



5-Year Bachelor of Architecture (B.Arch.) Curriculum and Syllabus
Second Semester

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	S	P	
Theory					
TIUACE-202	Strength of Materials	3	0	0	3
TIUBAR-201	Mathematics II	3	0	0	2
TIUAR-201	Evolution of Architecture	4	0	0	3
TIUAR-202	Building Material & Sciences-2	3	0	0	3
TIUAR-203	Environmental Science	2	0	0	2
Practical					
TIUAR- 208	Workshop Practice & Model Making-2	0	0	2	2
TIUAR- 211	Computer Application- 2 : CAD 2D	0	0	3	2
Sessional					
TIUAR - 205	Architectural Design - I	0	6	0	6
TIUAR- 206	Details of Construction – I	2	4	0	4
TIUAR - 207	Descriptive Geometry-II	0	6	0	4
Institute Programme					
TIUFY- 2##	Career Advancement Skill Development	3	0	0	3
TIUFY- 2##	Entrepreneurship Skill Development	0	0	0	2
Total Credits					36



2ND SEMESTER SPL (for 2014-15 Batch only)

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	S	P	
Theory					
TIUAME - 201	Engineering Mechanics	3	0	0	2
TIUACE - 202	Strength of Materials	3	0	0	3
TIUMTH - 201	Mathematics II	3	0	0	2
TIUAR - 201	Evolution of Architecture	4	0	0	3
TIUAR- 202	Building Material & Sciences-2	3	0	0	3
TIUAR - 203	Environmental Science	2	0	0	2
Practical					
TIUAR- 204	Workshop Practice & Model Making-2	0	0	2	2
TIUAR- 205	Computer Application- 2 : CAD 2D	0	0	3	2
Sessional					
TIUAR - 206	Architectural Design - I	0	6	0	6
TIUAR- 207	Details of Construction – I	2	4	0	4
TIUAR - 208	Descriptive Geometry-2	0	6	0	4
Institute Programme					
TIUSD- 2##	Career Advancement Skill Development	3	0	0	3
TIUFY- 2##	Entrepreneurship Skill Development	0	0	0	2
Total Credits					38



STRENGTH OF MATERIALS (TIUACE - 202)

L – S – P (4 – 0 – 0)

Credits-3

MODULE I

Simple Stresses & Strains: Mechanical Properties of Materials – Definitions with explanations only — Different types of loads and their effects on materials– Tensile, Compressive, Shear and Impact — Simple stresses and types of stresses — Simple strains and type of strains — Stress-strain diagram for M.S.in tensile test showing salient points such as Proportional Limit, Yield point, Elastic Limit, Ultimate points and Breaking Point — Study of stresses – Strain diagram for Cast Iron and Dead Steel — Modulus of Elasticity — Ultimate stress, working stress and Factor of safety and their effect on simple designs — Stresses in members with stepped cross section and stress in composite members — Stress in nuts and bolts — Temperature stress and strain — Simple problems

MODULE II

Shear Force & Bending Moment: Types of beams, types of supports and types of loads on beams — Definitions of B.M and S.F and their sign conventions — Bending Moment and Shear Force diagrams of simple cases such as: Cantilever beams with point loads and UDL, Simply supported beams with point loads and UDL, Simply supported overhanging beam – one side and both sides – Simple Problems

MODULE III

Bending Stresses in Beams: Definitions of bending stress deduction of simple bending formula i.e. $M/I = f/y = E/R$ with their usual notations (assumption made in theory of simple bending) – Neutral axis — Moment of Resistance, Section modulus and Radius of Gyration — Related problems in bending stress for symmetrical section about axis parallel to the plane of bending

MODULE IV

Deflection of Beams: Differential equation of elastic curve – Relation among deflection, slope, shear force, bending moment and rate of loading – Sign convention of slope and deflection — Standard formula (no proof) for maximum slope of deflection in: (a) cantilever beam subjected to point load at free end alone & when subjected to uniformly distributed load on entire span; (b) simply supported beam carrying a point load at mid span alone & when carrying a uniformly distributed load on entire span — Problems related to above two cases of cantilever and simply supported beams

MODULE V

Columns: Definitions of Columns & Struts – Long, Medium & Short columns – Effective Length – Slenderness Ratio – Critical load – Safe load — Different kinds of end conditions — Euler's formula for critical load (no proof) — Assumptions made and its limitations — Strength of columns

Recommended Books:

Timoshenko, S. P. & Young, D. H.; 'Elements of Strength of Materials'; 5th edition, East West Press, 1993; Timoshenko, S.; 'Strength of Material'; Tata McGraw Hill, New Delhi



MATHEMATICS II (TIUBAR - 201)

L – S – P (3 – 0 – 0)

Credits-2

MODULE I

Co-ordinate Geometry – Two dimensions: Transformation of coordinates – Translation
Rotation only, Reduction of general equation of second degree

MODULE II

Co-ordinate Geometry – Three dimensions: Coordinates, Direction Cosines, Planes,
Straight lines, Spheres, Standard equations of simple surface e.g. cylinders, cones,
ellipsoids, Hyperboloids etc.

MODULE III

Vector Algebra: Sum and products of vectors, Application of Geometry and Mechanics

MODULE IV

Linear Programming: Geometrical ideas of convex sets, feasible solutions and domains
etc. Fundamental theorem of LPP (statement only), Graphical methods, Applications of
Simplex Algorithm

MODULE V

Statics: Analysis data (direct and grouped), Frequency Diagrams, Ogive, Histogram,
Measures of central tendency: Mean, Median, Mode, Measures of dispersion, Skewness,
Curtosis Fitting of curves (Least square method).

MODULE VI

Differential Equations: Second order differential equations with constants co-efficient and
with variable co-efficient reducible to case constant co-efficient, applications

Recommended Books:

- Advanced Engineering Mathematics by i) E. Krysizig, ii) Peter V. O'Neil.
- Engineering Mathematics by iii) B. S. Grewal, iv) S. Arumugam, A. Thangapandi
Isaac & A. Somasundaram v) S.S.Sastry.



EVOLUTION OF ARCHITECTURE (TIUAR – 201)

L – S – P (4 – 0 – 0)

Credits-3

MODULE I

Introduction and Prehistoric Developments: Introduction to early interventions in the natural environment — Megalithic – Funerary architecture– Religious/Symbolic developments as at Stonehenge, Salisbury Plains, England – Neolithic settlements eg, Catal Huyuk, Anatolia.

MODULE II

Systems of Enclosure: Principles and examples of Trabeated, Arcuated and Corbelling systems, introduction to different developments of the arcuated form at conceptual level.

MODULE III

Surface Treatment and Ornamentation Techniques: Principles and techniques for treating surfaces definitions and examples.

MODULE IV

Architectural developments in Ancient Egypt: The contextual factors influencing the architecture – use of temporary materials of vegetable origin in the vernacular architecture and their translation into stone– evolution of tomb architecture from mastabas (in different stages), to The Step Pyramid to Bent Pyramid to the True Pyramids – Construction materials and systems in the pyramids of Egypt – Temple architecture – typology of temples — detail study of conceptual space organization and architectural elements in Egyptian temple architecture with examples.

MODULE V

Architectural developments in West Asia: The contextual factors influencing the architecture – building techniques and processes – three dimensional articulation of spaces – architectural elements – external finishing techniques – building services – introduction of the arch – temples and palaces as the chief building typologies – principles of architectural organization – symbolism and meaning – social underpinnings – Early Mesopotamian Architecture, Assyrian Architecture, Babylonian Architecture and City Planning, Persian Architecture (Palace of Persepolis).

MODULE VI

Architecture and Town Planning Principles in the Indus Valley: The contextual factors – town planning principles, residential architecture, public buildings such as The Great Bath in Mohenjo Daro and The Granary in Harappa.

MODULE VII

Early Vedic Architecture: The contextual factors influencing the architecture –residential architecture, introduction to the elements used in the essentially rural settlements – fences, roof and walls of huts, gateways, etc.

MODULE VIII

Buddhist Architectural Developments: Ashokan edicts - Buddhist Stupa architecture – Detailed study of the Sanchi Stupa



MODULE IX

Rock Cut Architecture of India: Buddhist, Jain and Brahmanical Pillars - Early Examples - Barabar Hills, Bihar - Orissan (Jain) monastic retreats at Udaygiri - Hinayana Phase – chaityas and viharas – Mahayana Phase – Rationale for developments – chaityas and viharas – Brahmanical Phase – Detailed study of the culmination of Rock cut architecture in India, the Kailasha Temple at Ellora.

Recommended Books:

1. A History of Architecture (Century Edition) / Sir Banister Fletcher / Butterworth Heinemann (Hb), CBS (Pb)
2. Indian Architecture Vol. 1 (Buddhist & Hindu) / Percy Brown / D.B. Taraporevala
3. Buddhist and Hindu Architecture in India / Satish Grover / CBS
4. Architecture: From Prehistory to Postmodernity / Marvin Trachtenberg and Isabelle Hyman/ Prentice Hall
5. A World History of Architecture / Marian Moffett, Michael Fazio & Lawrence Wodehouse / McGraw-Hill
6. Encyclopedia of Architectural Technology / Ed: Pedro Guedes / McGraw-Hill
7. The Story of Architecture from antiquity to the present / Jan Gympel / KÖNEMANN (Pb)
8. The Great Ages of World Architecture / G. H. Hiraskar / Dhanpat Rai.



BUILDING MATERIAL & SCIENCES-2 (TIUAR – 202)

L – S – P (2 – 0 – 0)

Credits-2

MODULE I

Clay Products: Tiles, their properties and use - terra-cotta, earthenware, stoneware, porcelain, vitreous.

MODULE II

Special Concrete: Water repellent, Waterproofing compounds, Accelerators, Air entraining agents. Hardeners, plasticizer, Fly ash. Their availability and uses. Light weight concrete, ready-mix concrete, and precast concrete

MODULE III

Wall & Floor Tiles: General character and construction process of traditional flooring like: IPS flooring, Terrazzo flooring. Sizes, Classification & Properties of tiles used in wall and flooring. Selection criteria & Methods of fixing various types of tiles.

MODULE IV

Varnishes, Paints Distempers: Characteristics and process of varnishing, Type and Compositions of Paints, Types of painting system: aluminum paints. Cement-based paints, oil emulsion paints, enamel paints and their selection criteria.

MODULE VI

Plastics and Polymers: Types and Use of Plastic in building construction. Properties of Plastic. Use of various Polymer Materials in building industry, Use of Nano-paints.

MODULE VII

Miscellaneous Materials: Glass, Fibre glass. Cork, rubber, Gypsum, sealants, Asbestos, heat and sound insulative materials. Their trade name and uses.

Recommended Books:

1. B. C. Punmia; Building Materials and Construction .Laxmi Publications Pvt Ltd, New Delhi, 1993
2. Bindra & Arora; Building Materials and Construction.
3. W.B. McKay, 'Building Construction', Vol. 1,2,3 Longmans, U.K. 1981.
4. Arthur Lyons; Materials for Architects and Builders- An Introduction; Arnold, London 1997



ENVIRONMENTAL SCIENCE (TIUAR – 203)

L – S – P (2 – 0 – 0)

Credits-2

MODULE– I

Environmental Awareness: Multidisciplinary nature of environmental Science, Definition, scope, importance and need for public awareness

MODULE– II

Ecology and Environment: concept of an ecosystem ,structure and function of an ecosystem, producer ,consumer and decomposer, energy and nutrient flow biogeochemical cycles, food chain ,food web, ecological pyramid

MODULE– III

Environmental Pollution : Segments of environment, sources, pathways and fate of environmental pollutants, causes of environmental pollution , physical ,chemical and biological transformation of pollutants , population explosion, environment and human health, human rights, value education ,women and child welfare

MODULE– IV

Air Pollution: various segments of atmosphere and their significance, classification of air pollutants, toxic effects, sampling and analysis, stationary and mobile emission, sources and their control, photochemical smog ,sulphurous smog, green house effect, global warming, ozone depletion, Air (prevention and control of pollution) Act(10)

MODULE– V

Water Pollution: Water resources ,sources of water pollution ,various pollutants, their toxic effect, potability of water , municipal water supply , disinfection, characteristics of waste water, primary and secondary waste water treatment, BOD and COD measurement and their significance ,rain water harvesting ,water shed management, Water (pollution and control) Act.(12)

MODULE– VI

Natural Resources and Biodiversity: Renewable and non renewable resources, Forest resource, consequences of deforestation, floods and draughts, equitable use of resources for sustainable development, Dams benefits and problems, Biodiversity: ecosystem diversity, threats to biodiversity, conservation of biodiversity.

MODULE– VII

A brief introduction to Noise Pollution, Soil Pollution, Solid Waste Management.

Recommended Books:

1. Sharma and Kaur, Environmental Pollution
2. De, Environment Chemistry



WORKSHOP & MODEL MAKING II (TIUAR – 204)

L – S – P (0 – 0 – 2)

Credits-2

MODULE– I

Model making exercise (Minimum 2 assignments): Study and develop 3D forms using plastic material such as clay and plaster of paris, putty- Develop 2/ 3D forms using hard material such as paper, paper board, thermo Cole, wire, cardboard, wax, POP, acrylic sheets, wood, plastics, glass fiber.

MODULE– II

Timber model making exercise. (Minimum 1 assignment): Exposing to carpentry tools, machines and timber joints- Exposing to different types of timber joints and wooden construction

MODULE– III

Rendering techniques exercises (Minimum 1 assignment each medium): Pencil rendering- Pen and ink- Water colour

MODULE– IV

Photography exercises

MODULE– V

Set designing exercises

MODULE– VI

Wall painting, sculpture making exercises

Recommended Books:

1. Rendering with pen and ink by Gill
2. Weninger (Magrus. J.) Spherical Models, Cambridge University Press, 1979
3. John W. Mills, The Technique of Sculpture, B.T. Batsford Ltd., New York Reinhold Publishing Corpn., London, 1966.
4. Mitchell, W. J., Digital Design Media by, Published by Van Nostrand Reinhold, USA



COMPUTER APPLICATION- 2: CAD 2D (TIUAR – 205) L – S – P (0 – 0 – 3)
Credits-2

AUTOCAD applications in two-dimensional architectural drawing:

- Sheet layout and toolbar generation;
- Different Draw and modify operation;
- Colour and Hatch, Object Properties
- Making of blocks;
- Text and Dimensioning;
- Formatting operation: dimensions, text, line type etc.
- Creation and Use of Layer
- Assigning Line types, Line thickness, Line type Scale;
- UCS generations, Use of View port;
- Creation of entities;
- Digitization of images;
- Creation of simple architectural elements, building drawings in 2-D;
- Composition of Drawing sheets



ARCHITECTURAL DESIGN I (TIUAR – 206)
0)

L – S – P (0 – 6 –

Credits-6

Course Objective:

After completion of this course student will be able to

- To identify and relate the concepts of space, form and order.
- To distinguish and analyze three dimensional designed space.
- To design objects based on the concept of space and form.
- To classify different functional spaces and analyze their space requirements.
- To compile data required for architectural designing.
- To identify the human standards of design based on ergonomics.
- To innovate, modify and evaluate an existing space.

MODULE- I

Relationship between Basic Design and Architectural Design: comprehensive understanding of space, form, function and design.

- Study of 3-d forms/shades and shadow study and composition.

MODULE- II

Application of elements of design to achieve design principles in creative work.

- Design of small objects (parts of building, like, window grill, boundary wall, floor tiles and similar projects) with respect to function structure aesthetics.

MODULE- III

Introduction to external and internal form concept, their quality, concept of space, relation of space and volume.

- Approach to design as a continuous process through aesthetics, function and technology; study of basic components of a building and their functions.
- Examples of Dimensions of different rooms.

MODULE- IV

Principal of design with reference to function, various activities and related spaces; Data collection, environments, climate, orientation, site conditions, circulation flow diagrams.

MODULE- V

Study of basic human needs, standard measurements of human activities and allocation of spaces: Concepts of Anthropometrics and ergonomics.

MODULE- VI

Study and concept of measured drawings of small buildings.

MODULE- VII

Study and design of single units like living spaces, sleeping and cooking spaces, stalls, bus-stops, telephone booths, etc detailed design of single room for simple function showing relationship with adjoining areas for other activities not more than 25sq.mts.

Design problems dealing with planning for activities such as individual living units shops,



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stalls, snack bars, unilevel activities with three to four functions of total area upto 80 sq.mts.

Recommended Books:

1. Ching, D.K; From, Space and Order.
2. A. Peter Fawcett; Architecture Design Notebook.
3. <http://www.scribd.com/doc/45018090/Architecture-Design-Notebook>
4. Robin Boyd; Puzzle of Architecture
5. National Building Code, BIS
6. Time Savers Standard



METHODS OF CONSTRUCTION - I (TIUAR – 207)

L – S – P (2 – 4 – 0)

Credits-4

Course Objective:

- To label the various parts of building
- To develop the brick bond for different types of wall junction
- To compare the material consumption in various brick bonds
- To apply the different types of Door Window detailing in building application
- To classify the requirement of DPC in various levels in building

MODULE I

BASIC BUILDING COMPONENTS: Development of Plan & Section of a small building to understand foundation, plinth, flooring, sill, lintel, roof slab and parapet. Typical Building Skin Section for a Two Storied House

MODULE II

BRICK MASONRY: Types of Brick bonds: English, Flemish & Rat-trap bond for one and half thick walls. Detail brick layout at corners, junctions and brick columns.

MODULE III

WOODEN DOORS & WINDOWS: Details of door and ventilator. Battened /ledged/Braced door, Flush/Panelled door. Venetian door. Details of window, glazed, pivoted, louvered window, corner and bay window.

MODULE IV

DETAILS: Waterproofing details in different levels: Details of simple foundation, wall, roof, Details of sill, lintel and roof in RCC, RB and steel, Damp proof details of basement, plinth, sill, lintel, and roof level.

MODULE V

SITE STUDY & REPORT: Different types of brick bonds in wall & Paving with sketches and some photographs, Traditional building component and Wood works

Recommended Books:

1. B. C. Punmia; Building Materials and Construction .Laxmi Publications Pvt Ltd, New Delhi,1993.
2. Bindra & Arora; Building Materials and Construction.
3. W.B. MacKay, 'Building Construction', Vol. 1,2,3 Longmans, U.K. 1981.



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DESCRIPTIVE GEOMETRY -II (TIUAR – 208)

**L – S – P (0 – 4 –
0)**

Credits-4

MODULE I

Axonometric Projection System

Isometric Projection System of points, lines, polygons and solids on Isometric plane using Isometric Scale.- Dimetric and Trimetric Projections systems-Isometric View/s of built forms / buildings / complex structures

MODULE II

Perspective Projection System

Development of concepts on Perspective Projection Systems – types of Perspectives - learning of various relevant nomenclatures like Station Point, Picture Plane, Eye Level, Vanishing Points, Horizon Line – Orientation Sheet- One-Point Perspective Projection- Two- Point Perspective Projection- Three-Point Perspective Projection

MODULE III

Sciography

Study of basic principles of Sciography – light sources - casting shades and shadows of points, lines, polygons and solids – Orientation Sheet Sciography - single and group of objects, built forms, furniture etc.

Recommended Books:

1. Engineering Drawing / N. D. Bhat — Basic Perspective Drawing / J.
2. Montage — Architectural Graphics / F. D. K. Ching