

SEMESTER – I

FS17B1.1C BUILDING SERVICES STUDIO – I

CORE/S : 10/wk	Int mks: 100	Ext mks : 100	Total mks: 200	End exam: Viva-Voce	Cr: 10
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UNIT I

Introduction to Buildings:

Introduction to building typologies- reading building drawings like plans, sections, elevations. Understanding how building works, various components and systems in building-like structural systems, spatial systems, services and networks.

Components in structural systems and how components work together – footings, columns, beams, slabs and their diagrammatic representation in a small building.

Components in spatial systems – various types of spaces designed for different functions; small spaces like toilets, lobbies, corridors etc., Different types of rooms/spaces and their spatial organization. Diagrammatic representation of various spaces; circulation diagrams, connectivity diagrams and the understanding of the functional requirements of the spaces. Introduction to building services as an enhancement of quality of spaces.

Brief introduction to Specific requirements-ventilation, lighting, thermal comfort for different spaces. Brief introduction to safety requirements- fire safety, security systems etc., for different spaces.

UNIT II

Plumbing Services and Layout:

Introduction to plumbing services- Water Supply, Waste Water, Storm Water.

Identifying various components and representation of these components by symbols in Water supply, waste water and storm water. Understanding and representing the plumbing services for a building in the form of diagrams.

Case study of residential building; Preparation of plumbing layout for the building; Technical terms and symbols for plumbing installations and accessories for a residence.

UNIT III

Electrical Services and Layout:

Introduction to electrical services.

Identifying various components and representation of these components by symbols. Understanding and representing the electrical services for a building in the form of diagrams.

Case study of residential building; Preparation of electrical layout of the building; Technical terms and symbols for electrical installations and accessories of wiring, electrical layout for residence.

UNIT IV

Mechanical Services and Layout:

Introduction to mechanical services in a building- mechanical circulation systems and HVAC.

Mechanical circulation systems like lift, elevators, conveyors and escalators- Various components in each of these systems, diagrammatic representation and location of these systems.

Case study of small commercial complex/ mall. Identification of mechanical circulation systems in relation to the building and its diagrammatic representation.

Brief introduction to concept of HVAC, types of HVAC systems, various components and diagrammatic representation of HVAC systems.

Case study of small commercial complex/ mall. Identification of HVAC systems in relation to the building and its diagrammatic representation.

Expected Output & Assignment:

Suggested outcome in the form of documentation of site visits and case studies, Assignments based on the units topics. Preparing charts displaying various kinds of building services. Preparing schematic diagram for various types of services.

REFERENCE BOOKS:

1. Graphic Thinking for Architects and Designers, Third Edition by Paul Laseau: John Wiley & Sons
2. How buildings work, The Natural Order of Architecture, Third Edition by Edward Allen: Oxford University Press

FS17B1.2C GRAPHICS AND PRESENTATION TECHNIQUES

CORE/S : 4/wk	Int mks: 50	Ext mks : 50	Total mks:100	End exam: 5hrs	Cr: 4
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UNIT I

Fundamentals of drawing and its practice

Introduction to drawing equipment, familiarization, use and handling simple exercises in drafting, points, types of lines, line thickness and intensities.

UNIT II

Concepts of scale and proportions

Graphic and numerical scales, dimensioning of lines and planes, enlargement and reduction of drawings, anthropometrics and the scale of man to function, lettering for titles and annotations, freehand lettering, measuring and drawing to scale different objects, rooms etc.

UNIT III

Isometric, Orthographic, Perspective projections

Isometric scale-Isometric views of lines, views of plane figures, simple and compound solids. Orthographic projections of point, lines, planes and solids, section of solids, study of Parallel and Angular perspective of simple objects.

UNIT IV

Freehand drawing and rendering techniques

Graphical representations of trees, hedges, foliage, vehicles, human figures etc in pen and ink, sketching exercises.

UNIT V

Symbolic representation of building elements

Representation of building elements, openings, materials, accessories etc., terminology and abbreviations used in architectural presentation.

UNIT VI

Measured drawings

Scales and construction of scales. Measured drawings of simple objects, furniture, rooms, doors and windows, room plans etc., in plan, elevation and section. Enlargement and Reduction.

UNIT VII

Basic Mechanical, Electrical and Plumbing drawings

Interpretation of existing mechanical, electrical and plumbing drawings and introduction to drafting of MEP drawings.

UNIT VIII

Workshop

Interpretation of mechanical, electrical and plumbing drawings in three-dimensional models.

Expected Output & Assignment:

Scale drawing of simple objects to minimum one room building plan, elevation, and section.

This is a studio subject and students should be made to prepare drawings as studio exercises.

REFERENCE BOOKS:

1. Geometrical Drawing for Art Students by Thoms, E. French: New York, McGraw Hill
2. Engineering Drawing: Plane and Solid Geometry, 42nd ed. by Bhatt, N.D. and Panchal V.M: Charotar Pub: Anand, 2000
3. T.B. of Geometrical Drawing, 3rd ed, by Gill, P.S: Dewan Suhil Kumar Kataria, Ludhiana, 1986
4. Building Drawing: with an integrated approach to built environment, 7th ed. by Shah, M.G., Kale, C.M. and Patki, S.Y: Tata McGraw Hill Pub., Delhi, 2000
5. Architectural Drafting: Structure and Environment, by Bies, D. John: Bobbs – Merrill Educational Pub., Indianapolis
6. H.B. of Architectural and Civil Drafting, by Nelson, A. John: Van Nostrand Reinhold, New York, 1983

FS17B1.3C ENGINEERING MATHEMATICS

CORE /TH: 4/wk	Int mks: 50	Ext mks: 50	Total mks: 100	End exam: 3 hrs	Cr: 4
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UNIT I

Differential equations of first order and first degree - exact, linear and Bernoulli.

UNIT II

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax} , $\sin ax$, $\cos ax$, polynomials in x , $e^{ax} V(x)$, $xV(x)$, method of variation of parameters.

UNIT III

Rolle's Theorem - Lagrange's Mean Value Theorem - Cauchy's mean value Theorem - (all theorems without proof).

UNIT IV

Radius, Centre and Circle of Curvature – Evolutes.

UNIT V

Applications of integration to lengths, volumes and surface areas in Cartesian and polar coordinates.

UNIT VI

Vector Calculus: Gradient- Divergence- Curl and their related properties of sums-products- Laplacian and second order operators.

UNIT VII

Vector Integration - Line integral - work done - Potential function - area- surface and volume integrals.

UNIT VIII

Laplace transform of standard functions - Inverse transform - first shifting Theorem, Transforms of derivatives and integrals - Unit step function - second shifting theorem.

Expected Output & Assignment:

Assignments on given topics and periodic internal tests.

REFERENCE BOOKS:

1. A Text Book of Engineering Mathematics, Vol-1 ,by T. K. V. Iyengar, B. Krishna Gandhi and Others: S. Chand & Company
2. A Text Book of Engineering Mathematics, by C. Sankaraiah:V. G. S. Book Links
3. A Text Book of Engineering Mathematics, by Shahnaz Bathul: Right Publishers
4. A Text Book of Engineering Mathematics, by P. Nageshwara Rao, Y. Narasimhulu & N. Prabhakar Rao:Deepthi Publications
5. A Text Book of Engineering Mathematics, by B. V. Raman:Tata Mc Graw Hill
6. Advanced Engineering Mathematics, by Irvin Kreyszig: Wiley India Pvt. Ltd

FS17B1.4C ENGINEERING PHYSICS

<i>CORE/TH : 3/wk</i>	<i>Int mks: 50</i>	<i>Ext mks : 50</i>	<i>Total mks:100</i>	<i>End exam:3 hrs</i>	<i>Cr: 3</i>
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UNIT I

Ultrasonic:

Introduction; Production of ultrasonic waves; Magnetostriction method; Piezo electric method; Detection of ultrasonic waves; Properties of ultrasonic waves; Use of ultrasonic for nondestructive testing; Applications of ultrasonic.

UNIT II

Acoustics of Buildings:

Basic requirement of acoustically good hall; Reverberation and time of reverberation; Sabine's formula for reverberation time; Measurement of absorption coefficient of a material; Factors affecting the architectural acoustics and their remedy.

UNIT III

Optics:

Interference; Interference in thin films by reflection; Coherence; Diffraction; Fresnel and Fraunhofer diffractions; Fraunhofer diffraction at a Single slit; Double slit; Polarization; Types of Polarization; refraction.

UNIT IV

Magnetic Properties:

Permeability; Magnetization; Origin of magnetic moment; Classification of magnetic materials; Dia, para and ferro magnetism; Hysteresis curve; Soft and hard magnetic materials.

UNIT V

Lasers:

Introduction; Characteristics of lasers; Spontaneous and stimulated emission of radiation; Einstein's coefficients; Population inversion; Ruby laser; Helium; Neon laser; CO₂ laser; Semiconductor laser; Applications of lasers in industry, scientific and medical fields.

UNIT VI

Thermal Properties:

Introduction; Specific Heat of Solids; Einstein Model; Debye Model; Lattice Vibrations; Phonons; Thermal Conductivity.

UNIT VII

Science & Technology of Nano-material:

Introduction to Nanomaterials; Basic principles of Nanoscience & Technology; Fabrication of nanomaterials; Physical & chemical properties of nanomaterials; Carbon nanotubes; Applications of nanotechnology.

UNIT VIII

Introduction to modern physics:

Quantum mechanics-solutions to Schrödinger equation, applications of quantum mechanics- Approximation Methods for Bound States, Scattering Theory, Time-Dependent Perturbation Theory, Electromagnetic Radiation and Quantum Electrodynamics, relativistic quantum mechanics theory,

Expected Output & Assignment:

Assignments on given topics and periodic internal tests.

REFERENCE BOOKS:

1. Physics Volume 2 by Halliday, Resnick and Krane: John Wiley & Son
2. Applied Physics by Dr. M. Chandra Shekar & Dr. P. Appala Naidu: V.G.S. Book links
3. Engineering Physics by R.K.Gaur & S.L. Gupta: Dhanpat Rai and Sons
4. Nanotechnology by Mark Ratner and Daniel Ratner: Pearson Education

5. Introduction to modern physics by Paolo Amore: John Dirk Walecka
6. Materials Science and Engineering by V. Raghavan: Prentice-Hall India
7. Engineering Physics by Dr. M. Arumugam: Anuradha Agencies
8. Nanomaterials by A.K. Bandyopadhyay: New Age International Publishers
9. Engineering Physics by M.N. Avadhanulu & P.G. Kshirasagar: S. Chand & Company Ltd.

FS17B1.5C ENGINEERING CHEMISTRY

CORE/TH : 3/wk	Int mks:50	Ext mks: 50	Total mks:100	End exam:3 hrs	Cr: 3
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UNIT I

Water Technology-I:

Introduction, effect of water on rocks and minerals, types of impurities in water, hardness of water – temporary and permanent hardness. Units and inter conversions of units. Estimation of hardness by EDTA methods. Problems on temporary and permanent hardness. Analysis of water - alkalinity; chlorides and dissolved oxygen. Disadvantages of hard water. Methods of treatment of water for domestic purposes-sedimentation, coagulation, filtration, disinfection - sterilization, chlorination, break – point chlorination, ozonization.

UNIT II

Water Technology-II:

Water for industrial purposes; water for steam making; boiler troubles; carry over; priming and foaming, boiler corrosion, scales and sludges, caustic embrittlement. Water treatment: internal treatment; colloidal, phosphate, calgon, carbonate, sodium aluminate conditioning of water. External treatment; lime-soda process, zeolite process, ion-exchange process; numerical problems.

UNIT III

Science of Corrosion:

Definition, examples; types of corrosion: theories of corrosion and mechanism; dry corrosion, (direct chemical attack), wet corrosion, (electro chemical theory) principles of corrosion, galvanic series, galvanic corrosion, concentration cell corrosion, mechanism of wet corrosion; hydrogen evolution type, oxygen absorption type. Factors influencing corrosion, control of corrosion; proper design, use of pure metal and metal alloys, passivity, cathodic protection – sacrificial anode and impressed current. Modifying the environment, use of inhibitors.

UNIT IV

Protective Coatings and their applications:

Surface preparation: (1)solvent cleaning (2)alkali cleaning (3)pickling and etching (4)sand blasting (5)mechanical cleaning. Types of protective coatings: metallic coatings – anodic coatings, galvanization; cathodic coatings – tinning, metal cladding, electroplating ex: chromium plating, metal spraying, cementation – sheradizing, colourizing, chromizing, chemical conversion coatings: (1) phosphate

(2) chromate (3) anodized coatings; organic coatings: paints – constituents and their functions

UNIT V

Polymer Science and Technology:

Polymerization reactions: basic concepts. Types of polymerization: addition and condensation polymerizations. Plastics: thermosetting and thermoplastics and differences. Compounding and moulding of plastics: compression, injection, transfer, and extrusion moulding methods. Preparation, properties and engineering uses of the following: polyethylene, PVC, Teflon, Bakelite, nylon, polyester, polyurethanes and silicone resins. Rubber: processing of natural rubber, vulcanization and compounding. Elastomers: Buna S, Buna N, Thiokol.

Expected Output & Assignment:

Assignment on given topics, periodic internal tests, report on field visit (water, sewage treatment plant)

REFERENCE BOOKS:

1. A text book of Engineering Chemistry by Jain & Jain: Dhanpat Rai Publishing Company, New Delhi(15 Edition) (2006)
2. Chemistry of Engineering Materials by C.P. Murthy: C.V. Agarwal and A. Naidu BS Publication Hyd. 2007
3. A Text book of Engineering Chemistry by S.S. Dara: S.Chand & Co, New Delhi (2004)
4. Engineering Chemistry by J C Kuriacose and J. Rajaram: Tata McGraw-Hill Co, New Delhi (2004)
5. Text book of Engineering Chemistry by Shashi Chawala: Dhanpat Rai Publishing Company, 15th edition New Delhi (2004)
6. Laboratory Manual on Engineering Chemistry by S.K. Bhasin and Sudha Rani: Dhanpat Rai Publishing Company, New Delhi (2004)
7. Engineering Chemistry by R. Gopalan, D. Venkappaya and S.Nagarajan: Vikas Publishing House, New Delhi (2004)
8. Engineering Chemistry by R.V. Gadag A.N. Tyanand Shortly IK: International Publishing house Pvt. Ltd. New Delhi

FS17B1.6C SURVEYING & LEVELLING

CORE/TH/L : 2/wk	Int mks: 50	Ext mks : 50	Total mks:100	End exam: 3 hrs	Cr: 2
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UNIT I

Introduction – Definitions – Basic Principles of Surveying; Classification of Survey; Uses of Survey - Scales and Symbols-Sources of errors in Survey – Linear Measurement: accurate and approximate methods, duties of Surveyor.

UNIT II

Chain Surveying – Introduction – Types of chains and tapes. Instruments for chaining and taping – ranging-cross staffs – offsets – obstacles in chain surveying

– errors and corrections (standardization, temperature and pull), composition of Areas (Trapezoidal rule – Average ordinate-Simpson rule).

UNIT III

Compass Surveying: Introduction on compass surveying –Types of Bearings-Designation of bearings – Fore bearing and back bearing – Types of Traverse – Temporary adjustments of compass, local attraction, Corrections, precautions, errors.

UNIT IV

Plane Table Survey: Introduction on Plane Table and their Accessories – Setting up the plane table – Methods of Plane Table (traversing Method – Radiation Method – Intersection Method) – Resection Method (two point problem). Three point problem

UNIT V

Leveling – Introduction –Definitions of terms used in leveling – Principle of leveling – Classifications temporary adjustments of dumpy level, RL's by height of Instrument and rise and fall method, Contouring and their characteristics, uses, – errors in leveling.

UNIT VI

Automated Surveying – Introduction to use of Digital Surveying – Instruments such as Total station, Electronic Theodolite, G.P.S, DGPS.

UNIT VII

Site Studies – Plot, site, land and regions, size and shape of site, Analysis of accessibility, Topography, Climate, land forms, Surface Drainage, Soil, Water, Vegetation, Ecology and Visual aspects.

UNIT VIII

Topographical Surveying: Concepts and Techniques: Definition, Procedure in topographic surveying, uses of topographical maps, Applications of surveying instruments.

Expected Output & Assignment:

Students are expected to use surveying equipment, prepare Longitudinal Section and Cross Section, contour maps and carry out field survey. Assignments and periodic tests to be conducted.

Note : One practical exam is compulsory as a internal assessment.

REFERENCE BOOKS:

1. K.R. Surveying Vol. I, 6th ed. by Arora: Standard Book House, Delhi, 2000
2. Surveying Vol. 1, 13th ed. by Punmia B.C: Laxmi Publications Pvt. Ltd., New Delhi, 1996

3. Surveying and Levelling, Volume 1, by S. S. Bhavikatti: I. K. International Pvt Ltd,
4. Surveying Volume 1, by Duggal: Tata McGraw-Hill Education, 2004.

FS17B1.7C COMPUTER APPLICATIONS IN FSP

CORE/L :2/wk Int mks: 50 Ext mks :50 Total mks:100 End exam: Practical & Viva-Voce Cr: 2
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UNIT I

Introduction

Introduction and history of computer, software & hardware concepts - bits, bytes - types of languages – Operating systems (windows, DOS, Linux).

UNIT II

Introduction to Word Processing Package (like MS office), toolbar, creating a new document, formatting text, inserting tables, pictures, page numbers and date/time, spelling and grammar checking, taking print outs.

UNIT III

Spread Sheets:

Introduction to spread sheets (like MS Excel), creating formulae, order of operations, borders and shading, inserting chart, taking print outs.

UNIT IV

Multi-media Presentations:

Introduction to multi-media presentation (like MS Power Point), creating a presentation, opening an existing presentation, creating a blank presentation, different Power Point views, slide manipulation, slide animation, slide transitions, view slide show, navigating while in slideshow, hyper linking to various other media/ application outputs, scanning of different media in different formats, setting of options, resolution settings, management of file size, integrating partial scans of large documents, pack up a presentation for use on another computer, taking print outs.

UNIT V

Exploring Microsoft Access:

Introduction, creating new and opening existing databases, creating a database using a wizard, creating a database without using a wizard, tables - what they are and how they work, create a table from scratch in design view, primary keys, switching views, entering data, manipulating data, advanced table feature examples.

Relationships - how to link multiple tables together, forms - what they are and how they work, creating a form using a wizard, reports - what they are & how they work, creating report & mail merge labels using a wizard.

UNIT VI

Internet concepts: Introduction to Internet, use of internet, various search engines, hyper text markup Language, e-mails.

UNIT VII

Programming languages:

C language, flow charts; Introduction, What is C? Structure of C program, Variables, I/O statements, Branching and Looping, Arrays, Strings, Functions, Pointers, Structures, files.

UNIT VIII

Database management systems

Introduction: SQL (structured query language), creating and inserting data into tables, updating values, modifying tables, working with queries Basic Structure of SQL, Variables and Types, Simple SQL Programs.

Expected Output & Assignment:

The internal assessment to be carried out through practicals and periodic tests on the above mentioned topics.

REFERENCE BOOKS:

1. Microsoft Office 2000, by Leon Hard Woody :Prentice hall of India. New Delhi
2. Microsoft Office for Windows, by Steve Sagman: India Addison Wesley, 1999
3. SQL/PL/SQL – The Programming Language Of Oracle, by Ivanbayross: Bpb Publications
4. LET US C, Fifth Edition, by Yashwath Kanitkar: Bpb Publications
5. Programming In ANSIC, by Balaguruswamy: Tata McGraw-Hill Education, 2008
6. The C Programming Language, by Karningh and others: Addison-Wesley
7. HTML Black Book, by Steven Holzner: Dreamtech Press

GN17B1.2A ENVIRONMENTAL STUDIES

<i>AECC-I/TH: 2/wk</i>	<i>Int mks: 50</i>	<i>Ext mks : 50</i>	<i>Total mks:100</i>	<i>End exam: 3hrs</i>	<i>Cr: 2</i>
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UNIT I

Introduction:

Definition, scope and importance, Measuring and defining environmental development indicators.

Environmental and Natural Resources:

Renewable and non-renewable resources - Natural resources and associated problems - Forest resources - Use and over exploitation, deforestation, case studies - Timber extraction - Mining, dams and other effects on forest and tribal people - Water resources - Use and over utilization of surface and ground water - Floods, drought, conflicts over water, dams - benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using

mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

UNIT II

Energy resources:

Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT III

Basic Principles of Ecosystems Functioning:

Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem Ecological succession. - Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT IV

Biodiversity and its conservation:

Introduction - Definition: genetic, species and ecosystem diversity. Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values Biodiversity at global, National and local levels. - India as a mega-diversity nation - Hot-spots of biodiversity

UNIT V

Threats to biodiversity:

Habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT VI

Environmental Pollution:

Definition, Cause, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. nuclear hazards

Social Issues and the Environment:

From unsustainable to sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, and watershed management - Resettlement and rehabilitation of people; its problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. -Consumerism and waste products. - Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water

(Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. - Public awareness.

UNIT VII

Solid Waste Management:

Introduction, Types of wastes, Sound Material-Cycle Society, Systems approach to waste management problems. Planning for solid waste management, Recycling system and treatment system of solid waste, Formulating recycling as systems (input recycling materials, using conversion apparatus, systematize. Output, and discuss ways to improve recycling). Recycling biomass (discuss theory of organic waste recycling) Illegal dumping problems and restoration of contamination, Illegal dumping problems (introduce examples of prevention and reclamation measures), Restoration methods for contamination (discuss adopting principles for restoration methods for Contamination)

UNIT VIII

Human Population and the Environment:

Population growth, variation among nations. Population explosion - Family Welfare Programme. Environment and human health. Human Rights. -Value Education. -HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. -Case Studies.

Expected Outcome & Assignment:

Assignments and periodic tests to be conducted.

REFERENCE BOOKS:

1. A Text Book of Environmental Studies for Undergraduate Courses, by ErachBharucha: University Grants Commission
2. Silent Spring, by Carson, Rachel: Mariner Books, 2002
3. This fissured land: an ecological history of India, by Gadgil, M. & Ramachandra: Univ of California Press.1993
4. Global Ethics and Environment, by Gleeson, B. and Low, N: London, Routledge

SEMESTER – II

FS17B2.1C BUILDING SERVICES STUDIO II

CORE/S : 10/wk	Int mks: 100	Ext mks :100	Total mks:200	End exam: Viva-Voce	Cr: 10
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UNIT I:

Basic anthropometrics – average measurements of human body in different postures – its proportion and graphic representation, application in the design of simple household furniture. Basic human functions and their implications for spatial planning. Minimum and optimum areas for various functions in a residence. Reference to building norms and standards.

UNIT II

Introduction to design methodology. Detailed study of functional spaces such as living, dining, bedrooms, kitchen, toilet etc. including the furniture layout, circulation, clearances, lighting and ventilation, etc. Case study of existing house and analysis of the spaces.

UNIT III

Desk study and analysis of designed spaces noted for comfort and spatial quality; spatial design and integration of MEP services in the design.

Unit IV

Design of a two-bed room house within a given site. Preparation of furniture layouts and MEP service layouts.

Expected Output & Assignment:

One major portfolio dealing with residential unit, with attention to circulation, ventilation, space planning and MEP service diagrams.

Note: In the end exam, which is a viva-voce, the students have to present the entire semester's work for assessment.

REFERENCE BOOKS:

1. Space planning Basics, by Karlen Mark: Van Nostrand Reinhold, New York, 1992
2. Time Saver standards for Interior, by Joseph D Chiara, Julius Panero, & Martin Zelnick: McGraw-Hill Education 2001
3. Interior Design Illustrated, 2nd edition, by Francis.D. Ching & Corky Bingelli:Wiley publishers, 2004.
4. Human Dimension & Interior Space : A source book of Design Reference standards, by Julius Panero & Martin Zelnick: Watson – Guptill, 1979.

5. Space Planning Basics, by Karlen Mark, Kate Ruggeri & Peter Hahn: Wiley publishers, 2003.

FS17B2.2C STRUCTURAL MECHANICS

CORE/TH : 3/wk	Int mks: 50	Ext mks : 50	Total mks:100	End exam: 3 hrs	Cr: 3
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UNIT I

Introduction: Forces, system of forces, resultant, equilibrant Parallelogram law, Triangle law, Lamis Theorem, polygon law, resultant of coplanar, concurrent force system, couple, characteristics of couple, moment, Equilibrium,

UNIT II

Analysis of trusses, types of stresses, Loads on trusses, 2-D truss analysis using method of joint (Cantilever & Simply Supported)

UNIT III

Stress, Strain, type of stresses, stress-strain curve for ductile Material, Hooke's law, Modulus of Elasticity, Bars of Varying Section, Bars of Composite Section.

UNIT IV

Shear stress, types of Strain, poissons Ratio, Shear modulus Bulk Modulus Relation between the three Elastic Constants members subjected to 3 mutually perpendicular forces

UNIT V

Types of Beams, types of loads, calculation of reactions for simply supported beam (Using Point loads & Udl's) definition shear force & Bending Moment SFD& BMD for Cantilever beams.

UNIT VI

Shear force (SF)& Bending Moment (BM) diagrams for simply supported & over hanging beams for point loads & UDL, point contra flexure & its location, Relation between loading, SF & BM

UNIT VII

Definition of centroid, line of symmetry ,centroid for some standard shapes, calculation of centroid for shapes like L,T,C,I Sections etc., moment of inertia, Derivation of M.I formula for Rectangle, circle, Triangle, calculation of M .I for L,T,C,I Sections etc.,

UNIT VIII

Types of joints, lap joint & butt joint, failure of riveted joints, strength of the joint, efficiency of joint, Unwins formula, chain riveting & Diamond Riveting. Welded joints: Introduction, Advantages and disadvantages of welded joints, types, strength of fillet weld, design of welded joint for plates and unsymmetrical sections for axial loading.

Expected Output & Assignment

Students to make documentation of different built elements and their aspects mentioned above. Structural/ study models of different structures such as force system, bending moment, welded joints etc., shall be made along with short notes on the same. Assignments and periodic tests to be conducted.

REFERENCE BOOKS:

1. Engineering Mechanics, by Khurmi. R.S: S. Chand and Co. Ltd., New Delhi, 1999
2. Engineering Mechanics, 7th ed. by Ramamrutham. S.: Dhanpat Rai Pub. Co. Ltd., Delhi, 2004
3. Engineering Mechanics, by Timoshenko. S. and Young, D.H: McGraw-Hill International Editions

FS17B2.3C FLUID MECHANICS AND HYDRAULICS

CORE/TH: 3/wk	Int mks: 50	Ext mks: 50	Total mks: 100	End exam: 3 hrs	Cr: 3
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UNIT I

Fluid statics:

Dimensions and units: physical properties of fluids- specific gravity, viscosity surface tension- vapor pressure and their influence on fluid motion- atmospheric gauge and vacuum pressure – measurement of pressure- Piezometer, U-tube and differential manometers.

UNIT II

Fluid kinematics:

Stream line, path line and streak lines and stream tube, classification of flows- steady & unsteady, uniform, non uniform, laminar, turbulent, rotational, and irrotational flows-equation of continuity for one dimensional flow.

Fluid dynamics:

Surface and body forces –Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its application on force on pipe bend.

UNIT III

Closed conduit flow:

Reynold's experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line.

Measurement of flow:

Pilot tube, venturimeter, and orifice meter, Flow nozzle, Turbine flow meter

UNIT IV

Basics of turbo machinery:

Hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work done and efficiency, flow over radial vanes.

UNIT V

Hydroelectric power stations:

Elements of hydro electric power station-types-concept of pumped storage plants-storage requirements, mass curve (explanation only) estimation of power developed from a given catchment area; heads and efficiencies.

UNIT VI

Hydraulic Turbines:

Classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies , hydraulic design –draft tube theory-functions and efficiency.

UNIT VII

Performance of hydraulic turbines:

Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitations, surge tank, water hammer.

UNIT VIII

Centrifugal pumps:

Classification, working, work done – manometer head- losses and efficiencies specific speed- pumps in series and parallel-performance characteristic curves, NPSH.

Reciprocating pumps:

Working, Discharge, slip, indicator diagrams.

Expected Output & Assignment:

Assignments on given topics and periodic internal tests.

REFERENCE BOOKS:

1. Hydraulics, fluid mechanics and Hydraulic machinery, by Dr P.N.Modi and Dr S.M.Seth :RK Bansal
2. Fluid Mechanics and Hydraulic Machines, by Rajput :Chand (S.) & Co Ltd ,India,
3. Fluid Mechanics and Fluid Power Engineering, by D.S. Kumar: Kotaria& Sons.
4. Fluid Mechanics and Machinery by D. Rama Durgaiah: New Age International.
5. Hydraulic Machines by Banga& Sharma: Khanna Publishers.

FS17B2.4C BUILDING MATERIALS

CORE/TH : 3/wk	Int mks: 50	Ext mks : 50	Total mks:100	End exam: 3hrs	Cr: 3
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UNIT I

Stones: Introduction, requirements of good building stones, uses and classifications, stone cladding, modern use of stone tiles in architectural works, artificial or cast stones.

Bricks and Clay Products:

Bricks, Composition of bricks, requirements of first class (good bricks), classification of bricks as per BIS, properties of burnt clay bricks, tests for bricks, special bricks.

Building Tiles:

Introduction to fire bricks and ceramic tiles.

UNIT II

Lime:

Introduction, lime as one of the cementing materials, classification of lime, storage and uses of lime. Aggregates: Introduction, types, classification, standard specification as per BIS.

Mortar:

Function and utility of mortar, types of mortars.

UNIT III

Cement:

Definition, brief description of manufacturing Portland cement, physical properties, tests for cement, standard specifications for Portland cement, uses of different types of cement, storage of cement.

UNIT-IV

Timber:

Introduction, properties of good timber, identification of timber, preservation of timber, some common timbers and their uses in Civil Engineering Works.

Wood based Products: Veneers, plywood, plywood grades and sizes (IS-303-1975), hard board, particle board, block board, battle board, laminated board.

UNIT V

Metals: Glossary of terms, introduction, properties and uses of cast iron, wrought iron, steel, mild steel, high tensile steel, commercial forms of steel and aluminum.

Asphalt, tar and bitumen: Description and uses of asphalt, tar and bitumen.

Asbestos: Introduction, specifications, uses of asbestos in civil engineering works.

Plastic: Introduction and definition, uses of plastic in construction, plastic building products produced in India, modern developments in plastics.

Glass: Function and utility of glass, types of glasses and their uses, selection of glass.

Insulating Materials: Introduction, heat and sound insulating materials, types of insulating materials.

Admixtures: Definition, function and utility of admixtures, types of admixtures.

UNIT VI

Introduction to Advance Building Materials:

Advance building materials plastic, PVC, metals, synthetic boards, fire resistant board/tiles, acoustic materials, glass, composite panels and their application, non load bearing gypsum board.

UNIT VII

Building Construction:

Masonry Work: Technical terms, header, stretcher, bond, course, bed, facing, face, backing, hearting, joint, bat, closers, perpends, frog, quoin, plinth, plinth course, sill, jamb, reveal, string course, cornice, corbel.

Bond: Definition and purpose of bond, common types of bond.

UNIT VIII

Damp Proofing: Sources of dampness, methods of its prevention, material used in Damp proof Course.

Expected Output & Assignment:

Students should be exposed to on site and laboratory tests for above materials. Students should conduct market survey on above contents. Assignments and periodic tests to be conducted.

REFERENCE BOOKS:

1. Engineering Materials, by S.C. Rangwalla: Ahmedabad Book Depot, 1964
2. Engineering Materials, by G.J.Kulkarni: Ahmedabad Book Depot, 1964
3. Building Materials Practice, by Ragsdale & Raynham : London E. Arnold 1972
4. Building Materials, by Deshapande: United Book Corporation, 1962

FS17B2.5C BASICS OF ELECTRICAL ENGINEERING

CORE/TH: 3/wk	Int mks: 50	Ext mks: 50	Total mks: 100	End exam: 3hrs	Cr: 3
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UNIT I

Introduction to Electrical Engineering:

Essence of electricity, Conductors, semiconductors and insulators (elementary treatment only); Electric field; electric current, potential and potential difference, electromotive force (EMF), electric power, ohm's law, basic circuit components, electromagnetism related laws, Magnetic field due to electric current flow, force on a current carrying conductor placed in a magnetic field, Faradays laws of

electromagnetic induction. Types of induced EMF's, Kirchhoff's laws, Simple problems.

UNIT II

Network Analysis:

Basic definitions, types of elements , types of sources, resistive networks, inductive networks, capacitive networks, series parallel circuits, star delta and delta star transformation , Network theorems- Superposition , Thevenin's, Maximum power transfer theorems and simple problems.

UNIT III

Magnetic Circuits:

Basic definitions, analogy between electric and magnetic circuits, magnetization characteristics of Ferro magnetic materials, self inductance and mutual inductance, energy in linear magnetic systems, coils connected in series, attracting force of electromagnets.

UNIT IV

Electronic circuits:

Terminal characteristics, operation of diodes, Zener diode, diodes models, Diode applications for Rectifier, invertors circuits. Operation and principle of Transistors and their applications.

UNIT V

Alternating Currents:

Principle of ac voltages, waveforms and basic definitions, relationship between frequency, speed and number of poles, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits, single phase parallel circuits, single phase series parallel circuits, power in ac circuits.

UNIT VI

Transformers:

Principles of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Transformer Test, Efficiency and Regulation Calculations (All the above topics are only elementary treatment and simple problems).

UNIT VII

Introduction to Electrical Machines, Instruments and Power generation

Three phase induction motor: principle of operation, slip and rotor frequency, torque (simple problems).

Synchronous Machines: Principle of operation, EMF equation (Simple problems on EMF). Synchronous motor principle and operation (Elementary treatment only)

Basic Instruments: MC, MI instruments, dynamometer wattmeter, digital energy meter.

Power generation: Elements of power system, layout of thermal, hydro and nuclear power plants. Introduction to renewable energy sources and recent trends in generation.

UNIT VIII

Fundamental Principles of Electricity:

Voltage, Amperage, wattage and transmission of power, distribution in cities, HT and LT consumers, Transformers and load calculations, Single and three phase connections, Indian Electricity rules.

Expected Output & Assignment:

Assignments and periodic tests to be conducted.

REFERENCE BOOKS:

1. Basic Electrical Engineering, by M.S.Naidu and S. Kamakshiah : Tata McGraw-Hill Education, 1995.
2. Basic Electrical Engineering, by T.K.Nagasarkar and M.S. Sukhija: Oxford University Press.
3. Theory and Problems of Basic Electrical Engineering by D.P.Kothari& I.J. Nagrath: PHI Learning Pvt. Ltd.1998
4. Principles of Electrical Engineering by V.K Mehta: S.Chand Publications.
5. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin Pearson: Pearson; 2nd edition ,2004
6. Electronic Devices & Circuit Theory, by R. L. Boylestad& Louis Nashlesky : Pearson Education
7. Basic Electronics- Devices, Circuits and IT Fundamentals, by Santiram Kal : Prentice Hall, India
8. Electronic Devices and Circuits, by David A. Bell : Oxford University Press 2008

BT17B2.1C MATHEMATICAL METHODS

CORE/TH: 4/wk	Int mks: 50	Ext mks : 50	Total mks:100	End exam: 3 hrs	Cr: 4
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UNIT I

Matrices and Linear systems of equations: Elementary row transformations-Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods-LU Decomposition- LU Decomposition from Gauss Elimination –Solution of Tridiagonal Systems-Solution of Linear Systems.

UNIT II

Eigen values, eigen vectors – properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalization of matrix. Calculation of powers of matrix – Modal and spectral matrices.

UNIT III

Real matrices – Symmetric, skew - symmetric, orthogonal, Linear Transformation – Orthogonal Transformation. Complex matrices: Hermitian, Skew-Hermitian and Unitary – Eigen values and eigen vectors of complex matrices and their properties. Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index - signature - Sylvester law.

UNIT IV

Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

UNIT V

Interpolation: Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial-Newton's formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae –Interpolation with unevenly spaced points-Lagrange's Interpolation formula.

UNIT VI

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares. Numerical Differentiation and Integration– Trapezoidal rule – Simpson's 1/3 Rule –Simpson's 3/8 Rule.

UNIT VII

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method, Runge-Kutta Methods, Predictor-Corrector Methods, Adams- Moulton Method, Milne's Method.

UNIT VIII

Fourier Series: Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions. Fourier integral theorem (only statement) – Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

Expected Output & Assignment:

Assignments on given topics and periodic internal tests.

REFERENCE BOOKS:

1. Mathematical Methods,by T. K. V. Iyengar, B. Krishna Gandhi and Others: S. Chand & Company
2. Mathematical Methods,by C. Sankaraiah: V. G. S. Book Links
3. A Text Book of Engineering Mathematics,by B. V. Raman: Tata Mc Graw Hill.

4. Numerical Methods for Scientific and Engineering Computation, by M. K. Jain, S. R. K. Iyengar & R. K. Jain: New Age International Publishers

GN17B2.1A COMMUNICATION SKILLS

AECC-II/L: 2/wk	Int mks: 50	Ext mks : 50	Total mks:100	End exam: Viva-Voce	Cr: 2
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UNIT I

Introduction

Orientation for improving the skills of grammar, punctuation, and vocabulary in English focused primarily on developing communication and presentation skills

UNIT II

Spoken English

Neutralization of accent, pronunciation, formal and informal communication, importance of voice and body language.

UNIT III

Listening Comprehension

Role of listening in communication, listening for accent, rhythm and intonation, listening for main idea and specific information.

UNIT IV

Reading Skills

Importance of Reading, Definition of Reading, Levels of Reading, Requirements of Reading, Types of Reading, Techniques of Reading, Academic Reading Tips

UNIT V

Communication Skills- Speaking Skills

Definitios, Barriers of Communication, Types of Communication, Know What You Want To Say

Expected Output & Assignment:

Each student shall present a written paper and a seminar at the end of the semester for final assessment on a topic to be finalized in consultation with the concerned faculty. Internal assessment to be in the form of book reviews, exercises in writing comprehensions and group discussions on any relevant topics.

REFERENCE BOOKS:

1. Course in Listening and Speaking Skills Part I,by GeethaRajivan, Kiranmai: Foundation Books Pvt Ltd.
2. Enrich your Communication in English,by Sujatha Mukiri: Lorven Publication Hyd

- 3 A Practice Course in English Pronunciation, by Sethi, J & et al: Prentice Hall of India, New Delhi
4. Communication Skills, by Sen, Leena: Prentice Hall of India, New Delhi
5. Communication Skills, by Prasad, P: S.K. Kataria& Sons
6. Spoken English, Bansal, R.K. and J.B. Harrison: Orient Language
7. English Vocabulary in Use, by McCarthy, Michael: Cambridge University Press
8. English Grammar and Composition, by Rajinder Pal and PremLata:Sultan Chand Publication

GN17B2.2A VALUE EDUCATION

AECC-III: 2/wk	Int mks: 50	Ext mks : 50	Total mks:100	End exam: Nil	Cr: 2
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Course Overview: To provide guiding principles and tools for the development of the whole person, recognizing that the individual is comprised of Physical, Intellectual, Emotional and Spiritual dimensions.

Knowledge Transfer /Expected Skills:

- _ To help individuals think about and reflect on different values.
- _ To deepen understanding, motivation and responsibility with regard to making personal and social choices and the practical implications in relation to themselves and others, the community and the world at large
- _ To inspire individuals to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening them.

UNIT I

Value Education—Introduction – Definition of values – Why values? – Need for Inculcation of values – Object of Value Education – Sources of Values – Types of Values: i) Personal values ii) Social valuesiii) Professional values iv) Moral and spiritual values) Behavioral (common) values

UNIT II

Personal values – Definition of person – Self confidence – Relative and absolute confidence, being self-determined, swatantrata (loosely equivalent to freedom).
Self discipline – Self Assessment – Self restraint –Self motivation – Determination – Ambition – Contentment
Self-respectand respect to others; expression of respect

UNIT III

Social values – Units of Society - Individual, family, different groups – Community – Social consciousness – Equality and Brotherhood – Dialogue – Tolerance – Sharing – Honesty-Responsibility – Cooperation; Freedom – Repentance and Magnanimity.
Peer Pressure – Ragging - examples - making one's own choices

UNIT IV

Professional values – Definition – Competence – Confidence – Devotion to duty – Efficiency – Accountability

– Respect for learning /learned – Willingness to learn-Open and balanced mind – Team spirit – Professional

Ethics – Willingness for Discussion; Difference between understanding and assuming

Time Management: Issues of planning, as well as concentration (and aligning with self goals)

Expectations from yourself. Excellence and competition, coping with stress, Identifying one's interests as well as strengths.

UNIT V

Behavioral values – Individual values and group values. Anger: Investigation of reasons, watching one's own anger; Understanding anger as: a sign of power or helplessness, distinction between response and reaction.

Right utilization of physical facilities. Determining one's needs, needs of the self and of the body, cycle of nature.

Relationship with teachers. Inside the class, and outside the class, interacting with teachers.

UNIT VI

Complimentary nature of skills and values. Distinction between information & knowledge

Goals: Short term goals and long term goals; How to set goals; How to handle responsibilities which have to be fulfilled while working for goals.

Reference Books

1. Ramancharla Pradeep Kumar. Compiled Reading Material IIIT Hyderabad
2. Dr. S. Ignacimuthu S. J., Values for life, Better yourself Books, Bandra Mumbai-600 050 (1999).
3. Values (Collection of Essays), Published by : Sri Ramakrishna Math., Chennai—4.,(1996)
4. Prof. R.P.Dhokalia., Eternal Human Values NCRT –Campus Sri Aurobindo Marg., New Delhi
5. Swami Vivekananda., Education., Sri Ramakrishna Math., Chennai-4(1957)
6. Holy Books of all religions