AR1101 ARCHITECTURAL DESIGN -I

Teaching Scheme: 0(L) - 0(T) - 3(P)   **Credits:** 4

Course Objective:

- *To introduce the architectural design language and design process.*
- *To understand the nature of built environment and its determinants.*

Module – I
LETTERING: Architectural lettering exercises - drafted and free hand, rendering and presentation techniques with pencil and ink

Module – II
TECHNICAL DRAFTING: Demonstration of drawing instruments and their use, architectural representation of materials on drawings, use of scales, Scaling and measuring of 3D forms and representing them in 2D form.

Module – III
ANTHROPOMETRIC STUDIES : Average measurements of human body in different postures, its proportion and graphic representation, application in design of simple household and street furniture.

Module – IV
SPACE STUDY: Basic human functions and their implications for space requirements. Minimum and optimum areas for various functions such as living, dining, sleeping, cooking, study, storage, toilet etc. including furniture layout, circulation spaces

Course Outcome:

Upon completion of the course, the student shall have achieved a comprehensive understanding of technical drawing techniques and architectural presentation.

The course shall prepare students to gain an understanding into the fundamental issues in architectural design and develop skills to create architectural solutions for simple problems.

References:

1. Francis D. K. Ching, *'Architecture: Form, Space and Order'*, John Wiley & Sons, 2007.
2. Geoffrey Broadbent `Design in Architecture' John Wiley and Sons, 1973.
3. Arthur L. Guptill and Susan E. Meyer, *'Rendering in Pen and Ink'* , Watson-Guptill, 1997
4. Neuferts' Architect's Data
5. Francis D. K. Ching, *'Architectural Graphics'*, Wiley, 2009.

Internal Continuous Assessment *(Maximum Marks-100) (Group1 Subject)*

   20% - Tests (minimum 2)
   70% - Class work.
   10% - Regularity in the class

University Examination Pattern:

   Examination duration: 4 hours   *Maximum Total Marks: 100*

The question paper shall consist of 2 questions of 100 marks each. Candidates have to answer one full question out of the two.

AR1102 BUILDING MATERIALS AND CONSTRUCTION I

Teaching Scheme: 2(L) - 0(T) - 0(P)   **Credits:** 4

Course Objective:

- *To introduce the elementary building materials, their applications and construction methods.*
- *To familiarize the students with building components and their role. To*
- *understand vernacular/ traditional building materials and practices. To*
- *understand prevailing BIS specifications.*

Methodology:

- *Introducing materials and methods of construction through lectures and studio exercises.*
- *Site visits to gain knowledge about construction details.*
- *Documentation and demonstration to some basic construction methods and elements.*
- *Collecting material samples and literature.*

Module – I

Introduction to building materials and construction- components of buildings-how to make drawings.

Stone: Classification stones suitable for construction-properties-available sizes-use.

Clay: Brick [country bricks & factory made]-properties-available sizes-use. Terracotta-available forms suitable for construction-sizes- properties-uses.

Mortar: Ingredients of mortar-water, mud, lime, cement and sand- proportions- properties-applications.

Concrete: Ingredients of plain cement concrete-grades-properties-applications and uses. Cement concrete blocks used for construction.

Module – II

Masonry: Stone masonry for foundations and super structure-various types-with and without mortar-methods of construction. Brick masonry for foundations and superstructure-brick bonds-different types-for varying thickness-other structural systems using bricks-arches and vaults-methods of construction.

Drawings: Stone masonry for foundations and super structure. Brick bonds, arches and vaults.

Module – III

Timber: Classification of timber according to position of hard core-available types of timber-areas of application-properties of timber-specification. Seasoning of timber-need for seasoning-methods-defects in timber.

Bamboo: Bamboo as a building material-types-properties-application.Comparison bamboo v/s wood.

Module – IV

Working with timber: Various steps involved-required sizes of members-joining wooden members for various applications like structural systems, doors, windows and furniture.Study of modern hardwares-locks,hinges,sliding guides,fasteners,nuts,bolts, screws ,wind stays,Traditional knowledge in carpentry.

Working with bamboo: Various steps involved-required sizes of members-methods of joining bamboo for various applications.

Drawings: *Joints in wooden joinery. Illustrations- details of bamboo constructions.*

Course Outcome:

Upon completion of the course, the student shall have acquired a basic awareness of the primary building materials used in construction, their properties, types and common usage. This will enable students to equip themselves with the knowledge of materials and their judicial usage in their future design projects.

References:

1. Harry parker, '*Materials and Methods of Architectural Construction*', John Wiley & Sons. Canada, limited, 1958.
2. W B McKay, '*Building Construction*', Orient Longman 21.
3. Robin Barry, '*The Construction of buildings (Vol.I-V)*', Blackwell publishing, 2000.
4. Olin, Harold & Schmidt, '*Building Construction – Principles, Material & Methods*', American Savings and Loan Institute Press, 1970.
5. Francis Ching, '*Building Construction Illustrated*', John Wiley, 1991.
6. Relevant BIS codes.

Internal Continuous Assessment *(Maximum Marks-50)*

20% - Tests (minimum 2)
70% - Class work.
10% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours   *Maximum Total Marks: 100*
The question paper shall consist of 2 parts.
Part A : Question 1. (40 marks) - Eight Short answer questions of 5 marks each. All questions are compulsory. There should be two questions from each module.

Question 2. (10 marks) –Questions for 10 marks from module I and II. Candidates have to answer any one out of the two.

Question 3. (10 marks) –Questions for 10 marks from module III and IV. Candidates have to answer any one out of the two.

Part B (40 Marks) – Drawing: Candidates have to answer any one full question out of the two each from modules II and III. Each question carries 20 marks.

AR1103 HISTORY OF ARCHITECTURE I

Teaching Scheme: 2(L) - 0(T) - 0(P)   Credits: 4

Course Objective:

To appreciate the importance of history of architecture and its relationship to the development of any region. To create awareness of the precious architectural past and how to interpret the future development based on that tradition, wisdom and technical knowledge.

Module – I

Factors influencing the architectural character of any place; Geographic, Climatic, Socio-cultural, Religious, Economic, etc.

Prehistoric architecture of the West, Middle East and East: General characteristics of the earliest Human Settlements: Gobekli Tepe, Catal Huyuk, Jericho, Jomon culture; Shoji walls, Pagoda, etc.

Early Settlements in India: Mehrgarh, Early Harappan.

Module – II

Ancient Mesopotamia: History, evolution and characteristics. Example: Ziggurat (Sumerian), Palace of Sargon (Assyrian), Ishtar Gate (Babylonian).

Ancient Egypt: History, evolution and characteristics. Example: Mastabas, Pyramid of Giza and Temple of Amon at Karnak.

Indus Valley Civilisation: City Planning. Domestic Architecture. Building materials and construction techniques. Example: Great Bath, Mohenjo- daro.

Ancient Greece: History, evolution and characteristics. Example: Classical Orders, Optical corrections, Parthenon, Acropolis, Agora, Theatre.

Ancient Rome: History, evolution and characteristics. Example: Roman engineering skills-Pantheon, Colosseum, Basilica.

Module – III

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

Buddhist & Jain: History, evolution and characteristics. Major typologies; Stupa, Chaitya hall, Vihara. Example: Lomas Rishi, The Great Stupa at Sanchi, Chaitya Hall at Karli,. Vihara 1 at Ajanta.

North Indian: Evolution of architectural style, major influences on the development of form and other architectural elements. Gupta Period. Example: Tigawa & Dasavatara Temples.

Central & South Indian: Chalukya & Pallava Architecture. Example: Ladkhan and Durga temples at Aihole (Chalukya), Rathas & Shore temple (Pallava).

Dravidian temple architecture: Principles of Design and Construction

Module – IV

Introduction to Kerala Architecture: Evolution of architectural style, Factors that influenced the development of architecture: Materials, Climate & Socio-economic factors.

Residential architecture: Residential Typologies and Palaces Example: Padmanabhapuram palace.

Religious architecture: Early Hindu Temples, Churches and Mosques. Evolution of religious architectural forms. Koothambalam, etc Examples: Hindu: Vadakkumnathan temple at Thrissur. Christian: St. Mary's Church at Kallooppara, Muslim: Miskal Masjid at Kozhikode.

Course Outcome:

Knowledge about the history of a culture, its building art and construction techniques helps an architecture student to develop designs that are rooted in the country. Upon completion of the course, the student will be able to develop a keen appreciation of our heritage buildings leading to the understanding that architecture is the product of a particular culture, time and place.

References:

1. Percy Brown, 'Indian Architecture: Buddhist and Hindu Periods', D. B. Taraporevala,1965.
2. Satish Grover, 'The Architecture of India: Buddhist and Hindu', Vikas, 1980.
3. Christopher Tadgell , 'The History of Architecture in India', Phaidon, 1994.
4. Satish Chandra, 'History of Architecture and Ancient Building Materials in India', Tech Books International, 2003.
5. James C. Harle , 'The Art and Architecture of the Indian Subcontinent:' Second Edition, Yale University Press,1994.
6. Banister Fletcher, 'Dan Cruickshank Sir, Banister Fletcher's a history of architecture: A History of Architecture', Architectural Press, 1996.
7. Dora P. Crouch, June G. Johnson, 'Traditions in Architecture: Africa, America, Asia, and Oceania', Oxford University, 2000.
8. Michael Raeburn, 'Architecture of the Western World', Rizzoli, 1982.
9. Ilay Cooper, 'Barry Dawson, Traditional Buildings of India', Thames and Hudson, 1998.
10. Balagopal T S Prabhu, A Achyuthan, 'Text Book of Vastu Vidya', Vastuvidya-pratishthanam Academic Centre, 2001
11. Ronald.M.Bernier, 'Temple Arts of Kerala', S.Chand, 1982.
12. Susan Visvanathan, 'Christians of Kerala', Oxford University Press, 1993.
13. Ashalatha Thampuran, 'Traditional Architectural Forms of Malabar Coast', Vastuvidya-pratishthanam Academic Centre, 2001
14. Ching, Francis, Vikramadithya Prakash, Mark M Jarzombek, 'A Global History of Architecture', John Wiley & Sons, 2011

Internal Continuous Assessment *(Maximum Marks-50) (Group 2 Subject)* 50% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, quiz, seminar, term-project, etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours   *Maximum Total Marks: 100*

The question paper shall consist of Two Parts

Part A (40 marks) - Eight Short answer questions of 5 marks each. All questions are compulsory. There should be two questions from each module.

Part B (60 Marks) – Two Questions from each module. Candidates have to answer any one full question out of the two from each module. Each question carries 15 marks.

AR1104 BASIC DESIGN & VISUAL ARTS

Teaching Scheme: 0(L) - 0(T) - 6(P)   Credits: 6

Course Objective:

- *To understand the relationship of basic design to architectural design and design field. To develop comprehension and visualization of geometric forms.*
- *To observe, express, record and analyze the environment as a basic creative instinct.*

Module – I

Fundamental elements of design and their definitions – point, line, shape, form, structure, space, texture, value Introduction to the principles of design – unity, balance, symmetry, proportion, scale, hierarchy, rhythm, contrast, harmony, focus, figure and ground etc.
Perception of colour and light

Module – II

Exploration of pattern with 2D compositions, Exploration of forms through 3D compositions Utility models

Module – III

Study of simple structural systems and behavior under load. Working model of structures (Like post and lintel, cantilever, trusses, arches, space frame, suspension etc), Development of basic skill in design expression, Visual analysis of built forms, sculptural and spatial qualities, analysis of solid and void relationship, Three dimensional projects developed through models and sketches.

Module – IV

Design Introduction: Short exercises in design and layouts of personal spaces and rooms.
Integration of form and function in the design of single room spaces(bus shelter, phone kiosk, snack corner, ATM Center, milk booth, security cabin, flower kiosk, temporary shelter, viewing gallery etc.) stressing on concept generation and development of rich design process.

Site visits, experimental exploration of built environment.

Course Outcome:

- *Upon completion of the course, the students shall have become familiar with visual and verbal vocabularies of architecture; and have developed analytical thinking and an understanding of spatial order and design field.*
- *They shall also appreciate the constraints in the Architectural design of a small building with reference to function, form and anthropometry.*

References:

1. Krome Barratt, *'Logic and Design in Art, Science and Mathematics'*,Globe Pequot Press,The,2005.
2. Francis D. K. Ching, *'Architecture: Form, Space and Order'*, John Wiley & Sons, Incorporated,2007.
3. Simon Unwin, *'Analizing Architecture'*, Routledge, 2003.
4. Geoffrey Broadbent `Design in Architecture,'* John Wiley and Sons, 1973.

Internal Continuous Assessment *(Maximum Marks-150) (Group 1 Subject)*

 20% - Tests (minimum 2)
 70% - Class work.
 10% - Regularity in the class

AR1105 ARCHITECTURAL GRAPHICS - I

Teaching Scheme: 1(L) - 0(T) - 3(P)   **Credits:** 4

Course Objective:

- *To provide a comprehensive introduction to technical and free-hand drawing techniques in architectural representation*

- *To provide an awareness in Visual arts*

Module – I

INTRODUCTION TO ART AND ARTMOVEMENTS: Exposure to the life and works of famous artists of Kerala, India; important movements in art.

Renaissance- Michelangelo, Da Vinci, Alberti; Baroque – Rembrandt, Bernini

Impressionism, Cubism; Influence of art on 20th cent. Mordern architecture – Kandinsky, Maholynagy

Module – II

FREE HAND DRAWING: Introduction to Architectural drawings using different mediums such as pencil, ink, crayons, pastels, water colors, types of papers etc. Introduction to drawing fundamentals- Drawing lines, curves and shapes- and form- Rendering in 3D form- Shading and shadow

Drawing of simple objects, parts of built forms, and natural elements such as plants, trees, and graphic human figures etc.

Outdoor sketching: study parts of built form, play of shade and shadows, streetscapes and landscapes with human figures

Module – III

USE OF COLOUR : Form in nature, Generation of visual images with analogies from nature. Use of colours, composition with colour. Colour theory -Colour Principles, Colour scheme, Colour combination. Drawing still life.

Module – IV

INTRODUCTION TO VISUAL ARTS: Its relation to architecture – study of fundamentals of visual arts- - line, shape, form, space, colour, value, and texture - three dimensional composition of spaces and their graphic expression- exercises given to meet the requirements of elements of art.

Principles of visual art – balance – unity – pattern - emphasis, movement, rhythm, contrast are introduced - exercises to explain the conditions.

Course Outcome:

Students shall acquire the necessary skills to translate their concepts into rendered drawings effectively capturing all dimensions of visual arts

References:

1. Cooper Douglas, '*Drawing and Perceiving*', Van Nostrand Reinhold, 1992
2. H.W. Janson – '*History of Arts*, Prentice Hall' (Higher Education Division), Pearson Education,2002

3. Philip Meggs, 'A History of Graphic Design' John Wiley & Sons; 3 edition (September 9, 1998)
4. Alexander W. White, 'The Elements of Graphic Design, Allworth Press; 1 edition (Nov 1, 2002)
5. Mark A, Thomas, Poppy Evans, 'Exploring Elements of Design' 2 edition (August 15, 2007)
6. Victor Perard, 'Anatomy and Drawing'

Internal Continuous Assessment *(Maximum Marks-100) (Group 1 Subject)*

20% - Tests (minimum 2)

70% - Class work.

10% - Regularity in the class

University Examination Pattern:

Examination duration: 4 hours *Maximum Total Marks: 100*

The question paper shall consist of 2 parts.

Part A (40 marks) - Eight Short answer questions of 5 marks each. All questions are compulsory. There should be two questions from each module.

Part B (60 Marks) – Drawing: Candidates have to answer one full question out of the two. Each question carries 60 marks.

AR1106 MATHEMATICS

Teaching Scheme: 2(L) - 0(T) - 0(P)   **Credits:** 4

Course Objective:

- To develop basic Mathematical skills for Architecture students to understand structural concepts complex form and geometry.
- To inculcate understanding of the application of differential equations, probability and sampling distributions in the study of architecture

Module - I

Ordinary differential equations: First order differential equations - exact differential equations, Bernoulli's equations--Methods of solution and Simple applications.

Linear differential equations of higher orders with constant co-efficients-Methods of solution of these equations. Cauchy's linear differential equations. Simultaneous linear differential equations - Simple applications of linear differential equations in engineering problems – Electrical Circuits, Mechanical Systems

Module- II

Partial differentiation: Partial differentiation-Concept of partial derivative - Chain rule-Total derivativeEuler's theorem for homogeneous functions, Differentials and their applications in errors and approximations,
Jacobians - Maxima minima of functions of two variables(Proof of the result not required)-Simple applications.
Co-ordinate systems: Rectangular co-ordinates-Polar co-ordinates-In plane and in Space-Cylindrical polar coordinates-Spherical polar co-ordinates.

Module -III

Probability distributions: random variables (discrete & continuous), Probability density, mathematical expectation, mean and variance of a probability distribution, binomial distribution, Poisson appro ximation to the binomial distribution, uniform distribution, normal distribution.
Curve fitting: method of least squares, correlation and regression, lines of regression.

Module -IV

Sampling distributions: Population and samples, the sampling distribution of the mean unknown(σ known), the sampling distribution of the mean (σ)the sampling distribution of the variance, point estimation, interval estimation, tests of hypotheses, null hypotheses and significance tests, hypothesis concerning one mean, type I and type II errors, hypotheses concerning two means. The estimation of variances: Hypotheses concerning one variance – Hypotheses concerning two variances.

Course Outcomes:

Upon completion of this course, students will be able to understand and apply the concepts of geometry and statistics to solve problems in different areas of architecture.

References:

1. S.S.Sastry, Engineering Mathematics -Vol1, PHI publishers

2. Erwin Kreyzig, Advanced Engineering Mathematics, Wiley Eastern

3. T.Veerarajan, Engineering Mathematics, TMGH Publishers

4. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers

5. Irvrin Miller & Freiend, Probability And Statistics For Engineers, Prentice Hall of India.

6. P.Kandaswamy.K.Thilagavathy, K.Gunavathy, Numerical Methods, S.Chand & Co.

7. A.Papoulis, Probability, Random Variables and Stochastic Processes, Mc-Graw Hill.

Internal Continuous Assessment *(Maximum Marks-50) (Group 2 Subject)*
    50% - Tests (minimum 2)
    30% - Assignments (minimum 2) such as home work, problem solving, quiz etc.
    20% - Regularity in the class

University Examination Pattern:

    Examination duration: 3 hours   *Maximum Total Marks: 100*
The question paper shall consist of 2 parts.

Part A (40 marks) - Eight Short answer questions of 5 marks each. All questions are compulsory. There should be two questions from each module.

Part B (60 Marks) – Two Questions from each module. Candidates have to answer any one full question out of the two each from module. Each question carries 15 marks.

AR1107 GEOMETRICAL DRAWING

Teaching Scheme: 1(L) - 0(T) - 3(P) **Credits:** 4
Course Objective:

- *To introduce students to the fundamental techniques of technical drawing.*
- *To develop the appropriate manual skills for visualization and technical representation of built forms in different types of drawings.*

Module – I

Scales : Construction of plain scale and diagonal scale

Conic Sections : Construction of conic sections given the distance of focus from the directrix and eccentricity. Construction of ellipse – concentric circle method, rectangular method and intersecting arc method. Construction of parabola by rectangular method and by tangent method. Construction of hyperbola – given the asymptotes and a point on the curve

Spirals : Construction of Archimedean spiral and Logarithmic spiral
Helix : Construction of cylindrical helix ,conical helix

Module – II

First angle projection

Points and Lines : Orthographic projection of lines for any given condition, determination of true length ,traces and inclinations to the planes of projection of any given line

Planes : Traces of planes , plane figure inclined to one or both the reference planes

Solids : Simple solids in simple position , prisms, regular pyramids, tetrahedron, cone, spheres and their combinations placed in different positions. **Auxiliary projections** of simple solids and their combinations. Change of position and auxiliary plane method.

Module – III

Intersection of surfaces : Line of intersection of two prisms , two cylinders and cone
Section of solids : Section of simple solids by planes inclined. True shape of sections.

Development of surfaces : Development of surfaces of simple solids, prisms, cylinders, pyramids, cones , spheres and truncated solids.

Module – IV

Isometric Projection : Isometric scale, isometric view of planes, simple solids, combination of objects

Perspective projection : Perspective projection of simple solids and their combinations by visual ray method and vanishing point method.

Course Outcome:

Upon completion of the course, the student shall have developed the necessary skills to analyze and solve basic problems involving graphics and spatial manipulations for architectural applications.

References:

1. Bhatt N.D., *'Elementary Engineering'*, Charotar, 1991.
2. Carl Lars Svensen and William E Street, *'Engineering Graphics'*, Van Nostrand, 1963.
3. Venugopal K., *'Engineering Drawing and Graphics'*, New Age Publishers, 2004.
4. Rajaraman S., *'Practical Solid Geometry'*
5. Varghese P I, *'Engineering Graphics'*

Internal Continuous Assessment *(Maximum Marks-100)*

40% - Tests (minimum 2)

40% - Class Work

20% - Regularity in the class

University Examination Pattern:

Examination duration: 4 hours   *Maximum Total Marks: 100*

The question paper shall consist of Two Parts

Part A (40 marks) - Eight Short answer questions of 5 marks each. All questions are compulsory. There should be two questions from each module.

Part B (60 Marks) – Two Questions from each module. Candidates have to answer any one full question out of the two from each module. Each question carries 15 marks.

AR1108 MECHANICS OF STRUCTURES

Teaching Scheme: 2(L) - 0(T) - 0(P)   **Credits:** 4

Course Objective:

- *To understand the basic principles of structural mechanics that would be pertinent to simple design elements.*
- *To understand the structural behaviour of building elements.*

Module – I

Forces: Force and Moment Concepts – Force system acting on a body and their resultant – equilibrium concept and free body diagram, frictional force Center of gravity of planes and solid bodies – simple practical problems and modelling and drafting of simple practical cases related to the above cases.(not for examination purpose)

Module – II

Moment of inertia concept – theorem of parallel axis and perpendicular axis – moment of inertia of composite section - principal axis and principal moment of inertia – simple plane trusses – different types of trusses – analysis by method of joints, method of section and Graphical methods - modelling and drafting of simple practical cases.(not for examination purpose)

Module – III

Beams – Different types of Beams – Support conditions - Different types of loads Analysis of simply supported, cantilever and over hanging beams subjected to point load, uniformly distributed load uniformly varying loads and moments– shear force and bending moment diagrams – analytical and graphical method -modelling and drafting of simple practical cases.(not for examination purpose)

Module – IV

Stresses and strains – General concepts – Stress – Strain relation-factor of safety – discussion on elastic constants - principle of super position – stresses in composite bars – stresses due to change in temperature, Concepts of shear stress and bending stress with simple problems. - modelling and drafting of simple practical cases.(not for examination purpose)

Course Outcome:

Upon completion of the course, the student shall have developed the necessary skills to analyze and solve basic problems involving graphics and spatial manipulations for architectural applications.

References:

1. Tayal, *"Engineering Mechanics"*, Umesh Publications , 13/e, 2006.
2. Bansal R. K., *"Engineering Mechanics"*, Lakshmi Publications Pvt Ltd, 3/e,1996.
3. Vazarani, *"Mechanics of structures"*, 16/e, 1995
4. Chakraborthi M., *"Strength of Materials"*, SK Kataria & Sons, New Delhi, 2010.
5. Abdul Mubeen, *"Mechanics of Solids"*, Dorling Kindersley (India) Pvt Ltd, 2/e, 2011.
6. Kumar D.S., *Textbook of Engineering Mechanics*, S K Kataria & Sons, 3/e, 2009.
7. Rajput R.K., *Textbook of Engineering Mechanics*, Danpat Rai & Sons, New Delhi, 2002
8. Prasad I.B., *Textbook of Applied Mechanics*, Khanna Publications, 12/e, 1998.

Internal Continuous Assessment *(Maximum Marks-50)*

50% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, quiz, term-project, etc. Weightage shall be given to modeling and drafting projects while considering mark-distribution for assignments.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours   *Maximum Total Marks: 100*

The question paper shall consist of Two Parts

Part A (40 marks) - Eight Short answer questions of 5 marks each. All questions are compulsory. There should be two questions from each module.

Part B (60 Marks) – Two Questions from each module. Candidates have to answer any one full question out of the two from each module. Each question carries 15 marks.

AR1109 SURVEYING AND LEVELLING

Teaching Scheme: 2(L) - 0(T) - 0(P)   **Credits:** 4

Course Objective:

- *To bring about awareness of the role of surveying and levelling in architectural and planning projects.*
- *To familiarize the student with the techniques of surveying and levelling.*

Module – I

Introduction: Introduction to surveying, understanding land topography and its relevance in Architecture. Types of surveys in practice

Chain Surveying: Principles of survey, equipment required, selection of station, methods of taking offsets. Booking the field notes, obstacles in chaining, errors in chaining, chaining on sloping ground and reciprocal ranging.

Plane Table Surveying: Equipment and methods. Two points and three points problems. Demonstration classes shall conduct for chain and plain table surveying.

Module – II

Theodolite Surveying : Theodolite, its temporary and permanent adjustment measuring of magnetic bearings, horizontal & vertical angles. Theodolite traverse and balancing the closing error. Demonstration classes shall be conducted for theodolite surveying.

Module – III

Introduction to modern surveying equipments: Total Station, GPS, Use of Distomat and Theomat, Aerial Photography, Digital Levels and Auto-Levels. (Preliminary information and use). Demonstration classes shall be conducted using the above methods.

Module – IV

Levelling: Principles of leveling; Study of instruments – Dumpy level and leveling staff, Temporary and permanent adjustments of level, Booking and reduction of levels – ' line of collimation method' and ' rise and fall method', Difficulties in leveling, Reciprocal leveling,

Sources of error in leveling, Basic ideas on plotting of longitudinal and cross sections, Contouring, Contour interval, Contour Maps characteristics, use and interpretation.

Note:

The students should be given a practical session of minimum 3 hours duration wherein

they prepare a drawing of the surveyed area.

Course Outcome:

Upon completion of the course, the student shall have developed a basic awareness of the general principles of surveying and levelling in context of Architecture and Planning, and shall have developed the necessary the knowledge and skills required to transfer information from the ground n to the drawings, and vice-versa for their future projects.

References:

1. Kanetkar and Kulkarni, *'Surveying and Levelling'*, Vol I, Pune Vidyarthi Griha, 2008.

2. Punmia B.C., *'Surveying and Levelling'*, Vol I and Vol II, Laxmi Publications Pvt Ltd, 2011.

3. Shahani P.B., *'Surveying and Levelling'*, Vol I and Vol II, Oxford and IBH Publishing Company, 1971.

4. Agor R., *'Surveying and Levelling'*, Khanna Publishers, 1984.

5. Duggal S.K., *'Surveying'*, Vol. I, Tata Mc Graw Hill Ltd, 1996.

6. David Clerk, 'Surveying', Constable, 1969.

Internal Continuous Assessment *(Maximum Marks-50) (Group 2 Subject)*

50% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, quiz, term-project, etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours   *Maximum Total Marks: 100*

The question paper shall consist of Two Parts

Part A (40 marks) - Eight Short answer questions of 5 marks each. All questions are compulsory. There should be two questions from each module.

Part B (60 Marks) – Two Questions from each module. Candidates have to answer any one full question out of the two from each module. Each question carries 15 marks.

AR1110 WORKSHOP PRACTICE & SITE EXPOSURE

Teaching Scheme: 0(L) - 0(T) 3(P)   **Credits:** 2

Course Objective:

- *To give opportunity to students for hands on experience*
  To expose the students to site situations of buildings

Hand on working /demonstration by fabricators/worksmen on carpentry,model making,plumbing and sanitary fittings-electrical wiring and bar bending.finishing works etc.group projects involving design and fabrication of articles like furniture,lamp shades, bags,pencil stand etc.

Internal Continuous Assessment *(Maximum Marks-100) (Group 2 Subject)*

50% - Tests (minimum 2)

30% - Assignments

20% - Regularity in the class