



JNAFAU-SCHOOL OF PLANNING AND ARCHITECTURE

NEWSYLLABUS W.E.F FROM ACADEMIC YEAR

CBCS –B.Tech(DTDP)- COURSE STRUCTURE- 2017

DTDP-CBCS-2017-SYLLABUS

SEMESTER-I

DT17B1.1C : DESIGN AND DRAWING-I

The course contains two parts viz. Basic Design and Architectural Drawing and Graphics

Design

Course Overview:

Basic Design provides the framework for understanding design as a new language by sensitizing students to the conceptual, visual and perceptual issues involved in the design process.

Objectives of the Course:

To impart an understanding of design process and provide knowledge of the principles of design and design elements. Exercises complement the lectures and ensure that the students learn to develop a series of compositions in two and three dimension.

Expected Skills / Knowledge Transferred:

The Course prepares ground for the students to gain an understanding into the fundamental issues in building design and develop the skill to create appropriate solutions for simple problems.

Course Contents:

Introduction to design – definitions and meaning of design, importance of design. Examples of design from nature. Fundamental elements of design in 2-D and their definitions; point, line, shape, form, space, texture, value, colour and material. Introduction to the principles of design in 2-D and 3-D -unity, balance, symmetry proportion, scale, hierarchy, rhythm, contrast, harmony, focus, etc; use of grids, creating repetitive patterns

Assignment: to compose patterns by incorporating the principles of design.

Concepts of geometry – introduction to different 3-D forms and primitive forms, shape and understand the behavior when combined. Transformations of 2-D to 3-D.

Assignment: to sketch the basic geometric forms and to analyze them based on transformation of simple to complex forms.

Principles of composition-using grids, symmetrical/asymmetrical, rule of thirds, center of interest etc.

Assignment: to compose patterns using grids and to incorporate the principles.

Colour theory, color wheel, primary, secondary, tertiary colors, color schemes, color value and intensity. Theoretical inputs to be followed by exercises to develop the ability to translate abstract principles into compositions in 2D and 3D.

Assignment: prepare a colour wheel, and composition based on colour theory.

Study of ornament in architectural design. Different types of ornamentation in buildings. Study and evaluation of artifacts and historic examples and their applicability.

Assignment: to document artifacts historical sites and to understand them with respect to the surround environment; to incorporate them of the design aspects to present day context or usage.

Basic anthropometrics-average measurements of human body in different postures-its proportion and graphic representation, application in the design of simple household and street furniture. Role of mannequins in defining spatial parameter of design. Basic human functions and their implications for spatial planning.

Visual analysis of built forms, noted for aesthetic delight; analysis of solid and void relations. Integration of form and function in the design of bus shelter, milk booth, watchman's cabin, traffic police kiosk, flower stall, ATM Center, etc.

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

Reference books:

Ching, Francis D.K. Architecture: Form, Space, and Order, 2nd ed. Van Nostrand Reinhold, New York, 1996.

Hanks, A. David. Decorative Designs of Frank Lloyd Wright, Dover Publications, Inc. New York, 1999.

Hepler, E. Donald, Wallach, I. Paul. Architecture Drafting and Design, 3rd ed. McGraw-Hill Book Company, New York, 1977.

Itten, Johannes. Design and Form: The basic course at the Bauhaus, Thames and Hudson Ltd., London 1997.

Krier, Rob. Architectural Composition, Academy Editions, London, 1988.

Meiss, Pierre Von. Elements of Architecture: From form to place, E and FN Spon, London, 1992.

Pipes, Alan. Drawing for 3-Dimensional Design. Thames and Hudson Ltd., London 1990.

Shibikawa, Ikuyoshi and Takahashi, Yumi. Designers Guide to Colour.

Smithies, K.W. Principles of Design in Architecture. Chapman and Hall, 1983.

Wucius, Wong. Principles of two Dimensional Design. Van Nostrand Reinhold 1972.

Architectural Drawing and Graphics

Course Overview:

The course introduces the fundamental techniques of architectural drawing and develops the appropriate skills for visualization and representation.

Objectives of the Course:

To introduce architectural drawing techniques and to facilitate effective visual communication

Expected Skills / Knowledge Transferred: Freehand, scale drawing, conventional architectural representations in drawings and graphics.

Course Contents:

Introduction: Fundamentals of drawing and its practice, introduction to drawing equipment, familiarization, use and handling.

Drawing: Drawing sheet sizes, composition, fixing. Simple exercises in drafting, point and line, line types, line weights, straight and curvilinear lines dimensioning, lettering, borders, title panels, tracing in pencil, ink, use of tracing cloth.

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

Measured and Drawing to Scale: Scales and construction of scales, simple objects, furniture, rooms, doors and windows etc., in plan, elevation and section. Reduction and enlargement of drawings

Building Geometry: Study of points, lines, and planes leading to simple and complex solid geometrical forms; Use of geometry in buildings, isometric, axonometric and oblique views; Exercises on Ionic volute, Entasis of column etc., working with models to facilitate visualization.

Free Hand Drawings /Sketching: Simple exercises in object drawing, light and shade of simple, natural and geometric forms. Outdoor sketching of simple building forms. Architectural representation of trees, hedges, foliage, human figures in different postures, vehicles, street furniture etc.; their integration to presentation drawings;

Note: This is a studio subject and students should be made to prepare drawings as studio exercises along with the theoretical inputs. The studio work should be supplemented with appropriate site visits.

Reference books:

Moris, I.H. Geometrical Drawing for Art Students.

Thoms, E. French. Graphic Science and Design, New York: MC Graw Hill.

Nichols, T.B. and Keep, Norman. Geometry of Construction, 3rd ed. Cleaver – Hume Press Ltd., London, 1959.

Bhatt, N.D. and Panchal V.M. Engineering Drawing: Plane and Solid Geometry, 42nd ed. Charotar Pub., Anand, 2000.

Gill, P.S. T.B. of Geometrical Drawing, 3rd ed. Dewan Suhil Kumar Kataria, Ludhiana, 1986.

Shah, M.G., Kale, C.M. and Patki, S.Y. Building Drawing: with an integrated approach to built environment, 7th ed. Tata McGraw Hill Pub., Delhi, 2000.

Bies, D. John. Architectural Drafting: Structure and Environment. Bobbs – Merrill Educational Pub., Indianapolis.

Nelson, A. John. H.B. of Architectural and Civil Drafting, Van Nostrand Reinhold, New York, 1983.

DT17B1.2C CLIMATOLOGY FOR BUILT ENVIRONMENT

Course Overview:

Science (tools, data, standards, methods and principles) of building design and site planning as related to climate, particularly to tropical climates as found in India.

Objectives of the Course:

To equip the student with the basic understanding of climatic types in India, and the impact on requirements of building design and site planning; to introduce them to the basic science of building design and site planning for thermal comfort, daylighting and natural ventilation; familiarize them with the data, methods, principles, standards and tools for planning and designing for climatic comfort

Expected Skills / Knowledge Transferred:

The student should be able to 'predict' climatic conditions in a given building (simple residence) and undertake redesign for given parameters

Course Contents:

Note: The topics here to be dealt with keeping in mind Indian climatic conditions. NBC and BIS guidelines / standards have to be introduced at all relevant contexts.

Unit – I

Introduction to Building Climatology:

Climate and built form interaction. Global Climatic factors, elements of climate, graphic representation of climatic data, Mahoneys Tables, macro and micro climate; challenge of rapid, extreme environmental change

Unit – II

Tropical Climates:

Definition, classification of tropical climates, characteristics of different climatic zones, Design considerations for warm-humid, hot-dry, composite and upland climates.

Unit – III

Thermal Comfort:

Thermal comfort factors, Physiological aspects, Body heat balance, comfort range, comfort charts.

Unit – IV

Heat flow through Buildings:

Basic principles of heat transfer through buildings, performance of different materials, Periodic heat flow.

Unit – V

Sun and the Design process:

Solar geometry, Solar charts, Sun angles and shadow angles, orientation for sun, sun control, design of shading devices, building form and heat gain, basic principles of daylighting, sunlight and glare

Unit – VI

Natural Ventilation:

Air movement around and through buildings, Orientation for wind, stack effect, Induced ventilation

Unit – VII

Passive Cooling:

Passive methods of Cooling, roof pond, desiccant cooling, evaporative Cooling, and earth sheltered buildings etc.

Site Planning (including landscaping) and building planning and design considering climate factors

Detailed appraisal/analysis of climatological performance of an existing residence and or a workplace; followed by redesigning or the same to improve climatological performance.

Reference books:

Koenigsberger, O.H. and Others. Manual of Tropical Housing and Building. Orient Longman, Chennai, 2003.

Konya, Allan. Design for Hot Climates.

Kukreja, C.P. Tropical Architecture. Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 1978.

Markus, T.A. and Morris. E.N. Buildings, Climate and Energy. Pitman Pub. Ltd., London, 1980.

Olgay and Olgay. Solar Control and Shading Devices.

DT17B1.3C MATERIALS AND CONSTRUCTION

Note : The student is expected to maintain a record book in which he / she shall record all the examples of his / her observations of the materials as found in use in buildings / development, specifying the material, building in which used, where used, how used / fixed, sourcing of the material, (also suppliers addresses,) sizes, Characteristics, costs, critical analysis of the appropriateness of its' use, etc.

List the materials used in buildings by type of building, part of building, building process and/ or in the building industry with respective physical, chemical, etc. properties effecting its supply (size, shape, thickness etc.), transportation, handling, stacking and storing, etc. Process of selecting / specifying materials. Knowledge of the relevant codes of the Bureau of Indian Standards.

Classification of stones; granite, laterite, quartzite, marble and slates -properties and uses; stone units - header, rubble, quoins, black stones, stone metal, flag stones, paving sets. Preservation of stonework, quarrying of building stones, quarry dressing, tools used. Clay bricks: constituents, harmful constituents, selection of clay, requirements and tests. Fire clay bricks - varieties; sand lime bricks;

paving bricks; Terra-cotta - its varieties: ordinary, glazed, porous, polished and fine - uses and properties. Building Tiles: Roofing Tiles, flooring and wall tiles.

Sand: Sources, classification, functions, properties, tests for silt and organic contents, size of sand and grading.

Mortars: Types, proportioning, mixing and grinding, mortar mills. Surkhi mortar, cement mortar, methods of preparing, handling and uses of mortars, light weight mortars i.e. cinder, sawdust and fibrous plasters, gypsum plaster, composition and uses, plaster of Paris.

Portland Cement: Raw materials, functions of cement ingredients, setting action of cement, tests for strength and setting time.

References:

1. Engineering Materials - by G.J.Kulkarni
2. Building Materials - by Deshpande
3. Engineering Materials - by Roy Chowdary
4. Building Materials Practice - by Ragsdale & Raynham
5. Engineering Materials - by S.c. Rangwalla

Elementary and simple construction methods explaining basic principles and considerations in the construction of one roomed rectilinear buildings with verandah: Foundations and footings using CRS, cement concrete, mortar (cement, lime, surkhi)

Walls:

Stone walls: rubblework, joints, plinths, and lintels) Brick walls: brickwork - English and Flemish brick bonds, stopped ends, quoins, piers, jambs, mortar joints. Openings: wooden doors and casement windows with simple and basic hardware Lintels and

Arches: lintels of wood, stone, brick; arches: terms defined, forms of arches, i.e.segmental, semi-circular, elliptical, three-centered, flat and relieving arch etc. rough and gauged arch.

Roofs: RCC roof - simply supported, single way reinforced. The mode of teaching shall be through (graphic) basic models of 'standard' construction details incorporating a maximum of three alternative variations in the building components and how these interact or impact on each other

in terms of jointing, dimensional coordination, resolving differential characteristics, etc.

The class and assignment work should include appropriate site visits by the students, and students will have to maintain field observation/record books.

DT17B1.4C: C' PROGRAMMING AND DATA STRUCTURES

UNIT – I

Algorithm / pseudo code, flowchart, program development steps, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bitwise operators, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation. Input-output statements, statements and blocks, if and switch statements, loops- while, do- while and for statements, break, continue, goto and labels, programming examples.

UNIT - II

Designing structured programs, Functions, basics, parameter passing, storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, header files, C preprocessor, example c programs.

UNIT - III

Arrays- concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two dimensional and multi-dimensional arrays, applications of arrays. pointers- concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory managements functions, command line arguments, c program examples.

UNIT - IV

Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bitfields, C program examples.

UNIT - V

Input and output – concept of a file, text files and binary files, streams, standard I/O, Formatted I/O, file I/O operations, error handling, C program examples.

UNIT - VI

Searching – Linear and binary search methods, sorting – Bubble sort, selection sort, Insertion sort, Quicksort, merge sort.

UNIT – VII

Introduction to data structures, singly linked lists, doubly linked lists, circular list, representing stacks and queues in C using arrays and linked lists, infix to post fix conversion, postfix expression evaluation.

UNIT - VIII

Trees- Binary trees, terminology, representation, traversals, graphs- terminology, representation, graph Traversals (dfs & bfs)

TEXT BOOKS:

1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
2. DataStructures Using C – A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson education.

REFERENCES :

1. C& Data structures – P. Padmanabham, B.S. Publications.
2. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education
3. C Programming with problem solving, J.A. Jones & K. Harrow, dreamtech Press
4. Programming in C – Stephen G. Kochan, III Edition, Pearson Educaion.

PRACTICALKNOWLEDGE:

DT17B1.5C – STATISTICAL METHODS

Unit –I

Importance and need of statistical methods and its applications in Design Technologies with reference to spatial planning and Architecture

Introduction of statistics :scope, functions ,analysis and presentation methods and its applications to spatial planning and Architecture

Unit-II

Data collection methods : types of data, sources of data, methods of data collection such as case study, interview method, questionnaire method; objectives , difference between survey and lab/experimental methods; self report method; observational method; critical examination of all the methods; flow charts;

Unit-III

Importance of designs and sampling : Properties of a Research Design, types of designs in brief ;sampling designs : significance of sampling, census vs. sampling, fundamentals of sampling; sample size, criteria for sampling design and its limitations, sampling methods (Probability and non-probability sampling); application of sampling techniques for different situations;

Unit- IV

Data processing and presentation : editing the data, coding the data for computerisation, selection of the variables as per objectives ; classification and tabulation of data ; graphical presentation of qualitative and quantitative data methods and its choice pertaining to design technologies data

Unit V

Analysis of data techniques: Preparation of data for data processing, Measures of averages, measures of dispersion, correlation and regression, Index numbers and time series basics;

Probability and its distributions: Probability and its types and laws (only definitions); Binomial distribution, Poisson distribution, Normal distribution ; t-distribution, Chi-square distribution

Decision making models : Testing of hypothesis with small and large sample distributions ;Linear Programming models, queuing theory, transportation problems

Expected outputs and assignments : The students will be exposed and explored to the framing of sampling methods in data collection, presentation of slides/charts on a small project for their future use to test their statistical knowledge as a pilot study for their future project work.

Suggested books for reading:

1. S.P. Gupta ----Statistical methods
2. Ram Ahuja ---Research methods
3. An introduction to statistical methods and data Analysis –R. Lyman Ott
4. MS- Excel for data analysis
5. Statistical packages such as SPSS, Minitab, Mat lab; SAS
6. Marketing Research ---An applied orientation—Naresh K. Malhotra

BT17B1.1C:ENGINEERING MATHEMATIS

UNIT – I

Differential equations of first order and first degree , Law of natural growth and decay, orthogonal trajectories.

UNIT – IV

Radius, Centre and Circle of Curvature – Evolutes and Envelopes Curve tracing – Cartesian, polar and Parametric curves.

UNIT – V

Applications of integration to lengths, volumes and surface areas in Cartesian and polar coordinates multiple integrals - double and triple integrals – change of variables – change of order of integration.

UNIT – VI

Sequences – series – Convergences and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence

UNIT –VII

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

UNIT–VIII

Vector Integration - Line integral – work done – Potential function – area- surfaceand volume integrals Vector integral theorems: Green's theorem-Stoke's and Gauss's Divergence Theorem (With out proof). Verification of Green's - Stoke's and Gauss's Theorems.

Text Books:

1. A text Book of Engineering Mathematics, Vol-1 T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
2. A text Book of Engineering Mathematics, C. Sankaraiah, V. G. S. Book Links.
3. A text Book of Engineering Mathematics, Shahnaz Bathul, Right Publishers.
4. A text Book of Engineering Mathematics, P. Nageshwara Rao, Y. Narasimhulu & N.Prabhakar Rao, Deepthi Publications.

References:

1. A text Book of Engineering Mathematics, B. V. Raman, Tata Mc Graw Hill.
2. Advanced Engineering Mathematics, Irvin Kreyszig, Wiley India Pvt. Ltd.
3. A text Book of Engineering Mathematics, Thomson Book Collection.

GN17B1.2A ENVIRONMENTAL STUDIES

Course Overview: A compulsory subject for all the undergraduate students of various discipline highlights significance of maintaining balance and sustainability of various components of the environment.

Objectives of the Course: To sensitize the students towards sustainable environment.

Course Contents:**Unit – I**

Environmental studies – Introduction: - Definition, scope and importance, Measuring and defining environmental development indicators.

Unit - II

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. - 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. Bio-geographical 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 - 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 - V

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

Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

Unit - VI

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

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.

Unit - VIII

Field work: Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems - pond, river, hill slopes, etc.

TEXT BOOK:

ErachBharucha, A Text Book of Environmental Studies for Undergraduate Courses, University Grants Commission.

GN17B1.3A COMPUTER APPLICATIONS

UNIT I

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

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 printouts.

UNIT II

Spread Sheets

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

UNIT-III

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 IV

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 wizard.

UNIT V

Graphical Concepts-I

Photo editing and Desktop publishing (application) software Introduction, software & system requirements, preferences, workspace, graphics terminology, image depth, resolution and image size, up sampling and down sampling, image sources, straightening an image, cropping an image, basic image correction, printing photo edited documents, selections, choosing foreground and background colors, filling with color, options & preferences revisited, file browser, stepping back in time, use ram efficiently, sharpening images, working with layers, painting in photo editing software, color theory, image modes, channels, more advanced adjustment commands, file format categories.

UNIT VI

Internet concepts, Introduction to Internet, Hyper Text Mark-up Language, introduction to basic features and uses of Java, VB.

UNIT VII

Graphical concepts-II

Photo editing and Desktop publishing (application) software

Import and export of photo edited files, Objects in photo editing, fills, outlines, total text control, basic toolbox of photo editing software (like CorelDraw), color management tools, starting your page right.

Introduction to Flash

PRACTICAL KNOWLEDGE:

1. The internal assessment to be carried out through practicals and periodic tests on the mentioned topics.
2. The internal assessment to be in the form of term papers and practicals on above mentioned topics.

Text/Reference books:

Microsoft Office 2000- Leon Hard Woody, New Delhi, Prentice hall of India. Microsoft Office for Windows –Sagman India Addison Wesley, 1999.

Adobe Photoshop CS Classroom in a Book (Classroom in a Book) by Adobe Creative

Team (Paperback -

December 1, 2003).Fundamental Photoshop: A Complete Introduction by Adele Droblas- Greenberg.

SEMESTER II

DT17B2.1C DESIGN & DRAWING-II

Course Overview:

This course is intended to provide skills for designing a single use, small span and single-storey buildings.

Objectives of the Course:

To develop abilities in design in the context of user requirements.

Expected Skills / Knowledge Transferred: use of standards, handling of space, and application of knowledge gained from other subjects in design.

Course Contents:

The design issues to be addressed:

- Various functions and their spatial implications.
- Formulations of concept.
- Anthropometry and furniture layout
- Horizontal circulation
- Interior volumes and space articulation through different materials.
- Integration of form and function.

The list of suggested topics to be covered as design problems:

Balwadi, Kindergarten School, Primary Health Centre, Doctor's Clinic, small Cafeteria, Highway Restaurant, Village Post Office, Bank extension counter, Police Station, Architect's Office, Departmental Store, School Gymkhana and Youth Club etc. Necessary theoretical inputs to be given highlighting the norms and design issues. The topics not covered as design problems will have to be covered by the Studio faculty members through lecture/slide show sessions and site visits.

Course Contents:

Unit – I

Introduction to Sciagraphy:

Simple and composite forms, shadows on horizontal, vertical planes and on their own surfaces. Study of shade and shadows of simple geometrical solids of various forms and groups of forms.

Unit – II

Advanced Sciagraphy:

Shade and shadow techniques leading to advanced practical examples: shades and shadows on buildings or parts of buildings. Relative changes in building shades and shadows with sun angle, time, building height etc.

Unit – III

Perspective:

Characteristics of perspective drawings: perspectives of simple geometric solids and spaces and complex geometries. Advanced examples in one point or parallel perspective, two point or angular perspective, introduction to three point perspective.

Unit – IV

Introduction to Rendering:

Introduction to surfaces and media, observation, recording and basic representation techniques in different media through drawing pencil, pen, brush, charcoal, crayons etc

DT17B2.2C STRUCTURAL SYSTEMS

UNIT I

Introduction to built elements

Study of built elements in settlements with respect to materials used, basic construction methods and general specifications. General types & classifications of buildings; overview of different functional, structural and architectural elements.

UNIT II

Fundamentals of Structures

Introduction to basic structural systems, elements of structure, their functions & behaviour, beams, slabs, columns, walls, foundations, bearing wall systems, trusses, rigid frames, linear and curved elements; simply supported, cantilever and overhanging beams for various loads; effect of simple geometric forms on the overall structural behaviour.

UNIT III

Fundamentals of Forces

Primary and secondary forces acting on structures - dead loads, live load, wind, seismic forces, distribution of loads through the elements of the system.

Basic fundamentals in force systems, stresses and strains, temperature variation and resultant stresses, relation between E , N , and K ; relation between bending moment and shear force, BM and SF diagrams.

Moment of inertia and section modulus for various structural shapes. Theory of simple bending, Columns and struts, failure of columns, Arches.

UNIT IV

Materials and finishes

Structural properties of basic materials like masonry, timber, concrete and steel, bricks, stone, timber, steel, plastics, composites, sand and aggregates, cement, types of paints and varnishes, claddings, finishes; uses, advantages and disadvantages.

Scope of the subject is limited only to understanding/ appreciating applications of above concepts/ principles in:

Infrastructure - roads, kerbs, paving, medians/ traffic islands, drainage channels, pipes, culverts, bridges, street furniture, lampposts, distribution poles.

Buildings- structural and functional typologies such as high-rise, large span, cantilevers, basements and cellars, ramps and elevators.

Expected Outputs & Assignment

Students to make documentation of different built elements and their aspects mentioned above. Structural/ study models of different structures such as arches; truss etc. shall be made along with short notes on the same.

References:

Rowland J. Mainstone: Development of Structural Form
Rangwala: Engineering Materials

S. P. Bindra, S. P. Arora: Building Construction
B.C. Punmia: Strength of Materials vol – I

DT17B2.3C APPLIED PHYSICS

UNIT I

BONDING IN SOLIDS : Introduction - Types of bonding in solids - Estimation of cohesive energy – Madelung constant.

CRYSTAL STRUCTURES AND X-RAY DIFFRACTION: Introduction -Space lattice - Basis - Unit cell - Lattice parameter - Bravais lattices – Crystal systems - Structure and packing fractions of Simple cubic - Body centered cubic – Face centered cubic crystals - Directions and planes in crystals – Miller indices - Separation between successive [h k l] planes - Diffraction of X-rays by crystal planes - Bragg's law - Laue method - Powder method.

UNIT II

PRINCIPLES OF QUANTUM MECHANICS: Waves and particles - Planck's quantum theory – de Broglie hypothesis – Matter waves - Davisson and Germer experiment – G. P. Thomson experiment – Heisenberg uncertainty principle - Schrödinger's time independent wave equation - Physical significance of the wave function - Particle in one dimensional potential box.

UNIT III

ELECTRON THEORY OF METALS: Classical free electron theory - Mean free path - Relaxation time and drift velocity - Quantum free electron theory - Fermi-Dirac distribution (analytical) and its dependence on temperature – Fermi energy – Electron scattering and resistance.

BAND THEORY OF SOLIDS: Bloch theorem - Kronig-Penney model (qualitative treatment) - Origin of energy band formation in solids – Classification of materials into conductors, semi conductors & insulators - Concept of effective mass of an electron.

UNIT IV

DIELECTRIC PROPERTIES: Introduction - Dielectric constant - Electronic, ionic and orientational polarizations - Internal fields in solids – Clausius - Mossotti equation – Dielectrics in alternating fields – Frequency dependence of the polarizability - Ferro and Piezo electricity.

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

SEMICONDUCTORS : Introduction - Intrinsic semiconductor and carrier concentration – Equation for conductivity - Extrinsic semiconductor and carrier concentration - Drift and diffusion - Einstein's equation - Hall effect – Direct & indirect band gap semiconductors.

SUPERCONDUCTIVITY: General properties - Meissner effect - Penetration depth - Type I and Type II superconductors - Flux quantization – DC and AC Josephson effect –BCS Theory - Applications of superconductors.

UNIT VI

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.

UNIT VII

FIBER OPTICS AND HOLOGRAPHY: Introduction - Principle of optical fiber - Acceptance angle and acceptance cone - Numerical aperture – Types of optical fibers and refractive index profiles – Attenuation in optical fibers - Application of optical fibers – Basic principles of holography – Construction and reconstruction of image on hologram – Applications of holography.

UNIT VIII

SCIENCE & TECHNOLOGY OF NANOMATERIALS: Introduction to Nano materials - Basic principles of Nanoscience & Technology – Fabrication of nano materials – Physical & chemical properties of nanomaterials – Carbon nanotubes – Applications of nanotechnology.

TEXTBOOKS:

1. Applied Physics 2nd edition by Dr. P. Appala Naidu & Dr. M. Chandra Shekar, V.G.S. Book links.
2. Introduction to Solid State Physics by C. Kittel ; Wiley Eastern Ltd.
3. Nanotechnology by Mark Ratner and Daniel Ratner; Pearson Education.

REFERENCES:

1. Materials Science and Engineering by V. Raghavan; Prentice-Hall India.
2. Materials Science by M. Arumugam; Anuradha Agencies.
3. Solid State Physics by N.W. Ashcroft & N. David Merwin; Thomson Learning.
4. Materials Science by M.S.Vijaya & G. Rangarajan; Tata McGraw Hill.
5. Solid State Physics by P.K. Palanisamy; Scitech Publications (India) Pvt. Ltd.
6. Nano Materials by A.K. Bandyopadhyay, New Age International Publishers.
7. Applied Physics by P.K.Mittal; I.K. International.
8. Applied Physics by K. Vijay Kumar & T. Sreekanth; S. Chand & Company Ltd.

DT17B2.4C ADV. DATA STRUCTURES & ALGORITHMS

Unit I:-

C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

Unit II:-

Function Overloading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

Unit III:-

Algorithms, performance analysis-time complexity and space complexity,O-notation, Omega notation and Theta notation, Review of basic data structures - the list ADT, stack ADT, queue ADT, implementation using template classes in C++, sparse matrix representation.

Unit IV:-

Dictionaries, linear list representation, skip list representation, operations- insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing,extendible hashing, comparison of hashing and skip lists.

Unit V:-

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, Application-Heap Sort, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

Unit VI:-

Search trees (part I) : Binary search trees, definition, ADT, implementation, operations- searching, insertion and deletion, Balanced search trees- AVL trees, definition, height of an AVL tree, representation, operations-insertion, deletion and searching. Search trees (part II)

: Introduction to Red –Black trees and Splay Trees, B-Trees-B-Tree of order m, height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees.

Unit VII:-

Divide and Conquer- General method, applications – Binary search, merge sort, quick sort, Strassen's matrix multiplication Efficient non recursive tree traversal algorithms, Biconnected components. Disjoint set operations, union and find algorithms.

Unit VIII:-

Greedy method and Dynamic programming : General method (Greedy), Minimum cost spanning trees, Job sequencing with deadlines, General method (Dynamic Programming), Optimal binary search trees, 0/1 knapsack problem, Ordering Matrix Multiplications

TEXT BOOKS :

1. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education, second edition.
2. Data structures, Algorithms and Applications in C++,S.Sahni,University press (India) pvt ltd, 2nd edition, Orient Longman pvt.ltd.
3. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson.
4. Data Structures using C++, D.S. Malik, Thomson

REFERENCE:

1. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Seventh Edition Wiley student edition, John Wiley and Sons.
2. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson
3. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
4. C++, The Complete Reference, 4th Edition, Herbert Schildt, TMH.

PRACTICAL KNOWLEDGE:

Execution of simple c++ program.

Execution of programs on different data types and their sizes.

Execution of programs on different types of operators and statements.

Execution of programs on class concepts.

Execution of programs on creation of objects to the classes.

Execution of programs on different constructors.

Execution of programs on destructors.

Execution of programs on parameter passing methods.

Execution of programs on different types of functions.

Execution of programs on friend function.

Execution of programs on exception handling.

Execution of programs on function over loading.

Execution of programs on operator over loading.

Execution of programs on overriding.

Execution of programs on different types of inheritances.

Execution of programs on different types of polymorphisms.

Execution of programs on data abstraction.

Execution of programs on different types of ADT's.

Execution of programs on different types of lists.

Execution of programs on different types of stacks.

Execution of programs on different types of queues.

Execution of programs on AVL trees.

Execution of programs on red black trees.

Execution of programs on B trees and B+ trees.

Execution of programs on different hash functions and hash tables.

Execution of programs on splay trees.

Execution of programs on quick sort.

Execution of programs on merge sort.

Execution of programs on heap sort.

Execution of programs on different graph traversals

DT17B2.5C WORKSHOP (IT & DESIGN)

IT

Introduction to various components of the computer. Assembling and disassembling.

DESIGN

Course Overview:

The course provides the foundation and capability to represent the concepts three dimensionally.

Objectives of the Course:

To introduce various fabrication skills and techniques necessary to produce scale-models and to encourage preparation of models as an essential phase in design development and evaluation. Expected Skills / Knowledge Transferred: Dexterity; Knowledge of materials and their properties; craft skills; visualization skills; Course Contents:

Unit – I

Introduction to model-making: Need; role of scale-models in design; general practices; Digital models.

Unit – II

Essentials of model-making: understanding of various tools and machines employed, best practices involved in operating the tools and the techniques.

Unit –III

Survey of various materials available for model making such as papers, boards, wood, plastics, films, plaster of paris, acrylic, Styrofoam, wax, metals, glass etc. and exploring their potential in model-making.

Unit IV

Techniques of Scale-modeling: Use of different scales; templates; measuring aids; conventions followed.

Unit –V

Techniques for preparation of presentation models, mock-ups, simulation of various materials and textures such as wood, glass, aluminium, steel, bricks, roofing tiles, flooring, corrugated sheets, upholsteries etc.

Unit -VI

Techniques for preparation of clay models and presentation.

Unit-VII

Set and stage designing and models.

BT17B2.1C : MATHEMATICAL METHODS

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.

UNITII:

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 DifferencesBackward 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- AdamsMoulton 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.

Text/Reference books:

Mathematical Methods, T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company. Mathematical Methods, C. Sankaraiah, V. G. S. Book Links A text Book of Engineering Mathematics, B. V. Raman, Tata Mc Graw Hill. Numerical Methods for Scientific and Engineering Computation, M. K. Jain, S. R. K. Iyengar & R. K. Jain, New Age International Publishers.

GN17B2.1A COMMUNICATION SKILLS

Course Overview: To prepare students to acquire understanding and fluency in English for professional work

Objectives of the Course: To provide an adequate mastery of technical and communicative English Language training primarily, reading and writing skills, and also listening and speaking skills.

Expected Skills / Knowledge Transferred: To prepare students for participation in seminars, group discussions, paper presentation and general personal interaction at the professional level.

Unit I: Communication: Importance of Communication; Elements of good individual communication; organizing oneself; different types of communication; Barriers in the path of Communication

Unit II: Listening skills: Listening to conversation and speeches (Formal and Informal)

Reading: Techniques of reading, skimming, Scanning, SQ3R technique

Unit III: Creative Writing: Scope of creative writing; Writing skills Signposting, Outlines, Rephrasing

Writing a report/ format of the report; Paragraph, Letter Writing, Essay writing, Memo, Circular, Notice, Cover Letter, Resume, Writing with a thesis, Summary, Précis, Product description – Description of projects and features

Oral Report; Periodical Report; Progress Report; Field Report

Preparation of minutes; Video conference; Tele conference / Virtual meeting

Unit IV: Speaking: How to converse with people, How to communicate effectively; Language and grammar skills; Pronunciation drills, Phonetics, vowels, Diphthongs, consonants, Stress, Rhythm and intonation, Conversational skills

Features of effective speech- practice in speaking fluently –role play – telephone skills – etiquette.

Short Extempore speeches – facing audience – paper presentation – getting over nervousness – Interview techniques – preparing for interviews – Mock Interview – Body Language.

Unit V: Impact of internet on communication; communication through computers; voice mail; broadcast messages; e-mail auto response; etc.

Reference books:

1. **Krishna Mohan &Meera Banerji:** Developing Communication Skills Macmillan India
2. **C S Rayudu:** Principles of Public Relations, Himalaya Publishing House
3. **K. Ashwathappa:** Organizational Behavior, Himalaya PublishingHouse
4. **Daniel Colman:** Emotional Intelligence,

GN17B2.2A VALUE EDUCATION

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 ValuesNCRT –Campus Sri Aurobindo Marg., New Delhi
5. **Swami Vivekananda.,** Education., Sri Ramakrishna Math., Chennai-4(1957)
6. Holy Books of all religions