**NOTIFICATION**

No. 105 /2025 Dated : 19 /07/2025

**Subject: Implementation of new syllabus of the subjects of Semester VII to X of B.Arch. (Bachelor of Architecture) as per C.B.C.S. pattern.**

It is notified for general information of all concerned that the authorities of the University have accepted to implement the new syllabus of the subjects of **Semester VII to X of B.Arch. (Bachelor of Architecture) as per C.B.C.S. Pattern** to implemented from the academic session 2025-2026 & onwards as mentioned below:

Sd/-
(Dr.A.M.Asanare)
Registrar
Sant Gadge Baba Amravati University

**SYLLABUS OF SEMESTER VII TO X OF BACHELOR OF ARCHITECTURE**

**SEMESTER PATTERN (CHOICE BASED CREDIT SYSTEM)**

## SEMESTER: SEVENTH

### 07ARC01 ADVANCE CONSTRUCTION - I

**Objective** : The course will enable the learning in progression, Construction systems of large buildings from foundation to roofs and walling systems.

Unit I: Different types of construction systems for foundation of large span and multistoried buildings, Viz; shaft foundation, Caisson foundation, group pile system, combined pile & raft foundation.

Unit II: Earthquake resistant structure.
a) Fundamentals of seismic design & control systems.
b) Introduction & role of non-structural elements in earthquake

Unit III: a) Remedial measures in terms of planning, designing and materials.
b) Retrofitting of earthquake affected buildings.

Unit IV: a) General study of standardization of building elements its uses for various construction.
b) Study of Modular co-ordination and its multipurpose functional application.

Unit V: Concept of structural glazing, curtain wall & building skin system, viz; glass, ACPs, jalies& adaptive building envelopes with fixing details.

Unit VI: Introduction & designing of Light Gauge Framing System (LGFS) or Light gauge Steel framing (LGSF).

Sessional work: Assignments, test, site visit and drawing on the above topics.

**Reference Books:**

1. S.C. Rangwala, Engineering Materials, Charotar Publishing House, Anand,1997
2. HUDCO - All you want to know about soil stabilized mud blocks, HUDCO Pub, New, Delhi, 1989.
3. W.B. Mckay Building Constrution, vol. 1,2,3, Longmans, U.K.1981.
4. Don A Watson, Construction Materials and Processes, McGraw Hill Co.,1972.
5. R. Chudley, Construction technology, Richard Clay (Chaucer Press) Ltd.,Suffolk,1978.
6. J. H. Callender,Time saver standard for Architectural Design Data, McGraw-Hill,1994.

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### 07ARC02 ENVIRONMENTAL SERVICES – I

**Objective**: To impart knowledge of various aspects of city level water supply systems, drainage and solid waste disposal.

Unit I: Sources of water supply their types, water collection, water treatment, distribution of water from various sources.

Unit II: Rain water disposal and roof drain and rain water harvesting system.

Unit III: Water pollution and preventive measures.

Unit IV: Sewage treatment plant and its locational factor.

Unit V: Garbage disposal and recycling methods. Concept of recycling of solid and liquid waste in building. Vermi-compost, Biogas production, etc.

Unit VI: Sewage disposal systems in unsewered location viz. septic tank, soak pit, acqua privy.

**Sessional work**: Assignments, test, site visit and drawings on the above topics.

**Reference Books:**

1. Manual of Water supply and treatment, second edition, CPHEEO, Ministry of Works and housing, New Delhi, 1977.
2. Manual of Sewerage and sewage treatment, CPHEEO Ministry of Works and housing, New Delhi, 1980.
3. S.C.Rangwala, water supply and sanitary Engineering,Charotar publishing House , Anand 1989.
4. Bureau of Indian Standards.
5. Pachauri, A.K., “Water Supply and Sanitary Installations, Design, Construction and Maintenance”, New Age International Ltd.
6. Manas Handbook of Plumbing, Manas Publishers.

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**07ARC03 PROFESSIONAL PRACTICE & VALUATION**

**Objective**: The objective of the course is to expose the students to the present trends of architectural practice and valuation.

Unit I: The Architects Act of 1972. Role of professional bodies like COA, IIA its working, byelaws, categories of membership, election procedure and code of conduct. Other professional bodies such as, ITPI, IIV, COA &IIA, etc.

Unit II: Professional responsibilities of the architect, copyrights, scale of charges, variation of charges, mode of payment, termination of services, specialized building services.

Unit III: Techniques of valuation, elements of valuation and factors affecting valuation. Methods, valuation of land and building property, comparable cost of sale, purchase and mortgage.

Unit IV: Valuation for compensation on acquisition, compensation under central and state legislation with reference to Town Planning Act.

Unit V: Valuation for renewal or lease/extension of lease, standard rent, easement rights, dilapidation, insurance, estate development and advice on investment policy.

Unit VI: Arbitration, arbitrators, umpire and nature of arbitration.

**Sessional work**: Assignments on - documentation for complete project with design documents & valuation report of site with respect to its visit and various aspects.

**Reference Books:**

1. Rangwala, S C , “Valuation of Real Properties”.
2. Piotrowski, A. and Williams, Julia, “The Discipline of Architecture”, University of Minnesota Press.
3. Eldred, G.W., “The Beginners Guide to Real Estate Investing”, John Wiley & Sons
4. Publications of COA, IIA Hand Book on Professional Practice, The Architects publishing Corporation of India, and Bombay 1987.

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**07ARC04: URBAN PLANNING**

**Objective**: The objective of the course is to develop the understanding of urban planning process through surveys, analysis, alternative planning strategies and to address settlement planning issues.

Unit I: Planning during Medieval and renaissance period in western and Indian context.

Unit II: Evolution of modern planning concepts. Impact of industrial revolution on planning process. Planning theories developed by Patric Geddis, EbenzerHoward, Lewis Mumford, C. L. Doxiadis, Patric Abercrombie.

Unit III: Need and study of Urban planning interrelationship between urban planning, urban design, urban landscape design and Architecture planning as a team work and role of urban planner in planning team. Hierarchical levels of planning.

Unit IV: Introduction to TPS, master plans, structure plan, regional plans,land use planning, Neighborhood Planning, zoning.

Unit V: Recent trends in urban planning, various governmental policies and schemes in urban development viz- SEZ, Amrut, Smart cities mission, ISHDP, Urban renewal process and Slum improvement scheme etc.

Unit VI: National habitat and housing policy, introduction to housing, various housing schemes and various housing agencies such as HUDCO, MHADA etc.

Sessional work: Assignments, test, site survey & analysis resulted into urban planning studio and drawings on the above topics.

**Reference Books:**

1. Gallion Arthur B &Eisna Simon, The Urban Pattern, City Planning and Housing.
2. C. L. Doxiadis, Ekistics, An introduction to the Science of Human Settlements, Hutchinson, London, 1968
3. John Ratchiffe, An Introduction to Town and Country Planning.
4. Gupta, V., “Energy and Habitat: Town Planning and Building Design for Energy Conservation”, Wiley Eastern.
5. Rangwala, S.C., “Town Planning”, Charotar Publishing House.
6. Eleanor, S.M., “British Town Planning and Urban Design: Principles and Policies”, Longman.
7. Randall, A., “Crossroads, Hamlet, Village, Town: Design Characteristics of Traditional Neighbourhoods, Old and New”, American Planning Association.

**07ARC05 ARCHITECTURAL STRUCTURE-VI**

**Objective**: Understanding of Basic Theory and principles of structural analysis and structural properties of elements.

Unit I : Design and detailing of simple ground plus onestory structure.

Unit II: Various structural systems for multistoried buildings, analysis of multistoried buildings and structure subjected to wind pressure.

Unit III: Introduction to coffered grid slab and design of flat slabs with its elements and details.

Unit IV: Failure of structure

a. Types of failure in various structure.
b. Causes of failure.
c. Evaluation of damage
d. Nondestructive testing techniques.
e. Techniques to prevent collapse failure of structures.

Unit V: Plastic analysis of Steel Structure and design of industrial shed.

Unit VI: Introduction to Digital structural design systems such as Etabs, Stadpro etc. with its pre-requisites, menus and toolbars.

**Sessional work**: Assignment based on G+1 RCC structural design and site visit reports of flat slab / grid slab.

**Reference Books:**

1. P.C.Punmia, Strength of Materials and Theory of Structures; vol I, Laxmi Publications, Delhi, 1994.
2. S.Ramanmurtham, Strength of Materials – Dhanpatrai& Sons, Delhi 1990
3. W.A.Nash, Strength of Materials – Schaums Series – McGraw Hill Book Company, 1989
4. R.K.Bansal – engineering Mechanics and Strength of Materials – Lakshmi Publications, Delhi, 1990.

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**07ARC06 ACCOUSTICS & ILLUMINATION**

**Objective**: To enable the students understand the articulation of sound within and around building, fundamentals of sound propagation and lighting requirements in buildings.

UNIT-I: Fundamentals - sound waves, frequency, intensity, wave length, measure of sound, decibel scale, speech and music frequencies, human ear characteristics.

UNIT-II: Sound transmission and absorption – outdoor noise levels, acceptable indoor noise level, sonometer. Sound absorbing materials, absorption co-efficient and measurements, resonance reverberation time , sound levels and their calculations.

UNIT-III: Acoustical defects and remedies. Structure borne and air borne noise, their effects and control.

UNIT-IV: Site selection, shape, volume, treatments for interior surfaces, basic principles in designing open air theatres, cinemas , broadcasting studio, concert hall , theaters, lecture Halls.

UNIT-V: Principles of Illumination- Visual tasks - factors affecting visual task – Modern theory of light and colour - synthesis of light - luminous flux - candela – solid angle illumination – Utilizations factor- Depreciation factor – MSCP – MHCP Laws of illumination. Application of laws in lighting calculations using point by point method.

UNIT-VI: Lighting Design – Classification of lighting – Artificial light sources - spectral energy distribution – luminous efficiency. Design of modern lighting for stores, offices, schools, hospitals and residential lighting.

**Sessional work**: Assignments on latest lighting & illumination systems, market survey on latest acoustical materials and test on the above topics.

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**07ARC07 ARCHITECTURAL DESIGN STUDIO – VII**

Objective: To enable the student to design the large-scale housing and housing project in an urban/ peri urban environment with emphasis on advanced building services and systems, urban development regulations, building byelaws and socio-economic analysis.

**Basic Contents:**

1) Introduction to the designing of multifunctional community housing project on an appropriate scale with varying building typologies.
2) Importance of case studies, data collection, area analysis, evolution of plan forms, climatic oriented planning and design features, space utilization, building & site services, site analysis and site planning, etc; in the Architectural design process.
3) Importance of culture, tradition, topography, climate and building bye laws in generating built form.
4) Planning and designing of large-scale housing and building projects in an urban/ peri urban environment, advance building services, energy conservations, cost effective techniques and materials, building bye laws, housing schemes etc.
5) Architectural study tour relevant to design project.

**Sessional work**: One major design project and one time project with other task and assignments.
Viva Voce by external examiner at the end of Semester.

**Suggested Text Books:**

1. Ching, F.D.R.: Form, Space and Order, Van Nostrand Rheinhold, New York (1979).
2. Parmar V.S.: Design Fundamentals in Architecture, Somoiya Publications, Bombay (1973)
3. Scott: Design Fundamentals ,Edward d Mills- Planning the Architects Hand Book – Bitterworth, London, 1985.
4. Watson,D (editor) Time –saver standards for Architectural Design: Technical data for professional practice, McGraw-Hill, 2005.
5. Neufert,P; Architects Data; Blackwell Science, 2000.
6. Agkathidis, A, Hudert, M and Schiling, G., "Form defining strategis: experimental architectural design". Wasmuth, 2007.

## 07ARC08 ADVANCE CONSTRUCTION STUDIO – I

Sessional work: Assignments and drawing on the above topics given in the subject 07ARC01 Advance construction – I.
Viva Voce by external examiner at the end of Semester.

## 07AR09 INTERIOR DESIGN – II

**Objective**: To unable students to work upon public scale interiors and transform initial designer into an interior designer.

Design of a larger interior space, viz; public & corporate buildings with respect to style, function, services, etc.
Special emphasis on material pallet, product design, visual arts, graphics, lighting, acoustics & presentation skills.

**Sessional work**: One major interior design project on the above topicswith assignments.
Viva Voce by external examiner at the end of Semester.

**Suggested Books:**

1. Chiara, J.D., Panero, J., Zelnik, M., "Time Saver Standards for Housing and Residential Development", 2nd Ed., McGraw-Hill.
2. Neufert, P., "Architects Data", 3rd Ed., Blackwell Science.
3. Watson, D.(Editor), "Time-saver Standards for Architectural Design: Technical Data for Professional Practice", McGraw-Hill
4. Ballard Bell, Victoria and Rand, P., "Materials for Architectural Design", Laurence King.

## 07ARC10 URBAN PLANNING STUDIO

**Sessional work**: Assignments and drawing on the above topics given in the subject 07ARC04 Urban Planning.
Viva Voce by external examiner at the end of Semester.

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## SEMESTER: EIGHTH

### 08ARC01 ARCHITECTURAL DESIGN – VIII

**Objective** : To expose students for designing of large scale urban design projects with emphasis on modern material, techniques, architectural styles advanced services, sustainable architecture, green architecture, climate responsive architecture etc.

**Basic contents:**

1) Introduction to urban design project planning and design consideration.
2) Importance of case studies, data collection, area analysis, evolution of plan forms, climatic oriented planning and design features, space utilization, building & site services, site analysis and site planning ,etc; in the Architectural design process.
3) Importance of culture, tradition, topography, climate and building bye laws in generating built form.
4) Major design project may include midrise/ high tall buildings viz. apartment and commercial mixed used complexes, five star Hotel, multifunctional complex, community centers, super specialty hospital, institutions etc.
5) Architectural study tour relevant to design project.

**Sessional work:** One major design project and one minor/ Allied design project with other task and assignments.

**Suggested Text Books:**

1. Ching, F.D.R.: Form, Space and Order, Van Nostrand Rheinhold, New York (1979).
2. Parmar V.S.: Design Fundamentals in Architecture, Somoiya Publications, Bombay (1973)
3. Scott: Design Fundamentals Edward d Mills- Planning the Architects Hand Book – Bitterworth, London, 1985.
4. Watson,D (editor) Time –saver standards for Architectural Design: Technical data for professional practice, McGraw-Hill, 2005.
5. Neufert,P; Architects Data; Blackwell Science, 2000.
6. Agkathidis, A, Hudert, M and Schiling, G., “Form defining strategis: experimental architectural design”. Wasmuth, 2007.

### 08ARC02 ADVANCE CONSTRUCTION – II

**Objective**: Study is to aim at teaching students the advance and more complexaspects of construction industry. It also aims at exposing them to systems and technology of construction use for large spaces with complex utilities.

Unit I: General introduction to large span structures and high rise structures, planning features and its construction aspects. Chronological development of large span structural framework such as lamella, laminated portal frame, R.C.C. & steel portal frames.

Unit II: A) R.C.C. and steel space frame structures. B) Study of shell structures and its construction techniques from historical perspective. C) Shell structures such as Geodesic Schwedeler and Gitter Kuppel and its construction aspect.

Unit III: Construction aspect considered in temporary structures which are of portable nature for various short terms events. Use of modular techniques and materials.

Unit IV: Ferrow cement techniques and its appropriate various uses for building construction elements.

Unit V: Stressed Skin Structures – Introduction:
Suspended / Tensile Roof Structures - Introduction, definition, design and structural principles - All types, a complete architectural study. Constructional aspect, erection of cable roofs. Examples, Merits and Demerits.

Unit VI: Tensile Membrane and Pneumatic Structures – Introduction, definition, design and structural principles - all types, a complete architectural study. Constructional aspects, Examples, Merits, Demerits.

**Sessional work**: Assignments, test, site visit and drawing on the above topics.

**Reference Books:**

1. S.C. Rangwala, Engineering Materials, Charotar Publishing House, Anand,1997
2. HUDCO - All you want to know about soil stabilized mud blocks, HUDCO Pub, New, Delhi, 1989.
3. W.B. Mckay Building Construction, vol. 1,2,3, Longmans, U.K.1981.
4. Don A Watson, Construction Materials and Processes, McGraw Hill Co.,1972.
5. R. Chudley, Construction technology, Richard Clay (Chaucer Press) Ltd.,Suffolk, 1978.
6. J.H.callender, Time saver standard for Architectural Design Data, McGraw-Hill, 1994.

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**08ARC03 ENVIRONMENTAL SERVICES – II**

Objective: Understanding complex relationship between natural and build environment with emphasis on strategies to transform the built environment considering the environmental issues.

Unit I: Natural and artificial ventilation system in buildings. Air conditioning methods equipments and ducting.

Unit II: Refuse disposal system in high-rise buildings, viz. – refuse chute, purpose of service floor and other services.

Unit III: Vertical & Horizontal transport system –Elevators Electric, hydraulic, passenger, hospital, capsule, freight etc., Parallel and criss cross escalators, horizontal belt conveyors , horizontal moving walkway's.

Unit IV: Energy conservation, low energy systems, hybrid systems, integration of P. V. and wind system in the building, wind, solar and other non-conventional energy systems, solar thermal application for heating and cooling, electricity generation in building.

Unit V: Fire safety – general provisions. Causes of fire in buildings, Fire protection standards – safety regulation – NBC – planning consideration in building like non- combustible material, construction, stair cases and lift lobbies, fire escapes and A.C. system.(Fire detectors and fighting installation. Type of detectors and usage. Alarm system, Firefighting pumps, fire tank, dry and wet risers, automatic sprinkler, fire drill, refuge areas)

Unit VI: Special features required in building types considering universal design principals. Lighting conductors& building automation system.Intelligent energy conservation systems, electronic security and surveillance systems for buildings, etc.; compliance requirements w.r.t. National Building Code and Energy. Conservation Building Code.

**Sessional work**: Assignments, test, site visit and drawings on the above topics.

**Reference Books:**

1. Manual of Water supply and treatment , second edition, CPHEEO, Ministry of Works and housing, New Delhi, 1977.
2. Manual of Sewerage and sewage treatment, CPHEEO Ministry of Works and housing, New Delhi, 1980.
3. S.C.Rangwala, water supply and sanitary Engineering, Charotar publishing House , Anand 1989.
4. Bureau of Indian Standards.
5. Pachauri, A.K., "Water Supply and Sanitary Installations, Design, Construction and Maintenance", New Age International Ltd.
6. Manas Handbook of Plumbing, Manas Publishers.

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**08ARC04 SUSTAINABLE ARCHITECTURE**

**Objective**: To sensitize students about the importance and need for Sustainable Planning concept and appropriate Architectural design concept as an emerging thrust area.

UNIT-I :Development in Historical Context - Climate Responsive features in early settlements – orientation of Streets and Buildings, Creation of Habitable Environment, Early Planning Methods.

UNIT-II: Introduction to– Environmental Impact Analysis– Ecological foot prints – Essential ingredients of sustainable development apart from social and economical – environment, stake holder, participation, institutional mechanism.

UNIT-III: Characteristics of sustainable architecture: fundamentals of passive designing with respect to thermal comfort, visual comfort, acoustic comfort.

UNIT-IV: Resource Efficiency – Land, Water, Energy, Human Resource, Biodiversity – Sustainable practices at settlement, Campus and Building Level.

UNIT-V:Sustainable Architecture –Basic strategies-3 R's, vernacular practices &innovative designs.Strategies with respect to ISO rating systems, assessment and ratingsystems like GRIHA, LEED, IGBC, ECBC etc.

UNIT-VI: Global Sustainable Planning and Policies – Awareness programme at International conventions on sustainability, Kyoto protocol, United nations SDG's and its relevance to Architecture.

**Sessional work**: Assignments and test on the above topics.

**Reference Books:**

1. O.H.keonigsberger; T.G. Ingersoll and others; Manual of tropical housing and building- Part-I; Longmans,London-1980
2. M. Evans; Housing, climate and comfort; Architectural press London- 1980
3. B.G.Givoni; Man,climate and architecture; Applied science, banking, Essex, 1982
4. N.K Bansal and others; Passive building design; Elsevier science-1994.
5. S.Drake; The third skin architecture, technology and environment;
6. UNSW–press-2007.
7. Manik & Girish Komisva, IIPA, keeping Cities Clean and Green, Uppal Publishing House, 1997.
8. Beer, Environment Planning for Site Development.

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## 08ARC05 INNOVATIVE STRUCTURAL SYSTEMS

Objective: Application of Basic Theory and principles of structural analysis and structural properties of elements with innovative and creative design techniques.

Unit-I Long span structures with spanning techniques Such as: - Conventional techniques of Arch, Vault Doming and its limitations Modern techniques for spanning -Parabolic shapes or hyperbolic shapes: - Long span trusses.

Unit-II Tall structures and its structural systems: - Earlystructures,lateral load resisting systems: - Braced systems, shear wall systems, shear wall frame and shear truss frame system, core out-rigger system, Tubular systems:- Frame tube, breast tube, bundle tube, tube in tube- with detailed diagrammatic illustration.

Unit-III Advance tubular system :- Composites building systems, combined & shared systems, concrete core systems with detailed diagrammatic illustration.

Unit-IV Tensile Structures:- Loading and tensile materials the relationship between form, function and structural material, case studies of some tensile systems.

Unit-V Ferrocement Structures to achieve plasticity in architecture, materials, concept and case studies advantages and disadvantages -Low cost systems Cost saving techniques applied for building elements such as – structural elements, wall elements, floor and roofing elements.

Unit-VI Sustainable, Green and Biophilic Architecture: -Green is Environment friendly,Sustainability is wider considers their pillars- Social, Environmental and economy. Biophilic-Tries connect with nature and other living organisms. Concept and case studies of above, Green rating systems .

**Sessional work**: Assignments, tests, and tutorials on the above topics.

**References:**

- Building structures Illustrated: Patterns, systems and Design:- By F.D.K. Ching
- Structural Systems for Tall Buildings-I.D. Bennets
- Thin-Walled Structures - Advances and Developments - J. Zaras, K. Kowal-Michalska, J. Rhodes

## 08ARC06 PROFESSIONAL ELECTIVE – I (1) HOUSING

**Objective**: To sensitize students about the need for, demand and supply of housing in India, to expose the role or function of various housing agencies, the typologies of housing with basic environmental issues.

UNIT-I: Housing Issues – Indian Context. Housing as Architecture – basic need – demand and supply of housing – Housing Agencies and their role in housing development.

UNIT-II: Social factors influencing housing design, affordability, economic factors and influence of traditional housing and planning features.

UNIT-III: Housing surveys and standards. Sources of Data and information, methods and techniques of housing survey, housing standards etc.

UNIT-IV : Housing Design – Traditional Patterns – Row housing and cluster housing – layout concepts – use of open spaces – utilities and common facilities.

UNIT-V: Case studies of housing schemes designed by eminent architects.
High Rise Housing.

UNIT-VI: Government schemes for slum improvement, Housing and urban development in India.

**Sessional work** : Assignment and case studies of above topics.

**Text Books :**

1. Joseph de chiara and others – Time Saver Standards for Housing and Residential Development McGraw-Hill Co., New York, 1995
2. Karnataka state Housing Board – MANE – Publication – 1980

## 08ARC06 PROFESSIONAL ELECTIVE – I(2) ARCHITECTURAL CONSERVATION

**Objectives**: To understand the significance of built heritage as a resource of an identity. To identify causes of deterioration and suggest remedial measures. To understand the importance of conservation and its legal aspects.

Unit:I Conservation, concepts, history, principles and methods. Various issues and practices of conservations, values and ethics.
Unit:II Concept of integrated conservation, related problems, Issues and solutions. Inventory and Documentation Techniques.
Unit:III International charters - INTACH, UNESCO, ASI, ICOMOS, etc., Introduction to approaches to conservation with relevant case studies from India and abroad.
Unit:IV Comprehensive scope of Architectural conservation, lessons for Indian situation. Character and issues in our heritage towns through case studies.
Unit: V Various guidelines for the preservation, conservation and restorations of buildings.
Unit: VI Community participation in Conservation, introduction to concept of World Heritage Sites.

**Sessional work**: Notes, Seminars, assignments on above topics. Method of Assessment: Sessional Exams, Teacher's Assessment, End Term Exam

**References**:

1. Bernard Feilden, "Conservation of Historic Buildings", Third Edition 2003,.
2. Aylin Orbasli, "Architectural Conservation: Principles and Practice".
3. Picard Gilbert, Charles, "Encyclopaedia of Archaeology".
4. A. S. Bizht, I. K. Bhatnagar, "Conservation of cultural property in India".

## 08ARC06 PROFESSIONAL ELECTIVE – I (3) SUSTAINABILITY ASSESSMENT & RATING SYSTEMS

**Objectives**: To understand sustainability as a global concern and every individuals responsibility.
To study the various aspects and principles of sustainability in architecture and planning.
To study various nuances of assessment of architectural sustainability.

Unit: I: Sustainability: - Definition Core idea, historical backdrop and traditional practices ensuring sustainability.Three pillars of Sustainability: - Social, economic and environmental.Principals to ensure suitability: 3 Rs Reduce, Reuse & Revitalize, following of traditional / cultural/ sustainable practices, innovative designs and community measures to stop their non- sustainable practices

Unit: II: Policies and lessons learnt from Global summits and united Nations Conferences on the Environment :-

- First Earth summit at stalkholm (1972) and community development pxogra memes as solution.
- Rio de janario conference 1992 focused sustainable development
- Kyoto Protocols
- Johannesburg Summit 2002, viz.
- Earth summit at stalkhotm in 2022 to set out post Covid-19 sustainable recovery plans.

Unit: III: Environmental and social sustainability in urban areas, Human activities and energy in cities, Ecological footprint, population carrying capacity, concepts and approaches for sustainable urban planning such as compact city urban form, density, landuse and accessibility systems, mixed land use, participatory and integrated approach.

Unit: IV: Assessing urban sustainability: - Scales of assessment Building or cluster, Neighborhood, City, Region, National and Global.

Unit: V: Assessment process- Identifying tools, parameters and indicators with sustainability framework, measurement systems and ranking /marking. Software tools for designing and performance evaluation of a building.

Unit: VI: Various measurement systems / framework of sustainability developed by different agencies such as: - LEED, GRIHA,BIM with case studies and best practices with rankings.

**Sessional work** :Assignment and case studies of above topics.

**Text Books :**

1. IGBC green new building rating systems, abridged reference guide September 2016 by Indian green building council.
2. An overview of green building rating systems by Raviraj Jadhav, Pritam Mali, Amit Patil, Lambard academic publishing.
3. Guide to green building rating systems by Linda Reeder, Jhon Wiley and sons limited.
4. Cities and Climate Change, OECD Publishing OECD (2010)
5. Eco-City Planning: Policies, Practice and Design, Tai-Chee Wong and Belinda Yuen, Springer
6. Guide to Sustainable Community Indicators, Hart, Maureen, North Andover, MA: Hart Environmental Data, Second Edition, 1999.
7. Sustainable Urban Planning, Joy Sen, The Energy and Resources Institute, TERI,2012
8. Social Sustainability in Urban Areas: Communities, Connectivity and the Urban Fabri, Tony Manzi, Karen Lucas, Judith Allen, Tony Lloyd Jones, Routledge, 2010
9. Sustainable Development in India: Stocktaking in the run up to Rio+20. TERI, New Delhi, Ministry of Environment and Forests, Government of India, 2011SGBC
10. Handbook of sustainability LEED ¼ for Building Design & construction.

## 08ARC06PROFESSIONAL ELECTIVE – I (4)CONSTRUCTION MANAGEMENT

**Objectives:**

To introduce students to fundamental principles of construction management, quality control measures and develop skills in project planning, scheduling with understanding of digital tools and their applications in construction management.

**Unit I: Introduction to Construction Management:**
Role and scope of construction management in architecture, Functions and responsibilities of a construction manager, Construction project lifecycle and phases, Organizational structures in construction projects, Introduction to contracts, tenders, and procurement.

**Unit II: Project Planning & Scheduling:**
Principles of project planning and work breakdown structures (WBS), Scheduling techniques: Gantt Charts, Bar Charts, Milestone Charts, Introduction to Critical Path Method (CPM) and Program Evaluation and Review Technique (PERT), Resource allocation and optimization in scheduling

**Unit III: Construction Financial Management:**
Direct and indirect costs in construction projects, Cost-time tradeoff and project crashing techniques, Financial planning, project budgeting, and cash flow management

**Unit IV: Construction Methods & Equipment:**
Selection of construction methods and their impact on project efficiency, Use of construction equipment: cranes, excavators, concrete mixers, scaffolding, formwork, etc.

**Unit V: Quality Control & Safety Management:**
Quality control techniques in construction, Inspection methods and construction defects management, Safety management: construction site hazards, safety standards, and OSHA regulations, Risk assessment and mitigation strategies in construction projects.

**Unit VI**: Use of Digital Tools in Construction Management
Introduction to Building Information Modeling (BIM) and its applications, Project management software: MS Project, Primavera, and Procore, Digital collaboration tools for construction teams, Use of Geographic Information Systems (GIS) in site planning and analysis, AI, automation, and data analytics in construction management

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**Sessional Work:**

- Assignments based on case studies and real-life project management scenarios
- Hands-on exercises using software like MS Project, Primavera, or BIM tools
- Site visits and interaction with industry professionals

**Recommended Text Books:**

1. Dr. B. C. Punmia& K. K. Khandelwal – Project Planning and Control with PERT/CPM, Laxmi Publications.
2. Peurifoy & Schexnayder – Construction Planning, Equipment, and Methods, McGraw Hill.
3. S. Seetharaman – Construction Engineering and Management, Umesh Publications.
4. Chitkara, K. K. – Construction Project Management: Planning, Scheduling & Controlling, McGraw Hill.
5. Jha, K. N. – Construction Project Management: Theory and Practice,Pearson Education.

**08ARC07 ARCHITECTURAL DESIGN STUDIO - VIII**

**Sessional work:**

Assignments and drawing on the above topics given in the subject 08AR01 Architectural Design Studio – VIII.

Viva Voce by external examiner at the end of Semester.

**08ARC08 ADVANCE CONSTRUCTION STUDIO - II**

**Sessional work:**

Assignments and drawing on the above topics given in the subject 08AR08 Advance construction Studio – II.

Viva Voce by external examiner at the end of Semester.

**08ARC09 LANDSCAPE DESIGN STUDIO –**

**Objective**:- To understand the basics of landscape design by studying the key elements at both small and large scale landscape, focusing on their form, function, and aesthetics through hands-on studio projects. The goal is to design outdoor spaces that are both practical and visually appealing, promoting sustainability enhancing the ecology.

**Unit I**: Landscape Graphics in Architectural Representation:
Landscape graphics & role in architectural assignments, especially in landscape design and site analysis. Understanding and applying landscape graphics enhances the clarity, precision, and impact of architectural projects.

**Unit II**: Landscape Appraisal – Analyzing existing Landscape Design with its typology & Process.
To study the methodologies and processes used in the case landscape design, with a focus on analyzing existing landscapes and evaluating their effectiveness. Application of tools and techniques for assessing landscape designs, identifying their strengths and weaknesses, and understanding how design principles have been applied in user-world scenarios.

**Unit III**: Understanding the Plantform Design with its Classification and Horticultural Practices in an illustrated manner. Other elements in landscape design.

Comprehensive understanding of plant classification systems in horticulture, emphasizing their role in landscape design. Students will learn how plants are categorized based on, function, ecology, and environmental factors. Further how they are are applied in landscape organization. Illustration in sections and sketches. Illustration of water conserving and revenue generating landscape proposals to be applied in major design as well.

**Unit IV**: Site Analysis, Site Planning and Development – Understanding and Derivation of Form
To understand the process of site analysis and site planning, with a focus on how to derive design forms from site characteristics. This unit focuses on understanding and evaluating the site in its geographical, political, and functional context. It covers essential aspects for effective site development.

**Unit V**: Study of essential services:
To understand and integrate essential services within landscape design, emphasizing the role of utilities, infrastructure, and services that support sustainable and functional outdoor spaces. Students will explore how essential services such as water supply, sewage systems, electricity, and waste management contribute to the overall effectiveness of landscape planning and development.

**Unit VI** : Landscape Design Project Application and implementation of landscape elements into a design for residential areas, urban spaces, campus design at institutional & industrial level, reclaimed lands, Forest parks, Theme parks etc.

**Sessional work:**
Assignments and Sketches, Case Studies of contemporary period, One major Landscape Proposals for Public/ Private and institutional purpose . Assignment shall be on the above topics.

**Reference Books:**

1. Sylvia Crowe Sheila Haywood, The Gardens of Mughal India , Vikas Publishing House, Pvt. Ltd, India, Delhi,1973.
2. Garrett Eckbo, The Art the Home Landscaping, McGraw-hill Book Co., London, 1956.
3. Testsuro Yoshida, Gardens of Japan, Jr. Marcus G. Sims, 1963.
4. Sir Banister Fletcher, A History of Architecture, University of London, The Antholone press, 1986.
5. Percy Brown, Indian Architecture (Islamic period), Taraporevala and Sons, Bombay, 1983tt
6. Satish Grover, The Architecture of India (Buddhist and Hindu Period), Vikas Publishing Housing Pvt. Ltd., New Delhi, 1981
7. Christopher Tadgelli, The History of Architecture in India from the Dawn of Civilization to the end of Raj, Longman group, U.K.Ltd., London, 1990

Viva Voce by external examiner at the end of Semester.

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## SEMESTER : NINTH

### 09ARC01 PRACTICAL TRAINING

Each candidate shall have to undertake practical training at the Architectural firm with establishment not less than 5 years and shall be headed by CoA registered Architect only. The training period shall be for 6 months with 120-150 work days to make it convenient. Candidate after successful completion shall prepare a detail report along with necessary drawing, sketches, measurement, record, reading, observations, survey analysis, log sheets and modes, if necessary on the following site aspects which are concerned with the practical training. This report shall be submitted for the Viva-Voce examination duly certified by the Principal of the College.

1. Log sheet and office certificate - A student shall fill the log sheets as a record of his every day work. While joining the Architect officestudents have to submit offer letter or Joining letter.At the end of practical training every student shall submit the training completion certificate from his/her employer.Marks (Sessional)- 25

2. Field Observation - A report on architectural use of the site conditions. For example, site characteristics, landmarks, infrastructure on and nearby site, flora & fauna, visual survey,contour survey, if required, etc. Marks (Sessional) – 10

3. Site Supervision and Practice-A detail report of any major part of a building that has been personally supervised by the candidate. It may include executing & checking site measurement preparation of a bills of Quantities, site instructions and checking of the executed work. Marks (Sessional) – 25

4. Working Drawings/ submission drawing/ presentation drawing- A student shall submit all the working details prepared by him/her during his/ her practical training along with project specification. Marks (Sessional) - 40

5. Estimate - A student shall study & prepare estimate considering the nature & requirement of project. Marks (Sess.) - 25

6. Critical appraisal - of any building that he/she-'or his/her employer has designed and executed. The building shall be used and the students may record the reactions of the users to support his/her appraisal in addition to photographs, drawing etc. Marks (Sessional) - 25

Viva-Voce- Each candidate shall be individually interviewed and questioned on any of the subject mentioned above by,Head of Department of Architecture, one or more Internal and external examiner appointed by the University as required.

| | | |
|---|---|---|
| Marks (External Viva Voce) | - | 150 |
| Total Marks | - | 300 |
| Minimum Passing Marks | - | 150 |

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## SEMESTER: TENTH

### 10AR01 PROFESSIONAL ELECTIVE – II (1) SUSTAINABLE CITIES & COMMUNITIES

**Objective:**
This course aims to provide students with an understanding of sustainable urban development, with a focus on designing cities and communities that promote environmental, social, and economic sustainability. The course will integrate various aspects of sustainability, including resource management, urban design, environmental protection, and social equity.

**Unit I**: Overview of Sustainability:
- Definition and importance of sustainability.
- Pillars of sustainability: Environmental, Economic, and Social.
- Sustainable Development Goals (SDGs) and their relevance to urban planning.

**Unit II**: Urban Design and Sustainability:
- Compact cities vs. sprawling cities.
- Mixed-use development and transit-oriented development.
- Human-scale design principles.

**Unit III**: Green Building Practices:
- Building performance and energy efficiency.
- LEED, BEAM,BREEAM,DGNB and other sustainability certification systems.

**Unit IV**: Urban Ecology and Environmental Impact
Ecological Footprint and Resource Management:
Measuring the environmental impact of cities.
Resource management: Water, energy, materials, and waste.

**Unit V**: Climate Change and Resilience
- Climate Adaptation and Mitigation in Cities:
- Climate-responsive architecture and urban planning.
- Flooding, extreme weather, and disaster resilience.

**Unit VI**: Social Sustainability and Community Engagement
-Social equity in urban spaces.
- Community Participation in Urban Development:
- Stakeholder engagement strategies.
- Participatory planning and co-design.
- Case studies of community-driven urban projects.

**Reference Books:**

1. Sustainable Urbanism: Urban Design With Nature by DouglasFarr
2. The Death and Life of Great American Cities by Jane Jacobs
3. Design with Nature by Ian McHarg
4. Ecology of Cities and Towns: A Comparative Approach by Mark J. McDonnell and Eric W. H. R.
5. Sustainable Cities: Urbanization and the Environment in India by Chander, R. and Kumar, R.
6. The Sustainable City by Steven Cohen.

## 10AR01 PROFESSIONAL ELECTIVE – II (2) CLIMATE RESPONSIVE ARCHITECTURE

**Objective**: To sensitize students about the importance and need for Climate Responsive Architecture Design concept.

UNIT -I : Introduction to the ideas, issues and concepts of sustainable Architecture, related to types of climates. Global Environment & Principles of Environmentally and supportive Architecture.

UNIT-II: Non- conventional Energy Systems, Solar Thermal Application for heating and cooling.

UNIT-III : Low Energy design Hybrid Systems, Integration of PV and wind systems in the buildings.

UNIT-IV : Day Light principles , Glare amount of daylight, daylight factor, orientations and sizes of opening to achieve diffused lights.

UNIT-V: Application of Climatic Principles – Evolution of Plan Form to minimize Heat Gain in Tropical Climates, Orientation of Building with respect to sun , wind, sizes of fenestration & its orientation, Use of evaporative cooling, cavity walls, topography , water bodies, vegetation. Landscape elements, cross ventilation system to achieve natural comfort level in indoor & outdoor spaces.

UNIT-VI: Planning and Design features to be considered with respect to various Climate.

**Sessional work**: Assignments and drawing on the above topics given in the subject.

## 10AR01 PROFESSIONAL ELECTIVE – II (3) TRAFFIC AWARENESS & TRANSPORT PLANNING

**Objective**: To introduce the concepts, principles, tools and aids or Road Safely and Civic Sense to the students of B.Arch. To acquaint them with the design and safety standards for roads. Also inculcate the practice of safe road behaviour and civic sense among them.

**Unit: I**: Introduction to Road Safety:
Road as an active space, Types of Users, User Behaviour, Sensory Factors like Vision and Hearing in User Behaviour. Types of Vehicles: Heavy Vehicles, Light Motor Vehicle, Vehicle Characteristics: Dimensions, Weight, Turning Radii, Braking Distance, Lighting System, Tyres, etc. Type of Hazards: Conflicts and Accidents.

**Unit: II**: Typology of Roads: Components and Design:
Road Classification: National Highways, State Highways, District Roads (MDR and ODR), Village Roads Urban Road Classification: Expressways, Arterial, Sub-Arterial, Collector, Local, Service Roads, One-Way, Two-Way etc. Mountainous Roads. Speed Limits of the Road types.
Design of Roads: Cross-Sectional Elements- Right of Way, Carriageway, Median, Shoulders, Sidewalk, Lanes.

**Unit: III**: Intersections: Types of Road Intersections: Basic Forms of at-grade Junctions (T, Y, Staggered, Skewed, Cross, Scissors, Rotary, etc. Grade Separated Junctions (with or without interchange): Three-Leg, Four-Leg, Multi-Leg, etc. Design of Intersections: Design and Spatial Standards for Traffic Islands, Turns, Turning Radii, Directional lanes, Pedestrian Crossings, Median Openings, Traffic Calming Components like Speed Breakers and Table-Top Crossings etc.

**Unit: IV**: Pedestrian Circulation and Barrier Free Design
Requirement of Pedestrian Infrastructure: Sidewalks and Footpaths, Recommended Sidewalk Widths, Pedestrian Crossings, Pedestrian Bridges, Subways, Cycle Tracks, etc.
Barrier Free Design: Location and Design Standards for Ramps for Wheel Chair Access. Other Provisions like Tactile for Visually Challenged etc.
Safety Provisions: Pedestrian Railings, Anti-skid Flooring, Pedestrian Signal, Walk Button, etc.

**Unit: V**: Road Safety and Civic Sense:
Need for Road Safety, Category of Road Users and Road Safety Suggestions. Precautions for Driving in Difficult Conditions (Night, Rain, Fog, Skidding Conditions, Non-Functional Traffic Lights, etc.)
Types of Breakdowns and Mechanical Failures**.**

**Unit**: VI: Traffic Regulations, Laws & Legislations:
Indian Motor Vehicles Act (Chapter Vlll: Control of Traffic to be discussed in detail)Regulations Concerning Traffic: Cycles, Motor Cycles and Scooters, Rules for Pedestrian Traffic, Keep to the Left Rule, Overtaking Rules, Turning Rules, Priority Rules, Hand Signals, etc.Speed and Hazard Management. Penal Provisions.National Road Safety Policy, Central Motor Vehicle Rules, State Motor Vehicle Rules Introduction to Good Practices.

**Assignments**: Tutorials and Case Studies on above topic.

**Reference Books:**
1. Introduction to Traffic Engineering, R Srinivasa Kumar
2. Traffic Engineering and Transport Planning, Kadiyali.
3. Book on Road Safety Signage and Signs, Ministry of Road Transport and Highways, Government of India
4. MORT&H Pocketbook for Highway Engineers, 2019 (Third Revision)
5. Publications by UTTIPEC namely, Street Design Guidelines, UTTIPEC Guideline for Road Markings, UTTIPEC Guideline and Specification for Crash Barriers, Pedestrian Railing and dividers, UTTIPEC Standard Typical Crossing Design.
6. Street Design Standards as provided in Time ÉSavers, Neuferts etc. Publications by Indian Road Congress.

## 10AR02 ARCHITECTURAL PROJECT / THESIS

**Objective:**

Develop any chosen architectural design project, emphasis being on integration of all technical, the topic would be selected by students, subject to approval by the department& supervisor. The topic selected may be a live design project or research oriented but essentially concluding in its application in architectural design project. The work progress evaluation would also be based on intermediate reviews of the studyin presence of panel of teachers and experts from professional field.

The Viva-voce would be in the form of final Review on the basis of sessional & final submission in presence one or more external examiner appointed by the University as required. The H.O.D. Department of Architecture and student's teacher Guide would act as Internal Examiners.

The students would be required to explain and defend their study and design. The submission would consist of proper Presentation of Drawings, Dissertation Report, 3D Model& walkthrough.

The candidate shall carry out thesis considering the following aspect – Research analysis and data collection, site selection & justification, user requirements & justification, climatic conditions, socio-economic problems, communication, Transportation, Landscape & Urban Planning.

## 10ARC03 RESEARCH METHODOLOGY & WRITING

**Course Objectives:**

1. To introduce students to various research methodologies in architecture.
2. To equip students with skills in writing research papers and dissertations.
3. To familiarize students with data analysis and presentation techniques.
4. To develop abilities for publishing and presenting research effectively.

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Unit I: Introduction to Research Methodology and its relevance in Architecture (Weeks 1-3)

- Definition, scope, and importance of research in architecture.
- Types of research:
  - Qualitative, Quantitative, and Mixed Methods.
  - Descriptive, Exploratory, Analytical, and Experimental Research.
- Research process: Identifying research problems, formulating objectives, and reviewing literature.
- Ethics in research: Plagiarism, authenticity, and responsible research practices.

Activities:

- Group discussion on different types of research in architecture.
- Case study analysis of published research papers.

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Unit II: Research Paper Writing and Publication (Weeks 4-6)

- Structure of a research paper:
  - Abstract, Introduction, Methodology, Results, Discussion, Conclusion, and References.
- Writing strategies: Clarity, coherence, and academic tone.
- Referencing and citation styles: APA, MLA, Chicago.
- Understanding peer review and the process of publishing in journals/conferences.
- Avoiding plagiarism and using research tools (Zotero, Mendeley).

Activities:

- Workshop on writing an abstract and introduction.
- Peer review of students' research paper drafts.

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Unit III: Research/Project Report Writing (Dissertation) (Weeks 7-9)

- Structure of a dissertation:
  - Title Page, Abstract, Introduction, Literature Review, Methodology, Data Analysis, Conclusion, and Bibliography.
- Writing techniques for effective research communication.
- Formatting and structuring dissertations.
- Case study approach and application of research findings.

Activities:

- Drafting a dissertation proposal.
- Peer review session on literature review and methodology sections.

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Unit IV: Research Presentation Techniques (Weeks 10-12)

- Various techniques for presenting research findings:
  - Case studies, reports, infographics, slides, and posters.
  - Graphical representation: Tables, charts, pie diagrams, bar charts, and mapping techniques.
- Research tools for data visualization: Excel, GIS, SPSS, AutoCAD, and Sketch Up.
- Effective PowerPoint and poster presentation techniques.
- Communication and audience engagement strategies.

Activities:

- Workshop on creating data visualizations.
- Research poster and PowerPoint presentation by students.

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Unit V: Data Collection, Analysis, and Interpretation (Weeks 13-14)

- Primary vs. secondary data sources in architecture.
- Methods of data collection: Surveys, interviews, observations, and archival research.
- Qualitative vs. quantitative data analysis.
- Introduction to basic statistical tools for architectural research.
- Software for data management and analysis (Excel, SPSS, NVivo).

Activities:

- Fieldwork: Conducting surveys and interviews on an architectural topic.
- Data analysis exercise using real-world datasets.

Unit VI: Case Studies and Application of Research in Architecture (Weeks 15-16)

- Review of significant architectural research projects.
- Application of research in:
  - Sustainable architecture and materials.
  - Urban studies and smart cities.
  - Climate-responsive design and energy efficiency.
- Emerging trends in architectural research: Artificial intelligence, Digital Fabrication, and Parametric Design.

Activities:

- Presentation of individual research projects or case studies.
- Discussion on current research trends in architecture.

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**Assessment Breakdown:**

1. Literature Review Assignment – 15%
2. Research Paper Draft – 20%
3. Dissertation Proposal – 25%
4. Data Analysis & Visualization – 20%
5. Research Presentation (Poster & Oral) – 20%

**References:**

1. Groat, L., & Wang, D. (2013). Architectural Research Methods. Wiley.
2. Creswell, J. W. (2017). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Sage Publications.
3. Zeisel, J. (2006). Inquiry by Design. W. W. Norton & Company.
4. Kumar, R. (2018). Research Methodology: A Step-by-Step Guide for Beginners. Sage Publications.
5. Kothari, C. R. (2004). Research Methodology: Methods and Techniques. New Age International.

6. Babbie, E. (2020). The Practice of Social Research. Cengage Learning.
7. Oliver, P. (2006). Built to Meet Needs: Cultural Issues in Vernacular Architecture. Routledge.
8. Journals: Journal of Architectural Education (JAE), Architectural Science Review, Building and Environment.
9. Zeisel, J. (2006). Inquiry by Design: Environment/Behavior/Neuroscience in Architecture, Interiors, Landscape, and Planning. W. W. Norton & Company.
10. Yin, R. K. (2017). Case Study Research and Applications: Design and Methods. Sage Publications.
11. Day, R. A., & Gastel, B. (2011). How to Write and Publish a Scientific Paper. Cambridge University Press.
12. Frampton, K. (2020). Modern Architecture: A Critical History. Thames & Hudson.

## 10ARC04 SEMINAR

**Objective**: Seminar is intended to evaluate the student's ability to explore in the field of architecture and make in depth investigation in the chosen area.

The students are expected to choose topics which are of special interest to them and prepare a Report and Drawings to show analysis of investigation. The Review of work would be done in presence of H.O.D. Department of Architecture, and nominated teacher guide, and other teachers.

The Viva-voce would be in the form of proper presentation of the Drawings, Information/ Data, data interpretation and Report. The Viva-voce would be inpresence of External Examiner. The H.O.D. Department of Architecture, and student's teacher Guide would act as internal examiners.

The Seminar topic can be related to any of the following subject – Architectural theory , history, design determinates, design language, design evaluation, building types, urban planning and design, housing, interior design, landscape design, building technology and environmental sciences, professional practice and any other related field, accepted and approved by the Department.

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