

# UNIVERSITY OF CALICUT

(Abstract)

Faculty of Engineering – B.Arch Degree Course- Curriculum and Syllabus of combined first and second semester - implemented – with effect from 2012 admissions – approved –orders issued.

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## GENERAL AND ACADEMIC BRANCH-IV- E SECTION

No: GA-IV/E1/1323/2012

Dated, Calicut University. P.O., 14.08.2012

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- Read:
1. U.O. No. GA IV/E1/1439/2011. dated 14.06.2012. .
  2. Minutes of the meeting of the Board of studies in Architecture held on 30.07.2012 ( item no.1 ).
  3. Orders of the Vice - Chancellor in the file of even No. on 08.08.2012.

### ORDER

As per paper read as 1 above, orders were issued implementing the Regulations of B.Arch Degree Course with effect from 2012 admissions..

Vide paper read as 2<sup>nd</sup>, the the Board of studies in Architecture at its meeting held on 30.07.2012 discussed in detail and finalized the curriculum and syllabus for the combined first and second semester B.Arch Degree course to be implemented from 2012 admissions onwards..

Considering the urgency of the matter, the Vice- Chancellor, exercising the powers of the Academic Council has approved and accorded sanction to implement the curriculum and syllabus of the combined first and second semester B.Arch Degree course with effect from 2012 admissions, subject to ratification by the Academic Council ,vide paper read as 4 above..

Sanction has therefore been accorded for implementing the Curriculum and Syllabus for the combined first and second semester B.Arch Degree Course with effect from 2012 admissions. (The curriculum and syllabus is uploaded in the university website ).

Orders are issued accordingly.

Sd/-  
**DEPUTY REGISTRAR (G&A-IV)**  
**For REGISTRAR**

To:- 1) The Principals of all affiliated Engineering colleges Offering B.Arch Course

Copy to: PS to Vice-Chancellor/ PA to Registrar/ PA to PVC/ PA to CE /DR /AR (B.Tech Section) EX Sn/Enquiry/EG. Sn/Chairman BOS in Engg.(UG/PG)/B.Tech Tabulation sn/ System Administrator (with a request to upload in the University website)/ SF/FC

**Forwarded/By Order**

**SECTION OFFICER**

**CALICUT UNIVERSITY B. ARCH COURSE**  
**2012 ADMISSION SYLLABUS -FIRST & SECOND SEMESTER (S1&S2)**

**AR01 - 11 BASIC DESIGN**

**8 hrs/week.**

**Credits-10**

**COURSE OBJECTIVES**

Introduction to design- problem-solving, elements of design, principles of design, 2-D designs in different mediums, colours and textures for articulation of abstract ideas.

Development of student's vision regarding 3-D forms (models and sculptures) in different materials, colours, and textures for specific themes/expressions to develop creative/imaginative thinking

**GENERAL GUIDE LINES :**

1. Course in Basic Design shall be conducted by giving small time assignments of the duration of 15 to 20 days each ( total 10 to 12 Nos. in a year )
2. Each assignment shall be aimed at teaching the principles of Aesthetics and Visual Design and its application in Architecture forms and spaces.
3. Goals and Objectives of each assignments shall be made clear to the students before starting the assignments.
4. There shall be transparency in process of evaluation and students shall be made aware about the visual merits and demerits of their work/submissions.
5. Each assignment shall have meaningful sequence with the previous assignments and the next assignment.

**MODULE 1: (40 Hours)**

1. Principles of Visual Compositions : The assignment shall be aimed at understanding and using principles like Repetition, Rhythm, Radiation, Focal point, Symmetry, Unsymmetry, Background, Foreground, Sense of Direction, Harmony, Balance and Proportion.
2. Elements of Visual Composition : Assignment shall be aimed at understanding role of the following basic elements of visual design existing in paintings, compositions, murals, sculptures, building and in a nature – Dots, Lines, Planes, Patterns, Shapes, Forms, Spaces, Colour, Texture, Levels, Light, Fenestration's.
3. Exploring Colour Schemes and its application on Architectural Forms & spaces : Assignment on Colour shall be aimed at developing the skills to create Visually pleasing Colour Schemes based on principles of Harmony and Contrast and degree of Chromatism.

**MODULE 2: (40 Hours)**

4. Study of Textures and Textures Schemes.
5. Study of Openings for light, shadow, shades and sciography : This assignment shall be related to openings in the building, windows, roof, lighting and its impact on visual character of the space.
6. Study of Planer Forms : This assignment shall be aimed at creating abstract sculptures out of Mount Board, Box Board, Metal Foils and any other planer material and also exploring the adoptability of these sculptures to Architectural functions.

**MODULE 3: (40 Hours)**

7. Study of Paper Forms : This assignment shall include explorations of various folded paper forms and its possible use in Architectural Spaces.
8. Study of Solids and Voids : This assignment shall include creation of abstract and semi abstract symbolic sculptural forms and spaces.
9. Study of Linear Forms : Students should be asked to create : Wire Sculptures, Mobile Sculptures, Atrium Sculptures, Space sculptures, Geodesic Domes etc. for outdoor and indoor Architectural spaces.

**MODULE 4:** (40 Hours)

10. Study of Fluid / Plastic Forms : This assignment shall include use of clay, plaster or any other mouldable material and create plastic and free flowing Sculptural forms.

11. Building Appraisal : In this assignment the students shall be asked to present any analytical study of the sculptural building forms and its critical appraisal of visual character.

12. Application of Basic Design in Architecture : This assignment shall be aimed at learning to adopt compositions, murals and sculptures for semi recreational and semi functional Architectural spaces like children playing area, Exhibition Spaces, Outdoor Dining Area, Entrance Gates of Exhibition, Compound Wall, Compound Gate, Floor patterns, Atrium or Courtyard with levels, Monumental Sculptures in Foreground of Buildings, Outdoor Recreational Spaces, Atrium Sculpture, Building Facades, Graphics on the Dead Walls, Murals in the Entrance Halls etc.

**TEXT BOOK**

1. Charles Wallschlaeger & Synthia Basic Snyder, *Basic Visual Concepts & Principles for artists, architects & designers*, McGraw hill, USA, 1992.

**REFERENCE BOOKS**

1. Paul Zelanski & Mary Pat Fisher, *Design principles & Problems* , 2nd Ed, Thomson & Wadsworth, USA, 1996
2. Owen Cappleman & Michael Jack Kordan, *Foundations in Architecture: An Annotated Anthology of beginning design projects*, Van Nostrand Reinhold, New York.
3. Trewin Coplestone, *Arts in Society*, Prentice Hall Inc, Englewoods Cliffs, N. J. 1983.
4. H. Gardner, *Art through ages*.
5. Paul Laseau, *Graphic Thinking For Architects and Designers*, John Wiley & Sons, New York, 2001.
6. Maitland Graves, *The Art of Colour and Design*, McGraw Hill Book Company Inc., 1951 (2nd Edn.)
7. Edward D. Mills - *Planning the Architects Hand Book - Bitterworth, London, 1985*.
8. V.S. Pramdar, *Design fundamentals in Architecture*, Somaiya Publications Pvt. Ltd., New Delhi, 1973.
9. Francis D.K. Ching - *Architecture - Form Space and Order* Van Nostrand Reinhold Co., (Canada), 1979.
10. John W. Mills - *The Technique of Sculpture*, B.T. Batsford Limited, New York - Reinhold Publishing Corporation, London, 1966.
11. Elda Fezei, Henny Moore, Hamlyn, London, New York, Sydney, Toronto, 1972.
12. C. Lawrence Bunchy - *Acrylic for Sculpture and Design*, 450, West 33rd Street, New York, N.Y. 10001, 1972.
13. Orbis Publishing Ltd., *Know how the complete course in Dit and Home Improvements NO.22, Bed Fordbury, London, W.C.2, 1981*.
14. 'Principles of three Dimensional Design' by Wucius Wong
15. 'Principles of two Dimensional Design' by Wucius Wong
16. 'Principles of color composition' by Wucius Wong
17. "Rendering with Pen and Ink" by Robert Gill

**WEBSITES**

[Http://www.infinet.net](http://www.infinet.net) - elements of design , <http://www.Okino.com> - design, visualization, rendering system , <http://www.interface-signage.com> , <http://www.designcommunity.com> - arch rendering, 3D design

## AR01 – 12 BUILDING MATERIALS AND CONSTRUCTION

3 hrs/week.

Credits-5

### COURSE OBJECTIVES

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

Impart required exposure to various constructions and the judicious use of materials for construction through visits to construction sites, material manufacturing sites etc.

### MODULE I (20Hrs)

Introduction to vernacular and conventional building materials

Sand: Sources, classification, functions, properties,

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

Brick: Brick as a building material -Raw materials for manufacture -Types of bricks - Brick manufacturing - Properties-use-classification - Simple tests to determine quality of brick - BIS specification → tests-energy and environmental aspects-suitability for construction

Clay Products and Ceramics: Tiles-types-properties-uses,manufacturing .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

### MODULE II (20 Hrs)

Introduction to all types of foundations

Foundations – Definition, functions, Types of foundations, foundation loads, Selection criteria for foundations based on soil conditions, Bearing capacity of soil, Methods of testing, Methods of improving bearing capacity of soil, Settlement of foundations, Precautions against settlement, Shallow and deep foundations, Different types of foundations – Wall footing (strip footing), isolated footing, Combined footing, raft foundation, pile foundation etc.

Drawings- Wall footing, isolated footing, Combined footing (1 sheet)

### MODULE III (45 hrs)

Introduction to mortar – types of mortar, uses of mortar

Introduction to masonry: superstructure - Stone masonry – Types-dry rubble, random rubble, coarsed rubble, uncoarsed rubble- Ashlar masonry, Ashlar faced stone work, 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 1/2, 2, 2 1/2 brick walls comers, junctions and cross junctions - special bonds like rat trap, herring- bone bonds, decorative brick work-brick jallies. Damp proofing

Drawings - English bond I, 1 1/2, 2 brick walls; (1 sheet)

Flemish bond 1, 1 1/2, 2 brick walls ;(1 sheet)

Details of corners and junctions (1 sheet)

Neat sketches of different types of stone masonry ;(1 sheet)

Case study/site study: Brick masonry, stone masonry and simple foundations.(atleast 3 sites-9 hours)

## **MODULE IV (12 Hrs)**

Joinery details in wood (ancient and modern)- Terms for various members, fasteners and fixtures used in joinery.

Doors-paneled, battened, glazed & sliding. . ( 2 sheets)

Drawings-Joinery details ( 1 sheet)

### **TEXT BOOKS**

1. Punmia B.C ,” Building construction”
2. Arora & Bhindra, “building construction”
3. Rangwala, “Building Materials”
4. Punmia.B.C., “soil mechanics& foundation Engineering”
5. Arora, “soil mechanics & foundation engineering”
6. Balagopal T.S. Prabhu, “Civil Engineering Drawing Hand book”

### **REFERENCES**

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

### **UNIVERSITY EXAMINATION PATTERN**

Q I -8 short type questions of 5 marks, 2 from each module.

Q II -2 Questions of 15 marks from module I with choice to answer anyone.

Q III -2 Questions of 15 marks from module II with choice to answer anyone.

Q IV -2 Questions of 15 marks from module III with choice to answer anyone.

Q V -2 Questions of 15 marks from module IV with choice to answer anyone.

## AR01 – 13 HISTORY OF ARCHITECTURE – I

2 hrs/week.

Credits-3

### MODULE I (15 Hours)

Study of the world civilizations to understand how people lived, their thoughts, beliefs, religions, social customs, cultural practices and related architectural growth.

A brief introduction to World Architecture

Prehistoric: Factors influencing Architecture, General characteristics.

Ancient Egypt: History, evolution, factors influencing architectural characteristics –Mastabas, Tombs & Temples: Great Temple of Karnak, Ammon, Great Pyramid at Giza.

Ancient Mesopotamia: History, evolution, factors influencing architectural characteristics–Ziggurat of Ur

Ancient Greece: History, evolution, , factors influencing architectural characteristics –Classical Orders, Optical corrections - Acropolis, Athens, The Parthenon, The Erektion

Agoras& Monuments

Ancient Rome: History, evolution, factors influencing architectural characteristics – Tuscan and composite orders, Roman engineering skills- lintels, arches & vaults, Aqueducts - Pantheon, Colosseum, Forum

Pre Colombian America: History, evolution, factors influencing architectural characteristics: Mayan Architecture

### MODULE II(10 Hours)

Indus Valley Civilisation: Introduction to art, culture and pattern of settlement - City planning, domestic architecture, building materials and construction techniques -- Mohenjo-Daro, Harappa

Vedic Period: Vedic Village. City Planning in later Vedic period. Building materials and construction techniques.

Buddhist Architecture: Introduction to Buddhist art, Hinayana and Mahayana Buddhism – cultural factors that shaped development of forms in their buildings. Architectural Productions during Ashoka's rule – Ashokan Pillar, Sarnath . Salient Features of Stupas, Chaityas and Vihara.-Development of Chaitya arch - The Great Stupa at Sanchi. Chaitya Hall, Karli. main caves of ajantha and ellora, Rani Gumpha- Udaigiri

### MODULE III(10 Hours)

Early temples: Evolution of architectural style, major influences on development of form and other architectural elements. Gupta and early Chalukyan styles -- Gupta temple, Tigawa. Dasavatara Temple, Deogarh. Ladhkhan and Durga temples, Aihole.

Hindu temple architecture: Principles of Design and Construction

Dravidian style

Pallavas : Rock cut architecture– Shore Temple and Rathas at Mahabalipuram ,Kailasanatha and Vaikuntaperumal Temples, Kanchipuram

Chola period- Brihadeswara temple, Thanjavur.

Hoysala - Hoysaleswara temple, Halebid

Vijayanagara : Hampi , Vittalaswami temple, Hampi.

## **MODULE IV (10 Hours)**

Pandya Period: Evolution of Gopuram – Complexity in Temple Plan of Srirangam Temple, Meenakshi Temple, Madurai-

Nayak style – Rameshwaram temple

Indo Aryan Style: Salient features of IndoAryan Temples

Orissan : Parasurameswara, Mukteswara, Lingaraja temples, Bhubaneswar. Sun temple, Konark.

Khajuraho : Kandariya Mahadeva Temple and Lakshmana Temple, Khajuraho.

Gujarat - Sun temple, Modhera

## **REFERENCE BOOKS**

1. Banister Fletcher, 'Dan Cruickshank Sir, Banister Fletcher's a history of architecture: A History of Architecture', Architectural Press, 1996
2. Percy Brown, 'Indian Architecture: Buddhist and Hindu Periods', D. B. Taraporevala, 1965
3. Satish Grover, 'The Architecture of India: Buddhist and Hindu', Vikas, 1980
4. Christopher Tadgell, 'The History of Architecture in India', Phaidon, 1994
5. Satish Chandra, 'History of Architecture and Ancient Building Materials in India', Tech Books International, 2003
7. James C. Harle, 'The Art and Architecture of the Indian Subcontinent:' Second Edition, Yale Univ Pr, 1994
8. Henri Stierlin – Hindu India- From Khajuraho to the Temple city of Madurai – Taschen 2002
9. Carmen kagal, vistara: the architecture of India, published by festival of India, 1986.
10. Ilay Cooper, 'Barry Dawson, Traditional Buildings of India', Thames and Hudson, 1998
11. Balagopal T S Prabhu, A Achyuthan, 'Text Book of Vastu Vidya',
12. Ronald.M. Bernier, 'Temple Arts of Kerala', S.Chand, 1982
13. Susan Visvanathan, 'Christians of Kerala', Oxford University Press, 1993
14. Ashalatha Thampuran, 'Traditional Architectural Forms of Malabar Coast', Vastuvidyapratishthanam Academic Centre, 2001

## **UNIVERSITY EXAMINATION PATTERN**

Q I -8 short type questions of 5 marks, 2 from each module.

Q II -2 Questions of 15 marks from module I with choice to answer anyone.

Q III -2 Questions of 15 marks from module II with choice to answer anyone.

Q IV -2 Questions of 15 marks from module III with choice to answer anyone.

Q V -2 Questions of 15 marks from module IV with choice to answer anyone.

## AR01- 14 ARCHITECTURAL DRAWING AND GRAPHICS

5 hrs/week.

Credits-6

### **COURSE OBJECTIVE:**

The objective of the course is to introduce students to the fundamental techniques of architectural drawing and develop the appropriate manual skills for visualization and technical representation of built forms in different types of drawings. The course also acts as a bridge to understanding basics of computer aided drafting and architectural graphics.

### **MODULE: 1**

#### INTRODUCTION (10 hrs)

Introduction to Architectural drawings: types of drawings- Freehand sketches and mechanical drawing for architectural applications and presentation drawings. Different mediums used such as pencil, ink, types of papers, reproduction methods. Demonstration of drawing instruments and their use. Essential kit for making architectural drawings.

#### BASIC ARCHITECTURAL DRAWING (10 hrs)

Concept of orthographic projections, drawing conventions such as plan, elevation and section, symbols, lettering, dimensioning, values in drawn lines, tone, texture and color. Different types of lettering for titles and annotation of drawings. Architectural representation of materials on drawings, terminology and abbreviations used in architectural drawings.

### **MODULE NO: 2**

#### SCALE AND MEASURED DRAWING(15 hrs)

Use of scale in drawings, Classification of scales- Representation fraction (R.F.), Construction detail of Plain scale, Diagonal scale and Vernier scale. Making simple 3-dimensional model forms of thermocole sheets, scaling and measuring of these forms and representing them in plan, elevations and sections using different scales. Reduction and enlarging of given drawings, tracing in pencil and ink medium. Measured drawing to scale of furniture pieces, rooms, doors, windows etc. Representation of wall thickness and openings in walls in geometrical plan shapes.

### **MODULE NO: 3**

#### BUILDING GEOMETRY IN 2D (15 hrs)

Drawing by method different polygons, circle, ellipse, hyperbola, parabola, and spiral.

#### PROJECTION (15 hrs)

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- Lines parallel to both planes- Lines 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 & true inclinations. Projection of planes: projection of plane lamina with surface inclined to one plane. Projection of plane lamina with diagonals inclined to both planes. Projection of solids: Orthographic first angle projection and study of geometrical solids- rectangular parallelepiped, cube, prism, pyramid, cylinder, cone, sphere. Study of interpenetrating solids and preparing orthographic projections. Development of surface of solids.

### **MODULE NO: 4**

#### PICTORIAL PROJECTIONS AND SCIOGRAPHY (20 hrs)

Isometric projection, Isometric scale, difference between Isometric projection and isometric view- method of drawing isometric projection, isometric views of solids like prisms, cylinders and pyramids- isometric projection of composite solids. Perspective projections: Introduction to perspective projections, classification of perspectives. Constructing one point and two point perspective views of



simple solids and furniture pieces. Introduction to Sciography and principles of shades and shadows, Drawing shadows of simple objects in plan, elevation and perspective.

Note: All drawing exercises mentioned above are for class work. Additional exercises wherever necessary may be given as home assignments.

## **REFERENCE BOOKS**

1. N. D. Bhatt, 'Elementary Engineering'.
2. Cari LaraSvensan and Wiliam Ezara Street, 'Engineering Graphics'.
3. K. Venugopal, 'Engineering Drawing and Graphics'.
4. S. Rajaraman, ' Practical Solid Geometry'.
5. Francis D. K. Ching, ' Drawing, Space, Form, Expression'.

## **UNIVERSITY EXAMINATION PATTERN**

Q I -1 Questions of 25 marks from module I with choice to answer anyone.

Q II -1 Questions of 25 marks from module II with choice to answer anyone.

Q III -1 Questions of 25 marks from module III with choice to answer anyone.

Q IV -1 Questions of 25 marks from module IV with choice to answer anyone.

## AR01 - 15 THEORY OF DESIGN –I

2 hrs/week.

Credits-4

### OBJECTIVE

To provide the student of architecture a foundation in the conception of forms, spatial aspects, compositions and their analysis in buildings

### INSTRUCTIONAL OBJECTIVES

To develop understanding of the basic principles of space and mass, circulation and architectural composition.

#### MODULE 1 (15 Hours)

##### ARCHITECTURAL SPACE AND MASS

Definition of architecture- elements of architecture - Space defining elements , openings in space defining elements, spatial relationship, spatial organization

Primary forms, properties of form, transformation of forms - dimensional transformation, subtractive, additive forms, organization of additive forms - Articulation of forms

#### MODULE 2 (10 Hours)

AESTHETIC COMPONENTS OF DESIGN Exploration of the basic principles of design such as Proportion, scale, balance, rhythm, symmetry, hierarchy, axis with building examples.

##### PRINCIPLES OF COMPOSITION

Study of the basic principles that govern an architectural composition such as Unity, Harmony, Dominance, Fluidity, Emphasis, Contrast etc.

#### MODULE 3 (5 Hours)

CIRCULATION Components of building circulation - The building approach, The building entrance, Configuration of path, Path space relationship, Form of circulation space -Circulation diagram for residence and restaurant

#### MODULE 4 (10 Hours)

DESIGN PROCESS AND ANALYSIS OF BUILDING Design process –integration of aesthetics and function - Understanding of formative ideas, organization ,concepts, spatial characteristics,

Massing and circulation in design analysis of the following buildings:

Falling water house,& Guggenheim museum by f . l. wright –

Villa Savoye & Chapel of Notre-dame DuHaut by le corbusier.

### TEXT BOOKS

1. Francis D. K. Ching, *Architecture - Form, Space and Order*, Van Nostrand Reinhold Company ,1979

2. Roger H. Clark, Michael Pause, *Precedents In Architecture*, Van Nostrand Reinhold Company ,1996

#### REFERENCE BOOKS

1. K.W.Smithies, *Principles of Design in Architecture*, Van Nostrand Reinhold Company , 1981

2. Sam F. Miller, *Design Process - A Primer For Architectural & Interior Design*, Van Nostrand Reinhold Company , 1995

3. Ernest Burden, *Elements of Architectural Design – A Visual Resource*, Van Nostrand Reinhold Company , 1994

4. V.S.Pramar, *Design Fundamentals in Architecture*, Somaiya Publications, New Delhi, 1973

5. Paul Alan Johnson - *The Theory of Architecture - Concepts and themes*, Van Nostrand Reinhold Co. NewYork,1994.

6. *Helm Marie Evans and Caria David Dunneshil, An initiation to design, Macmillan Publishing Co.Inc.,NewYork,1982.*

#### UNIVERSITY EXAMINATION PATTERN

Q I -8 short type questions of 5 marks, 2 from each module.

Q II -2 Questions of 15 marks from module I with choice to answer anyone.

Q III -2 Questions of 15 marks from module II with choice to answer anyone.

Q IV -2 Questions of 15 marks from module III with choice to answer anyone.

Q V -2 Questions of 15 marks from module IV with choice to answer anyone.

## AR01-16 ENGINEERING MECHANICS

3 hours / week

Credits: 4

### OBJECTIVES

To acquaint the general methods of analyzing engineering problems.

To illustrate the applications of the methods to solve practical engineering problems.

Units: System International

### MODULE I (16 hours)

Introduction to Engineering Mechanics-Principles of statics- Free body diagrams - Composition and resolution of forces -Resultant and equilibrant concurrent forces - Triangle of forces - Lami's theorem - Parallelogram law of forces - Method of moments - Theorem of Varignon - Parallel forces - Couples - Centre of parallel forces and centre of gravity - Conditions of equilibrium for general system of coplanar forces -Polygon of forces - Resultant of a system of coplanar forces -Problems of equilibrium.

### MODULE II (16 hours)

Friction - Laws of friction - Angle of friction- Equilibrium of a body on a rough inclined plane - Ladder friction-Properties of surfaces- First moment and centroid of curve and area- centroid of composite plane figures of various shapes- Theorems of Pappus and Guldinus-Parallel and perpendicular axis theorem- Centre of Gravity- Moment of inertia of a lamina -Product of Inertia-Principal axes and principal moment of inertia- Moment of inertia of composite sections and rigid bodies ( cylinder, circular rod, sphere)

### MODULE III (14 hours)

Plane trusses- Different types of supports-Reaction at supports-Method of joints- Method of sections. Graphical method- Funicular polygon- Maxwell's diagram- Distributed forces in a plane-beams- different types of beams- support conditions- different types of loads-support reactions. Principle of virtual work (Elementary treatment only)-application of virtual works in beams.

### MODULE IV (14 hours)

Principles of dynamics- Kinematics of particles-rectilinear motion-curvilinear motion-motion of a projectile-tangential and normal acceleration. Kinetics of particles-rectilinear motion-curvilinear motion-Newton's second law-D'Alembert's principle-Motion on horizontal and inclined surfaces- Motion of connected bodies-Motion of a lift.

Work ,power and energy-work energy equation-transformation and conservation of energy-impulse and momentum.

### TEXT BOOKS

1. Shames I.H, Engineering Mechanics-Statics and Dynamics, 4<sup>th</sup>ed., Prentice Hall of India,New Delhi,2001.
2. Hibbeler R.C.,Engineering Mechanics,Vol.I statics,Vol II Dynamics, 2<sup>nd</sup> ed.,Pearson Education,Delhi,2004.

## **REFERENCE BOOKS.**

1. Rajasekharan S.and Sankarasubramanian G., Engineering Mechanics-Statics and Dynamics, 3rded., Vikas Publications,New Delhi,2005.
2. R.K.Rajput., Engineering Mechanics, 3rded, Dhanpat Rai Publications,New Delhi 2005.

## **UNIVERSITY EXAMINATION PATTERN**

Q I -8 short type questions of 5 marks, 2 from each module.

Q II -2 Questions of 15 marks from module I with choice to answer anyone.

Q III -2 Questions of 15 marks from module II with choice to answer anyone.

Q IV -2 Questions of 15 marks from module III with choice to answer anyone.

Q V -2 Questions of 15 marks from module IV with choice to answer anyone.

## AR01-17 VISUAL ARTS & PRESENTATION

3hrs/week.

Credits-4

### COURSE OBJECTIVES:

The objective of the course is to provide requisite knowledge of visual language involving various media. The primary focus is on developing basic drawing and painting skills, as applied to architecture. Through this course a student acquires basic knowledge about the characteristic of colors (water/ poster/ crayon etc.) and develops skills in using this medium as an effective and versatile presentation tool.

### MODULE I:

#### FUNDAMENTALS OF VISUAL ARTS (15 HRS)

- a. Introduction to Art object, definition and Interpretation. Introduction to History of Art, Artistic Tradition and Theories.
- b. Graphic representations – Visual composition and Abstraction- Exercises involving Logo design, collage and calligraphy.
- c. Drawing: Types, Characteristics & functions of lines and its visual impacts.

#### Module II: (20 HRS)

- a. Primary pencil sketching, tonal value and variation, shading techniques and texture technique.
- b. Primary ink drawing techniques using nib pens, Radiograph, Rotring pens, tonal value and variation, shading techniques and texture technique.
- c. Study of Objects having varied shapes (cuboids, prismatic, spherical, globular etc.) in different media- charcoal, pencils, pastels and ink.
- d. Out door Study; study of monuments. Buildings in pencils, ink, charcoal, pastels etc. study should focus on Architectural details, wherever relevant.

#### Module III: (15 HRS)

- a. Elements of Painting: Pictorial & Spatial organizations, Form and 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.
- c. Techniques of Rendering in water, poster, oil, mixed media and New Media.

#### Module IV: (20 HRS)

- a. Introduction to Indian aesthetics/ Canonical principles of Indian Art, Sculpture & Painting.
- b. Mural Tradition in Kerala- Study of Style, Form and Technique.
- c. Languages, Methods & Techniques of Sculpture: Form, Texture, Mass and Volume. Sculpture in relief, Shallow relief, Sculpture in round. Free standing sculpture in relation to Architectural space.
- d. Techniques: Molding & casting in Plaster, Mud, Cement and Fiber glass.

Students may be assigned to prepare studies at home and submit them in classes.

## REFERENCE BOOKS

1. J.H. Bustano, '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-Principle 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

Q I -8 short type questions of 5 marks, 2 from each module.

Q II -2 Questions of 30 marks from module I and module II with choice to answer anyone.

Q III -2 Questions of 30 marks from module III with choice to answer anyone.

## AR01-18 BASIC COMPUTER GRAPHICS

2hrs/week.

Credits-2

### OBJECTIVE

To familiarize students to computer based representations and to impart necessary skills for using graphic software and creating two dimensional composition and drawings

### MODULE I (10 HRS)

Introduction to the advancements in the field of computer application in Architecture, Information technology and network concepts- Computer as a design medium. Applications and limitations of computer in Architecture.

Concept of Computer aided drafting – Conventional drafting and CAD- Brief overview of related software. Units of a CAD workstation, their operation and critical parameters. General concepts of building geometry and typology

### MODULE II (10 HRS)

Introduction to Graphics Software – Painting, drawing and image editing using Photoshop, Paint shop, Corel Draw, Power Point and Illustrator.

### MODULE III (10 HRS)

Creating two dimensional composition and drawings-

Controlling various CAD software environment – creating two dimensional drawings and editing commands. Coordinate space and metric, Geometric, Primitive and Symbols, Object properties. Basic transformations absolute and referential, Editing, Segmentation by colour, layering and grouping.

### MODULE IV (10 HRS)

Organizing drawings with layers – Advanced geometry editing & using blocks inquiry tools – CAD-design center. Text annotation – Creating hatch patterns - dimensioning Plotting slide presentation &. Importing /exporting files.

### TEXT BOOKS

1. Mitchell, 'Computer Aided Architectural Design', Van Nostrand
2. Omusa, George – Advanced techniques n AutoCAD

### REFERENCES

1. DH Sanders, 'Computers Today' Mc Graw Hill
2. Omura George, "Mastering AutoCAD, BPB Publications, New Delhi,
3. Bain – Using Corel Draw
4. Adele and Seth Green Berg – Fundamental Photoshop 5.5.



## **AR01-19 CONSTRUCTION &MODELLING WORKSHOP**

**2hrs/week.**

**Credits-2**

### **MODULE I (10 Hours)**

Introduction to carpentry tools and machines - Introduction to the carpentry tools, processes, joints and wood working machines..

Different types of timber joints. Identification and selection of timber, Timber finishes, varnish, polish etc.

### **MODULE II(10 Hours)**

Demonstration of brick work, plastering textures and finishes.

Models for Basic design and Architecture design studio – work.

fixing of plywood, blackboards, commercial boards etc. and their application in furniture.

### **MODULE III(10 Hours)**

Introduction to modelling with paper, paper board and plaster.

Basic model making techniques.

Techniques for preparation of models using different mediums i.e. clay, thermocol, mountboard, paper, acrylic sheet etc with application of different mediums for painting different surfaces and textures.

### **MODULE IV(10 Hours)**

Modelling- Preparation of models of live materials in full scale and models of 3D objects.

Painting and polishing- Classification of paints, varnishes ingredients of paints, painting methods-brush, spray, hot spray etc.

Use of clay, Plaster of Paris, metal scrap, jute fiber etc. for study of forms.

## CALICUT UNIVERSITY- B. ARCH COURSE CURRICULUM– 2012 ADMISSION COMBINED FIRST AND SECOND SEMESTER (S1,S2)

CourseCode	Subject	Credits	Hours/Week			Duration of Exam	Marks			Total
			L	T	P/D		W	J	S	
AR01-11	Basic design *	10	0		8	0		200	300	500
AR01-12	Building ConstructionMaterials & Structural system- I	5	1	0	2	3	100	.....	100	200
AR01-13	History of Architecture- I	3	2	0	0	3	100	.....	50	150
AR01-14	Architecture Drawing & Graphics	6	0	0	5	3	100	.....	100	200
AR01-15	Theory of Design - I	4	2	0	0	3	100	.....	50	150
AR01-16	Engineering Mechanics	4	2	1	0	3	100	.....	50	150
AR01-17	Visual Arts & Presentation	4	1	0	2	3	100	.....	100	200
AR01-18	Basic computer graphics	2	0	0	2	0	.....	.....	100	100
AR01-19	Construction &Modelling Workshop	2	0	0	2	0	.....	.....	50	50
<b>TOTAL</b>		<b>40</b>	<b>8</b>	<b>1</b>	<b>21</b>		<b>600</b>	<b>200</b>	<b>900</b>	<b>1700</b>

\* Evaluation by the Jury as per the B.Arch degree manual

L - Lecture, P/D - Drawing,Studio,Practical, J - Jury, T- Tutorial, W - Written university examination, S- Sessional marks

### THIRD SEMESTER (S3)

CourseCode	Subject	Credits	Hours/Week			Duration of Exam	Marks			Total
			L	T	P/D		W	J	S	
AR01-31	Architectural Design - I *	5	0	0	9	0		200	300	500
AR01-32	Building ConstructionMaterials & Structural system- II	2	1	0	2	3	100	.....	100	200
AR01-33	History of Architecture- II	3	3	0	0	3	100	.....	50	150
AR01-34	Building Climatology	3	3	0	0	3	100	.....	50	150
AR01-35	Theory of Design - II	3	2	0	0	3	100	.....	50	150
AR01-36	Theory of structures - I	3	2	1	0	3	100	.....	50	150
AR01-37	Vernacular Architecture	2	2	0	0	3	100	.....	50	150
AR01-38	CAAD Laboratory - I	2	0	0	2	0	.....	.....	100	100
AR01-39	Building Services I Water supply and Sanitation	2	3	0	0	0	100	.....	50	150
<b>TOTAL</b>		<b>25</b>	<b>16</b>	<b>1</b>	<b>13</b>		<b>700</b>	<b>200</b>	<b>800</b>	<b>1700</b>

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### FOURTH SEMESTER (S4)

CourseCode	Subject	Credits	Hours/Week			Duration of Exam	Marks			Total
			L	T	P/D		W	J	S	
AR01-41	Architectural Design - II *	5	0	0	9	0		200	300	500
AR01-42	Building ConstructionMaterials & Structural system- III	2	1	0	2	3	100	.....	100	200
AR01-43	History of Architecture- III	3	3	0	0	3	100	.....	50	150
AR01-44	Land Survey	3	3	0	0	3	100	.....	50	150
AR01-45	Sociology& Economics	3	2	0	0	3	100	.....	50	150
AR01-46	Theory of structures - II	3	2	1	0	3	100	.....	50	150
AR01-47	Building Science Lab	2	0	0	2	0	.....	.....	100	100
AR01-48	CAAD Laboratory -II	2	0	0	2	0	.....	.....	100	100
AR01-49	Survey Practical	2	0	0	3	0	.....	.....	100	100
<b>TOTAL</b>		<b>25</b>	<b>11</b>	<b>1</b>	<b>18</b>		<b>500</b>	<b>200</b>	<b>900</b>	<b>1600</b>

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## FIFTH SEMESTER (S5)

CourseCode	Subject	Credits	Hours/Week			Duration of Exam	Marks			Total
			L	T	P/D		W	J	S	
AR01-51	Architectural Design - III *	7	0	0	9	0		200	300	500
AR01-52	Building Construction Materials & Structural system- IV	3	2	0	3	3	100	.....	100	200
AR01-53	History of Architecture- IV	3	3	0	0	3	100	.....	50	150
AR01-54	Estimation ,Costing & Specification	3	3	0	0	3	100	.....	50	150
AR01-55	Building Services II Accoustics,Fire Fighting	3	3	0	0	3	100	.....	50	150
AR01-56	Structural Design I	3	2	1	0	3	100	.....	50	150
AR01-57	Working Drawing I	3	0	0	4	0	.....	.....	100	100
<b>TOTAL</b>		<b>25</b>	<b>13</b>	<b>1</b>	<b>16</b>		<b>500</b>	<b>200</b>	<b>700</b>	<b>1400</b>

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## SIXTH SEMESTER (S6)

CourseCode	Subject	Credits	Hours/Week			Duration of Exam	Marks			Total
			L	T	P/D		W	J	S	
AR01-61	Architectural Design - IV *	7	0	0	9	0		200	300	500
AR01-62	Elective I	3	3	0	0	3	100	.....	50	150
AR01-63	Interior Design & Detailing	3	1	0	3	3	100	.....	100	200
AR01-64	Landscape Architecture	3	3	0	0	3	100	.....	50	150
AR01-65	Building Services III Electrification and Architectural Illumination	3	3	0	0	3	100	.....	50	150
AR01-66	Structural Design II	3	3	1	0	3	100	.....	50	150
AR01-67	Working Drawing II	3	0	0	4	0	.....	.....	100	100
<b>TOTAL</b>		<b>25</b>	<b>13</b>	<b>1</b>	<b>16</b>		<b>500</b>	<b>200</b>	<b>700</b>	<b>1400</b>

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## SEVENTH & EIGHT SEMESTER(S7 & S8)

INTERNSHIP UNDER A REGISTERED ARCHITECT (PRACTICAL TRAINING)										
Note: The office where training is taken shall be of an approved Council of Architecture, registered architect with not less than five years of professional standing										
CourseCode	Subject	Credits	Hours/Week			Duration of Exam	Marks			Total
			L	T	P/D		W	J	S	
AR01 -71	Internship/practical training-for minimum 240 working days.Certified by office where training is taken along with log sheets of attendance portfolio/copies of drawing done in office									
	Field observation study of Architectural details.	15						250	250	
	Critical appraisal of an important historical or modern building in the town where training is taken	10						50	50	
<b>TOTAL</b>		<b>25</b>						<b>300</b>	<b>300</b>	<b>600</b>

Refer practical training manual

\* Evaluation by the Jury as per the B.Arch degree manual

## NINTH SEMESTER (S9)

CourseCode	Subject	Credits	Hours/Week			Duration of Exam	Marks			Total
			L	T	P/D		W	J	S	
AR01-91	Architectural Design - V *	5	0	0	10	0		200	300	500
AR01-92	Elective II	3	3	0	0	3	100	.....	50	150
AR01-93	Town Planning	3	3	0	0	3	100	.....	50	150
AR01-94	Professional Practice	3	3	0	0	3	100	.....	50	150
AR01-95	Environmental Studies	3	3	0	0	3	100	.....	50	150
AR01-96	EarthQuakeresistant design& Disaster management	3	3	0	0	3	100	.....	50	150
AR01-97	Building Services IV Heating Ventilation and Airconditioning	3	3	0	0	0	100	.....	50	150
AR01-98	Construction Management	2	2	0	0	0	100	.....	50	150
<b>TOTAL</b>		<b>25</b>	<b>20</b>	<b>0</b>	<b>10</b>		<b>700</b>	<b>200</b>	<b>650</b>	<b>1550</b>

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## TENTH SEMESTER

CourseCode	Subject	Credits	Hours/Week			Duration of Exam	Marks			Total
			L	T	P/D		W	J	S	
AR01-91	Thesis and Viva Voce-*	25	0	0	30			250	250	
<b>TOTAL</b>		<b>25</b>	<b>0</b>	<b>0</b>	<b>30</b>			<b>250</b>	<b>250</b>	<b>500</b>
<b>AGREGATE FOR 10 SEMESTERS = 10450</b>										

\*Thesis viva voce shall be conducted as per the manu

L - Lecture, P/D - Drawing,Studio,Practical, J - Jury, T- Tutorial, W - Written university examination, S- Sessional marks



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