



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

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	S	P	
Theory					
TIUBAR-101	Mathematics I	3	0	0	3
TIUFY-105	English for Communication	2	0	0	2
TIUAME-101	Engineering Mechanics	3	0	0	2
TIUAR- 103	Building Material & Sciences-I	3	0	0	3
TIUAR-102	Principles of Architecture	3	0	0	3
Practical					
TIUAR-104	Workshop Practice & Model Making-I	0	0	3	2
TIUAR-105	Computer Application-I: Non Graphic	0	0	2	2
Sessional					
TIUAR-107	Architectural Graphics-I: Basic	0	4	0	4
TIUAR-108	Free Hand Sketch Workshop	0	4	0	4
TIUAR-109	Descriptive Geometry-I	0	4	0	4
Institute Programme					
TIUFY- 101	Career Advancement & Skill Development	3	0	0	3
TIUFY- 181	Entrepreneurship Skill Development	0	0	0	2
Total Credits					34



MATHEMATICS - I(TIUBAR-101)
0)

L – S – P (3 – 0 –

Credits-3

MODULE – I

Functions of a Single Real Variable: n-th order derivative, Leibnitz theorem for successive differentiation, Rolle's theorem (statement only), Mean value theorems of Lagrange and Cauchy, Taylor's theorem with Lagrange's and Cauchy's forms of remainders, Taylor's and Maclaurin's series, expansion of functions, curvature, asymptotes, curve tracing

MODULE – II

Functions of Several Real Variables: Partial derivatives, chain rule, differential and small error, Euler's theorem for homogeneous functions, Taylor's theorem. (statement only), expansion of functions of two real variables, maxima and minima, Lagrange's method of undetermined multipliers.

MODULE – III

Infinite Series: Geometric series, Comparison test, p-series, D'Alembert's Ratio Test, Cauchy's Root Test, Rabbe's test, Power series, and radius of convergence.

MODULE – IV

Multiple Integrals: Double integral, change of order of integration, change of variables, determination of area, volume, moment of inertia, centroid.

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.



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ENGLISH (TIUFY-105)

L – S – P (2 – 0 – 0)

Credits-2

MODULE I

Note Making — Paragraph writing — Commercial Correspondence — Précis — Preparing Instruction Manual — Preparing Proposal — Report Writing — Writing of Dissertation/Thesis — Elements of Grammar and Vocabulary

MODULE II

Group Discussion — Extempore Speaking — Presentation Strategies — Interview Preparation



BUILDING MATERIALS & SCIENCE-I (TIUAR- 103)

L – S – P (3 – 0 – 0)

Credits-3

MODULE I

BRICK: Composition — Sizes — Properties and Classification of bricks — Tests for bricks
Introduction of Brickworks: masonry bonding & ornamental bonding — Substitutes for bricks

MODULE II

STONES: Classification of stones — Common building stones used in India — Characteristics and use of stones — Dressing of stone — Artificial stones —
Introduction of Stonework: Rubble and Ashlars masonry.

MODULE III

METALS: Pig iron, cast iron, wrought iron – types, properties, steel – properties, types, market form of steel and uses of steel in construction, properties of mild steel and hard steel, defects in steel.

MODULE IV

TIMBER: Qualities of timber for construction – Seasoning, Storage and Preservation of timber – Use of different types wood in various parts of building – Industrial timber: veneers, plywood, fibre board, etc.

MODULE V

LIME: Classification of lime – Fat and hydraulic lime – properties and use.

MODULE VI

CEMENT: Composition of ordinary cement – Function of cement ingredients – Properties of cement – Fineness, Soundness, Setting times, etc. – Grades of cement and different types of cements used in construction – Storage of cement in site.

MODULE VII

SAND: Sources of Sand, Classification, Test of Sand. Grades of sand and their uses

MODULE VII

MORTAR: Types of mortar – lime mortar, mud mortar, lime-surkhi mortar, cement mortar – Different grades of mortar, their compositions and properties – Preparation of cement mortar – Use and selection of mortar for different construction work.

MODULE VIII

CONCRETE: Compositions and grades of concrete – Various steps in concrete construction – batching, mixing, transporting, compacting, curing, shuttering, jointing – Tests and quality control of concrete – Design Mix of concrete.

Recommended Books

1. B. C. Punmia; Building Materials and Construction.
2. Bindra & Arora; Building Materials and Construction.
3. W.B. Mckay, 'Building Construction', Vol. 1,2,3 Longmans, U.K. 1981.



PRINCIPLES OF ARCHITECTURE (TIUAR- 102)

L – S – P (3 – 0 – 0)

Credits-3

MODULE I

Introduction: Defining design — Design as a process — Thought process as a design process: Vertical & Lateral

MODULE II

Contrast: Perception of Light: Chrome – Brightness – Hue – Saturation — Perception of Reflecting Surfaces: Tonal quality: value, hue & intensity – Visual texture — Composition – Figure-Ground Relationship: Space, Shape, Format, Figure, Ground, Closure

MODULE III

Figure Organisation: Spatial basis for Grouping of figure elements: Shapes that Touch: Corner to corner – Corner to side – Side to side — Shapes that Overlap: Partially – Completely — Shapes that Interconnect: Interpenetrating – Interlocking – Interlacing — Likeness basis for Grouping of figure elements: Formal factors: Shape – Size – Position (direction, interval, attitude) — Tonal Factors: Achromatic-chromatic – Warm-cool – Value – Hue – Intensity — Visual Texture — Meanings from experience: Representation – Association – Symbolism — Variety in Unity: Hogarth's -line of beauty||

MODULE IV

The Idea of Unity: Qualities of Unity: Pattern of Movement – Balance – Proportional Relationships – Rhythm — Background of Visual Unity: Structure of Visual Field – Eye movements in perception — Movement & Balance: Movement in Design – Dynamic Values in the Field — Balance: Axial Balance – Radial Balance – Occult Balance — Proportion & Rhythm: Analyzing proportion & rhythm: Simple numerical ratios – Values of the summation series – Geometric Ratios – Dynamic symmetry (golden-mean rectangle, root-five rectangle, root-two rectangle) & Intrinsic geometric ratios — Rhythm: Sequence of Progression & Alteration – Occult Rhythm — Dominance & Sub-ordination

MODULE V

Colour Pigment & Tone Control: Colour Theory: Subtractive mixing — Colour Wheel: Primaries – Secondaries – Tertiaries — Tone Control: $T = H + B + W$ – Tints [$T = H + W$] – Shades [$T = H + B$] – Greyed tones [$T = H + (B + W)$] – Complimentary ($T = H + cH$)

MODULE VI

Colour Relationships: Colour Schemes: Related (Monochromatic & Analogous) – Contrasting (Complementary, Split Complimentary & Triad) — Physiological-Psychological basis for Colour Relations: Likeness – Sequence in hue, value and intensity perception – Psychological complements — Simultaneous Contrast: Value Contrast – Hue Contrast – Intensity Contrast

MODULE VII

2-D Organisation: Basis of Space Illusion — Indication of Depth on a Two- Dimensional Plane: Contrast & gradation in size – Converging parallels & diagonal action – Position in the picture plane – Overlapping – Transparency – Diminishing detail – Atmospheric perspective – Advancing & receding colour — Plastic Effect on Two-Dimensional Plane: Structural Enhancement, line – Differences of tone – Chiaroscuro Modelling – Effect of light

MODULE VIII

3-D Organisation: Closed and Open Form — Inter-relationship between Material, Structure & Form: Homogeneous materials – Assembled materials



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MODULE IX

Design Methodology: General principles of architectural design on the basis of functions and forms
— Brief – Analysis – Synthesis – Implementation – Communication & Feedback — Journey from known to unknown

Recommended Books:

1. Design Fundamentals/ Robert Scott — Form, Space and Order
2. F.D.K. Ching — Introduction to Architecture
3. J. C. Snyder & A. J. Catanese — Space, Time and Architecture
4. Siegfried Giedion — Space, Time and Architecture



ENGINEERING MECHANICS (TIUAME-101)

L – S – P (3 – 0 – 0)

Credits-2

MODULE I

Introduction: Concept of engineering mechanics – statics & dynamics – scalar quantity – vector quantity – addition & subtraction of vectors – basic units – derived units – SI units – relationship: m.l.t.

MODULE II

System of forces: Definition of a force with explanation – linear representation of force – system of co-planar forces – parallelogram law of forces – composition and resolution – transmissibility of forces – action and reaction – Triangle law & Polygon law of forces – determination of resultant by analytical and graphical method with equalitarian space diagram – vector diagram – Bow's notation

MODULE III

Moments & couples: Definition of moment of a force about a point – physical significance of moment – moment of a system of parallel and inclined forces – Varignon's theorem – definition of moment of a couple – physical significance of couples equivalent couples – resultant of any number of coplanar couples – replacement of a force about a point by an equal like parallel force together with a couple – resultant of a couple and a force

MODULE IV

Condition of equilibrium: Lami's theorem – Triangle law & Polygon law of equilibrium – conditions of equilibrium of co-planar system of concurrent forces – conditions of equilibrium of co-planar system of non-concurrent parallel forces (like & unlike) – conditions of equilibrium of co-planar system of non-concurrent non-parallel forces (simple problems excluding statically indeterminate)

MODULE V

Friction: Definition – useful and harmful effects of friction – laws of static friction – co-efficient of friction – angle of friction – angle of repose – equilibrium of a body on a rough inclined surface with and without external force

MODULE VI

Centre of gravity: Concept & definition – centre of mass – centroid — methods of finding out centroids of simple area — finding the centroid of the following areas by integration: (i) uniform triangular lamina, (ii) uniform rectangular lamina, (iii) uniform circular lamina, (iv) uniform semi-circular lamina, and, (v) uniform lamina of quadrant of a circle — finding the centroid of the following sections using the method of moment: (i) t-section, (ii) equal and unequal angle sections, (iii) equal and unequal i-sections, (iv) channel-sections, (v) z-sections

MODULE VII

Moment of inertia: Definition and unit — m_i of a lamina — theorems of finding out m_i by: (i) parallel axis theorem, and, (ii) perpendicular axis theorem — radius of gyration — finding out m_l of the different sections about axes lying in the plane of the sections by integration — m_i of irregular areas such as I sections, t-sections, angle-sections, channel sections, z-section, composite sections (composite area method) – related simple problems — polar m_i

MODULE VIII

Rectilinear motion: Displacement-time and velocity-time diagrams – motion equations (with deduction) – Newton's Second Law of Linear Motion $p = mf$ and momentum of a body – conservation of momentum of a body – numerical problems



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MODULE IX

Curvilinear motion: Angular displacement – angular speed – angular velocity – relation between angular speed & angular velocity – angular acceleration – relation between linear & angular velocity – relation between linear & angular acceleration – motion and path of a projectile (numerical problems) – centripetal and centrifugal force (numerical problems)

Recommended Books:

1. Engineering Mechanics International student ed./Timoshenko & Young/MGH



WORKSHOP PRACTICE & MODEL MAKING-I(TIUAR-104) L – S – P (0 – 0 – 3)
Credits-2

MODULE I

Laying of Brick courses & various bonds of brick courses with & without mortar.

MODULE II

Mortar mixing & Mortar preparations of cement mortar for masonry and for plaster.

MODULE III

Lime burning and preparation of lime mortar for masonry & lime plaster.

MODULE IV

Architectural Model Making with different materials such as card board, ivory sheets,

MODULE V

Welding of MS section: types of Weld

MODULE VI

Study of development of surfaces, drawing of unfolded surfaces of 3-D objects.

MODULE VII

Submission of Report on all the above items at the end of the Semester. Report to contain sketches, Photographs etc



COMPUTER APPLICATION-I: NON GRAPHIC (TIUAR – 105) L – S – P (0 – 0 – 2)
Credits-2

MODULE I

Word Processing: Page setup, margins – Header Footer insertion – Indents and hanging Indents – Text and fonts – Paragraph & Alignment – Spell check – Simple Letter & communication Formats – Table and other Inserts

MODULE II

Spread Sheets: Page setup, margins – Header Footer insertion – Text and fonts – Cell Management – Spell check – Insert Image, data etc – Data Management – Commonly used Formulea –View Management

MODULE III

Presentation: Slide Design – Text box – Insert Picture, Shapes etc – Spell check – Insert Sound & Video – Animation & Custom Animation – Packaging of Presentation – Slide Management



ARCHITECTURAL GRAPHICS-I: BASIC (TIUAR – 107)

L – S – P (0 – 4 – 0)

Credits-4

MODULE I

Colour Schemes: Study of the hue spectrum and representation of the primary, secondary and tertiary colours through colour-wheels — Study of related and contrasting colour schemes through simple applications

MODULE II

Two Dimensional Composition: Study of monochromatic and chromatic shapes through two-dimensional composition of simple geometrical shapes

MODULE III

Three Dimensional Compositions: Study of monochromatic and chromatic forms through three-dimensional composition of simple solids

MODULE IV

Modular Composition: Study of modules through compositions based on the principles of ratio and proportion

MODULE V

Model making: Study of the design process from whole to part and part to whole applying different elements and principles of design using homogeneous and assembled materials



FREE HAND SKETCH WORKSHOP (TIUAR – 108)

L – S – P (0 – 4 – 0)

Credits-4

MODULE I

Freehand Drawing: Freehand drawing of objects / group of objects with shades & shadows and using colours in various media such as pencil, crayons, watercolour, poster colours etc.

MODULE II

Delineation of landscape elements: Presentation and rendering of Trees, herbs, shrubs, ground covers, contours & water bodies as a single entity and in clusters / groups in association with built forms, in plans, elevations and 3- dimensional views rendered in various mediums

MODULE III

Working with Scale: Presentation and rendering of various designed objects, human figures, cars etc in different scales

MODULE IV

Delineation of buildings: Monochromatic / Coloured Presentation drawings of sites / buildings / building parts / furniture in plan/s, elevation/s and view/s using various mediums

Recommended Books:

1. Rendering with Pen and Ink / M.W. Gill



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**DESCRIPTIVE GEOMETRY-I (TIUAR – 109
0)**

L – S – P (0 – 4 –

Credits-4

Introduction to Engineering Drawing and Descriptive Geometry; Introduction to the drawing instruments and their use

MODULE I

Line types: Types of lines used in Engineering Drawing – Lettering techniques and types

MODULE II

Scale: Concept of Representative Fraction – Scales generally used for Architectural and Engineering Drawing – Concept of Diagonal Scale

MODULE III

Drawing of different lines and 2-D Objects: Curve line drawing (concave, convex curve) – bisecting of angles – different line drawings – drawing technique of 2D Objects

MODULE IV

Orthographic Projections: Planes of Projection – Concept of 1st angle and 3rd angle projection – ISI code of practice – projection of straight line, lamina and solid

MODULE V

Section of Solids: True shape of a section 12

MODULE VI

Surface Development: Principal Developments – Parallel and Radial Developments

MODULE VII

Intersection of surfaces

Recommended Books

1. B. Gupta; A Textbook of Engineering Drawing
2. N.D. Bhatt; Engineering Drawing
3. Hiram. E. Grant; Engg Drawing, , Mc.Graw Hill Book Company
4. Sherkey W, MORGAN; Architectural Drawing, Mc Graw Hill
5. Arthur L. Gupfill, Watson; Rendering in Pen and Ink,- Gupfill Publications, New York.