

## Semester Pattern Syllabus for II Year , III Year and IV Year - B.Arch

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#### BACHELOR'S DEGREE COURSE IN ARCHITECTURE

##### PREAMBLE

In the Academic Council meeting held on December 9, 2010 under items Prof. Manoj Mathur stated that syllabus still needs lot of changes to be incorporated and revised syllabus will be presented in next meeting of AC

Referring the Council of Architecture norms which have been supplemented in 2008, major changes are expected in near future, which may lead to eight semesters of teaching and one year of practical Training after eight semesters.

In view of such scenario it was decided that that syllabus of B. Arch course be revised only after said issues have been settled and be continued with existing syllabus for year 2011-12 with following minor changes

1. The rules of Examination as approved by EC on 16<sup>th</sup> December 2009 to replace the rules presently written in existing syllabus to be applicable from session 2011-2012.
2. The exams to be held at the end of each semester instead of end of year. Hence the subject names are marked with semester number instead of year number.
3. No changes in subject except the flexibility in studio themes of semester 7 (Housing) and 9 (Urban Design) introduced by given subject options from themes like: energy Conscious Architecture, Interior Design, Product Design, Building Management Landscape etc. In addition to Housing and Urban Design to enable student to pick their areas if interest.
4. The Council of Architecture also stipulates that maximum student in each class to be 40. In view of that three sections to be made for classes having more than 100 students.

##### OBJECTIVES

The Bachelor of Architecture Degree programme prepares students for professional practice in the field of Architecture. Being an undergraduate programme, it has a broad scope, providing exposure to a variety of interests in this field and assisting students to discover their own directions for further development.

There is increasing recognition today of Architecture as an intellectual discipline, both as art and as a profession. Architects make a vital contribution in the shaping of our environment and society, in the design and technology for a diverse range of situations, both in the rural and urban contexts. In India, we have further complexities of different social, cultural, geographical, economic and technical nuances which are unique and typical of every region in our country.

It is the appreciation of this over-changing context that the architect must bring to bear of his work. This demands appropriate skills, understanding and knowledge and a deep commitment to professed ideals. Addressing Architectural Design as a comprehensive creative process, this programme is based on the following broad intentions:

- To stimulate sensitivity and unveil creative talents.
- To reinforce intellectual capabilities and develop proficiency in professional skills to enable graduates to competently pursue alternative careers, within the broad spectrum of architecture.
- To provide opportunities to students to try out the role they will eventually play as responsible members of society, under supervision and interactive guidance.

The program aims at attaining a high level of excellence in Architectural Design. To this end, the design course is seen as the core of the programme with supportive inputs from courses in other streams viz., the Humanities, the Technological and the Professional, built upon a strong foundation of enabling skills in communications and data processing. The emphasis is on the development of faculties of discernment and decision-making with the aid of both objective information and subjective attitudes, based on reason.

Given the complexities of present-day design projects, the architect's role is that of a team Leader and coordinator of the input of specialists in various specific disciplines. He needs to possess a sound knowledge of all aspects of modern building technology to be able to draw up an integrated framework for activities of the other members of the team, to direct them and to assume overall responsibility for the collective effort. This is manifested in the courses in the Technological and professional streams.

## RULES OF EXAMINATION FOR THE BACHELOR OF ARCHITECTURE

The rules of examinations shall be as approved by the EC on 16<sup>th</sup> December, 2009.

## EXTERNAL JURY SUBJECTS

### DESIGN/THESIS STUDIOS/BUILDING CONSTRUCTION/LABORATORIES

Subjects

Bachelor of Architecture

Architectural Design I, II, III, IV, V, VI, VII, VIII, IX, X

Exam

Graphics I and II Exam.

## Building Construction IV

### LIST OF COURSES

DESIGN STREAM	Architectural Design	AD-1, AD-2	IE
		AD-3, AD-4	
		AD-5, AD-6	
		AD-7, AD-8 (Training)	
		AD-9, AD-10	
	Theory of Design	TD-2	
		TD-4	IO
		TD-5, TD-6	
TECHNOLOGY STREAM	Building Construction	BC-1, BC-2	IE
		BC-3, BC-4	
	BC-5, BC-6		
	BC-7		
	Advanced Building Technology	BC-9	IO
	Theory of Structure	TS-1, TS-2	IE
		TS-3, TS-4	
		TS-5, TS-6	
		TS-7	
	Building Science & Services		
	Climatology	BS-2	
	Water & Waste Mgmt.	BS-3	
	Electrical Instals	BS-4	
	Lighting & Acoustic	BS-5	
	Ventilation, Commun. & Security Systems	BS-6	IE
	Integrated Energy Mgmt.	BS-7	
PROFESSIONAL STREAM	Building Management		
	Surveying & Leveling	BM-1	IO
	& Contracts	BM-5 BM-6	IE

	Quantities & Estmn.	BM-7	
	Building Economics	BM-9	IO
	Project Management		
	Professional Practice	BM-10	IE
HUMANITIES	History of Architecture	HA-3, HA-4	
		HA-5, HA-6	IE
	Theory of Settlement	TP-3	IO
		TP-5, TP-6	IE
	TP-7	IE	
	Art Appreciation	AA-3, AA-4	IO
ENABLING SKILLS	Mathematics	XM-1	IO
	Graphics & Communication	XG-1, XG-2	IE
		XG-3, XG-4	IE
	Computer Applications	XC-1, XC-2	IE
OPTIONS	Electives	XE-7	IO
		XE-9	IO
	Project Report/Seminar	PRX	IO
		SRX	IO
	Architectural Thesis	ADT	IE

## COURSES OF STUDY

### 1. ARCHITECTURAL DESIGN

Architectural Design is the central discipline of the programme. The Design studio is the area where the students apply their knowledge and develop design skills while testing out the theories and methods learnt in other courses in the Humanities, Technological and Professional streams. The students will endeavour to acquire an understanding of the determinants of the built form such as social imperatives, environmental concerns and the craft of building. They will review experiences from their own immediate and personal environment as well as the values and perceptions of other people involved in the process of design viz., the user, the client and the public at large, Derivation of concepts and strategies will then lead to a deliberate response in the shape of a specific design proposal with the help of organisational and communicative skills.

The study of Architectural Design is seen as a cumulative process where the experience of the previous year is used as a base for increasing the depth and breadth of knowledge and development skills in the following year. The range of design problems shall include projects of progressively increasing complexity from a simple rural habitat to multi- use urban mega-structures.

Each Architecture Design Course upto the Third Year shall include both major problems (fully developed schemes) and short problems (Time problems or sketch designs).

At least one short problem shall be a six-hour design test on a topic unrelated to the major problem, but of a similar level of understanding. This is to encourage students to hone their skills and invigorate their creative faculties to come up with quick, intuitive responses to 6 difficult situations, as happens in the real world. A part of the design programme in each term will be allocated to the development of a particular aspect of design, consistent with the inputs in other subjects. The internal assessment in this subject shall be on basis of the distribution of credits as follows:-

- 70% of the marks for internal assessment shall be allotted to the major Design Problem.
- 20% marks shall be allotted to short problems which may or may not be related to the major design problem but which address any of the specific aspects of design such as structures, services, history, economics, management etc. as theoretically dealt with the other concurrent courses.
- 10% marks shall be allotted to the Design test.

At least one of the major design problems in an academic year, in either term, may be a group design exercise wherein students may take up detailed design of a part of a larger problem to produce a consolidated design solution. This will help students to acquire deeper understanding of smaller areas and also promote the collaborative rather than the competitive aspect. Courses in Design Theory will run concurrently with studio courses at every stage, various aspects of the design problem shall be dealt with lectures, group discussions and library research so as to provide the necessary philosophical and attitudinal background to a rational design approach.

The studio programme of various design problems shall be set well in advance of the commencement of the terms by the studio Director in close consultation with the other subject teachers to ensure that exercises in other subjects are directly relevant to the

studio problem as far as possible. The content of the exercises and criteria of assessment shall be ascertained and discussed with the students before taking up the problems. Vertical integration with problems in other years shall be encouraged to induce multiple interactions within the student community at all levels and between the students and the faculty as a whole.

The courses AD-1 through AD-6 shall run in sequence beginning in the first term of First year and ending in the second term of Third year. Thereafter the courses AD-4 and AD-5 shall run in sequence in the second term of Fourth Year and first term of the Final Year. The Architectural Thesis is to be taken up after these two sequences, set to an independent and flexible time schedule.

## Stage I

Problems related to the understanding of the elements of architectural design, concepts of space and form and their perception.

AD-1 Parameters of design, Anthropometrics, human activity and the use of space, Interrelationship of Architectural space to form, structure, and materials and to nature as a contextual setting.

Synthesis of observations in the study of a given space through elementary measured drawings, sketching & photography. Design of a basis shelter, an architectural form with a specific function.

AD-2 Design of a simple building in the immediate or observable environment. Exercises relating personal experiences to behavioral needs and translating them into architectural program requirements. Systematic introduction to issues related with the design of human habitat, its components and space standards.

Element of site-planning and landscaping. Interpretation of site information as a decision-making aid. The design of the environment outside the building. Problems aimed at drafting and presentation skills in the 2-D format.

AD-3 Design of a simple building for public activity in a non-urban setting, or a situation without urban regulatory controls. Introduction to other role players in the Architectural process viz., the client and the user. Appreciation of the non-personal view as a process resources. Study of the social and physical

environment & methods of construction in vernacular architecture, emerging out of the traditional way of life of the people in a given place including topographic survey. This may be a village or part of a small town.

Design of a group of building and ancillary, set in the context studied in ADS-3. Introduction to concepts of shared open space, clustering, community, aggregation and economy. Emphasis will also be laid on site planning. This shall be a group design exercise with each member handling a different aspect or a different portion of the total problem. Problems aimed at drafting and presentation skills in the 3-D format.

AD-4

This course shall be fully integrated with the building construction studio with the objective of producing basis working drawings of one or more of the designed buildings upto two storeys. Emphasis shall be laid on clarity of details and architectural expression in functional and constructional elements.

Design of a multi-functional public building in the urban setting. Introduction to urban development, controls, codes and bye-laws. Exercises in articulation and manipulation of programmed needs, Design methodology, criticism and evaluation of alternative concepts. Study of an urban environment in use. Urban activities, services and construction methods, and phenomena of social utilizations, growth and change shall be the focus of the study.

AD-5

Design problems on the design of closed environment, with emphasis on the articulation of interior spaces, detailing and finishing materials, textures, colour and light, acoustics and air-conditioning. Exterior spaces formed by buildings, Elevations, fenestration and built form as a moderator of urban space, site planning and landscaping. The problems may be set in the context studied in ADs 5. Working drawings related to one or more aspects studied above with a view to understanding structure and services related to buildings of 3 to 5 storeys and the implications of specifications on the quality and cost of the final architectural product. This course shall be integrated with the building Construction studio. This may be group efforts in a simulated a real-time situation.

AD-6

## Stage II

The flexibility in studio subjects of semester 7 (Housing) and 9 (Urban Design) to be looked into by giving subject options from subjects like: Energy Conscious Architecture, Interior Design, Product Design, Building Management, Landscape etc. in addition to Housing and Urban Design to enable student to pick their areas of interest.

AD-7 The brief would be as per the area of study as suggested above. E.G. Housing: Design problem involving a high density, large scale housing, Socio-economic determinants, Legislative and economic constraints and technological alternatives shall be studied in detail. Exercises in simulation and conceptual modeling shall be conducted. Application of concepts of community participation, phasing, financing and construction planning.

Project documentation including basic working drawings, preliminary estimates, outline specifications and scheduling aimed at comprehensive understanding of the implementation process.

The brief would be as per the area of study as suggested above.

AD-9 E.g. Urban Design: Design of a multi-functional complex of buildings in the metropolitan context. Issues related to the growing problems or urban areas in third world countries their future development shall be explored. Emphasis on the design with relation to the contextual environment, traffic and Planning controls and impact analysis.

An understanding of the architectural implications of such development scheme should lead to insights in the formulation of political and administrative policy. Preparation of analytical report of a high order and innovative presentation of final design proposals will be insisted upon.

ADT The Architectural Thesis is the culmination of the development of the student's knowledge, attitudes and skills over the course of studies in architecture. It is an occasion for exercising conscious choices in the field based on the students personal abilities and inclinations, and for testing out his commitment. The student, in consultation with the faculty, is expected to demonstrate through an imaginative approach, his expertise in effecting positive changes in our built environment.

#### THEORY OF DESIGN : Stage I

The courses in Design Theory aim to evolve a conceptual frame work for intelligent appreciation of architecture and to develop a vocabulary for discussing design ideas. The structure of the courses consists of set of lectures and prescribed reading followed by group discussions and seminars.

TD-2 The genesis of indigenous architecture, its geographical and cultural sign posts. Evolution of ideals and design principles in modern architecture. Influences governing the formation of attitudes as a prelude to the act of



- design. The translation of design ideas into architectural expression.
- Architecture as a socially useful discipline. The concept of measuring, function, style, type, social purpose and ideology, The relationship of architecture to the sciences, arts, economics and politics. Study of selected writing, and buildings in monumental and vernacular scales. Man-made design at all levels including objects of daily use.
- TD-4
- Design Methodology :- Design as a multi-variety problem solving process. Theories of Program and Function, thinking techniques, information processing and research methods, generators of creativity, design matrices and system integration.
- TD-5
- Design Evaluation and Criticism: Value judgments in design, Appreciation of designer's skills, theories of perception and variability of perception. Theoretical issues in contemporary architectural thought, Seminars on the works of selected Indian and International architects and related topics.
- TD-6

## BUILDING CONSTRUCTION

This course is designed to expose students to the process of building construction, the components of buildings and the materials, skills and equipment used in shaping them. The emphasis is on familiarisation by direct handling and observation, Students shall be encouraged to acquire a taste for good workmanship and quality products.

The course is visualized as having three essential components viz. a lecture course in materials and methods of construction, a building workshop which may be conducted within the School and at specific venues outside and a construction studio wherein principles and practices shall be applied to the production of meaningful working details and drawings. The construction studio will be integrated with the Architectural design studio wherever possible.

### Stage I

- Historical evolution of building material and Construction method. Introduction to primary building elements, walls, peirs, foundations, roofs, bricks, stone and block masonry their properties and manufacture. Studio exercises in brick bonding foundation details, wall details upto plinth level. Workshop in brick laying, setting- out, mudblocks, etc.
- BC-1
- BC-2 Introduction to secondary elements door, windows, railing and sunshades etc.

timber sawing and seasoning, timber products, roof tiles, and sheets, studio exercise on door and window details, timber trusses and miscellaneous joinery, workshop, in carpentry and joinery, fixing of frames in masonry, simple wall and floor finishes.

BC-3 Introduction to specialized elements such as staircases, built-in-furniture, show windows, sliding and folding doors, paneling and external paving, gets, grills etc. Studio exercises related to metal windows, partitions, mezzanines and cabinetry. Workshop in steel welding and forging, shuttering, bar bending and concreting, painting and laminating.

BC-4 Investigation of materials, techniques and details related to vernacular architecture as studied in AB-3. Exploration of alternatives. Studio programme to be integrated with AB-7. Workshops in appropriate and innovative materials and construction at various research institutions and building centres.

BC-5 Introduction to the problems of large scale industrial, commercial and institutional buildings such as basements, large span roof, rooflights, false ceilings and floors, cavity walls curtain walls and renovation and strengthening of existing structures. Studio exercise related to industrial structure comprising of some of the above components, workshop on shoring, underpinning, dewatering, waterproofing, erection and cladding.

BC-6 Investigation of hi-tech material and technologies related to interior finishing and detailing, exterior finishes etc. Studio Programme to be integrated with AD-6. Workshop on sanitary and plumbing installations, finishing works.

## Stage II

BC-7 Studio programme integrated with AD-7. Production of a set of detailed working drawings.

BC-9 Advanced Building Technology. Introduction of pre-stressing, prefabrication & systems building. Jointing, tolerances and modular co-ordination. Mass production, transportation, storage and handling of materials. Characteristics, performance and application of mechanized construction equipment. Advanced vernacular construction techniques.

## THEORY OF STRUCTURES

The objectives of the course is to develop is the students a feel for structural principles and they relates to building design. Essentially, the students should be able to conceive structure as a system that forms space and that architecture and structures cannot be conceived independently. In current architectural practices, structural engineering is a specialist discipline. The architect therefore should be able to appreciate his consultant's concerns and make an informed choice regarding the most appropriate structural system for his building. He should have a reasonable understanding of its operational and economic implications.

The course is visualized as having three essential components viz., a lecture series introducing concepts, a studio in which those will be applied in demonstrative exercises to determine elements and preparing drawings for the same, and laboratory studies for testing of structural material and systems models.

### Stage-I

TS-1 Concept of direct force mechanism in structures, tension and compression. Equilibrium of forces, concept of structure and tie. composition and resolution of forces. Concept of loads as forces, response as deformation, stress and strain, Hook's Law. Concept of Euler's load, phenomena of buckling, short and long columns, masonry walls and piers, and design using slenderness ratio and monogram method.

Laboratory verification of Booke's Law destructive testing of brick and brick-mortar combinations. Study of models using ties, struts and membranes only.

TS-2 Concept of direct force and bending mechanism. Concept of force applied as displaced from the point of support. Bending moment and shear force. Behaviour of homogeneous material in response of direct and bending forces. Theory of simple bending and principles of super-position, distribution of shear and bending stress.

Beam as a structural element. Design of steel and timber beams. Concept of compound stresses as material response to a set of applied forces. Analysis and design of masonry structures subject to direct and bending forces.

TS-3 Concept of arch, vault and dome as direct stress members alimenting bending. Development of advanced arches that take direct forces and

bending also. Design and drawings of simple trusses in steel and timber, riveted, welded and bolted joints. Laboratory studies in truss design and model formation, and testing to failure.

TS-4 Concept of behavior of heterogeneous materials in direct force and bending. Elastic Theory, Ultimate Load Theory. Design of RCC beams, columns, slabs. Introduction to pre-stressed concrete structures.

Laboratory testing of concrete samples and RCC beams.

TS-5 Concept of Structural indeterminacy and its application in structural system development. Soil mechanics, soil bearing capacity. Design of continuous structures in steel and RCC. Foundation Engineering. Design of foundations in RCC, piles and rafts, retaining walls.

TS-6 Principal considerations for structural analysis. Methods of analysis. Complex and composite structures. Design of continuous beams in steel and RCC. Design of complex girders and box girders. Behaviour of structures under wind and seismic loads.

## Stage II

TS-7 Structure System Studies, Synthesis of force systems to create structure systems Vector active, surface-active and built-active systems. Shells and folded plates, Vierendeel Trusses, Space structures, High-rise and large-span structures. Pre-stressing and post-tensioning.

## BUILDING SCIENCE & SERVICES

The objective of the course is to provide a wide exposure to environmental support systems as they apply to human habitat. The subjects covered shall be under two basic aspects of (i) climate and environmental control and (ii) water and waste management. These will be studied as areas of energy consumption, with special emphasis on alternative and appropriate methods of energy use and its conservation through innovative operational management.

The course will be supported by a theoretical background of environment, ecology and human settlements as studied in Theory of Settlements courses TP-3 and TP-6. Integration with the workshops in Building Construction will be sought at various stages.

## Stage I

- BS-2 Climatology and Thermal Control. Global climatic factors, thermal comfort, heat gain and loss, u-values for walls and roofs, solar geometry, shading devices, solar heating and cooling, passive systems.
- BS-3 Water and Waste Management. Water resources, collection, processing and distribution, internal hot and cold water supply. Domestic plumbing and sanitary fixtures. Waste and sewage disposal systems, storm water drainage. Sewage and effluent treatment, septic tanks, sewage systems for a small project. Solid waste treatment.
- BS-4 Energy Systems and Installations. Thermal, mechanical and electrical energy and its generation, properties and applications. Electrical distribution systems and safety devices, internal wiring, loads, demand, tariffs and rules. Electrical equipment and appliances, Solar-powered appliances, photo-voltaics, wind and wave energy. Fossil fuels, natural gas and bio-gas.
- BS-5 Lighting and Acoustics. Day lighting, Indian design sky and calculations based thereon, artificial lighting, illuminance and glare, lighting systems, design and choice of luminaires, architectural lighting and special effects. Basic acoustical concepts, sound insulation and transmission, absorption, reverberation time, noise control and attenuation.
- BS-6 Ventilation, Communications and Security Systems. Principles of air-cooling and air-conditioning, their implications on architectural form and details, systems and equipment. Lifts, escalators and conveyors, inter-communication, monitoring devices, fire protection and alarm system.

## Stage II

- BS-7 Integrated Energy Management. The energy crisis, renewable & non-renewable energy sources. Waste recycling, energy recovery techniques, integrated systems for non-potable water supply and sewage treatment, scavenging. Social forestry, fodder and the nitrogen chain, strategies and technological for a developmental needs, incremental extension of urban services and their management.

## BUILDING MANAGEMENT

This course deals with the entire gamut of activities concerned with the implementation process subsequent to the preparation of the design and

construction drawings. The sequence shall begin with the framing of work specifications and progressively lead to concepts of scheduling construction management and project planning.

### Stage I

- BM-1 Surveying and Leveling Tools and equipment for land surveying. Interpretation and preparation of contour maps. Exercises in layout of buildings and checking the same at site.
- BM-5 Specifications & Contracts. Methods of specification writing, typical space for building works, implications of variations and incomplete specifications, impact on building costs. Types of contracts, tenders, relative merits, general conditions and commercial terms. Studio exercises related to specifications for a small building project. Standard CPWD specifications, Scheduled and Non-scheduled items.
- BM-6 Quantities & Estimation. Types of areas, types of estimates, methods of taking out quantities, modes of measurement, preliminary and detailed estimates, plinth area rates and cost indices, rates of labour and material, rate analysis, CPWD schedule of rates.
- ### Stage II
- BM-7 Building Economics, Fundamental economic concepts and analysis, cost control, cash-flow analysis, cost projections, cost-benefit, financing, feasibility, Estate investments and returns, rentals, easement, valuation, law relating to properties and buildings.
- BM-9 Introduction to Project Management. Project Planning, feasibility studies, project report, project financing, Project organisation, process and structure and personnel selection, responsibilities of the project manager. Project implementation, Site investigations, layout, site organisation, networking techniques, PERT/CPM, LOD, time-cost analysis, value engineering, Project monitoring, cost control, manpower management, safety and labour laws.
- BM-10 Professional Practice. The Architects' Registration Act. The architect and his office. Relationship with clients, consultants and contractors. Legal responsibilities. Code of Professional Practice Fees, Agreements and Contracts, negotiations, arbitration and Architectural competitions. Building Codes and regulations. Building Permit. Presentations, business management, sales promotion, human relations and personnel management. Efficiency studies and performance appraisal, billing, accounting,

correspondence, information storage and retrieval.

## HISTORY OF ARCHITECTURE

The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation. The importance of the timelessness of architecture shall be emphasized. Students shall undertake a chronological study of world architecture with emphasis on the Indian sub-continent and a comparison of the different stages of developments in India and other parts of the world. The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc. The course shall include sketching and understanding of historical buildings, historical analyses and measured drawings.

### Stage I

HA-3 Indus Valley civilization and the early Aryan architecture of the Ganges valley, Vedic planning principles. Study of the architecture of the Chinese, West Asian, Egyptian, Greek, Roman and Latin American civilization. Buddhist architecture in India and abroad.

HA-4 Early Hindu temple forms, regional nuances and growth of temple cathedrals. Hindu architecture outside India. Development of Christian architecture including Early Christian, Byzantine, Romanesque and Gothic. The development of Islamic architecture in the west.

HA-5 The advent of Islam into India, Architecture of early Islamic Delhi and the regional variations. Influences of Islamic ideas on secular and religious architecture in India. The Mughal period in India, Renaissance in Italy, the spread of renaissance and Baroque in Europe.

HA-6 Architecture of the Industrial Revolution in Europe and the Revival styles. Colonial architecture, Lutyens's New Delhi. Introduction to Modern architecture, Post- Introduction to Modern architecture, Post-Independence Indian architecture upto contemporary times.

## THEORY OF SETTLEMENT PLANNING

The courses aims at familiarizing the student with the social, economic and

organizational perspectives at the national, regional and local levels as a context in which his architectural product is likely to be placed. This will also provide the necessary background for making informed choices for further studies in related specialized disciplines. Special reference to the problems of urbanization in India, and global environmental concerns.

#### Stage I

TP-3 Sociology. Man, Environment & Sociology. Rural society, village community, traditional patterns and trends of change. The concept of social stratification, urbanism, urbanization and modernization. Concept of social structure, cultural and social institutions. Distinctive nature of a sociological approach. Relationship between social structure and spatial structure.

TP-5 Introduction to Settlements. Historical survey of the city as an architectural form, and as an expression of the vitality of a civilisation. Comparative study of the origin and growth of settlements. River Valley Civilisations. Principles of settlement planning in ancient Greece, Rome and India. Medieval towns in Europe and India.

Renaissance city planning. Colonial urbanization. Industrial revolution and planning theories of the nineteenth century.

TP-6 Urban Planning. On-the-spot study of an existing settlement. Contemporary problems of settlements, Current theories on physical planning. New towns and cities. Environmental impact of planned and unplanned growth, regional linkages, indigenous life support systems in rural India. Natural eco-systems and interdependence of systems in the biosphere. Rural housing problems and policies.

#### Stage II

TP-7 Housing and Urban Development. Social-economic aspects of urban housing and problems of slums. Housing policy, finance and development. Modern city planning process, survey methods and programme analysis techniques. Master Plans. Site planning and the rationale of urban regulatory controls, densities and related concepts. Urban redevelopment and renewal urban traffic and transportation planning. Seminar on human settlements.

#### ART APPRECIATION

The course is considered as a medium for understanding architecture as one of the principal arts in the patheon of human creativity. The flowering of aesthetic sensibilities and a taste for the visual and sensory appeal of



physical form. The emphasis is to make students into connoisseurs of art rather than consummate artists themselves.

#### Stage I

AA-3 History of Art. Art through the ages, architecture as art, milestones in art from the prehistoric, Paleolithic, Neolithic, classical, medieval, renaissance and modern periods. Indian art heritage, Indus valley to the present day.

Art consciousness. Aesthetics, perception, symbolism, expression, style, fashion, appropriateness and values. Critical appraisal of examples from the visual as well as performing arts. Seminar Course.

AA-4 The following courses are classified under the stream of enabling skills which shall help students in finding methods of learning, problem solving and expression of ideas, relevant to all subjects in the curriculum. They will introduce students to the full range of possibilities with simple exercises in their application. The students are expected practice extensively with a view to their own personal improvement till a satisfactory standard is achieved.

#### MATHEMATICS : Stage I

XM-1 Differentiation, maxima and minima, integration, menstruation, centroids and moment of inertia, simple differential equations, Geometric mapping, cartography, matrix algebra, vector algebra.

#### GRAPHICS : Stage I

XG-1 Basic Architectural Drawing. Freehand and mechanical drawing appropriate to architectural applications. Projections, symbols, lettering, conventions; values in drawn lines, tone, texture, colour and light, sciagraphy. indoor and outdoor sketching.

XG-2 Basic Design and Communication Graphics. Studies in composition, scale and proportion, rhythm, harmony and character, diagrams, ideograms, business graphics, skills and presentation techniques.

XG-3 Architectural Presentation Techniques. Three-dimensional views, cut-away views, architectural rendering and model making in different media, colour

presentation, optics and kinetics, Life drawing, Art lettering.

XG-4 Advanced Business Presentation. Multi-media presentation, Reprographic techniques, print-making, architectural photography, Audio-visual projection, animated graphics. Business graphics appropriate for illustration of reports and as accompaniments for seminars.

#### COMPUTER APPLICATIONS IN ARCHITECTURE : Stage I

XC-1 Introduction to computers as an analytical tool. Hardware and software. Computer languages, basic operations and applications such as word-processing and database management, simple computer programming.

Computer programming for structural design, Project documentation management. Computer Graphics, Computer-aided design and drawing.

XC-2 The following courses are classified under optional subjects wherein the exact course content will vary depending on the students' choice, their interests and the interests of the School as an institution. It is possible that, consistent with the school's commitments from time to time, certain themes may be permitted and students encouraged to choose their subject matter, for study or research, accordingly.

#### ELECTIVES : Stage II

Electives courses shall be offered on the basis of availability of expertise both within the faculty as well as from outside. The endeavour shall be to offer a wide variety for students to choose from commensurate with their abilities and interests.

#### • PROJECT REPORT / DISSERTATION : Stage II

PRX Project Report is intended to keep the students in touch with academic world while they are out of the School and doing field training in professional offices

or construction sites. The students are expected to choose topics which are of special interest to them and prepare a report after research.

The topics shall be whetted by a Project Co-ordinator. The topics may be related to the work done during the training period and on certain occasions certain topics may be assigned by the school in as much they would form a part of a major research project which the school may be handling at that time.

#### SEMINAR: Stage II

The Seminar shall be a research paper on a subject of theoretical nature on any aspect of architecture. This may or may not be related to the thesis topic. The overall supervision shall be by a Seminar Co-ordinator to be Appointed from within the faculty and the individual guidance shall be provided by experts in the subject, preferably from within the faculty but in exceptional cases, if found expedient in the opinion of the Co-ordinator, outside experts may be appointed.

SRX

The thrust of the seminar shall be on achieving a thorough understanding of the topic of study and on the ability to present it to an intelligent and critical guidance.

#### ARCHITECTURAL THESIS : Stage II

The Architectural Thesis is the culmination of the development of the student's knowledge, attitudes and skills over the course of studies in architecture. It is an occasion for exercising conscious choices in the field, based on the student's personal abilities and inclinations, and for testing out his commitment. The student, in consultation with the faculty, is expected to demonstrate through an imaginative approach, his expertise in effecting positive changes in our built environment.

ADT