirements for submission. Submission of the Architectural Design Thesis Project shall be in the form of drawings, project report, models, slides, CDs and reports

Course Content

A. The thesis project will comprise the following

- An illustrated report, which will include the validity and scope of the chosen project, methodology, prototype studies, site analysis, client's and architect's briefs, delineation of programme and design criteria.
- A fully worked-out design proposal including consideration of site planning structures, services, and any other aspects/specific tothe project.

B. Stages of Work

- Approval of project:
  - The intent of the thesis project as well as the criteria for selection of the project will be introduced to the students around the 16th week of the previous semester, i.e. 9th Semester B.Arch.
  - Before the closing of the 9th Semester, students will submit brief write-ups on three projects out of which one will be approved.
- Rough Report: comprising all analytical aspects of the project including the synopsis, library studies prototype studies, site analysis, delineation of building program, etc.
- Evolution of Design, to be worked out in a minimum of four stages.
- Draft of Final Report, including Evolution of Design
- Final Report, drawings and model, to be evaluated through a University Examination.

Notes:

1. Students will submit two copies of the final report (original and one photocopy) on a standard format prescribed in the thesis programme issued every year by the Thesis Coordinator.
2. The report must also include A-4/A-3 size copies of all final drawings and at least two photographs of the final model/models.
3. The original copy of the report, the final drawings arid models will be returned to the student after the declaration of the result. The photocopy of the report will be retained for reference in the college library.

C. **Schedule of submissions/examination**

(Note: Commencement of the semester is considered as 0 week)

Stages of Work			Time allocated	Max. Marks
1.	Sessional Work			
(a)	Rough Report			
	i)	Introduction topic finalization	1 week	-
	ii)	Synopsis	2 week	25
	iii)	Preliminary Library studies	2 weeks	25
	iv)	Site analysis, Prototypes additional library studies	2 weeks	100
s(b)	Evolution of Design			
	i)	Design Criteria and Concept	2 week	50
	»)	Design Proposal Stage-I	2 week	50
	iii)	Design Proposal Stage-2 (incorporating structures & services)	2 week	50
(c)	Pre-final Design		2 weeks	150
	Draft Final report (Incorporating improvements suggested in Rough Report, Design Criteria and explanatory sketches of Evolution of Design).		1 week	50
2.	External Examination		-	500
	Total		16 weeks	1000

NOTES:

- Students are required to submit the Final Report, all final drawings and model/s in the standard format prescribed in the Thesis Programme.
- Submission will be made one day before the date of examination.

D. **Teaching and evaluation system**

1. The thesis studio will be conducted under the overall coordination of the Thesis Coordinator. In addition, two members of the Visiting Faculty would also be associated throughout the duration of the studio. Each student will be assigned a Thesis Guide (from amongst the faculty) who will supervise the progress of the student's work on a regular basis.
2. The Principal, the Thesis Coordinator and the concerned Thesis Guide will do approval of the thesis project/topic.
    a. All stages of sessional work will be evaluated jointly by the Principal and the entire studio team (Thesis Coordinator, Visiting Faculty members and the concerned Thesis Guide).
    b. Jury for the External Examination will comprise the Principal, Thesis Coordinator, the concerned Thesis Guide and two External Examiners appointed by the Noida International University.
    c. Marks awarded at each stage will be based on the average of those awarded by all jury members. The decision of the Principal will be final in case of dispute/discrepancy.
    d. Students will be required to attend weekly reviews for their sessional and attendance.
    e. In view of the practical and creative nature of the thesis projects, the presence of the candidate at the viva voce examinations at all the prescribed stages shall be mandatory. If the candidate fails to appear in the viva voce examination at any stage, the thesis project submitted by him/her shall not be accepted
    f. Candidate who fails to clear the thesis examination either in the periodic assessment or in the final examination can only be allowed to reappear with the regular batch of thesis students in the next academic year.

g. Students, who fail to obtain pass marks in the periodic assessment, shall be required to change their thesis project.

Course Learning Outcome

1. To use all the skills acquired in the duration of preceding academic courses.
2. Methodically self-direct effort by choosing the project of choice, builds capacity to work independently and methodically in a variety of intellectually and professionally demanding contexts.
3. Learn to make an original and individual, creative contribution to the academic discipline and/or the professional field in some cases.

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	External Viva
40%	-	60%		**500**	**500**

Course code:	BAR1002	Course Name:	CAREER DEVELOPMENT AND PORTFOLIO-X
Total Credit hours:	**4**	Total contact hours:	**72**

Course Objective

The objective is to prepare students for professional field and create awareness about higher education prospects.

Course Description

Introduction to entrepreneurship; leadership skills and self-motivation; marketing and finance management; starting a small business; future-oriented design principles to increase the design organization‘s innovative and competitive qualities; Sustainability; Risk-taking; Job procurement; Employee management; marketing; Social entrepreneurship and its relevance to the practice of architecture.

Course Content

UNIT-I

- Sessions to educate students about career prospects in diverse architectural fields.
- Preparing students for interviews.
- Personality development.

UNIT-II

- Creating awareness among students with respect to higher education.
    - Higher Education in India.
    - Higher education abroad.

UNIT-III

- Teaching skills for portfolio making.
- Portfolio compilation.

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

Course Learning Outcome

1. Clarify their values, interests, strengths and skills
2. Gain experience and insights through site visits, job shadowing and internship
3. Identify and use relevant tools in the job search, including activating professional networks
4. Understand and plan for future educational pursuits (graduate school, professional credentials, professional development, etc.)
5. Knowledge of portfolio for relevant field job and higher education.

Assessment method: (Continuous Internal Assessment = 100%, Final Examination =

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	N.A.	Sessional work	Examination
100%	-	-		**100**	No Exam

Course code:	BAR1003	Course Name:	CONSTRUCTION MANAGEMENT-X
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To make them understand the concepts of Project Management for planning to execution of projects, also understand the feasibility analysis in construction management and network analysis tools for cost and time estimation.

Course Description

Project management concepts–objectives& scope, planning /monitoring and control, scheduling / Quality and cost; Traditional management system; Development of bar chart; Critical Path Method networks- Merits and Demerits; Program Evaluation Review Technique network, theory of probability and statistics; Cost model and cost optimization; resource allocation-resource smoothing, resource leveling; Project Feasibility study, Real estate and regulatory strategies, Facility Programming & Planning, Design management, Engineering Procurement Construction, Testing and commissioning.

Course Content

UNIT-1

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

UNIT-II

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

UNIT-III

- Project management for repetitive type 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.

Course Learning Outcome

1. Understand terminology of construction management and role of architect.
2. Understand various toolsa and techniques apply in comstruction management
3. Apply knowledge, techniques, skills, and tools of the construction industry in construction activities;

Reference books/ Text books

1. Building Construction & Materials, S.C. Rangwala
2. Building Construction, Mackay WB Vol. 1-4
3. Construction Technology, Chudley Vol. 1-6
4. cpm in construction management james j o'brien and fredric l plotnick.
5. project management for facility constructions a guide for engineers and architects alberto de marco.
6. project management in construction by dennis lock.
7. construction project management : planning and scheduling by henry f.w. naylor.

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR1004	Course Name:	SUSTAINABLE ARCHITECTURE - X
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To make the student understand the importance of natural resources & their use in building construction and maintenance as well as to make optimal use of the resources through various technique.

Course Description

Natural systems; Complex relationships between the built and natural environments; Impact of pollution on natural and man-made environments; Strategies to transform the built environment to meet the risks of climate change; Biomimicry - the study of natural structures and processes- in helping to solve man-made problems and enabling design; Concepts of urban ecology and landscape urbanism; case studies; integration of Renewable Energy Systems in built environment

Course Content

UNIT-I: Global warming - Reasons.

- Sustainable Development and various Dimensions (Economic, Social & Environmental) viewpoints.
- Role of Architects in sustainable Development.

UNIT-II: Concepts in sustainable Development

- Sustainable Construction
- Ecological Building
- Green Building & Ratingsystem
- Environmental Arch.
- Carbon Credits & Rating System.

UNIT III: Issues in Sustainable Development

- Energy
- Resources - Water/Earth/Air
- Materials - Production anduse
- Water
- Quality of indoor/outdoorenvironment
- Site (Topography/Air-condition/surrounding).

UNIT -IV: Design Strategies

- Process and Assessment
- Solar Passive
- Lesser consumption of resources (optimization ofresources)
- Climate responsive
- Recycling/Reuse
- Life Cycles assessment
- The basics of sustainableDesign
- The Luminous Sonic

UNIT V: India‘s approach to sustainable Development.

Course Learning Outcome

1. Know the background and understand the reasons for a more sustainable development of the built environment
2. Know alternative energy systems that could be applied in different building typologies
3. Identify and develop technologies for optimizing the building's environmental performance
4. Recognizes environmental challenges behind an extensive development of the built environment

5. Know alternative green building concepts, recognizing their qualities and limits in lowering environmental impact

Reference books/ Text books

1. Gray, O., Robinetle, "Landscape Planning for Energy Conservation", Van Nostrand Reinhold, New York, 1984.
2. Geiger, R. "The Climate near the Ground" Harvard University Press, Cambridege, Massachusetts, 1965.
3. McPherson, E. G. "Energy Conserving site Design" American Society of Landscape Architects, 1984.
4. MEBsh, W. M., "Landscape P

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR1005	Course Name:	LANDSCAPE DESIGN-X
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

This course is aimed at providing a comprehensive knowledge regarding ecological aspects and environmental concerns in landscape design.

Course Description

Man and Nature; Landscape traditions; Elements and principles of landscape design; Aspects of outdoor design and site planning in enhancing and improving the quality of building environs, functionally and aesthetically; Site structure relationship; Analytic, artistic and technical aspects of designing open spaces at different scales; Role of Landscape design in sustainability; Overview of ecological balance; Impacts of human activities and the need for environmental protection and landscape conservation.

Course Content

UNIT-I

- Introduction and historical backdrop of the evolution of landscape design as a process of interface between Man and Nature.
- Introduction to ecology and its importance to Landscape Designers.
- A brief history of gardens world over - and their relevance in their time, context and social needs.
- Advanced knowledge of basic elements of landscape such as earth, rock, water and vegetation, in the context of their environmental aspects and concerns.

UNIT-II

- Site analysis and site-structure unity.
- Environmental Impact Assessment techniques.
- National environmental policy and Bio-diversity significance in urban areas.
- Basic knowledge of contour/mapping and various methods of documentation of physical features, topography and landscape elements.

UNIT-III

- Contemporary landscape design work/projects in India.
- Case studies of varied urban situations with typical different landscape characters in and around Delhi-NCR region to analyse 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.
- Expert lectures/workshops be organized.

Course Learning Outcome

1. Demonstrate knowledge of fundamental concepts and ideas in the field of landscape architecture.
2. Understand relationship of built environment and ecological balance
3. Gain sensitivity to the natural, visual and cultural features of a site and learn how they provide opportunities for and constraints to the use of the land
4. Knowledge of various landscape design in india and their contextual relation.
5. Aware of various environmental polocies.

Reference books/ Text books

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380013,
3. Panich & Trulsson: Desert Southwest Gardens.
4. Lyall Sutherland: Designing The New Landscape. London, Thamas & Hudson, 1997.
5. Time Saver Standards for Landscape Architecture, Charles W Harris and Nicholas T Dine Mcgraw –

Hill International Edition, Arch. Series

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**

Course code:	BAR1006	Course Name:	ARCHITECTURAL PHOTOGRAPHY-X
Total Credit hours:	**2**	Total contact hours:	**36**

Course Objective

To familiarize students with the basic skills of photography for use in architecture, and related fields like, landscape design interior design both as a tool of documentation and aesthetic interpretation.

Course Description

Photography has become a tool to strengthen the understanding of architecture, to highlight aesthetic and design ideas and to critically interpret the space, architectural photography and the photography of urban space, both in relation to their historical roots and contemporary practice. this offers a perfect environment to develop one's artistic talent while learning the art of photography and discovering the secrets

Course Contents

UNIT-I

- Nature, history and scope of photography.
- Various applications of photography.
- Creative composition in photography.
- Architectural photography and its role in documentation and creative design process.
- Various types of cameras and films.

UNIT-II

- Components of 35 mm SLR camera.
- Various types of lenses for 35 mm cameras and their uses/applications.
- Other camera accessories.
- Medium, format and large format cameras and their special uses.
- Digital cameras and their usage.

UNIT-III

- Laboratory demonstration of developing and printing of black and white photography.
- Field assignments in groups of architectural photography, interior and landscape photography work both in colour and black and white mediums.
- To document and interpret as aesthetic expression - various subjects of photography such as buildings, landscapes and interiors.

Course Learning Outcome

1. Have improved their ability to express their ideas clearly through their pictures.
2. Have improved their understanding of the opportunities to independently produce photographs in a broad range of styles.
3. Have developed a sensitivity to the importance of light and composition in creating a photograph.
4. Have worked towards a cohesive body of work to be shown in the final exhibition and final critique

Reference books/ Text 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

Assessment method: (Continuous Internal Assessment = 40%, Final Examination =60%

Continuous Assessment			Exam Duration	Maximum Marks	
Class Assignments	Mid Term	End Term exam	2 hrs	Sessional work	Examination
20%	20%	60%		**25**	**25**