



**Kavayitri Bahinabai Chaudhari
North Maharashtra University, Jalgaon.**

**Syllabus for
Third Year B. Arch.**

**Semester System
For Semester V & Semester VI**

**Syllabus Pattern.
Form June -2017.**

Under the Faculty of Science & Technology

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

THIRD YEAR B. ARCH. SEMESTER - V**TERM - I**

Sr. No.	Subject Code	Subject	Lecture	Studio	Total	Paper	Sessional	Oral	Total
1	AR05-01	Architectural Design - V	1	9	10	-	100	100	200
2	AR05-02	Building Construction and Materials - V	1	5	6	100	100	100	300
3	AR05-03	Structure - V	4	-	4	80	20	-	100
4	AR05-04	Building Services - V	3	1	4	100	50	-	150
5	AR05-05	Landscape Design	2	2	4	-	50	-	50
6	AR05-06	Working Drawing - I	1	5	6	-	50	50	100
7	AR05-07	Secification and Valuations	3	-	3	-	50	-	50
8	AR05-08	Architectural Acoustics	3	-	3	50	50	-	100
Total			18	22	40	330	470	250	1050

THIRD YEAR B. ARCH. SEMESTER - VI**TERM - II**

Sr. No.	Subject Code	Subject	Lecture	Studio	Total	Paper	Sessional	Oral	Total
1	AR06-01	Architectural Design - VI	1	9	10	100	100	100	300
2	AR06-02	Building Construction and Materials - VI	1	5	6	100	100	100	300
3	AR06-03	Structure - VI	4	-	4	80	20	-	100
4	AR06-04	Building Services - IV	3	1	4	50	50	-	100
5	AR06-05	Town Planning	3	1	4	50	50	-	100
6	AR06-06	Working Drawing - II	1	5	6	-	50	50	100
7	AR06-07	Quantity Surveying and Estimating - I	4	-	4	80	20	-	100
8	AR06-08	Elective - I	2	-	2	-	50	-	50
Total			19	21	40	80	490	200	1150

**SYLLABUS FOR THIRD YEAR ARCHITECTURE DEGREE COURSE
TERM I**

SUBJECT: - ARCHITECTURAL DESIGN – V (AR05-01)

Lecture	15	Paper	-	Internal (Sessional)	100
Studio	135	Duration	-	External (Oral)	100
Total	150			Theory Paper	-
				Total	200

Note: -

- 1) Minimum two problems should be covered.
- 2) Knowledge of climatology, building construction and materials, structures, building services etc. (First and Second Year Subjects) should be applied.
- 3) Out of two problems one should be completed in Manual presentation.

Collection and analysis for design of medium size buildings with multilevel complex planning. the student should learn about collection of data and requirements of prescribed buildings with actual design problem of **three buildings**.

Data collection in groups of three to four students and proper presentation in suitable forms such as **charts, graphs, sketches including circulation diagrams** of different personal vehicles etc. Day and night factor of design.

Study of works of renowned architects on similar problems. Study of their philosophy and approach. (Book and internet case studies)

Analysis of any building in terms of design process, design principles, materials etc.

The design problem may include buildings of medium density and size, multilevel complex planning, structures of three floors, shops and departmental stores, bank with residence, post office with residence, hostels, row houses, multi-storey offices and apartments, It offices, government offices and schools, recreation and health facilities, pavilions, clubs, other service oriented buildings etc.

Study of all above types of buildings and actual **design problems for three buildings**. (Each up to **500 square metre** and not more than **1000 square metre**)

Considerations for **Psychological aspects of Architectural space** and **Aspect of sociology in design** to be covered in prescribed theory lectures.

REFERENCE BOOKS

It is strongly recommended that students refer books focusing on various building types, journals, magazines to widen their knowledge of design and the readings not to be limited to the list of booksgiven below.

Correa, C. (2010). A Place in Shade. Delhi: Penguin Books.

Kanvinde, A., & Miller, H. (1969). Campus Design in India. Topeka: ostens/American Yearbook Co. .

Lynch, K. (1962). Site Planning. MIT Press.

Pandya, Y., & Foundation, V. S. (2007). Elements of Space Making. Ahmedabad: Mapin Publishing Pvt. Ltd.

White, S. (1995). Building in the Garden: Architecture of Joseph Allen Stein in India and California. Delhi:

Oxford India Paperbacks.

SUBJECT: - BUILDING CONSTRUCTION AND MATERIALS V (AR05-02)

Lecture	15	Paper	1	Internal (Sessional)	100
Studio	75	Duration	4 hrs	External (Oral)	100
Total	90			Theory Paper	100
				Total	300

1. FOUNDATION

- Foundations in soils having low bearing capacity- grillage footing (shallow) and RCC pile foundation (deep)
- Dewatering of excavation trenches
- RCC and masonry retaining walls.

2. SUPERSTRUCTURE

- Glass curtain walls and structural glazing
- Aluminium cladding
- Cladding stone wood tiles and GRC
- Steel stanchions and girders

3. STAIRCASE

- RCC, Timber and Steel

4. FERROUS METALS

- Introduction
- Iron ores - selection, varieties of iron ores
- Pig iron - manufacture, properties, types, other methods of manufacture
- Cast iron - composition, types, properties, uses
- Wrought iron - manufacture, properties, defects and uses

5. STEEL

Manufacture of steel, use, factor affecting physical properties and magnetic properties, defects in steel, market form of steel, properties of mild and hard steel

6. NON-FERROUS METAL

- Aluminium – manufacture, properties, uses, economics of using aluminium, forms of aluminium
- Copper - manufacture, properties, uses
- Lead- manufacture, properties, uses
- Zinc- manufacture, properties, uses
- Asbestos- properties, use, asbestos cement products
- Alloy - aluminium and copper alloys

7. PLASTICS

History, composition, polymerization, classification, resins, moulding, compound fabrication, properties, uses, PVC AND FRP, application in building industry.

REFERENCE BOOKS

1. Ching Francis D.K. Building Construction illustrated. John Wiley & sons. 2014
2. National Building Code-2005 & ISI specifications for Materials and Methodology of Various Construction.
3. Technical Manuals of various manufacturing companies for proprietary systems of partitions, paneling and suspended ceilings.
4. Alan Everett, Yvonne Dean. Mitchell building series, Building materials and finishes. Routledge 2014
5. Mackay J.K. Building Construction vol.-1-4. Longman Scientific & Technical, 1988.
6. Barry. 'Building Construction' Vol. 1 – 5
7. Cudley. 'Construction Technology' Vol. 1 – 6

SUBJECT: - STRUCTURE - V (AR05-03)

Lecture	60	Paper	1	Internal (Sessional)	20
Studio	-	Duration	3 hrs	External (Oral)	-
Total	60			Theory Paper	80
				Total	100

PREAMBLE

Considering the intention of architecture course in which students are expected to deal with construction of building structures, the orientation of syllabus shall be such that the students shall be able to understand the behaviour of structural systems, feasibility of different structural systems, limitation of forms and spans, and proper choice of material in construction of structural components, considering their strength, behaviour and response during service loads.

The intention of this course is to impart basic knowledge different structural systems, preliminary design procedures and understanding behaviour of structure and design concept. Designing simple individual components of small buildings.

It is not expected from students to carry out all load assessments, analysis, designs, checks of major structures/special structures for which they can seek the help of structural engineer.

However they shall be able to take decisions regarding selection of proper structural systems.

At T. Y. B. Arch. Students expected to carry out analysis, design of basic structural components and design of small structures and preparing sectional plans and elevations for simple components.

Student shall be permitted to use relevant I.S. codes, steel tables, for the purpose of calculations.

1. Fixed and continuous beams: advantages and disadvantages of fixed and continuous beams.
 - Determination of positive and negative moments for point loads and distributed load
 - Theorem of three moments
 - Continuous beams of two to four spans - SFD, BMD
 - Conceptual ideas of full and partial fixity in case of RCC and steel beams
2. Design of steel columns with axial and eccentric loads, bending moment about one axis.
 - Concept of bending moment about two axis.
 - Concept of built up columns with lacing and battening.
3. Conceptual ideas of steel roof trusses for different spans, material, roof shapes, calculation of load design of simple roof trusses up to 12 mt. Span.

REFERENCE BOOKS

1. R.C.C. design – Khurmi, Punmia, Sushilkumar.
2. Design of steel structures- L. S. Negi., Vajrani-Ratwani.
3. Structure in Architecture – Salvadori and Heller.
4. Structural Decisions.- F. Rosenthal
5. I.S. 456, I.S. 800, I.S. 875, I.S. 1893, I.S. 13920

SUBJECT: - BUILDING SERVICES - III (AR05-04)

Lecture	45	Paper	1	Internal (Sessional)	50
Studio	15	Duration	3 hrs	External (Oral)	-
Total	60			Theory Paper	100
				Total	150

Note: the study of services in third year salary to generate awareness of various services in

buildings, concepts of working of various services, effects of these services on building planning and understanding adequate to work with the consultants of these services. The institute shall encourage site visit and discussion with consultants and architects to ensure understanding of building planning.

1. ELECTRICITY

Electrical generation and transmission, cogeneration, captive power plants, standby systems, uninterrupted power supply, inverters.

Pollutants in electrical generation, green energy, renewable energy concepts, carbon footprint and carbon credits.

AC and DC supply, three phase and single phase supply

Components of electrical installations for various building uses, HT, transformers, electrical panel rooms, cable trenches, controls, wiring systems, safety devices, starter, earthing and metering of electricity.

Electrical installations in various building types such as residential bungalows, apartments, commercial and recreational buildings and factory buildings etc. site visits to such installations with particular stress on electrical installation for lifts, AC motor pumps etc.

Market survey of electrical materials and electrical appliances

Exercises of preparation of electrical layouts of residential buildings.

2. LIGHTING

Natural illumination, sky components, principle of good illumination. Illumination levels required for various activities. Different lighting systems (direct, diffuse and indirect methods) and concepts of the same. Lamps and luminaries.

Study of lighting for residential activities, offices, shops, theatres, factories etc.

Outdoor lighting

3. HOT WATER SUPPLY

Polluting and non polluting renewable sources of energy for water heating systems. Systems and multi storeyed buildings, boilers and pressure boilers, location of boilers, storage tanks, upward and downward feed systems. Piping for hot water and insulations, etc.

Site visits

4. LIFTS AND ESCALATORS

Various types of lifts, lift planning in buildings, innovations in lifts. Planning of escalators, limitations. Site visits

5. PUMPS

Different types of pumps, working and applications

Water pump, sewage pump, centrifugal, reciprocating volute, turbine

6. COMPRESSORS

Different types of compressors and their applications.

REFERENCE BOOKS

1. Tricomi, Ernest. ABC of Air-conditioning.1970
2. Smith, Philips & Sweeney. Environmental Science
3. Daniels, Klaus. Advanced Building Systems – A Technical Guide for Architects and Engineers. Birkhauser, Boston. 2003
4. National Building Code of India

SUBJECT: - LANDSCAPE DESIGN (AR05-05)

Lecture	30	Paper	-	Internal (Sessional)	50
Studio	30	Duration	-	External (Oral)	-
Total	60			Theory Paper	-
				Total	50

1. Introduction to landscape architecture
 - a. The profession of landscape architecture
 - b. Conceptual definition and landscape architecture
 - c. Components of practice in landscape architecture
 - d. Theory of landscape architecture
2. The garden in history
Origin of garden concept and garden in history in various periods like ancient, early modern, modern with respect to India and Europe.
3. Study of aspect of landscape architecture with respect to social, economic, cultural and functional aspects.
4. Study of landscaping elements, their types and characteristics.
5. Study of different landscaping materials, the uses and construction details- detailing of outdoor spaces.
6. Study of different types of plants, their local names, botanical names, physical characters and design values
 - a. Trees
 - b. Shrubs
 - c. Creepers and ground covers
7. Factors affecting landscape design- climate, surrounding etc
8. Case studies - nurseries and gardens
9. Design of indoor and outdoor landscapes.

REFERENCE BOOKS

1. Mcharg, I, Design with Nature. John Wiley and co. 1978.
2. Jellicoe, G and Jellicoe, S, The Landscape of Man, London: Thames and Hudson, 1991.
3. Simonds, J .O, Landscape Architecture: The Shaping of Man's Natural Environment, N Y: McGraw Hill Book Co.Inc. 1961.
4. Lynch, K, Site Planning, Cambridge: The MIT Press, 1962.
5. Shaheer, M, WahiDua, G and Pal A (editors), Landscape Architecture In India, A Reader: LA, Journal of Landscape Architecture, 2013.

SUBJECT: - WORKING DRAWING - I (AR05-06)

Lecture	15	Paper	-	Internal (Sessional)	50
Studio	75	Duration	-	External (Oral)	50
Total	90			Theory Paper	-
				Total	100

The subject introduces the student to methodology of preparation of working drawing based on principles of visual communication interpretation and reading of drawing. These drawings should enable the site staff to transform the drawing into actual construction with the help of sufficient dimension and details.

Legal aspects of working drawing and its status in contract document.

Preparation of a set of working drawing of load bearing construction or composite construction based on design problem done in second year architecture which should include:

- Foundation plan
- All elevation and sufficient number of sections
- Difficult doors and windows with joinery details
- Other architecture details
- Roofing shelves, working platforms, railing etc.
- All floor plans, elevation section and other relevant details and information required to obtain building permission from local authorities as per DC rules of Maharashtra government.
- Rainwater drainage of roofs
- Drawing for plumbing drainage water disposal
- Layout plan showing electrical lighting and installation and other services
- Use of computer technology may be permitted to prepare working drawings. But periodical checking of drawings shall be done and these drawings shall be kept for inspection along with final drawings at the time of external (oral) exam.

SUBJECT: - SPECIFICATIONS AND VALUATION (AR05-07)

Lecture	45	Paper	-	Internal (Sessional)	50
Studio	-	Duration	-	External (Oral)	-
Total	45			Theory Paper	-
				Total	50

SPECIFICATION

1. Introduction to type of specifications, its relationship with working drawing and need of writing specifications.
2. Method, form and language of writing specifications for materials and workmanship.
3. Stylish specifications writing in accordance with PWD current district schedule rates of Maharashtra state i.e. DSR and IS specifications
4. Study in detail specification clauses concerning building works:
 - a. Brickwork and stone masonry
 - b. RCC items like footing, columns, slabs etc
 - c. Plastering works
 - d. Floorings
5. Studying detail of specification clauses concerning services and installations:
 - a. Drainage and sanitation (domestic)
 - b. Water supply installations
 - c. Electrical installations

VALUATION

1. Definitions of value, cost, price, Importance of valuation, Different types of values, Factors affecting value, Different purposes of valuation, Gross income, outgoings and Net Income, different outgoings
2. Different methods of valuation for land and building
3. Application of valuation tables
4. Valuation Questionnaire
5. Valuation of Commercial Buildings like hostels, Lodges, theaters etc.
6. Valuation report for two simple cases

REFERENCE BOOKS

1. Indian Standard specifications
2. C.P.W.D. Specifications and schedule of rates
3. Specification Writing for Architects & Engineers, By Donald A. Watson
4. Specification Writing for Architects & Surveyors, By Arthur J. Wills
5. Estimating, Costing, Specification & Valuation, By M. Chakraborty

SUBJECT: - ARCHITECTURAL ACOUSTICS (AR05-08)

Lecture	45	Paper	1	Internal (Sessional)	50
Studio	-	Duration	2 hrs	External (Oral)	-
Total	45			Theory Paper	50
				Total	100

ARCHITECTURAL ACOUSTICS

1. BASIC THEORY : Origin of sound, propagation of sound, sound and vibration wave motion and spherical wave front: Frequency, wave length and amplitude of sound : Sound spectrum ,velocity of sound sensitivity of sound hearing : inverse square law : directional sound: Sound and distance : Masking : Decibels: Pattern of reflected effect of climatic condition on Sound in open space , sound.
2. Brief history of architectural acoustics
3. Acoustical phenomena (Behaviour of sound) in enclosed spaces – Sound reflection, Absorption, transmission, refraction, cross talk diffraction, diffusion, Reverberation, room resonance, room echo, flutter echo, sound shadow, multiple echo, whispering gallery etc.
4. Sabins formula and reverberation time calculations. Sound absorption, sound absorption coefficients
5. Sound absorbing materials and their market forms Porous materials, panel absorbers, cavity resonators, space absorbers, different variable absorbers, absorption by openings Mounting and distribution of absorbing materials, choice of materials, measurements and sound absorbing calculations.
6. Graphical representation of the first order reflection in different geometrical forms and their application in design
7. Acoustical design requirements for different types of the enclosed and open spaces in brief. Open air theatre, Auditorium, Cinema theatre, Halls for diff. Uses seminar halls, studios (Radio / T.V.)
8. Noise and its effects, Measurement of noise, various noise sources, air borne, and structure borne noise, transmission of noise in the building.
9. Various methods of Environmental noise control,
10. Control of mechanical noise and vibration in various building services e.g. Air conditioning, machinery noise in industry, plumbing.
11. Check list for the noise control for different types of bldgs. e.g. Auditoriums, Hospitals, Industrial buildings.
12. Noise reduction coefficient for different materials and calculation
13. Acoustical construction details and sound insulation construction details e.g. soundproof door, window, floor, partition, wall applications, ceilings etc.

For Internal sessional work sketches should be made on a3 size drg. Sheets to explain the various terms on topics as follows. •

- Topics 1 to 3 2 sheets
- Topic 4 – R.T. Calculations in detail , explain plan and section the application of materials etc. – 2 sheets
- Topics -6 - Graphical presentation of sound reflection – 1 sheet
- Topic 13 - Construction details – 2 sheets

REFERANCE BOOKS

- Detailing for Acoustics – Architectural press London
- Acoustical design in Architecture – Vern O Knudsen Cyril M Harries , (John Wiley and Sons)
- Environmental Acoustics – Lislle L Doelleo (Mc Graw Hill Book Co.)
- Concepts in Architectural Acoustics – M davidegan(--do-)
- Architectural Acoustics – Shiraskar
- VastushilpacheDhwaniSanyojan – Edki&Pethe

SYLLABUS FOR THIRD YEAR ARCHITECTURE DEGREE COURSE

TERM II

SUBJECT: - ARCHITECTURAL DESIGN – VI (AR06-01)

Lecture	15	Paper	1	Internal (Sessional)	100
Studio	135	Duration	18 hrs	External (Oral)	100
Total	150			Theory Paper	100
				Total	300

COURSE OBJECTIVES:

Designing a building by stacking of different functions vertically and addressing various concerns such as coordinating various building services, vertical circulation, basement parking, and structural grids with introduction to disaster management design strategies/techniques and universal design.

COURSE OUTLINE:

- Introduction to various concerns of building design in an urban context on sites with limited areas there by necessitating multi storied buildings.
- Strengths and weaknesses of horizontal vis a vis vertical spatial arrangements in buildings.
- Study of buildings in which vertical arrangements are desired.
- Design and layering of different activity areas with different spatial scales.
- Coordination of various building services such as water supply, lifts, drainage, garbage disposal, lighting, air conditioning etc.
- Exposure to natural disaster management or disaster management through design mitigation.
- Exposure to Universal Design or Accessible Design concept.

SESSIONAL WORK:

- A major design project of duration 10-12 weeks of a building complex. Example : Hotel, Hospital, Office building, commercial complex, bus station etc.
- A minor design project of duration 4-6 weeks which could be stand alone building on a site with area not less than 1500 sq.m. It is recommended that the minor project may be programmed to integrate knowledge of art-architecture history, contemporary art-architecture movements learnt by the student in history / contemporary architecture seminar.
- One time bound project of duration around 12 hours. The typology and scale of the project can be decided by the college.

Important Note: At least one of the two projects [major or minor] mentioned above has to be

in a different socio geographic context. The design has to be communicated through architectural graphics, two and three-dimensional sketches, models and narratives. All the design projects must have different sites.

REFERENCE BOOKS

It is strongly recommended that students refer books focusing on various building types, journals, magazines to widen their knowledge of design and the readings not to be limited to the list of books given below.

1. Correa, C. (2010). A Place in Shade. Delhi: Penguin Books.
2. Kanvinde, A., & Miller, H. (1969). Campus Design in India. Topeka: ostens/American Yearbook Co. .
3. Lynch, K. (1962). Site Planning. MIT Press.
4. Pandya, Y., & Foundation, V. S. (2007). Elements of Space Making. Ahmedabad: Mapin Publishing Pvt. Ltd.
5. White, S. (1995). Building in the Garden: Architecture of Joseph Allen Stein in India and California. Delhi: Oxford India Paperbacks.

SUBJECT: - BUILDING CONSTRUCTION AND MATERIAL – VI (AR06-02)

Lecture	15	Paper	1	Internal (Sessional)	100
Studio	75	Duration	4 hrs	External (Oral)	100
Total	90			Theory Paper	100
				Total	300

1. DOORS AND WINDOWS

- TW framed & glazed sliding-folding doors, aluminium framed & glazed pivoted doors, PVC doors
- Concrete, steel and stone door frames
- Aluminium sliding windows
- MS Gates, MS shutters, MS rolling shutters and MS grills for Windows

2. ROOFING

- Types of MS trusses
- Roof covering by pre-painted aluminium sheets-straight and curved
- Polycarbonate, fibre and PVC sheets for roof covering

3. Precast construction components (RCC) used for columns, beams, slab, staircases, floorings and partitions

**4. Partitions in aluminium, TW and plywood with respect to interior design
Modular partition aluminium.**

5. Ferro cement, siporex - introduction only

6. CERAMICS

- Clay product
- Tiles, manufacture, characteristics, types
- Encaustic tiles
- Terra – cotta –manufacture, varieties, advantages and disadvantages etc.
- Earthenware
- Stoneware
- Porcelain
- Clay blocks

7. GLASS

- Introduction
- Classification, composition and properties of glass
- Types of glass
- Manufacture of glass
- Treatment of glass, coloured glass
- Special variety of glass

8. INSULATING MATERIALS.

9. SOUND ABSORBANT MATERIALS.

10. HEAT INSULATING MATERIALS.

11. NEW SYNTHETIC MATERIAL IN MARKET.

Note: this subject should be dealt with keeping in mind the flag. Construction is a process and understanding the process should be given importance. Site visit should be done for better understanding of construction processes.

Measured drawing may be done for better understanding

REFERENCE BOOKS

1. Central Public Work Department, Indian Building Congress. Handbook on Seismic Retrofit of Buildings. Narosa Publishing House. 2008 Andrew Charleson. Seismic Design for Architects: Outwitting the Quake. Elsevier Ltd 2008
2. Terri Meyer Boake. Understanding Steel Design: An Architectural Design Manual. Birkhauser Basel 2012.
3. Stephen Emmitt. Barry's advanced construction of buildings. Wiley, 2006
4. Central Public works Department CPWD), IBC, CEAI & CCPS. Guidelines on use of Glass in Buildings - Human Safety.
5. Mackay J.K. Building Construction vol.-1-4. Longman Scientific & Technical, 1988.
6. IS 7921 : Recommendations for modular coordination in building industry Horizontal coordination
7. IS 7922 : Recommendations for modular coordination in building industry Vertical coordination
8. M. M. Mistry. Modular coordination & prefabrication, Principles of Modular Coordination in building.
9. BMTPC. Standards & Specifications for Cost-Effective Innovative Building Materials and Techniques. BMTPC 1996

SUBJECT: - STRUCTURE - VI (AR06-03)

Lecture	60	Paper	1	Internal (Sessional)	20
Studio	-	Duration	3 hrs	External (Oral)	-
Total	60			Theory Paper	80
				Total	100

1. Cement concrete - properties during and after setting
2. Theory of reinforced cement concrete - neutral axis, lever arm, steel percentage, moment of resistance of sections, modular ratio, permissible stresses under reinforced sections, balanced sections over reinforced sections.
3. Concept of shear, Bond and development length
4. Conceptual idea of application of working stress method to RCC design, concept of limit state method of RCC design.
5. Design of simply supported slabs, cantilever and continuous RCC slab by limit state method.
6. Design of singly reinforced beams, conceptual ideas of doubly reinforced, T and L beams.
7. Design of shear reinforcement for beams
8. Design of short axially loaded columns, reinforcement details, conceptual idea of designing long column.
9. Design of simple square and rectangular footings, consideration of Bond stress and punching shear.

SESSIONAL WORK: minimum 4 drawing sheets based on about topics.

References :

1. R.C.C. design – Khurmi, Punmia, Sushilkumar.
2. Design of steel structures- L. S. Negi., Vajrani-Ratwani.
3. Structure in Architecture – Salvadori and Heller.
4. Structural Decisions.- F. Rosenthal
5. I.S. 456, I.S. 800, I.S. 875, I.S. 1893, I.S. 13920

SUBJECT: - BUILDING SERVICES - IV (AR06-04)

Lecture	45	Paper	1	Internal (Sessional)	50
Studio	15	Duration	2 hrs	External (Oral)	-
Total	60			Theory Paper	50
				Total	100

1. HEATING VENTILATION AND AIR CONDITIONING (HVAC)

Natural and artificial ventilation, comfort conditions, temperature control and humidity control, air changes and filtration of air.

Fans, exhaust fans, blower fans etc. Air filters of various types

Humidification of spinning Mills

Site visit

Building heating, energy forms for heating, preventing heat loss from building, local and Central heating, radiators and convectors etc.

Passive solar heating, orientation, heat storage materials.

Air conditioning, preventing heat gain, energy for air conditioning, refrigeration cycle, different systems of AC, window, split, duct-able, air cooled, water cooled, air cooling and water-cooling systems. Fire dampers, ducting and diffusers etc. Exhaust and plenum.

Intelligent building systems in air conditioning.

Sick building syndrome, effect of pollutants, improving air quality in AC buildings. Application to various buildings.

Site visits.

2. FIRE SAFETY

Fire regulation for buildings, fire resistant materials, fire rating, ease of evacuation, types of fires, fire hazards, alarm systems, fire sensors, fire officer, fire drills.

Extinguishing materials, portable extinguishers, sprinklers, dry and wet risers, hose reel installations etc.

Site visits

3. SAFETY SYSTEMS

Burglar protection systems, security systems, limited access systems, CCTV etc.

Site visits

Data cabling systems, terminals etc.

REFERENCE BOOKS

- Leslie, Doelle. Environmental Acoustics. McGraw Hill.1972
- Kundsén, V.O. & Harris, C.M. Acoustical designing in Architecture. John Wiley. 1950
- Egan, M. David. Architectural Acoustics. McGraw-Hill, NY.1988
- Mehta, Madan, Johnson, J., Rocafort, J. Architectural Principles and Design. Prentise_Hall, NJ. 1999
- National Building Code of India

SUBJECT: - TOWN PLANNING (AR06-05)

Lecture	45	Paper	1	Internal (Sessional)	50
Studio	15	Duration	2 hrs	External (Oral)	-
Total	60			Theory Paper	50
				Total	100

1. Introduction to physical planning, development of settlement- villages – towns – metropolises. Salient features of historic towns and its relevance in present context.
2. Standards of land use allocations, public amenities.
3. Hierarchy of roads and junctions, planning elements, its influence on planning of settlements.
4. Salient features and elements of development plan of a town – city and region – Role of MRTTP act
5. Conceptual study of – neighbourhood, industrial town, satellite town, garden city and new towns
6. Skyline, colour and texture of townships, conservation of heritage, role of urban Arts commission.

REFERENCE BOOKS

1. Urban Pattern: Arthur Gallion
2. City in History: Lewis Mumford
3. Spreriegen, Paul. Urban Design: The Architecture of Town and Cities. Malabar,FL- USAKrieger Publishing Co., 1967
4. Lynch, Kevin. The Image of The City London: The MIT Press, 1960
5. Book of Development Control Regulations by Local Municipal Corporation (latest edition available)
6. Book of AITP Exam study material: 'Planning Law and Legislation' by ITPI New Delhi
7. Guide to Planning Surveys including Landuse Classification: TCPO, Govt of India: 2004
8. Housing and Urbanization: Charles Correa
9. Garden Cities of Tomorrow: Sir Ebenezer Howard
10. Maharashtra Regional and Town Planning Act, 1966
11. Traffic and Transportation Planning by L.R. kadiali

SUBJECT: - WORKING DRAWING II (AR06-06)

Lecture	15	Paper	-	Internal (Sessional)	50
Studio	75	Duration	-	External (Oral)	50
Total	90			Theory Paper	-
				Total	100

Preparation of set of working drawings of a sample RCC frame structure of ground + 1 storey buildings

OR

Preparation of a set of working drawing of one of the buildings design by student in assignment of architectural design-V by designing at with RCC frame structure.

SESSIONAL WORK:

- Preparing a manually drafted/ CAD generated working drawing set of 'own design project with carpet area not less than 250 Sq. M. and at least Ground plus one storied building having framed/composite construction. The set to also include at least two civil details out of following.
 - I. Façade / skin of the building with fenestration and weather protection.
 - II. Stairway/ staircase
 - III. Public Washroom

Any one detail related interior finishes/ custom made furniture of following

 - IV. Floorings,
 - V. False ceiling
 - VI. Panelling or partitions
 - VII. Built in or standalone furniture
- A rough folio comprising of design development drawings, sketches supporting the final working drawing set shall be retained by the candidate.

SUBJECT: - QUANTITY SERVEYING AND ESTIMATING – I (AR06-07)

Lecture	60	Paper	1	Internal (Sessional)	20
Studio	-	Duration	3 hrs	External (Oral)	-
Total	60			Theory Paper	80
				Total	100

Objective: To help students in taking quantities of simple structures, mode of measurements and methods of billing.

1. To Introduce Estimation as an important Subject for Architecture.
2. To Understand Different methods of Computing Quantities for items of work in a structure.
3. To enable students in working out quantities of various items of work for simple load bearing and R.C.C. framed structure and acquaint them with various types of estimates including standard method of measurement on building works and mode of measurements as adopted by I.S 1200.

REFERENCE BOOKS

1. B.I.S 1200- Part-I 1992. n.d.
2. Prof.B.N.Dutta, Estimating and Costing in Civil Engineering.
3. B.S.Patil. Civil Engineering Contarcts and Estimates.
4. Dr. Roshan Namavati. Professional Practice.
5. Rangawala. Estimating Costing and Valuation.

SUBJECT: - ELECTIVE – I (AR06-08)

Lecture	30	Paper	-	Internal (Sessional)	50
Studio	-	Duration	-	External (Oral)	-
Total	30			Theory Paper	-
				Total	50

1. OFFICE AND SITE PRACTICE

This subject serves as basic introduction to "professional practice" subject taught later on. Subject will deal with how the job is "processed" during planning and execution, both in architects office and at site.

Letter writing in architect's profession, report on design, concept of this year's design project. Office administration, feeling and recording of letters and drawings, maintenance of accounts, modes of maintenance of accounts, cash book, bank transaction ledgers, depreciation and profit and loss statements. Modern office equipment, reproduction, drafting machines and modern drawing equipment.

Method of execution of works, types of tenders and their suitability for various projects, tender documents, tender procedures, condition of contract of IIA and state PWD (introductory) , scrutiny of tenders and recommendations.

Infrastructure for commencement of work

Work order, bar chart for construction work and office work, site supervision, duties, site visit reports, interim and final bills, completion certificates, sessional work based on about topics like drafting of tender notice, special conditions, bar chart for a typical building, visit report etc

2. TROPICAL ARCHITECTURE

- **INTRODUCTION**

- **CLIMATE: THE GIVEN CONDITION**

Global climate factor, elements of climate, classification of tropical climates, site climate.

- **COMFORT: THE DESIRABLE CONDITIONS**

Thermal comfort factors, thermal comfort indices, effective temperature its use.

- **PRINCIPLES OF THERMAL DESIGN**

Thermal quantities, heat exchange of buildings, periodic heat flow.

- **MEANS OF THERMAL CONTROL**

Mechanical contrast, structural control, ventilation and air movement

- **LIGHT AND LIGHTING**

Light principles, daylighting and prediction techniques

- **NOISE AND NOISE CONTROL (INTRODUCTION)**

Sound: principles noise control and noise problem in tropics

- **APPLICATION**

Shelter for hot - dry climate, shelter for warm - humid climate, shelter for composite climate, shelter for tropical unplanned climate.

- **SUSTAINABILITY AND BUILDING DESIGN (CLIMATIC APPROACH)**

Five pillars of sustainability

- a. Environmental (ecological)
- b. Society (community)
- c. Economy (employment generation)
- d. Architecture
- e. Climate

- **GREEN BUILDING DESIGN (CLIMATIC APPROACH)**
 - a. Site planning
 - b. Energy efficiency
 - c. Effective water management
 - d. Waste management
 - e. Indoor air quality
- **ENERGY EFFICIENCY IN BUILDING (CLIMATIC APPROACH)**
 - a. Site planning (plan form, ratio of built/open space, location of water bodies, landscaping)
 - b. Building envelope and fenestration
 - c. Solar passive techniques
- **VERNACULAR ARCHITECTURE**
 - a. Locally available material and construction techniques
 - b. Culture and traditions
 - c. Application to modern contemporary buildings

Reference book: Climatic design, manual of tropical housing and building.
By Koenigsberger, Ingersoll, Mayhew, Szokolay

3. HOUSING

Human settlements and housing concepts

Traditional housing systems and different ages and different countries

Housing in different climatic conditions, effect of social and economical conditions on housing.

Building materials for housing, respective use, fabrication and construction technique

Residential zoning as a part of town planning, coordination with zones, air pollution and environmental protection.

Problems of mass housing in city

Housing problems in India

Housing problems in urban rural and industrial areas

Cooperative and ownership housing

Role of promoters and builders in housing, housing through private, semi public, public and industrial sectors.

Present laws and regulations regarding housing

4. CONSTRUCTION PROJECT MANAGEMENT – 1

- Introduction to project Management concept
- History of Management
- Purpose goals and objectives
- Characteristics of projects
- Different aspects of Management
- Introduction to traditional management systems- Gantt's approach and bar chart
- Introduction to work, study, time study and motion study
- Concept of work breakdown schedule
- Introduction to modern Management concept
- Concept of equipment management-
 - Construction tools and equipment
- Concept of material Management-
 - Local and nonlocal material
 - Investigation
 - Exploration
- Site layout for construction work (introductory)