

Syllabus of 3rd Sem B.Arch. (CBCS)

Department of Architecture and Planning, IGDTUW

Detailed Course Curriculum/Scheme of Examination-Semester III
Bachelor of Architecture, IGDTUW

SECOND YEAR					
Third Semester					
S.No.	Code	Subject	(L-S-P)	Credit	Category
1	BAP 201	Architectural Design – III	0-10-0	10	DCC
2	BAP 203	Building Materials & Construction Technology – III	0-5-0	5	BSAE
3	BAP 205	Computer Aided Design Techniques - I	0-0-4	2	HMC
4	BAP 207	History of Architecture- III	2-0-0	2	DCC
5	BAP 209	Structures – III	2-0-0	2	BSAE
6	BAP 211	Theory of Design-I	2-0-0	2	DCC
7	BAP 213	Building Services-1: Water Supply & Sanitation	2-0-0	2	BSAE
8	BAP 215	Advanced Surveying and Levelling	0-0-2	1	BSAE
			Total	26	

- Departmental Core Courses (DCC)
- Humanities, Social Sciences, Management and Skill/ Entrepreneurship Development Courses (HMC)
- Basic and Applied Science Courses (BSAE)
- Departmental Elective Courses (DEC)
- Generic Open Elective Courses (GEC)

ARCHITECTURAL DESIGN-III			
Course Code	BAP 201	Credits	10
Contact Hours (Hrs/Week)	10	Semester	03
Course Category	DCC		

INTRODUCTION

This subject introduces students to the idea of space making with emphasis on process, abstraction, and modes of representation.

COURSE OBJECTIVES

- To develop understanding of interconnections between form, volume and function.
- To sensitize students towards the interconnectedness of various elements of a context which impact the architectural design.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- To foster understanding about the impact of geo climatic context on the elements of built spaces.
- To develop sensitivity to shapes, forms and built volumes.
- How local geo climatic and socio-economic factors shape architectural design in vernacular architecture.
- Design for small public space.

PEDAGOGY

- Case studies along with primary and secondary surveys, involving field visit of outstation site if required.
- Documentation of various data collected from case studies, research and literature studies.
- Models and sketches.
- Synergy of various layers of data and its application in a small-scale space design.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	10	--	--	--	50	--	--	-	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Site Analysis Climatic consideration for the design, orientation of building on site their application in elevations as functional/aesthetic solutions will also be a part of the design exercise.	30

	Contextual Understanding Study of the context and elements of built and un- built spaces in an observable setting to develop the understanding of socio-cultural attributes of the physical environment, methods of construction emerging out of the way of life of the people in a given place including topographical and climatic survey.	
2.	Minor Problem Exercises related to understanding user's behaviour and context and needs and documenting various pattern and using it to develop designs may be explored to develop design. Exercises relate to Spatial organisation. Understanding aesthetic appeal, functional quality and elementary structural concepts required to evolve the specific form.	40
3.	Major Problem Small public building with repetitive elements (school, small hospital, office, housing) activity in a non-urban setting, or a situation without urban regulatory controls. The project would address the study of built form and its relationship to the site, surroundings and the climate. Design proposals shall be based on the site and basic climate analysis.	70

REFERENCE BOOKS

1. Ching, F. D. K. (2012). Architecture: Form, Space and Order. 3rd Ed. Hoboken: John Wiley & Sons.
2. Agkathidis, A., Hudert, M. and Schillig, G. (2007). Form Defining Strategies: Experimental Architectural Design. New York: Wasmuth.
3. Watson, D. (Editor). (2005) Time-saver Standards for Architectural Design: Technical Data for Professional Practice, 8th Ed., McGraw-Hill.
4. Shah M.G, Kale C.M, Patki S. Y. (2002). Building drawing with an integrated approach to Built Environment, Tata McGraw-Hill Education.
5. Neufert, P. (2000). Architects Data. 3rd Ed. UK: Blackwell Wiley.
6. Ching, F.D.K and Juroszek, S.P (1998). Design Drawing. New York: Van Nostrand Reinhold.

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY-III			
Course Code	BAP 203	Credits	05
Contact Hours (Hrs/Week)	05	Semester	03
Course Category	BSAE		

INTRODUCTION

This course introduces students to the manufacturing process and properties of various composite materials. Further the course details out construction details of different types of doors and windows in timber and metal.

COURSE OBJECTIVES

- To acquaint students to properties, usage and application of composite building materials commonly used.
- To make students understand the various typologies of doors and windows.
- To familiarize students with different technology/ techniques used for construction of wooden and metal doors & windows.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand the appropriate application of composite building materials in different contexts.
- Understand the complete joinery and fabrication details of doors and windows in timber and metal.
- Equip themselves with suitable construction technique/ technology as per building usage and demand.

PEDAGOGY

Classroom teaching is supported with preparation of drawings and may also be supported with site visits.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAS	MTET	MTES	ETET	ETIS	ETES
0	0	5	--	--	--	50	--	--	--	--	50

CONTENT

S. No.	Contents	Contact Hours
1.	<u>Unit 1</u> Building materials: Composite materials: R.C.C. and R.B.W, Use of Bamboo for Reinforcement, Water proofing materials and systems for basement, Ferrocement, steel, laminated timber, brick cladding, Structures like ferrocement channels, plank and joist.	15
2.	<u>Unit 2</u> Doors and Windows: Doors: Types of doors, construction techniques, decorative panel	35

	doors, glazed doors, flush doors, doors with fanlight, and calculation of woodwork, frameless doors. Windows: Detail of timber frames & shutters, fixed shutters, Calculation of woodwork. Frameless window details.	
3.	<u>Unit 3</u> Metal doors: Doors: Different types of doors in steel, Aluminium and Glass. Sliding, Sliding and folding, revolving doors. Fireproof and Soundproof doors. Types of Rolling Shutters.	15
4.	<u>Unit 4</u> Metal windows: Windows: Different types of windows in Steel, Aluminium and Glass. Sliding windows in Steel and Aluminium	15

REFERENCE BOOKS

1. Francis D.K. Ching (2011). Building Construction Illustrated. John Wiley & Sons.
2. Punamia B.C., Jain Ashok Kr., Jain Arun Kr. (2008), Building Construction, 10th Ed., Laxmi Publications Pvt Limited
3. McKay, W. B. (2005). Building Construction Metric Vol., I–IV. 4th Ed. Mumbai: Orient Longman.
4. Kumar, S.K. (2001). Building Construction, 19th Ed., Standard Publishers Distributors.
5. Rangwala, S.C. (2001) Building Construction, 19 th Ed., Charotar Publishing House.

COMPUTER AIDED DESIGN TECHNIQUES-I			
Course Code	BAP 205	Credits	02
Contact Hours (Hrs/Week)	04	Semester	03
Course Category	HMC		

INTRODUCTION

This course is designed to introduce students to the application of various software and hardware related to Architecture curriculum.

COURSE OBJECTIVES

The objectives of the course are to:

- To familiarize students with basic computer use.
- Brief description of various hardware and software.
- Basic knowledge of various operating systems i.e. windows, Linux etc.
- Basic introduction to software available for architectural applications.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Apply the softwares in the design and other assignments.
- Use the techniques for better design scalability and presentation.
- Achieve better visualisation and imagination.

PEDAGOGY

Classroom teaching may be supported with lectures, tutorials, study of archival material, reports, and drawings etc.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP*
0	4	0	Yes	--	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	Introduction to Computers & Commonly Used Software Brief Description of various Hardware and Software, Basic knowledge of different operating systems i.e. Windows, Unix, Linux etc. Introduction of various software available for documentation, presentation & drawing purposes, Familiarizing the use of scanners, printer's plotters etc. Microsoft Word, Microsoft Power Point, Microsoft Excel, Adobe Page Maker	8

2.	Auto Cad <p>Introduction to CAD, Intro to AutoCAD/ Precision Drawing & Drawing Aids/ Geometric Shapes Setting up & controlling the AutoCAD drawing environment – Creating & Editing Commands, Organizing a drawing with layers Advanced geometry editing – Creating & using Blocks – Inquiry Tools – AutoCAD Design Center, Internet and collaboration ,Blocks, Drafting symbols, Attributes, Extracting data Attributes – understanding object linking and embedding – Importing objects into AutoCAD using OLE working with OLE objects., Text annotation – Creating & Customizing Hatch patterns – Productive Dimensioning – Defining Text & Dimension Styles Printing & plotting - creating a slide presentation – Drawing utilities – importing / exporting files.</p> <p>Introduction to the programming of AutoCAD CAD .Understanding <u>Object ARX®</u> programming environment with the object-oriented C++ programming interfaces, AutoCAD .NET API, the complete <u>Visual LISP®</u> development environment and the ActiveX® interface.</p>	12
3.	Revit/BIM <p>Introduction to contemporary practices such as Building Information Modelling and Revit.</p>	16

REFERENCE BOOKS

1. Farrelly Lorraine, Crowson Nicola (2014). Representational Techniques for Architecture (Basics Architecture), 2nd Revised edition Bloomsbury
2. Aouad Ghassan, Wu Song, Lee Angela, Onyenobi Timothy (2014). Computer Aided Design Guide for Architecture, Engineering and Construction. New York: Routledge
3. Omura George, Benton Brian C (Jul 2014). Mastering AutoCAD 2015 and AutoCAD LT 2015, Autodesk official press.
4. Fiorello J.A (2010). CAD for Interiors beyond the Basics. Hoboken, New Jersey: John Wiley & Sons, Inc.
5. Trivedi M.C. (2009). Computer Graphics & Animation. 1st edition Jaico Publishing House
6. Groover M, (2003). Computer Aided Design and Manufacturing, 1st edition Pearson Education.
7. Grabowski Ralph (2002). The Illustrated AutoCAD 2002 Quick Reference. First Edition Cengage Learning

HISTORY OF ARCHITECTURE-III			
Course Code	BAP 207	Credits	02
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	DCC		

INTRODUCTION

Architecture is one of the products of civilization. It is a combined outcome of various factors such as geology, geography, climate, belief systems, religion, society, politics, economy, culture and way of life. This syllabus revolves around the architectural history civilizations of medieval ages in Indian subcontinent and rest of the world.

COURSE OBJECTIVES

- To study the development of civilizations and evolution of architecture as a manifestation of the world views, geo climatic and socio-economic factors.
- To study and generate understanding about the Buddhist, Hindu, Islamic and European Renaissance architecture.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to understand:

- Development of civilizations.
- Evolution of architecture through times.
- Understand the impact of various factors such as geology, geography, climate, beliefs, religion, society, politics, economy, culture and way of life on architecture.

PEDAGOGY

Classroom teaching through multi-media may be supported by visit to site of historical importance as per syllabus.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP [#]
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	Unit 1 Architecture of Buddhist origin and associations in India Sri Lanka Far Eastern Countries Tibet China Japan Viharas Chaityas and Stupas and Monasteries North Indian Temple architecture (circa 6th –12th C).	07

2.	Unit 2 Important temples in North and Central India. Temples of Orissa. Khajuraho etc. South Indian temple architecture under the Chalukyas, Pallavas, Cholas, Pandyas and important temples like Meenakshi, Brihadishwara etc	07
3.	Unit 3 Architecture of Medieval & Modern Western World –I Introduction to Islamic architecture: Islam and its philosophy, its implementation in various building types such as mosque, tomb, fort and their elements like domes, minarets, arch etc.	07
4.	Unit 4 Architecture of Medieval & Modern Western World -II Orthodox Christian, Byzantine &, Venice, Constantinople Romanesque Ecclesiastical Gothic Architecture in Continental Europe and England. Great Cathedrals - Notre Dam, Canterbury, etc.	07

REFERENCE BOOKS

1. Brown Percy (2014). Indian Architecture (Islamic Period). Bombay: D.B.Taraporevala and Sons Co. Pvt. Ltd.
2. Grover Satish (1996). Islamic Architecture In India. Galgotia Pub.Co., New Delhi.
3. Tadmor Christopher (1990). A History of Architecture in India – From the Dawn of Civilization to the End of the Raj. Phaidon Press Ltd., London.
4. Fletcher Sir Banister (1987). A History of Architecture.Pub. Butter-worth Heinemann Ltd. 19th edition London (UK), Indian collaboration- CBS Pub. Delhi.

STRUCTURES - III			
Course Code	BAP 209	Credits	02
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	BSAE		

INTRODUCTION

This subject will familiarize students with the structural designing of roof spanning structures like trusses (short span) and beams.

COURSE OBJECTIVES

- To familiarize the student with designing aspects associated with short span trusses and beams.
- To help students analyse the behaviour of these structural members in terms of Deflection and Stresses.
- To introduce students to different typologies of these systems.

PREREQUISITE NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand various typologies of spanning members.
- Understand bending and shear stresses in Trusses and Beam, in both symmetrical and asymmetrical sections.
- Carry out structural analysis of Beams.

PEDAGOGY

Classroom teaching may be supported by case studies, site visits, photo documentation and hands on exercises.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP*
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Trusses</u> Design of steel truss up to short span, Method of analysing (Method of section, Method of joint and Graphical Method). Effect of Wind load on Truss.	07
2.	<u>Unit 2: Stresses in Beam</u> Bending Stress in Beam: Bending equation, bending stresses in symmetrical and asymmetrical sections. Shear stress distribution in various sections.	07
3.	<u>Unit 3: Beams</u>	07

	Simply supported and cantilever, understanding through nature and history, Analysis, Draw Shear Force Diagram (SFD) and Bending Moment Diagram (BMD).	
4.	Unit 4: Deflection in Beams Double integration method, Moment area method, Conjugate beam method.	07

REFERENCE BOOKS:

1. Kumar, A. (1985). Stability Theory of Structures, Tata McGraw Hill Co. Ltd.
2. Jain, A.K. (2008). Strength of Materials and Structural Analysis, 2nd Ed., Nem Chand & Bros.
3. Ramamrutham, S (2014). Theory of Structures, Dhanpat Rai Publications,
4. Hibbeler, R.C (2019). Structural Analysis , 10th edition, Pearson Publication

THEORY OF DESIGN – I			
Course Code	BAP 211	Credits	02
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	DCC		

INTRODUCTION

The courses in Design theory aims to evolve a conceptual framework for nuanced understanding and appreciation of Architecture and to develop a vocabulary for discussing design ideas.

COURSE OBJECTIVES

To understand and comprehend ideas in architecture through writings in architecture

- To appreciate architecture as the development of changing ideas over time, and as the representation of their time and context.
- To be able to chart the change of ideas chronologically over time.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will:

- become familiar with and improve comprehension about architecture using theoretical texts and architectural criticism.

PEDAGOGY

Seminars, Tutorials/ additional classes for any course, Guest Lectures, putting up Exhibitions, Workshops, participating in Architectural Competitions or conducting Site Visits or Study Tours.

EVALUATION SCHEME

Course Type			Examination		Relative Weights						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Introduction</u> Definitions of Architecture - Origin of Architecture – Architecture as a discipline – Context for architecture as satisfying human needs - Functional, aesthetic and psychological. Introduction to the formal vocabulary of architecture and Gestalt ideas of visual perception. Design methodology: Design as a multi-variety problem solving process.	07
2.	<u>Unit 2: Elements of Architecture-Form and Space</u> Understanding fundamental principles such as proportion, scale, balance, symmetry/asymmetry, rhythm, axis, hierarchy, datum,	07

	unity, harmony, dominance – detailed study of relationship between architectural form and circulation. Understanding perceptual effects of specific geometric forms such as sphere, cube, pyramid, cylinder and cone and specific configuration of architectural spaces – Enclosure – Internal and External, Continuous spaces.	
3.	Unit 3: Architecture as socially useful discipline The concept of measuring, function, style, type, social purpose and ideology, the relationship of architecture to the sciences, arts, economics and politics. Study of selected writing, buildings or manmade design at all levels including objects of daily use.	07
4.	Unit 4: Issues in Contemporary architecture Theoretical issues in contemporary architecture, Study on the works of selected Indian and International Architects and related topics.	07

REFERENCE BOOKS:

1. Ching, F.D.K. (1979). Architecture – Form, Space and Order. Van Nostrand Reinhold Company.
2. Lang, J., Desai, M. and Desai, M. (2000). Architecture and independence: The search for identity – India 1880 to 1980. New Delhi: Oxford University Press.
3. Lang, J.T (2002). A Concise History of Modern Architecture in India.
4. Eisenman, P. (1999). Diagram Diaries. New York: Universe.
5. Heidegger, M. (1993). Building Dwelling Thinking. Basic Writings. HarperCollins.
6. Lefebvre, H. (1991). The production of space. Oxford: Cambridge.
7. Pallasmaa, J. (2005). The eyes of the skin: Architecture and the senses. Chichester: Wiley Academy.
8. Pandya, Y. (2007). Elements of Space making. Ahmedabad: Mapin.
9. Tschumi, B. (1994). Architecture and disjunction. Cambridge, Massachusetts: MIT.
10. Venturi, R. (1966). Complexity and Contradiction in Architecture. New York: The Museum of Modern Art.
11. Vitruvius, P. and Morgan, M. H. (1960). Vitruvius: The ten books on architecture. New York: Dover Publications.
12. Borngasser Barbara (Reprint edition 2010). History of Architecture: From Classic to Contemporary, Parragon Inc

BUILDING SERVICES-I (WATER SUPPLY AND SANITATION)			
Course Code	BAP 213	Credits	02
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	BSAE		

INTRODUCTION

Services are integral part of any building without which the building cannot function. It is important for an architect to know how services related to water supply and sanitation are designed and integrated in any building. This course introduces the students to various concepts, components and aspects related to sustainable water supply and sanitation in the building.

COURSE OBJECTIVES

Having successfully completed this course, the student will be able

- To prepare students to be able to design an effective and efficient water supply and drainage system for any building.
- To develop understanding of water supply and sanitation system with emphasis on sustainability.
- To develop understanding of functioning various fittings used in water supply and sanitation system.
- To understand the concept of wastewater recycling and methods of water conservation.
- To learn about drainage system / planning of bathrooms through layout exercise.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand the types, sizes, joining, use and functions of various fittings used in water supply and drainage system.
- Plan for sustainable, effective and efficient water supply and drainage system for a building.
- Learn various methods for conservation of water.

PEDAGOGY

Classroom teaching may be supported by site visit, market survey, preparation of construction drawings and hands-on activity etc.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP*
2	0	0	Yes	--	10	--	30	--	60	--	--

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1: Water supply:</u> Sources of water supply, The Water Crises, Impurities of water and	10

	systems of water supply, Various kinds of water meters, Water storage tanks, their capacity and location. Calculation of water consumption based on types of building occupancies. Water Balance, Domestic hot and cold-water supply systems. Solar Hot water heating systems for domestic and industrial usage, Size of pipes and their joining details. Connections of different sanitary fittings like ferrule, stopcocks, bib cocks etc. Efficiency in Watering of Landscape & Crops, Drip Irrigation, Hydroponics), Stormwater drainage, Rainwater Harvesting & Groundwater Recharge.	
2.	Unit 2: Sanitation: Basic principles of sanitation and disposal of waste matter from buildings, Dry and wet carriage systems, Sanitary fittings- washbasins, WC's, bathtubs, sink, urinals, bidets, flushing cistern, traps etc. Low flow fixtures and Waterless fixtures with calculation of flow rates and water usage, Various types of joints, manholes and septic tanks. Proper location and ventilation of intercepting chambers and inspection chambers, Drainage systems- separate, combined and partially combined systems. Single stack system. One pipe and two pipe systems, Testing of house drains. Gradients used in laying drains and sewers. Self-cleaning and non-scouring velocities for drainpipes, Size of drainpipes and materials used, Innovative and Cost-Effective Sanitation concepts. E.g. EcoSAN, Rural & Distributed Sanitation Concepts.	08
3.	Unit 3: Concept of wastewater recycling Methods of treating wastewater- STP's and ETP's, conventional methods, improvised methods, additives, Conserving Water- overview & Zero discharge concepts and calculations for the same, Methods of water conservation.	06
4.	Unit 4: Plumbing Layouts exercises Exercises in layout of simple drainage systems for small buildings. Planning of bathrooms and lavatory blocks in domestic and multi-storied buildings. Exercises can also be clubbed with design studio project.	04

TEXTBOOKS

1. Mohan CR and Vivekanand (2014). Design & Practical Handbook on Plumbing, Standard Publishers Distributors.
2. Garg, S. K. (2009). Environmental Engineering, Vol. II, Khanna Publications, New Delhi
3. Duggal, K. N. (2008). Elements of Environmental Engineering, S Chand and Co. Ltd., New Delhi.
4. Birdie, G. S., and Birdie, J. S. (2007). Water Supply and Sanitary Engineering, Dhanpat Rai and Sons, New Delhi.
5. Rangwala, S. C. (2005). Water Supply and Sanitary Engineering, Charoter Publishing.
6. Pachauri, A.K. (1999). Water Supply and Sanitary Installation, Design, Construction and Maintenance, New Age International Ltd.

7. Greeno, Roger (1997). Building Services Technology and Design, Longman Scientific and Technical, Harlow.
8. Wise, A.F.E. and Swaffield, J.A. (1995). Water Sanitary Services for Buildings, Longman Scientific and Technical, Harlow.

REFERENCE BOOKS

1. Handbook on Technological Options for On-site Sanitation in Rural Areas, published by Ministry of Drinking water & sanitation, Government of India, 2016
2. Handbook on Drinking water treatment & technologies, prepared by National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur and issued by Ministry of Drinking Water & Sanitation, Government of India, 2011
3. Revised Guidelines for Swachh Bharat Mission Gramin, published by Ministry of Drinking Water & Sanitation, Government of India, 2017
4. Bureau of Indian Standards. 1995
5. National Building Code of India. 2016
6. Manas Handbook of Plumbing, Manas Publishers.

ADVANCED SURVEYING AND LEVELLING			
Course Code	BAP 215	Credits	01
Contact Hours (Hrs/Week)	02	Semester	03
Course Category	BSAE		

INTRODUCTION

This subject gives insight about various surveying techniques and develops understanding relevance of land topography for designing and planning.

COURSE OBJECTIVES

- To introduce the student with different principles of surveying and levelling.
- To equip student with the knowledge and skill of representing a 3D area on a 2D plan.
- To make students understand how site contours are delineated and analysed for optimum design solution.

PREREQUISITE: NIL

COURSE LEARNING OUTCOMES

Having successfully completed this course, the student will be able to:

- Understand various surveying and levelling methods.
- Analyse and prepare survey drawings.
- Prepare contour map of terrain and propose optimum utilization of the project site.

PEDAGOGY

Classroom teaching may be supported by practical of surveying and hand on activity etc.

EVALUATION SCHEME

COURSE TYPE			EXAMINATION		RELATIVE WEIGHTS						
L	P	S	TH	PR	CAT	CAP	MTET	MTEP	ETET	ETIP	ETEP*
0	2	0	Yes	--	--	35	--	15	--	--	50

CONTENT

S. No	Contents	Contact Hours
1.	<u>Unit 1 Introduction</u> Introduction to surveying, understanding land topography and its relevance in Architecture. Types of surveys in practice. Introduction to survey equipment. 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.	06

2.	<u>Unit 2: Compass Surveying</u> The prismatic compass, its construction and uses. Other types of compasses. Reduced and whole circle bearing, magnetic declination, effects of local attraction. Compass traverse and balancing the closing error.	08
3.	<u>Unit 3: Levelling and Contouring</u> Different types of levels, their temporary and permanent adjustment, levelling staff. Book of the readings and reduction of levels. Errors in levelling. Curvature and refraction reciprocal levelling profile, levelling cross sections. Plane Tabling: Equipment and methods. Two points and three points' problems. Contouring: Characteristics of contour lines, direct and indirect methods of contouring and interpolation of contours. Interpretation and preparation of contour maps.	08
4.	<u>Unit 4: Theodolite Surveying</u> Theodolite Surveying: Theodolite, its temporary and permanent adjustment, measuring of magnetic bearings, horizontal and vertical angles. Theodolite traverse and balancing the closing error. Total station theodolite. Tacheometric Surveying: General instruments, different systems of tacheometric measurements, stadia method, Subtense method. Introduction to Site modelling with total station survey (TSS) and demonstration exercise (videos) in setting out of building works. Process of Measurements of coordinates and elevations of objects from various points and minimising the errors with traversing with TSS.	06

TEXTBOOKS

1. Punmia B. C., Jain Ashok, Jain Arun K. (2016). Surveying (Volume I & II). 17th edition 2016 Laxmi Publications
2. Schofield, W. and Breach, M. (2007). Engineering Surveying, 6th Ed., Butterworth-Heinemam.
3. Chandra, A. M. (2002). Surveying. New Age Publishers.
4. Singh Harbhajan (2014). Surveying and Levelling for Architects, 1st edition Abhishek Publications

REFERENCE MATERIAL

1. Online Latest Manual on Application of Land Surveying Instruments, i. e. Total Station Survey, DGPS etc.