First Year First Semester

Arch/T/111 EVOLUTION OF ARCHITECTURE-I

a) Definition of Architecture and architect. The origin of architecture and its development as a profession. Practice of the subject in the contemporary period. General pieces of service as provided by an architect. Relationship of the subject with various other interdisciplinary subjects. Relationship of the profession with the other related professions. Architectural education - scope and objects.
b) Influences governing the development of architecture. General - physical, emotional and intellectual; Natural - climate, topography, vegetation, available materials; Man - social, culture and religious attitudes; Technological - intellectual advancement, Progress in science& technology, construction, materials etc.
c) Development of Architecture from caves and huts of prehistoric era. Principles of layout of Vedic villages to mounds, mausoleums, stupas and such structures as were developed in the Indus Valley, Egyptian, Mesopotamian and South-east Asian regions. Renovated natural caves of the Buddhist period as methods of obtaining large internal spaces. Examples are to be presented as expressive forms of attitudes towards greatness, fear, pride, possession, protection, seclusion etc.
d) The Earliest Remains of Indian Architecture -
- The Earliest Temples of India,
- Early and Later Dravidian Temples,
- The Temples of Orissa,
- Islamic Architecture in India,
- Influence of Western Architecture in Indian Architecture;

Arch/T/112 DESIGN FUNDAMENTALS

a) Definition of Design. Comparison between designed and non-designed objects. Appreciation of design criteria; Orientation of design (general) process.
b) Visual properties of two-dimensional forms of both geometric and non-geometric surfaces - Line, Shape, Form, Figure-ground relationship, Direction, Contrast.
Visual textures and tonal variations - colour, contrast, brightness, hatch etc. applied to the above exercises.
c) Principles of two-dimensional compositions - Spatial tension, Likeness basis, Balance, Movement, Scale, Proportion, Rhythm Dominance and Subordination.
d) Principles of three-dimensional composition - Form, Mass, Volume, Scale, Surfaces of solids, Voids, Planes etc. their combination, variation, assimilation, orientation etc.
e) Elementary principles of Architectural Design on the basis of structure, function and aesthetics.
f) Structure- mechanics of load distribution, tension, compression, stress, strain (visual and conceptual), nature of materials for architectural uses.
g) Function - Anthropometrics, circulation, light, ventilation, basic services and

utilities.
h) Aesthetics - composition, form, volume, mass, etc. with site and landscaping.

Arch/T/113 MATERIALS AND METHODS OF CONSTRUCTION-I

a) Materials of building construction: Sources, general & special characteristics. Composition and physical and chemical properties of building materials. Behaviour towards environment. Prospective areas and locations of use of building materials. Advantages and disadvantages of use of various building materials. Sustainability of use. Materials in combination and use of the same in buildings. Innovative use, Variation in use and study of alternative building materials.
b) Introduction to various fundamental tools and instruments used in building construction.
c) Basic methods of taking measurement of building works.
d) Elaboration on various established methods of construction related to different materials and their comparison; Study of characteristics, advantages and disadvantages, needs and usage of various methods of construction.
e) Upgradation, modification and revision of various methods of construction
f) Natural materials : Brick, Stone and Timber - characteristics, needs and properties.

Arch/CE/T/114 STRUCTURAL MECHANICS-I

Equilibrium of forces ; concurrent forces ; composition and resolution of forces; Polygon of forces; analytical and graphical methods, Bow's notations and vector diagram; Parallel forces; Moments; Couples;
Maxwell's diagrams; Trusses of simple nature' Definition of' statically determinate and indeterminate structures; Controid and centre of gravity - applications; Moment of Inertia; Section Modules.
Tutorial Problems with application shall be worked out.

Arch/Math/T/115 MATHEMATICS-IA

Successive differentiation, Rolles Theorem (Statement only), Mean Value Theorem Taylor's & Maclaurin's expansions. Indeterminate forms, Maxima and minima of functions of a single variable; Partial differentiation.
Integration by the solution into partial fractions; properties of definite integrals; Definite integral defined as the limit of a sum. Fundamental theorem of integral Calculus. Important Integrals, Beta and Gamma functions; Areas bounded by Improper plane curves and straight lines; Lengths of plane curves; Surface areas and volumes of solids of revolution; Multiple Integrals and their applications in calculation of areas, volumes etc. Numerical Integration by Simpson's Rule.

Arch/T/116 DESCRIPTIVE GEOMETRY

a) Geometry and Graphics in architecture. Drawing point, line, polygon, circle, ellipse and other geometrical forms (manually or with computer graphics or both);

b) Principles of Orthographic projection and other projection systems; Principles of projection of lines; Isometric and Axonometric views; Sciography.

Arch/S/111 FREEHAND DRAWING

- Techniques of drawing lines of various gradations and inclinations
- Finding Visual proportions and principles of perspective
- Free-hand drawing of simple objects in single and group formation
- Free-hand drawing of simple furniture
- Outdoor sketching of natural objects/ buildings/ any relevant structure, etc.
- Study on shades and shadows, on contrasts of light and on textures.

Arch/S/112 DESCRIPTIVE GEOMETRY

a) Assignments for developing an insight in Geometry and Graphics in architecture.
b) Assignments on drawing line, polygons, circle, ellipse and other geometrical forms in isolation and in combination (manually or with computer graphics or both);
c) Principles of Orthographic projection and other projection systems; Principles
of projection of lines; Isometric and Axonometric views.

Arch/S/113 BASIC DESIGN

Comparison of designed and non-designed objects (I) exercises in line, shape,
form applied to figure & ground relationships and patterns.
Two dimensional composition based on the elements as specified in Design Fundamentals.
Drawings of the three dimensional compositions and elementary architectural spaces.
Design of elementary three dimensional and architectural spaces and their
a) Study and analysis
b) Presentation of Architectural Designs
c) Block models for exercises in three-dimensional composition

WS/ME/S/6A WORKSHOP PRACTICE-VI (Carpentry and Fitter Shop)

Introduction to types of Indian woods used for engineering purposes and carpenter's tools; use of wood working machines; making of selected joinery. Introduction to fitter's tools, gauges, measuring instruments etc.; marking of jobs; fitter's job involving chipping, filing, sawing, drilling; use of taps and dies; pipe fittings and plumbing.

First Year Second Semester

Hum/T/B HUMANITIES-B

English - 2 Pds/week - 50 Marks
Sociology - 2 Pds/week - 50 Marks

HUMANITIES

1.Basic writing skills
2.Report, Covering Letter & Curriculum-Vitae writing
3.Reading and Comprehension
4.Selected Short Stories

Text Book: ENGLISH FOR ALL

SOCIOLOGY

1.Sociology: Nature and scope of Sociology - Sociology and other Social Sciences - Sociological Perspectives and explanation of Social issues
2. Society and Technology: Impact of Technology on the Society - A case study
3. Social Stratification: Systems of Social Stratification - determinants of Social Stratification - Functionalist, Conflict and Elitist perspectives on Social Stratification
4.Work: Meaning and experience of work: Postindustrial society- Post-Fordism and the Flexible Firm
5.Development - Conceptions of and approaches to development - The Roles of State and the Market in the Development
6. Globalization: The concept of globalization - globalization and the nation state - Development and globalization in post colonial times.
7. Industrial Policy and Technological change in India - The nature and Role of the State in India
8. Technology Transfer: The Concept and Types of Technology Transfer-Dynamics of Technology Transfer
9. Technology Assessment: The Concept - Steps involved in Technology Assessment
10. Environment: Sociological Perspectives on Environment - Environmental Tradition and values in ancient India
11.The Development of Management: Scientific Management - Organic Organization - Net Work organization - Post modern Organization - Debureaucratization - Transformation of Management
12. Technological Problems and the Modern Society: Selected Case Studies - Electric Power Crisis, Industrial and/or Environmental Disaster, or Nuclear Accident.

Arch/T/122 EVOLUTION OF ARCHITECTURE-II

a) Space: Study of transformation of internal space from mono-spatial structures of Greek temples to multi-spatial structures of the Egyptian and expanding space of the Byzantine periods; Liner spatial forms of early Christian churches to the inter-weaving space of the Gothic cathedrals.
b) Character: Extrovert character of Greek buildings and Introvert nature of those of the Romans; Static Symmetry of earlier examples to multiplicity of forms and massive works of the Romanesque period.
c) Expression: Trabeated to Arcuated construction; Corbelling of vaults to buttresses of the gothic pointed arches; The changing expression of a building designed for a few to that for the mass; Gradual supremacy of technology over ornamentation; studies are to be illustrated from selected examples of Egyptian, West Asiatic, Saracenic, Byzantines, Romans, Early Christian, Romanesque, Gothic, Renaissance and Baroque periods of architectural history with special emphasis of relative growth in relation to the prevalent social, political, religious, cultural, economic and technological base.

Arch/T/123 MATERIALS AND METHODS OF CONSTRUCTION-II

General & special characteristics of materials; Properties both physical and chemical; Behaviour towards other materials and environment; Identification of needs: advantages and disadvantages; Various usage of the material and a comparative analysis; Innovative use; Variation; Study of alternative building materials.
Elaboration on various methods of construction related to a material and their comparison; Study of characteristics, advantages and disadvantages, needs and usage of various methods of construction.
Upgradation, modification and revision of various methods of construction; Various applications and examples of Stone and Brick masonry;Various types of Mortars and their characteristics; Processing and seasoning of timber; Joinery; Cement - Concrete-Composition and uses; Properties of reinforcement.

Arch/CE/T/124 STRUCTURAL MECHANICS-II

Stress, Strain and Elasticity; Stress-strain curves; Factor of Safety; Working stresses' problems of direct stress and strain;
Thermal stress Poisson's ration; Elastic constants, simple theory of bending. B.M. and S.F. diagrams; Bending stresses; Moment of resistance.
Tutorial Problems with application shall be worked out.

Arch/Math/T/125 MATHEMATICS-IIA

Determinants; definition and properties, Cramer's Rule. Matrix and Multiplication of matrices; Inverse of a matrix; solution of linear equations by matrix method, Mathematical Optimization (Basic concept - with working examples from Linear Programming).
Some properties of plane curves; Tangent and Normal, Curvature, Asymptotes; Conic sections, Catenary, Geometry of three dimensions: Cartesian Coordinates. Curves represented by mathematical functions;. Three dimensions in, direction cosines, planes and straight lines; standard equations of sphere, cylinder, cone, ellipsoid, hyperboloid of one and two sheets, hyperbolic paraboloid and their properties.

Arch/T/126 ARCHITECTURAL GRAPHICS

a) Basic principles of drawing Perspective views, Concept of vanishing points, Concept of One point, Two point and Three Point Perspectives, Manual Perspective drawings and Computer aided Perspective Drawings,
a) Methods of division of lines; placement of objects of given height at a desired places like human figures, trees, street furniture, etc.
b) Defects of standard projection method, Improvement on it.

Arch/S/121 EDUCATIONAL TOUR- I

a) A study of Indian architecture both traditional and contemporary to be done

during the educational tour and a photo-documentation report to be submitted/ presented.

Arch/S/122 ARCHITECTURAL GRAPHICS

Each of the items listed below are to be done by the use of instruments along with Tee and set-squares. Following items are also to be done with the help of computer graphic packages (excepting items 5).

1) Line work and architectural lettering.
2) Measurements, divisions and building up simple geometric figures (ellipses, polygons etc.).
3) Measurements, divisions and building up of simple 3.D forms (e.g. cones, cylinders etc.).
4) Isometric and axonometric drawings.
5) Orthographic presentation, Complex Orthographic drawings.
6) Principles of casting shades and shadows.
7) Basic principles of perspective drawings. Complex perspective drawings.
8) Drawing of simple plans, elevations and sections of small objects like furniture, part of
a building, etc.

Arch/S/114
Arch/S/123 MATERIALS & METHODS OF CONSTRUCTION

a) Studies of Materials : Stone, Timber, Bricks, Concrete, Steel, Glass, Timber joinery etc. and their variations.
b) Foundation, load bearing wall, stone & brick masonry.
c) Floors and flooring materials.
d) Roof: Pitched roof, Concrete roof; Roof Coverings : Clay tiles, A.C. Sheets etc.

Arch/S/124 ARCHITECTURAL DESIGN-I

Design of spaces with respect to function, structure and aesthetics.
Study & Design of Part of or Full Residential Building/s with respect to indoor and outdoor
spaces of Building/s.
Design of small structure - street furniture, kiosks, clock tower etc. and objects of interest
with respect to form and construction.

Note: A) During various stages of a particular design professionals, experts, potential users, expected clients, critics, intellectuals, academicians, students and teachers of different discipline related to the topic, theme, activities and essence of the given design problem must be incorporated.
B) Special care to be taken that the theoretical subjects are implemented at their best in the design. They should rather have an effect of convergence and assimilation in the design problem.

Second Year First Semester

Arch/T/211 CLIMATE AND ARCHITECTURE

a) Necessity of study of climatology in architecture.
b) Concept of Thermal Comfort; different factors determining thermal comfort of human being in a built environment.
c) Effect of Sun in architecture; orientation of Sun: azimuth and altitude; mathematical equations to determine azimuth and altitude of Sun from latitude of a location and date & time; study and method of drawing sun path diagram; study of shading devices in buildings.
d) Study of airflow: global and regional, in and around city and buildings.
e) Thermal conductivity of building materials and study of its impact in thermal comfort.
f) Impact of various climatic elements in different regions of our country in building design with a special emphasis on Bengal.
g) Energy efficient building design.

Arch/T/212 ARCHITECTURAL CONSTRUCTION-I

Study of the sequences Techniques of construction of various elements of Masonry building.
Foundation, load bearing walls & partitions, cavity wall etc.
Openings: Jamb, Sill, Lintel, Chajja, Sunshade.
Floor: Concrete floor, timber floor, brick flooring.
Roofs: Timber Trusses, Steel Trusses, R.C.C. beam.
Roof Coverings: Clay tiles, A.C. Sheet, G.K. Sheet. R.B. Slab. Etc.
R.C.C. Slab etc.

Arch/T/213 THEORY OF ARCHITECTURE-I

Space as protagonist of Architecture:
Representation of space -Evolution of spatial qualities through the ages
Form and function -Form and technology -Scale and proportion -Solids & voids and their contrasting effects -Colour planes and their effects and impacts on arhcitetcture;
Occidental and Oriental expressions in architecture.

Arch/CE/T/214 THEORY OF STRUCTURES-I

Principal stress, shear stress, normal stress, conjugate stress. Mohr diagram.
Bending and shear stresses in beams.
Area moment Theorem. Principle of superposition. Deflection of beams, determinate and propped cantilever. Fixed and continuous beams.
Columns and struts.
Euler's theory of long columns. Emperical formulas for design of columns
Short columns and piers with eccentric loading (small eccentricity).

Arch/CE/T/215 SURVEYING

Arch/Math/T/216 MATHEMATICS-IIIA

Differential equations, geometrical and engineering applications; spherical trigonometry and its application in determining azimuth and altitude of sun's position for a given latitude and solar time; stereographic projection and its use in preparation of sun-path diagrams; Sample survey: simple random; probability proportional to size and stratified sampling.

Arch/S/211 CLIMATE AND ARCHITECTURE

a) Drawing sun path diagram and utilizing it for design of buildings and shading devices;
b) Air flow and architecture.
c) Thermal conductivity of building materials and study of its impact in thermal comfort.
c) Study/documentation of buildings giving due consideration to the impact of various climatic elements such as sun, airflow, precipitation etc. in different climatic regions of the country, with special emphasis on the climate of Bengal.
d) Study and Documentation on the latest developments in the field of climate and architecture; materials and methods, technology, research, fieldwork etc.

Arch/S/212 COMPUTER AIDED DELINEATION

Elements of Graphics and Visualization
Basics of two- and three-dimensional computer graphics systems: Computer aided drawing and 3-D modeling and rendering, and selected graphics software APIs. Other topics may include interactive graphics, animation, graphical user interfaces, and the graphical presentation of information.

Second Year Second Semester

Arch/T/221 ELEMENTS OF COMPUTING

a) General structure of electronic computers; concept of bit, byte and word.
b) Binary, octal, decimal, hexadecimal, BCD & floating point numbers;
c) Idea about machine language, assembly language, high level language, interpreter & compiler.
d) Flow-chart and algorithm.
d) Computer aided graphics, AutoLisp.

Arch/T/222 ARCHITECTURAL CONSTRUCTION-II

a) Damp Prevention: (1) Materials, D.P.C. Cement Plaster, Lime Terracing, Tar felting etc. (ii) Design: Overhang, mouldings, drip courses, copings etc.
b) Moving Elements: Doors, Windows, Ventilators, Skylights etc.
c) Miscellaneous Elements: Threshold, Staircase, Paving, Veneering etc.
d) Chemical Agents: Plasticiser, fillers, quick setting, retarding, adhesives, anti-termite, anti-fungi etc.

Arch/T/223 THEORY OF ARCHITECTURE-II

Basic principles & Design -Integration of function. Architecture as Art and Science of Buiilding; Structure & Aesthetics.
Stages of design -Design methods -Design procedure -Visual design-Perception of space/architecture analysis of colour, texture, form, shape and line - and other human perceptions involved. Total composition and assimilation as a whole by synthesis.
Environmental conditions -Basic structural systems -Basic building services -Orientation of buildings, solar and other factors -Circulation, planning and efficiency; anthropometry & ergonomis in architecture; Facilities for physically handicapped persons.

Arch/CE/T/224 THEORY OF STRUCTURES-II

Rivets and design of riverted joints, eccentric connection.
Welded joints.. Design of M.S. truss members, joints, Design of R.S.J. beams and columns. Theory of reinforced concrete, properties and assumptions,
Design of singly reinforce 4d rectangular and T. beams. Slabs spanning in one direction.R.C. columns.

Arch/T/225 STRUCTURE FOR ARCHITECTS

Study of new structural systems with emphasis on limitation and scope of these systems - multistoried R.C.C and steel buildings, pre-stressing, shells, folded plate, space frame, suspension structures.
Emphasis will be given to the structural philosophy and not on the rigorous calculation. Models of structural form.

Arch/T/226 ARCHITECTURAL DESIGN-II

Syllabus same as of Sessional.

Arch/S/221 EDUCATIONAL TOUR-II

a) A study of Indian architecture both traditional and contemporary to be done during the educational tour and a precise report to be submitted.
b) Thorough measured drawing of architecture/ architectural elements/ pieces to be done belonging to a particular style, period, influence, spatial appraisal, social or cultural importance etc. at least within seven days at a particular location of interest.
Should be submitted by each student.

Arch/CE/S/222 SURVEYING PRACTICAL

Chain survey, Compass Traversing, Levelling, Plane Table Survey, Computations and Plotting.

Arch/S/213 ARCHITECTURAL CONSTRUCTION I
Arch/S/223 ARCHITECTURAL CONSTRUCTION II

Drawing Work
Study Sheet on various types of foundations
Study Sheet on sill, jamb, lintel, overhang, threshold
Study Sheet on Concrete and timber flooring
Study Sheet on R.C. & R.B. roof
Study Sheet on pitched roof with timber trusses, clay tile & A.C. Sheet
Study Sheet on Doors of various types
Study Sheet on Windows (timber & steel)
Study Sheet on Threshold, Staircases
Practical Work : At least three visits to be paid to a construction site covering the various sequences of construction taught and a brief report to be submitted by individual student in a standard Performa, as a part of sessional work.

Arch/S/214
Arch/S/224 ARCHITECTURAL DESIGN- II

a) Design of a small building with respect to function, structure and aesthetics.
b) Analysis and documentation of architecture of a village or neighborhood of a city.
c) Design of a small complex of buildings of not more than two floors in rural or low-density urban environment.
d) Design of vital components, details of structure, building services, etc.
Rendering techniques in various media:
a) Pencil sketches.
b) Pen and ink drawings.
c) Colour presentation in water colour, poster colour etc.
Note: a) During various stages of a particular design professionals, experts, potential users, expected clients, critics, intellectuals, academicians, students and teachers of different discipline related to the topic, theme, activities and essence of the given design problem must be incorporated.
b) Special care to be taken that the theoretical subjects are implemented at their best in the design. They should rather have an effect of convergence and assimilation in the design problem.

Third Year First Semester

Arch/T/311 LANDSCAPE ARCHITECTURE

1. Principles of Landscape Architecture :
a) Historical background Oriental and occidental.
b) Man, building and Landscape.
c) Elements of outdoor space organisation.
d) Contemporary thoughts on Landscape Architecture.
e) Application of design fundamentals ...a brief study of contemporary works.
2. Materials of Landscape Architecture :
Plants, Water, Land, Rock, Nature -work, Man -made elements and outdoor furniture etc.

3. Guidelines for Landscaping of Specific Areas :
a) Residential -Individual and group of building
b) Commercial and Shopping
c) Recreational -parks and play areas
d) Plaza and Squares
e) Signage
4. Technical Aspects of Construction and Maintenance:
Planting, water forms, paving, illumination, street furniture & vocabulary etc.

Arch/T/312 ARCHITECTURAL CONSTRUCTION-III

Construction of special items like
a) Both way swinging and sliding folding types of doors built of timber or of extended metal sections like Aluminum
b) Rolled up doors,
c) Sliding types of casement windows,,
d) Veneering wall surfaces with, timber and tiles,
e) Suspended ceilings with method of suspension, framing materials of timber, pressed steel, aluminum, covering materials like acoustic boards, gypsum boards, P.V.C. tiles etc. with special considerations for fire and acoustical insulation
f) Construction material, technological alternatives, application methods and details essential to create barrier free environment.

Arch/T/313 ANALYSIS OF CONTEMPORARY WORKS-I

Analysis of the evolution of various concepts in Contemporary Architecture in different phases on chronological or thematic basis from the end of nineteenth century; Future Trend and Realism in Contemporary Architecture.

Arch/CE/T/314 DESIGN OF STRUCTURES-I

Strain Energy: Castigiliano's theorems, Analysis of indeterminate structures and use of moment distribution method, Effect of wind and earthquake on structures.

Arch/T/315 SERVICES & EQUIPMENTS-I (Water Supply & Drainage)

a) Water supply, sources (surface and underground), Methods of lifting storage and supply, Standard of portable water and methods of removal of impurities, Standard of requirement of water for daily uses. Simple principles of design for water supply, system for low as well as high buildings.
b) Equipment for water supply- pipes, pumps, tube well, reservoirs and cisterns for storage, different types of pipes and accessories, controlling fixtures like valves, taps, etc. receptacles like wash basins, sink bath- tubs, shower-trays, etc.
c) Drainage- Different types of drainage for rain water waste and soil, systems of collection carriage and disposal; simple graphical methods of determining sizes, jointing system of pipelines and fixtures. Equipment like- trap, yard outlines, man-holes, water closets, urinals, slop sinks, septic tanks, etc.

Garbage disposal, incinerators, protective devices against insects, rodents, etc.
d) Minimizing pollution, Recycling processes. Fire fighting in buildings - regulations and requirements, different types- dry and wet risers, sprinkler system, chemicals.

Arch/T/316 COMPUTER PROGRAMMING FOR ARCHITECTS

Writing programs in C programming language: Basic structure of a C program; preliminary concept about header files, constants and variables; concept of basic functions like main() and input-output functions; data types of variables with a particular emphasis on integer, floating point and character type variables; statements and expressions; control and loop; how to write functions; concept and use of pointers; arrays; graphics; writing small programs for architectural uses.

Arch/S/311 WORKING DRAWING

Preparation of working drawing for small residential, commercial and special types of building designed by the students/ professionals, Preparation of details to clarify constructional techniques and use of material.

Arch/S/313 ARCHITECTURAL CONSTRUCTION-III

Syllabus same as that of the theoretical subject "Architectural Construction-III".

Third Year Second Semester

Arch/T/321 ANALYSIS OF CONTEMPORARY WORKS-II
Analysis of the creations of notable Architects to evaluate their contributions in Contemporary Architecture; Future Trend;

Arch/T/322 QUANTITY SURVEYING, SPECIFICATION

Standard method of measurement and unit, procedure of taking out quantities, abstracting and preparation of bills of quantities. Specifications of different materials and constructions, various test and properties related. Normal specification for different methods of construction in general and also specific items.
General principles of Valuation on the basis of area and volume
Definitions: value, Price, Market Value, Book Value, Replacement Value, Depreciation, Sinking Fund, Gross Rent, Ground Rent, Net Rent, Gross Income, Outgoing, Net Income, Year's Purchase, Free-hold Property.
Simple Workouts on Valuation by Rent, Depreciation, Year of Purchase of land and building.

Arch/T/323 BUILDING DISEASES AND TREATMENT (Building Maintenance and Repair)

1. Definition and identification of "Building Diseases and Treatments", i.e., distress, defects, decay, damage, etc.
2. Historical background of the subject.
3. Determination of age and strength of structural members of a building under diagnosis.
4. Foundation - related problems and treatments.
5. Masonry and concrete walls - causes, effects and remedies of - a) dampness, condensation, efflorescence, b) cracks in walls. Insertion / replacement of DPC.
6. Effect of age, weather, environment and temperature variation on masonry structure and mud-walls.
7. R.C.C. and Steel Structures - a) R.C.C. Structures - factors affecting durability of concrete and remedial measures, diagnosis and treatment of distressed structures, R.C.C. Floor / Roof - preventive measures, waterproofing, leaking, treatments, expansion joints; R.B.C. construction, buildings affected by atmosphere near seashore, fire resistance, treatment to R.C.C. structure damaged due to fire, b) Steel Structures - maintenance and repair.
8. Timber Works - diagnosis of decay and treatment; new materials substitute to timber works in building.
9. Studies on Natural Calamities - preventive and remedial measures for earthquake, flood, storm, etc.

Tutorial
Diagnostic studies in the form of report illustrated by graphics, sketches, drawings, charts, tables, illustrations, photographs with site visits of necessary and important places of maintenance / repair and restoration of the items mentioned in the theory.

Arch/T/324 SERVICES AND EQUIPMENT-II

a) Ventilation- Natural and Forced or mechanical, standard of requirement quantity, and velocity for different conditions of living and works, principles of natural ventilation and simple methods of induced or forced ventilation. Air-conditioning - Control of quality, quantity, temperature and humidity, conditions for comfort, principles refrigeration and its commercial application in air-conditioning.
Simple calculations for finding cooling load, major equipment used, their characteristics and suitable place for location; consideration and reduction of heat gain and for economic layout for supply and return air ducts.
b) Mechanical equipment for vertical transport, recommended sue for escalators and elevators; simple calculation to determine number if type of escalators and elevation sketch drawings showing the air-conditioning system of an auditorium, multistoried hotel and office Buildings. Plan and section of elevators, machine room and escalators.
c) Various methods of building automation, general overview.

Arch/CE/T/325 DESIGN OF STRUCTURES-II

Doubly reinforced concrete beams, two way R.C. slabs, sections subject to

combined bending and thrust.
Design of M.S. plated beams and compound columns, tests for measuring workability and strength of concrete.

Arch/T/326 ARCHITECTURAL DESIGN-III

Syllabus same as sessional for the same.

Arch/S/321 EDUCATIONAL TOUR- III

a) A study of Indian architecture both traditional and contemporary to be done during the educational tour and a precise report to be submitted.
b) Thorough measured drawing of architecture/ architectural elements/ pieces to be done owing to particular style, period, influence, spatial appraisal, social or cultural importance etc. at least within seven days at a particular location of interest should be submitted by each student.

Arch/S/314
Arch/S/322 ARCHITECTURAL DESIGN-III

Design problems are to be set on (i) two comparatively large problems of about 5 weeks or 60 periods of work for each in both the semesters, and (ii) two short-term sketches on the smaller problems of lesser depth of work of about 1 week of 12 hours at each semester. The nature of drawing problems for the larger projects may be of the following types:-
School and industrial buildings, student Hostels, market places, community buildings etc. short term sketches may be set on club house, gymnasium, guest house, small branch office for banks, post offices, police and fire stations etc. creation of barrier free environment for disabled and elderly persons is to be adequately emphasized.
Note: a) During various stages of a particular design professionals, experts, potential users, expected clients, critics, intellectuals, academicians, students and teachers of different discipline related to the topic, theme, activities and essence of the given design problem must be incorporated.
b) Special care to be taken that the theoretical subjects are implemented at their best in the design. They should rather have an effect of convergence and assimilation in the design problem.

Arch/S/312 ARCHITECTURAL SERVICES-I
Arch/S/323 ARCHITECTURAL SERVICES-II

a) Large scale plan, section, elevation of attached and detached type of lavatories and Kitchens, Sculleries etc. showing fixtures and connections of water supply drainage and sewage disposal. Layout drawing for sewage and storm water drainage etc. rain water disposal system for roof terraces etc. location of air conditioning plant room, air handling unit rooms, systems of horizontal and vertical ducts layouts for conveying conditioned air, return air fresh air, chilled water and return water pipes.
b) Drawing of Lift, Lift well and Lift machine room; Escalator with necessary details.

c) Drawings related to building automation, preparation of flow charts, detailing and systems involved.

Arch/CE/S/324 CIVIL ENGINEERING LABORATORY

Using civil engineering lab for various materials, their structural properties and tests involved. General discussion and guidelines to enrich the concept of structure and different materials involved.
Structural models and their analysis. Study and analysis of any specific problem related to architecture and structure.

Fourth year Second Semester

Arch/T/421 ENVIRONMENTAL SYSTEMS

An exploration of the fundamental principles of human physiology, thermal and luminous comfort, and indoor quality. Emphasis is on bioclimatic and psychometric climate analysis and its relationship to architectural design, understanding the energy exchange between body in space, the natural meaning of enclosures, and non-structural materials and systems. The focus is on passive heating, cooling, and day lighting systems and their design. Exercises include Vital Sign analysis of existing spaces (thermal, air, luminous), forming hypotheses of building performance, using scientific instrumentation, tenant survey techniques, and physical modeling and simulation techniques related to day-lighting and shading techniques.

Arch/T/422 HOUSING -I (Urban, Rural)

a)Urban
* Study of principles of housing standards:
Housing for all classes, Housing cost.
* Financing the housing for the Economically weaker section of the population, working class.
* Housing for special groups such as single or aged persons.
* Different methods for providing housing such as housing Co-operatives, Employees housing etc., their applicability to the different parts of the country; their prospects and problems.
* Slums and bustees and causes for their growth, Arresting growth of slums and bustees, measures adopted to control growth and development of slums and bustees.

b) Rural
* House in rural areas, study of houses in different climatic zones in India with emphasis on rural housing in West Bengal.
* Efficiency of rural houses at different climatic zones, Roof insulation, ventilation, Damp and Moisture prevention, Planning and Circulation, sanitation, Health and Hygiene.
* Available materials in different regions and their impact on planning and Architecture of rural housing, innovation and introduction of new materials and new ideas.

* Housing economics and public policy.

Arch/T/423 URBAN DESIGN

* Introduction to Urban Design
Introduction to urban design concept and house Community and environment, community and technology, individual & Collective needs, Social physical : economic constraints.
* Urban Sociology:
Fundamentals of Sociology, Social pattern and problems of urban settlements (including high rise and over crowding). Social pattern of rural settlements. Study, of behaviour of individuals & groups and their interactions. Migration Problems & issues related to hawkers squatters and evicted persons.
* Introduction to Research Methods and Techniques:
Introduction to fundamentals of research and investigation basic theories and methods. Different research methods and techniques. Application of research methods to Architecture, Urban Design and Planning including field study.

Arch/T/424 SERVICES & EQUIPMENT-III (Illumination and domestic wiring)
* Importance of light in architecture; perception of light and color; photometry.
* Lamps, luminaries, their characteristics and their field of application. Standard levels of illumination for different visible tasks; architectural effects through illumination; different indices.
* Design directives for illumination in interiors and exteriors-in homes, public places, centre of performing arts, art galleries, display & shop windows, parks and play grounds, indoor play spaces, factories, offices and conference halls, dining halls etc.
* Domestic wiring systems (exposed and concealed) for small residence and high-rise buildings. Sub-station, protection against lightning, earthing.

Arch/ET/T/425 ARCHITECTURAL ACOUSTICS

* Sound, musical sound, noise-echo, reverberation-reverberation time-Live room. Plane wave and its propagation in two different media-reflection, Absorption coefficients.
* Design of an auditorium-size, shape-sitting arrangement.
* Effect of noise on hearing in auditorium -Effect of regeneration on hearing of speech-variation of reverberation with frequency.
* Design of a school building-site selection -building layout and design of school auditorium. Characteristics of a musical room-its rating and design. Specification of different sound absorbing / insulating materials different uses. Design of an open air- theatre-site selection.
* Design and modification for auditorium used for sound picture theatre.

Arch/T/426 ARCHITECTURAL DESIGN-IV

Design studio-introducing students to the processes of critical inquiry specifically as it relates to architecture investigations.

Arch/S/421 ARCHITECTURAL SERVICES-III

Design and layout Drawing of wiring and lighting system in a residence, working drawing (with symbols).
Drawing for substation, protection against lightning and earthing.

Arch/S/422 ARCHITECTURAL DESIGN- IV

Design studio-introducing students to the processes of critical inquiry specifically as it relates to architecture investigations. These processes are seen as interrelated and always informed by the societal, technological, and historical contexts within which architects work. Parallel instruction in drawing, computing, and construction technology are integrated within the work of this studio. Technology 1: The technology aspects focus on discovering the basic systems used to create space such as structural systems, enclosure types, and systems for movement. Emphasis is placed upon construct ability and sustainability. These discoveries are through hands-on applications and field visits. Computing: Explorations with the Computer focus on both the development of a fundamental knowledge of 3-D modeling and 2-D image manipulation software and a nontraditional application of this knowledge to design representations. The computer media (3-D modeling "space," Computer printouts, video projections) are conceived of as yet another "physical" material for experimentation, and are integrated in this way with the studio design projects. Drawing: The drawing segment consists of freehand drawing exercises that relate to studio projects and help students develop basic drawing skills and a familiarity with two-dimensional design concepts. Taken in conjunction with Design Studio.

Arch/S/423 INTERIOR DESIGN

Elements of Interior Design, Colours, Craping furniture, furnishings, fittings/fixture, construction materials, illumination, plant materials.
A student will take anyone or more of the above topics and write a paper or a project design in consultation with the teacher-in-charge of the subject.

Arch/S/424 LANDSCAPE ARCHITECTURE

Design of landscape (natural) in residential and institutional environments using plants, water, land and rock etc.
Design of landscape (man-made) in urban environments using man-made elements and furniture (hard landscape)
Plazas and squares in Urban centers.

Fifth Year First Semester

Arch/T/511 PRINCIPLES OF URBAN AND RURAL PLANNING

Definition and scope: definition of town in India, classification of towns according to population (Indian census), Criteria of urban settlement in ancient time. Towns according to forks, Indian (Manasara, Gridiron, Radisi,

Linear, Ribbon Development, Growth and development of Towns (Urban Settlements):
Ancient: Egyptian, Indus, and West Asiatic.
Classic: Greek Roman.
Mediaeval: Renaissance, Pre-industrial.
Town planning concept since industrial revolution :Impact of Industrial revolution on planning. Planning concepts by utopians: Cadbury, Lever brothers, etc. Patric Geddes Sir Ebenezer Howard and Garden City concept, Lecthworth, Wylwin Town planning laws.
Survey : Zoning, Master Plan, Roads and Communication, Recreational areas, open spaces, Residential areas, Neighborhood unit, etc. New Towns, Harlows, Stevenage, Chandigarh, Brasilia, Contemporary Planning
The background of rural planning and development socially, economically and physically.
Review of rural development in India generally, Rural planning in West Bengal.
Importance of Community Development concept on rural planning and development in post-Independence period.
Rural services & infrastructure, Sanitation, Water supply. Conservation, development energy planning and environmental protection, rural industry. Administration
Case studies

Arch/T/512 ENTREPRENEURSHIP DEVELOPMENT

* Strategy and the privately-held company transition
* Managing change in the family-owned business
* Next generation leadership development
* Family enterprise and economic development

Arch/T/513 PROFESSIONAL PRACTICE

* Study of relevant building bye-laws (Calcutta, Salt Lake).
* West Bengal Municipal Acts.
* Real Estate Laws.
* National Building Code.
* Tender and its different constituents.
(a) Conditions of engagement.
(b) Specifications of Workmanship & Materials.
(c) Specifications of different items of works.
(d) Schedule of quantities.
* Supervision of projects.
* Checking and certifying contractor's bills.

Arch/T/514 BUILDING ECONOMICS & PROJECT MANAGEMENT

* Detail study on PERT, CPM, Bar Chart.

Building Economics
Economic Principles:-

i. Definition of Economics and Economic System.
ii. Factors of production with special emphasis on land.
iii. Types of Business organization.
iv. Business units.
v. Cost of production.
Accounting :
i. Definition of Accounting -Types of Accounting.
ii. Definition of cost classification and interpretation of cost.
iii. Preparation of cost sheet.
iv. Marginal costing and Management Decision.
v. Contract costing.
vi. Accounting Ratios.
vii. Value analysis and project evaluation.

All the above factors should be considered with respect to
Building Operation as economic activity.

Arch/T/515 VALUATION

* General Principles of Valuation;
* Concepts : Value, Price and Cost;
Market : Perfect, Imperfect and Monopoly, Law of Demand, Supply and Pricing;
* Definitions : Value in Use and Value in Exchange, Market Value, Reproduction Value, Replacement Value, Re-installment Value, Book Value, Salvage Value / Scrap Value, Capital Value / Sinking Fund;
* Depreciation and Obsolescence
* Rent : Ground Rent, Gross Rent, Rack Rent, Net Rent, Leases and Reversion - examples by sums on rent and valuation of Lease-holds;
* Net Income : Tear's Purchase, examples by sums on Income Computation;
* Property : Freehold, Lease-hold, Condominiums and Co-operatives, Time-shared Property, Developmental Rights;
* Principal Methods of Valuation : Cost Approach, Income Approach, Market Approach

Arch/T/516 DESIGN METHODOLOGY

a) Meaning of Architectural Design; usefulness of design methods in architecture; short-comings in the knowledge of architectural design method; impact of high capacity electronic computer and new trend in the study of design method; different approaches in the architectural design process.
b) Meaning of system; natural and man-made systems; built-environment as a system; steps in system design.
c) Rational and creative approaches: application in architectural design solution - need for both approaches.
d) Model: different methods of representing architectural design - iconic, analog and symbolic models; applying modeling techniques in architecture - housing in particular.
e) Identification of multiple criteria in architecture; study different criteria; identifying architectural design solution as a multi-criteria decision making

problem.
f) Optimization: graphical optimization with two variables; linear programming - application in architecture and its short-comings; non-linear optimization; multi-criteria decision-making process; genetic algorithm.
g) Concept of Pattern Language; modern developments in the concept of space representation: Dimensionless Rectangular Dissection, Shape Grammar, Space Syntax.

Arch/S/511 ARCHITECTURAL DESIGN-V

Design Problem related to group of buildings accommodating different uses. Problem having given due regard to environmental and ecological requirements; Special attention is to be given to create barrier free environment for disabled and elderly.

Arch/S/512 ARCHITECTURAL THESIS PROGRAMMING

The students should take help from the Thesis Coordinator and the panel of teachers from time to time pertaining to formulation of action plan including methodology of selection of the topics, case studies, site selection, functional requirements, design methodologies, drafting procedure and defence techniques.
Students are to select architectural topics of individual interest reflecting social and technological considerations. The topics so chosen should be subjected to discussions and criticisms by a panel of teachers from time to time.
At the end of the semester, each student would be required to make a formal presentation on the chosen and approved subject of Thesis.

Arch/S/513 ELECTIVE-I

1. ADVANCED COMPUTER APPLICATION
2. INTERIOR AND FURNITURE DESIGN
3. ADVANCED LANDSCAPE ARCHITECTURE
4. STUDY OF BUILDING TYPES
5. ARCHITECTURAL CONSERVATION AND RESTORATION PROJECT
6. ENERGY EFFICIENT BUILDINGS

Arch/S/513A ADVANCED COMPUTER APPLICATION

Programming in a high level language for architectural application- one problem
Computer aided architectural graphics- one problem: one programming project in consultation with the teacher -in- charge.

Arch/S/513B INTERIOR AND FURNITURE DESIGN

Elements of interior design, furniture , furnishings, fittings, fixture, colour, illumination, landscaping elements. A student will take any one or more of the above topics and write a paper or a project design in consultation with the teacher-in-charge.

Arch/S/513C ADVANCED LANDSCAPE ARCHITECTURE

The students would be given individual or group assignments on topics related to Landscape Design. Introduction to landscape grading. The students have to prepare reports and /or presentation documents on the assigned topic.

Arch/S/513D STUDY OF BUILDING TYPES

Different types of buildings are to be studied with respect to planning and Aesthetics; Justification for different statutory requirements are to be studied.

Arch/S/513E ARCHITECTURAL CONSERVATION AND RESTORATION PROJECT

To study the definition, theory and values of conservation. To study the conservation- ethics and the principles defined in the Venice Charter and Burra Charter. Students have to study a historic building appropriate for conservation in context of the various conservation-values, study the architectural style and survey to prepare a floor plan layout, inspect its structural and physical condition and suggest the possible method of restoration.

Arch/S/513F ENERGY EFFICIENT BUILDINGS

To study the different energy-efficient principles of a building and their various application techniques in different climatic zones prevailing in India including solar active and passive features. The students have to take individual or group projects dealing with at least one or more than one technique

Arch/S/514 GENERAL VIVA VOCE

A Viva-voce test would be conducted by a panel of teachers of the Department. The test would cover the topics related to the various subjects taught to the students throughout their all previous years of academic sessions and would also contain topics of general nature related to Architecture.

Fifth Year Second Semester

Arch/T/521 VIVA VOCE ON ARCHITECTURAL THESIS

The individual student has to present his final outcome on Architectural Thesis and defend the same. The presentation should portray the performance through drawings, models, etc. The verbal communication should reflect the command over the work.

Arch/S/521 ARCHITECTURAL THESIS

Students should select their individual subjects for theses by the middle of the

first semester of the final year of the course. Along with a programme of action, the subjects so selected should be approved by the Thesis Coordinator, the Head of the Department and BOS. The Subjects should be restricted to areas of Architecture meaning without going into Urban Design or Town Planning. The knowledge earned during the five years of study should be reflected in the Theses works.
At least three reviews should be conducted prior to final jury of the theses.

Arch/S/522 ELECTIVE-II

1. DISASTER RESISTANT BUILDINGS
2. ENVIRONMENTAL STUDIES
3. SUSTAINABLE BUILDING DESIGN
4. INFRASTRUCTURE PLANNING

Arch/S/522A DISASTER RESISTANT BUILDINGS

Study of Factors causing disaster for buildings, Design of Earthquake Resistant Buildings, environmental conditions in coastal areas, cyclones and tornados, Wind resistant buildings. Fire protection provisions in buildings, infrastructure provisions for flood mitigation.

Arch/S/522B ENVIRONMENTAL STUDIES

Natural Environment, Man-made Environment, Air and Water in urban environment, Air Pollution, Water Pollution, Open and Green Spaces, Environmental Impact Assessment, Natural Disasters and their Impacts on Urban Environment.

Arch/S/522C SUSTAINABLE BUILDING DESIGN

To study Climate, indoor environment quality and energy use for Energy conservation, Conservation of historic buildings, Sustainable management of existing building stocks, Recycling of building materials, parts of buildings and debris, Conservation of water, energy and infrastructure, proper Management of wastes, Environmental Impact Assessment and Tools, Environmental ethics and sustainable building design practices,

Arch/S/522D INFRASTRUCTURE PLANNING

Study of the definitions of infrastructure. Necessity and Importance for Infrastructure. Various Public Infastructural Facilities like Roads, Water Supply System, Drainage and Sewerage Systems, Waste Disposal System, Electrification, Gas Supply System, etc. Government Organizations, Public Agencies associated for Planning of such Infrastructure. Planning strategies of various Infrastructural facilities in a new and existing town. Planning for infrastructure of rural areas of the country. Current National and International trends in Infrastructural Planning. Technology for execution of such Infrastructure.