

# B. Arch. SYLLABUS

(M.G. University, Kottayam)

## SCHEME OF EXAMINATIONS Combined First and Second Semester (S1 and S2)

COURSE CODE	NAME OF SUBJECT	CREDITS	HOURS PER WEEK			UNIVERSITY EXAMINATION DURATION	MARKS			TOTAL
			D	L	P		WRITTEN	SESSIONAL		
							INT	EXT*		
2011 AR 101	ARCHITECTURAL DESIGN - 1	8			5	No Exam		150	150	300
2011 AR 102	BUILDING MATERIALS & CONSTRN. - 1	5	2	1		4	100	50		150
2011 AR 103	HISTORY OF ARCHITECTURE - 1	4		2		3	100	50		150
2011 AR 104	STRUCTURAL DESIGN - 1	3		2		3	100	50		150
2011 AR 105	BASIC DESIGN	8	3	1		No Exam		100	100	200
2011 AR 106	VISUAL ART	4	3			4	100	50		150
2011 AR 107	ARCHITECTURAL GRAPHICS	3	3			4	100	50		150
2011 AR 108	PRINCIPLES OF TRADITIONAL ARCHITECTURE	4		2		3	100	50		150
2011 AR 109	WORKSHOP PRACTICE	2			3	No Exam		50		50
2011 AR 110	MATHEMATICS	3		2		3	100	50		150
	<b>TOTAL</b>	<b>44</b>	<b>11</b>	<b>10</b>	<b>8</b>		<b>700</b>	<b>650</b>	<b>250</b>	<b>1600</b>

## MANUALS

### **I. BASIC DESIGN AND ARCHITECTURAL DESIGN I**

1. The Evaluation of Basic Design and Architectural Design I to VI is based on continuous evaluation and by a panel of Jury.
2. The marks for the Continuous Assessment will be awarded by the staff member in charge.
3. Head of the Department of the teaching Institution shall nominate one external examiner and one internal examiner on the panel of the Jury.
4. Internal examiner shall be one member from among the faculty members of the teaching institution other than the faculty member who evaluated the work for awarding the internal mark.
5. The External Examiner shall be from among the faculty members of other teaching institutions or an Architect registered with the Council of Architecture, incorporated under Architect's Act 1972, with not less than 5 years experience.
6. Students shall submit the presentation consisting of the assignments done for the subject during the course period, with the approval of the staff-in-charge of the subject on the previous working day of the commencement of the jury.
7. The staff-in-charge of the subject shall submit a report consisting of the details of assignments given and its objectives and weightage given to each work to the Head of the Department.
8. The jury members (internal and external examiners together) will evaluate the presentation on the basis of the report.
9. Students shall be present and explain their work to the Jury members at the time of evaluating their presentation.
10. A student who has appeared in front of the main Jury and could not get 50 % aggregate mark (C.A marks + Jury) shall be provided a make up chance to make him eligible for promotion to higher semesters. In the make up chance the student will get an opportunity to make his presentation and get it reevaluated by another panel of Jury.
11. Main Jury for Design shall be conducted before the commencement of the University theory Examinations of the particular semester and the make up jury shall be conducted within one week of the completion of the University theory examinations.
12. Students who cannot get minimum marks for the Jury even after make-up chance will have to repeat the course-work for the paper with the next batch of students.
13. The Jury members shall submit the consolidated marks to the Head of the Dept on the last day of the Jury.
14. The jury marks shall be published on the next working days.

**Subject Code: 2011AR 101**

**Subject Title: ARCHITECTURAL DESIGN I**

---

### **Objectives:**

Architectural Design begins as continuation of Basic Design principles now including function, nature of building materials and structural systems as a new language by sensitizing students to the conceptual, visual and perceptual issues involved in the design process.

This course is to introduce designing of shelters for various functions and human activities based on ergonomic requirements. The knowledge of design as a process to be imparted through design projects are oriented to develop awareness of relationship between function, space, order, form, materials, colour, texture, and/or structural system.

The course also prepares the ground for the students to understand the nature of the built environment, human scale, basic organizational principles, design determinants and Design Disciplines. So Also to understand design language, space and form, space-structure-form correlation. The subject forming the foundation of the study of architecture and is offered in six courses, at the end of which the students are expected to present their work.

### **Syllabus**

#### **Projects:**

1. Preparation of measured drawings, site visits to explore the various aspects of decision-human scale and its relation
2. Analytical studies of built environment and project exploring space, scale and basic spatial organization (minimum 2 projects)
3. Design of small institutions involving structure-space-form correlation and site-location-form -landscape correlation (minimum 2 projects)

#### **References**

1. Maitland Graves, "Treatment of colour and design"
2. Geoffrey Broadbent "Design in Architecture"
3. Christopher Alexander "Pattern Language"
4. Unwin, Simon, "Analyzing architecture"
5. James C Snyder, Antony JC "Introduction to Architecture"
6. Neuferts' Architects data

**No university examination –evaluation will be done as per the manual**

**Subject Code: 2011AR 102**

**Subject Title: BUILDING MATERIALS AND CONSTRUCTION I**

---

### **Objectives:**

Understanding of materials, basic principles of construction and elements of building through theory and drawing;

To give adequate knowledge about the properties and uses of construction materials .

To Impart required exposure to various constructions and the judicious use of materials for construction;

Subject is offered in 3 courses by the end of which the student is expected to gain knowledge and understanding of various materials and construction techniques.

### **Syllabus**

#### **MODULE I (24Hrs)**

Introduction to vernacular and conventional building materials

**Stone:** Classification properties- suitability for construction-various stones used for construction dressing and various finishes in stone masonry-stone decay and preservation.

**Brick:** Raw materials for manufacture-properties-use-classification- BIS specification tests-energy and environmental aspects-suitability for construction-mud bricks-stabilizing

**Clay Products and Ceramics:** Tiles-terra cotta-stoneware ceramic materials properties-raw materials for manufacture-uses

**Timber:** Various kinds of Timber-properties- suitability for construction-defects in timber decay and preservation of timber- BIS specification

**Vernacular materials** like lime, laterite, surkhi, mud, bamboo, thatch, hay, coir, coconut leaves and trunk, their study and uses, energy and environmental aspects.

#### **MODULE II (48 Hrs)**

Understanding of elements of construction and systems in load bearing construction - Walls, roof s and the principles of their construction

**Foundation:** Different type of foundation used for load bearing system-Wall footing, column footing, combined footing, raft, etc

**Drawings:** Wall footing, Column footing & Combined footing,

**Masonry:** Introduction to masonry: superstructure - Stone masonry - ancient, traditional and modern construction practices - Brick masonry - general principles - construction bonding - types of

bonding - relative merits and demerits of different bonds - English and Flemish bond in detail 1, 1:2, 2, 2:2 brick walls - corners, junctions and cross junctions - special bonds like rat trap, herring- borne bonds, decorative brick work-brick jallies.

**Drawings -** English bond I, 1 1/2, 2 brick walls;  
Flemish bond 1, 1 1/2, 2 brick walls;  
Jallies 1/2 & 1 brick jallies, Details of corners, junctions and all special bonds;  
Neat sketches of different types of stone masonry;  
Case study/site study: Brick masonry, stone masonry and simple foundations.

### **MODULE III (24 Hrs)**

Joinery details in wood (ancient and modern)- Doors-panelled, battened, glazed & sliding. Windows-panelled, battened, glazed, top hung pivoted-gable window, dormer window, bay window, French window.

Terms for various members, fasteners and fixtures used in joinery

Study of roof structures - wood, steel-trusses-King post truss and Queen post truss-roof terminology-north light details, girders, space frames

**Drawings-** Wooden joinery details;  
Panelled joinery details; sliding doors;  
Panelled windows; glazed windows;  
Wooden king and Queen post truss; Steel angular and tabular truss; details of roof coverings and gutter details

Case study / Site study: Joinery details of wooden doors, windows and ventilators, details of trusses

### **References**

1. Harry Parker, "Materials and Methods of Architectural Construction"
2. Mackay. "Building construction"
3. Barry R., "The construction of Buildings (Vol. I-V)"
4. Olin, Harold & Schmidt, "Building Construction - Principles, Material & Methods"
5. Francis Ching, "Building Construction Illustrated"
6. Relevant BIS Codes

### **University Examination Pattern**

#### **PART-A**

8 short questions of 5 marks, from all modules 40  
3 questions of 10 marks each from Module I, II, & III with choice to answer any two 20

#### **PART-B (Drawing)**

3 questions of 20 marks each from Module I, II & III with choice to answer any two 40

**Subject Code: 2011AR 103**

**Subject Title: HISTORY OF ARCHITECTURE**

---

### **Objectives:**

The objective courses in History of Architecture offered in B. Arch curriculum is to develop the student is appreciation and awareness of the historic significance and richness of tradition and design theories and construction in world civilizations to be learnt with time line framework. Hence the subject is offered in four courses beginning from the prehistoric times and ending in contemporary times.

### **Syllabus**

#### **Module-1(16Hrs)**

##### **Early Cultures**

Architecture as part of culture-understanding the early cultures;  
Paleolithic age, Ice Age, Neolithic Period-Apollo II Cave-Africa, Wadi Kubbaniyain-Egypt, Pachmari Hills-India, Monte Verde -South America, Clovis Culture-North America, Jomon culture-Japan, Eynan and Ain Mallaha- Africa.

#### **Module-2(24 Hrs)**

##### **3500 BC-1500BC**

Yangshao Culture-China, Indus Valley-India, Predynastic period -Egypt, Uruk Period, Mesopotamia, Bronze Age;

China Civilization, European Megalithic tombs, Mohenjo- Daro-Harappa, Stone circles, ziggurats, Pyramids, Stone Henge.

##### **1500BC-0**

Egypt -later period, Iron age, Minoan culture Machalilla Culture, Olmec cultures-Cent. America, Holy city of Varanasi-India, Neo-Assyrian Empire-Babylon, Greece-Geometric Period, Archaic Period, Classical Period, Hellenistic Period, Buddha Period-India, Mauryan Empire-India, Eastern Zhou dynasty-China, Preclassic Mayan culture-Guatemala.

Sun Temple at Amarna, Hattusas. Poverty Point, Temple of Solomon, Greek Architecture and language, Temple of Apollo, Greek orders, Asoka Pillar, Tomb of Zeng Hou Yi, Kaminaljuyu

#### **Module-111(24 Hrs)**

##### **0-400 AD**

Roman Empire, Mauryan Empire, Kushan Empire, Zhou Dynasty-Quin Dynasty-China, Teuchitlan tradition, Pre-classic Maya Culture.

The Colloseum, Roman Urban Villa, the Forum of Augustus, Sanchi Complex, Chaithya hall, Great Wall of China.

### **400AD - 800 AD**

Roman Empire, Satvahana and Ikshvaku Dynasties, Kushan Empire, Han Dynasty, Teotihuacan culture-America, Gupta Period, Byzantine Empire, Sixteen kingdom Period, Kofun Culture-Japan, Hindu Renaissance, Emergence of Christianity, post- Constantinian Age.

Pantheon, Roman Bath, St.Peters Rome , Han Tombs, Gupta Period Temples, Ajanta Caves, Mahabodhi Temples.

### **References**

1. Sir Banister Flectcher "A History of Architecture"
2. Francis D.K Ching et al "A Global History of architecture"
3. Percy Brown "Indian Architecture ( Buddhist and Hindu Periods)"
4. Satish Grover "Buddhist and Hindu Architecture in India"
5. Michael Raeburn, "Architecture of the Western World"
6. History of World Architecture (Series), Vols. Titled "Ancient Architecture, Primitive Architecture, Greek Architecture, Roman Architecture and Byzantine Architecture"

### **University Examination Pattern**

There will be two sections A & B

A section will have 8 short questions of 5 marks, from all modules

There will not be any choice

**8X5 = 40**

B section will have 3 subsections each covering one module.

There will be three questions of 10 marks from each module of which 2 questions are to be answered

**20X3 = 60**

**Subject Code: 2011AR 104**

**Subject Title: STRUCTURAL DESIGN - 1**

---

**Objectives:**

- To equip the Architectural students in understanding the structural behaviour and materials properties;
- To give the concept of behavior of structures under loading;
- To make the students aware of the various design forces acting on the structure;
- To acquire deep knowledge about structural systems;
- The subject is offered in 5 courses, by the end of which the student is exposed to the deep intricacies of Structural design in various

**Syllabus**

**MODULE - I (20 Hrs)**

Forces –Force and moment concepts-Force system acting on a body and their resultant –Equilibrium concept and free body diagram. Simple Harmonic Motion - Free vibration – Single degree of freedom system-Spring in series and parallel;  
Simple practical problems related to the above cases.

**MODULE – II (22Hrs)**

Centre of gravity of planes-Moment of Inertia concept- Theorem of parallel and perpendicular axis-Principle axis and Principle moment of inertia;  
Stresses and Strains-General concepts-Stress strain relations-Elastic constants- principle of super position-stresses in composite bars-stresses due to temperature – concept of strain energy.

**MODULE – III (22Hrs)**

Beams-different types-support conditions-different types of loads-analysis of simply supported, cantilever, overhanging beams-Shear force and bending moment diagrams –only analytical method  
Theory of simple bending-bending stress in symmetrical beams, section modulus, bending of composite beams;  
Shear stresses in beams – its concepts – distribution of shear stresses in simple sections

**References**

1. Bansal “Engineering Mechanics”
2. Rajasekharan and Sankara Subramaniom “Engineering Mechanics”
3. Kumar “Engineering Mechanics”
4. Beer and Johnston “Engineering Mechanics”
5. B.C Punmia and Jain “Strength of Materials and Theory of Structures – vol 1”
6. Junnarkar “Mechanics of structures”
7. Ramamrutham “Strength of Materials”

**University Examination Pattern**

There will be two sections A & B.

Section A will have 8 short questions of 5 marks, from all modules - There will not be any choice  
**8X5 = 40**

Section B will have 3 subsections each covering one module. There will be three questions of 10 marks from each module of which 2 questions are to be answered **20X3 = 60**



**Subject Code: 2011AR 105**  
**Subject Title: BASIC DESIGN**

---

**Objectives:**

- To introduce architecture student to the design abilities, Visual literacy and expressional skills.
- To provide comprehensive understanding of design field through observation, visual perception and expression.

**Syllabus:**

**Module-1 (32Hrs)**

Introduction to Architecture- meaning -importance –relevance. Fundamental elements of design and their definitions – point, line, shape, form, structure, space, texture, value and colour. Introduction to the principles of composition – unity, balance, symmetry, proportion, scale, hierarchy, rhythm, contrast, harmony etc. Use of patterns in design

**Projects:** Two-dimensional and Three dimensional exercises, sketches, models, group works, involving the above principles

**Module-2 (64Hrs)**

Students are introduced to Architectural vocabulary, understanding of space, graphic-communication skills, the Relationship between the human body and three-dimensional space- Anthropometrics content in design, methods of measurements, idea of human scale and proportion. Design Fundamentals. Introduction to 2D, Colour concepts, Visual theory.

**Projects:** Two dimensional and Three dimensional exercises, sketches, models, fieldworks, group works, sculpture, discussion and criticism involving the above principles

**Module-3 (32Hrs)**

Design and expressional skill development through more complex observations, Basic design as applied in the built environment, development of architectural ideas. Visual analysis of built forms, sculptural and spatial qualities, analysis of solid and void relationship. Two-dimensional and three-dimensional presentations. Hands on experience with 3D –developed through models sketches, drawing, rendering, formulation of abstracted concepts and logical visual models. Introduction to interior/exterior explorations of forms and spaces. Design process is emphasized.

**Projects:** Emphasis on three-dimensional products involving above principles

**Reference**

1. Kevin Forseth "Graphics for Architecture"
2. William Kirby Lockard "Design Drawing Experiences"
3. Rendow Yee "Architectural Drawing: A Visual Compendium of Types and Methods"
4. Pierre Von Meiss "Elements of Architecture"
5. Paul Jacques Grillo "Form, Function, and Design"
6. William K Lockhard & William Kirby Lockard "Drawing As a Means to Architecture"
7. Eugene Tsui "Evolutionary Architecture: Nature as a Basis for Design"
8. A Peter Fawcett "Architecture Design Notebook"
9. Philip Meggs "Type and Image: The Language of Graphic Design"
10. Simon Unwin "Analyzing Architecture"
11. Krome Barratt. "Logic and Design in Art, Science and Mathematics"
12. Francis D. K. Ching, "Architecture: Form, Space and Order"

**No University Examination - valuation will be conducted as per Manual**

**Subject Code: 2011AR 106**

**Subject Title: VISUAL ARTS**

---

### **Objectives:**

The objective of the course in Visual Arts is to familiarize the students to the basic principles and techniques of (a) Drawing (b) Painting and (c) Sculpture. The course will also provide the students with a chronological introduction to the developments in the art and architecture of India.

### **Syllabus:**

#### **MODULE I (24 Hrs)**

Fundamentals of Visual Arts:

(a) Introduction to the Art object, Definition, Interpretation.

(b) Drawing: Types, Characteristics & functions of Lines, its visual impact (Vertical, Horizontal, Diagonal, Zigzag, Curvilinear, Spiral etc.)

(c) Study of Objects: Study of objects having varied shapes (Cuboids, Prismatic, Spherical, Globular, etc.) in different media - Charcoal, Pencils, Pastels. Students may be assigned to prepare studies at home and submit them in the classes.

(d) Out Door Study: Study of Monuments, Buildings in pencils, ink, charcoal, pastels etc.

Study should focus on Architectural details, wherever relevant.

#### **MODULE II (20 Hrs)**

(a) Elements of Painting

Pictorial & Spatial organizations, Form & Texture in Painting, Theory of Colour: Chromatic Values, Colour Wheel, Colour Chart, Two-dimensional / Three-dimensional aspects of Painting

(b) Basic Psychological aspects of lines forms and colours unity of Forms: Gestalt theory.

Exercises based on above studies.

#### **MODULE III (32 Hrs)**

a) Introduction to Indian aesthetics / Canonical principles of Indian Art, Sculpture, Painting

b) Mural/Tradition in Kerala - Study of Style, Form & Technique.

c) Languages, Methods & Techniques of Sculpture

Form, Texture, Mass, Volume, Sculpture in relief, Shallow relief, Sculpture in round, Free standing sculpture in relation to Architectural space, Techniques (a) Carving in stone, wood (Additive / Subtractive Processes), Techniques (b) Moulding & Casting in Plaster, Cement, Fibre Glass

### **Reference:**

1. J.H Bustano by "Principles of Colour and Colour Mixing"
2. Frank Ching , "Architectural Graphics", John Wiley, 2002
3. Francis D.K. Ching, "Drawing, Space, Form, Expression",
4. Victor Perard, "Anatomy and Drawing"
5. Luis Slobodkin "Sculpture-Principles and Practice"
6. Suzanne Huntington "Art of Ancient India"
7. Roy C. Craven "Indian Art"
8. J.C.Harle "Art & Architecture of the Indian Sub Continent"

### **University Examination Pattern**

#### **PART-A**

8 short questions of 5 marks, from all modules - There will not be any choice 40

#### **PART-B**

Drawing –There will be 3 questions of 30 marks each of which two questions to be answered 60

**Subject Code: 2011AR 107**

**Subject Title: ARCHITECTURAL GRAPHICS**

---

**Objectives:**

- To communicate through technical drawings
- To develop visualization power of the students.
- To develop 2-D & 3-D perception through observation and interpretation.
- To stimulate and expand the skill of observing and interpreting an object and its position.

**Syllabus:**

**Module I (33 Hrs)**

Introduction: What is graphics, Bureau of Indian standard (B.I.S Various instruments Required for drawing, layout of drawing sheet, Method of dimensioning and lettering)

**Scales:**

Classification of scales- Representation fraction (R.F)

Construction details of the following, with examples , Plain scale, Diagonal scale, Vernier scale

**Conic section:**

What is conic, Eccentricity, Types of conic, Construction methods-Ellipse-Construction methods ,Hyperbola & Parabola

**Miscellaneous curves:**

Construction details of following curves: Spirals- Archimedean Spiral & Logarithmic Spiral, Helix – Cylindrical & Conical

**Projections**

Introduction, Theory of projection, Systems of projection, Orthographic projection, First angle projection

**Projection of points** in First, second, third and fourth quadrant

**Projection of lines:**

Introduction - Line Parallel to both planes - Line Parallel to one plane & perpendicular to the other – Projection of lines parallel to one plane & inclined to other - Line inclined to both planes-traces, determination of true length and true inclinations.

**Module II (36 Hrs)**

**Projection of Planes**

Projection of plane lamina with surface inclined to one plane

Projection of plane lamina with diagonals inclined to both the planes.

**Projection of solids:**

Simple solid in simple position-top & front views Auxiliary projection-Axis inclined to one plane & parallel to other, Axis inclined to both planes –Altering the position method and Auxiliary plane method

**Section of solids:**

Sectional planes

What is a section-sectional top & front view, true shape of section - exercises –

Sectional views of solids like cylinders, cones, prism, pyramids & spheres - True shape of section -

Sectional views from the true shape of section

**Intersection of surfaces:**

Method of drawing intersection between prism & prism, cylinder & cylinder, cone, and cylinder (Cases with mutually perpendicular axes only)

**Development of surfaces:**

What is development- Development of simple solids like cylinder, prism, pyramids & cone  
Development of simple-cut solids

**Module III(27Hrs)****Isometric projection:**

What is isometric projection, Isometric scale, difference between Isometric projection and Isometric views – Method of drawing Isometric projection, Isometric views of solids like prisms, cylinders, and pyramids - Isometric projection of composite solids

**Perspective projections:**

Nomenclature of perspective - Types of perspective projection-One-point perspective, two-point perspective and three point perspective - Perspective projection of simple solids by visual ray method and vanishing point method.

**Shades and Shadows:**

Shades of points, lines & simple solids on the plane projected by parallel and divergent rays of light and plotting of shade line. - Perspective of shadows of a simple structure on the ground and on a vertical plane when the light is behind the observer.

Visualization of object from pictorial views, Conversion of pictorial views into orthographic views.

**References**

1. N.D.Bhatt, "Elementary Engineering",
2. Cari LaraSvensan and William Ezara Street, "Engineering Graphics",
3. K. Venugopal, "Engineering Drawing and Graphics",
4. S. Rajaraman, "Practical Solid Geometry"

**University Examination Pattern**

There will be two sections A & B

Section A will have 8 short questions of 5 marks, from all modules –

There will not be any choice **8X5 = 40**

Section B will have 3 subsections each covering one module.

There will be three questions of 10 marks from each module of which 2 questions are to be answered **20X3 = 60**

## **Subject Code: 2011AR 108**

### **Subject Title: PRINCIPLES OF TRADITIONAL ARCHITECTURE**

---

#### **Objectives:**

Traditional Architecture involves the study of ancient principles used in Architecture and planning, their development over the period of time, adaptability in the changed Sociocultural environment. This subject mainly focuses on the development that has taken place in the ancient subcontinent geographical region (comprising of present India, Pakistan, Burma, Bangladesh, Part of Afghanistan and Iran)

- To make the students aware of the rich traditional heritage in Architectural practice, which is very ancient and descriptions are seen in the Vedas .
- To make the students aware how and why these principles have been formulated based on the Indian philosophy of “AHAM BRAHMAASMI”, differentiate between the scientific technical aspects and the Superstitious and to relate these principles in the modern context. The students are expected to make use of these principles in the modern situation.
- The subject is taught for a period of one year and the students are expected to given the basic knowledge of Vastusastra.

#### **Syllabus:**

##### **Module I**

Philosophy of Brahmanda and Pindanda-Its physical manifestation in Architecture – definition of Vastu-Holistic approach to design – System planning principles – Guild of Architects – Characteristics and qualities – Hierarchy and responsibilities of different personnel.

Basic concepts of Vastusastra – Universe, Prakrithi and Purusha, Vastupurusha, Mandala, Padams and Padadevatha, Padavinyasam, Sutrams and Murmams their significance in physical planning – Design process – Selection of sites, Sectors and their significance in planning – fixing cardinal direction – planning principles – Ayadi formula, concept of veethi – 4 veethi and 9 veethi concept in planning – minimum width of veethi and its relation to Habitable space - proportionate system-in defining the space.

Measurements basic Unit- Anthropometrics - Matrangulam – Horizontal and Vertical measurements - Manangulam or Standard Angulam – Its significance in physical aspect - standard scale – Variations in scales – their significance and usage – Actual measurement based on modern scales – Both FPS and Metric units.

Talamanan and its use in Iconography – Concept of modular planning in residences and temples.

##### **Module II**

Design of Buildings- concept of Aaroodham – its characteristics- Unit house - kettu, Sala- Naming of Salas – Design of Salas – Different proportions - Gunavistaram, Ishtadeergham – Concept of Pariantham and its relation with Ayadi formula – Proportion of the Sala both vertical and horizontal – Development of Sala by addition and extension –Design of Dvisala and Trisala- Nalukettus- Its characteristics - classification w.r.t plan- shape of roof-configuration of roof etc. -Minimum width of Salas - positioning of Nalukettu in Kshetrakhandam - size of Nalukettu w.r.t Kshetrathandam and vice versa in 4 veethis and 9 veethis - Development of Nalukettu with extensions and additions- difference between kettu and Koottikkettu - Higher forms of residences - Ettukettu, Pathinarukettu

### **Module III**

Planning of Temples – Basic module and its relation to the temple planning – Anthahara, Madhydhara and Bahirhara of temples – Design of Mahakshetram – Panchaprakarams and its relation to the module. Design of Sanctum, Gopuram and other ancillary units – Planning of towns and villages with respect to the temple – basic principles of Padavinyasam and veethi nirnayam and the adaptation in town planning - System planning principles followed in town planning –Sectors and sub sectors- Holistic approach to planning based on philosophy-- Locational aspects of planning – Characteristics of towns with respect to location, activity, road pattern – Villages planning in Ekakudumbaka Gramam and Bahukudumba Gramam.

### **References:**

1. Manasara - Bhojaraja
2. Mayamata,
3. Samaranganasutradhara, 2 volumes
4. Traditional Residential Architecture of Malabar Coast – Dr. Aashaltha Thampuran
5. A text Book of Vastuvidya - AA & BTSP
6. Manushyalayachandrika –Dr. Balagopalan T.S. Prabhu
7. Shilparatna 2 volumes- Sreekumar
8. Tantrasamuchayam Silpabhogam – Chennasa Narayanan Namboodirippad

### **University Examination Pattern:**

There will be two sections A & B

Section A will have 8 short questions of 5 marks, from all modules

There will not be any choice **8X5 = 40**

Section B will have 3 subsections each covering one module.

There will be three questions of 10 marks from each module of which 2 questions are to be answered **20X3 = 60**

**Subject Code: 2011AR 109**  
**Subject Title: WORKSHOP PRACTICE**

---

**Objectives:**

- To understand the basics of building construction practices
- To create an awareness and understanding of three dimensional forms.
- To get hands on Experience in construction methods.
- To get an experience in model making methods.

**Syllabus:**

**Carpentry ( 15 Hrs)**- Study of carpentry hand tools and power tools - Introduction to basic carpentry-processes and joints - Different type of wood fastening.

**Welding (15 Hrs)** – Introduction to welding - Classification of welding - Study gas welding tools and arc-welding tools - Welding joints

**Plumbing (15 Hrs)**- Study of hand tools and special tools, Different types of pipe joints.

**Electrical Wiring (15 Hrs)**- Study of materials and tools- Different types of wiring.

**Masonry Concrete (15 Hrs)** – Study of tools-construction of walls using different type of bonds. Making of Plain cement Concrete using different mixes

**Building Model (21 Hrs)**- Detailed study of building/ Product model making using materials like Plywood board, Perpex board, Forexsheet, Veneers, Etaflex, Rubber, and Softwood like Balsa wood - Cutting, finishing, painting techniques.

A separate workshop building to be set up with a minimum of 100 Sq mtr areas with a construction yard of equal size adjacent to it. All equipments and tools to make models with stone , bricks, concrete, wood, steel, aluminium, plastics, etc tools plywood . The material given above are to be installed. Special tools and equipment to do carpentry plumbing & electrical wiring to be purchased for setting up the workshop.

**No university examination –evaluation will be done as per the manual**

**Subject Code: 2011AR 110**

**Subject Title: MATHEMATICS**

---

**Objectives:**

- To make the students understand the importance of Mathematics in architecture and planning as a tool.

**Module I (20 Hrs)**

**Calculus:** Successive differentiation, nth derivative, Leibniz rule, Curvature, Circle of curvature, volute Application of integration-Area bounded by plane curve- length of plane curves-volume of a solid of revolution- surface area of revolution.(Cartesian only)

**Module II(20Hrs)**

**Analytic geometry:** Conics, parabola, ellipse, hyperbola, rectangular hyperbola-derivation, properties , Tangents-normal

**Module III(24 Hrs)**

**Statistics:** Measure of central tendency -Mean, Median, Mode. Measures of dispersion Mean deviation– Standard deviation, variance, correlation coefficient, rank correlation coefficient.-fitting of straight line and parabola by method of least squares.

**Probability distribution:** Probability density function, distribution function, properties, mathematical expectation, mean, and variance. Binomial, Poisson -Mean and variance, Normal distribution.

**References:**

1. B.S. Grewal, "Higher Engineering Mathematics"
2. B.S. Grewal, "Elementary Engineering Mathematics",
3. M.K.Venkataraman, "Higher Mathematics for Engineering and Science".
4. Miller and Freund, " Probability and Statistics for Engineers".

**University Examination Pattern**

There will be two sections A & B

Section A will have 8 short questions of 5 marks, from all modules –

There will not be any choice **8X5 = 40**

Section B will have 3 subsections each covering one module. There will be three questions of 10 marks from each module of which 2 questions are to be answered **20X3 = 60**