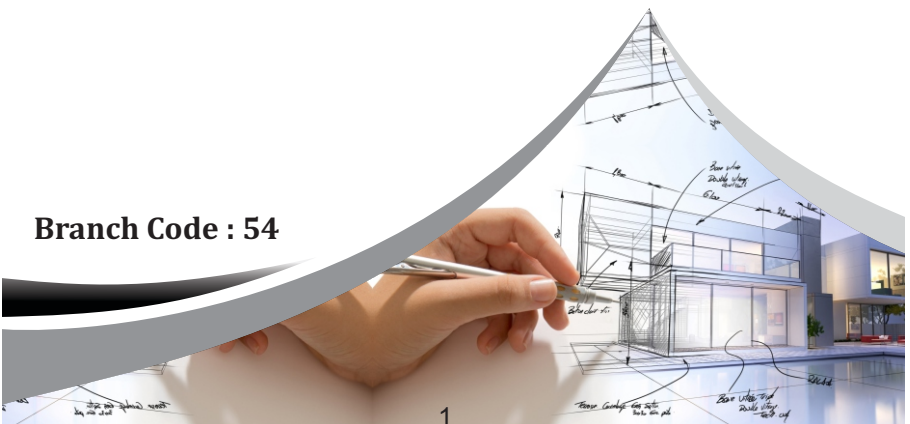


**(EVALUATION SCHEME)
I & II SEMESTER**

**“DIPLOMA
IN
ARCHITECTURE”**

Branch Code : 54





UTTARAKHAND BOARD OF TECHNICAL EDUCATION
INSTITUTE OF RESEARCH DEVELOPMENT & TRAINING
(STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME)



BRANCH NAME: DIPLOMA IN ARCHITECTURE

SEMESTER – I

BRANCH CODE: 54

w.e.f. 2024-25

Course Code	Course Title	TH	T	P	T O T	EVALUATION SCHEME						Total Marks	Total Credit
						Internal Assessment		External Assessment					
						Theory	Practical	Theory		Practical			
						Max Marks	Max Marks	Max Marks	Duration in Hrs.	Max Marks	Duration in Hrs.		
Periods Per Week													
541001	Architectural Drawing & Rendering	3	-	5	8	25	25	100	3:00	50	3:00	200	5
541002	History of Architecture-I	4	-	-	4	50	-	50	2:30	-	-	100	4
991001	English and communication Skills-I	3	1	2	6	20	30	50	2:30	50	3:00	150	3
991002	Applied Mathematics-I	3	2	-	5	50	-	100	2:30	-	-	150	4
991005	Computer Fundamentals	2	-	3	5	10	10	50	2:30	30	3:00	100	3
991006	Engineering Graphics-I	8	-	-	8	50	-	100	3:00	-	-	150	4
991007	General Workshop Practice-I	-	-	8	8	-	50	-	-	50	3:00	100	4
991051	General Proficiency#	-	-	4	4	-	25	-	-	-	-	25	1
991052	Industrial Exposure (Assessment at Inst. Level)+	-	-	-	-	-	25	-	-	-	-	25	-
	TOTAL	23	3	22	48	205	165	450	-	180	-	1000	28



UTTARAKHAND BOARD OF TECHNICAL EDUCATION
INSTITUTE OF RESEARCH DEVELOPMENT & TRAINING
(STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME)



BRANCH NAME: DIPLOMA IN ARCHITECTURE

SEMESTER – II

BRANCH CODE: 54

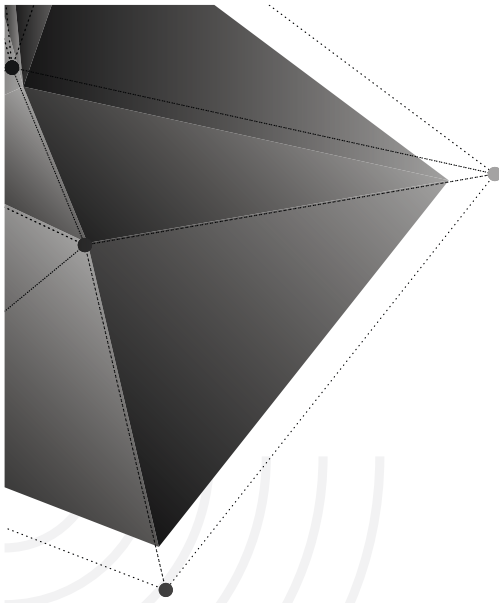
w.e.f. 2024-25

Course Code	Course Title	TH	T	P	T O T	EVALUATION SCHEME						Total Marks	Total Credit
						Internal Assessment		External Assessment					
						Theory	Practical	Theory		Practical			
						Max Marks	Max Marks	Max Marks	Duration in Hrs.	Max Marks	Duration in Hrs.		
Periods Per Week													
542001	Architectural Design-I	2	-	8	10	-	50	100	6:00	50	3:00	200	6
542003	Building Construction -I	1	-	4	5	25	25	50	2:30	50	3:00	150	3
542004	Software Application in Architecture-I	-	-	10	10	-	50	-	-	50	3:00	100	5
542002	History of Architecture-II	4	-	-	4	50	-	50	2:30	-	-	100	4
542005	Surveying	3	-	4	7	25	25	50	2:30	50	3:00	150	5
992002	Applied Mathematics-II	3	2	-	5	50	-	100	2:30	-	-	150	4
992005	Environmental Science & Energy management	3	-	-	3	20	-	80	2:30	-	-	100	2
992051	General Proficiency#	-	-	4	4	-	25	-	-	-	-	25	1
992052	Industrial Exposure (Assessment at Inst. Level)+	-	-	-	-	-	25	-	-	-	-	25	-
	TOTAL	16	2	30	48	170	200	430	-	200	-	1000	30

- # General Proficiency will comprise of various co-curricular activities like games, hobby clubs, seminars, declamation contests, extension lectures, NCC, NSS, cultural activities and discipline etc.
- + Industrial visit compulsory at minimum 2 industries or department.
- + In each session atleast one out of station study tour / visit at architectural relevant places is compulsory.

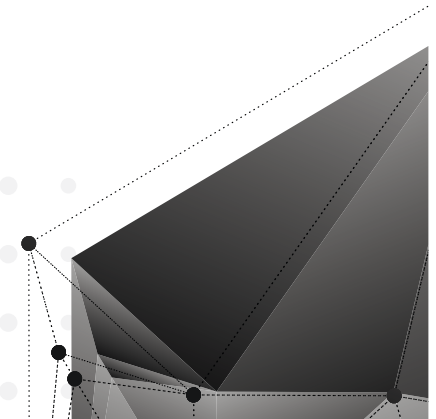
Note :-

1. Each period will be of 50 minutes.
2. Each session will be of 16 weeks.
3. Effective teaching will be at least 12.5 week



**FIRST SEMESTER
(Detailed Syllabus)**

'DIPLOMA IN ARCHITECTURE'



ARCHITECTURAL DRAWING & RENDERING

Course Code:	541001
Course Title	Architectural Drawing & Rendering
No. of Credits	5 (TH:3,T:0,P:5)

RATIONALE

Through this subject student will learn the graphical art of communication which is used among all artisan working in construction industry. Introducing the student to free-hand drawing of object/ building, with the help of site visits, they are able to express their ideas through free-hand sketches. Developing visual literacy and basic expressional skills that involve the ability to perceive, abstract and create as a process of the design of objects and spaces. Knowledge of anthropometry, color schemes & compositions helps the student to instill life into their drawings/sketches.

DETAILED CONTENTS

UNIT-1

1. Introduction To Design (Form, Space and Order)

(8 periods)

- Introduction to Design Principles and Elements of Design
No of sheets – min. 03

2. Introduction To Anthropometry (8 Periods)

- Understanding and sensitivity about human proportions with space.

- Identify basic activities for the assigned body posture and enact them. Draft in sketch form. (Sleeping, Standing, Sitting, Walking, Cooking, Bathing etc.) (Medium- Water color on waterman sheet)

No of sheets – min. 02

3. Freehand Drawing/Sketching (10 Periods)

Orientation exercise in different medium (pencil/ink/ water color/pastels etc.) should be given.

- Free hand drawing appropriate architectural representation, indoor & outdoor sketching like trees, Humans, vehicle, building inside and outside, natural environment and furniture.(sketchbook can be used)
- Basic drawing and rendering techniques to depict various material or finish or texture representation (scribbling/shading/hatching/doodling etc.)

(Medium- Pencil & Ink)

No of sheets-min. 02

4. Color Fundamentals (6 Periods)

- Perception of color and light
- hue, value, intensity, tint and shade
- Theory of color and Color wheel showing primary, secondary and tertiary colors.
- Color schemes and its effect.

(Medium-color on Cansan sheet) No. of sheets-min. 02

5. Rendering (8 Periods)

Rendering techniques in color & ink, in order to

develop the skills of presentation and to visualize forms in space.

- The drawing of any sketch to be given, to render in color, pencil and ink with emphasis on shades and shadows in same size or after enlarging / reducing.
- Principal of composition, Line composition, Arrangement of geometrical forms within the given space or area; to be finished in various colors or tints of a color. No of sheets- min. 05

6. Perspective (8 Periods)

(Interior-Exterior building block / Streetscape)

- One Point Perspective
- Two Point Perspective No. of sheets- min.-02

7. Graphic Presentation (8 Periods)

- Plan, Section, Elevation of Solid forms involving Cube, Prism, Pyramid, Cone, Cylinder, Sphere, Polygons
No. of sheets- min.-02

UNIT - 2

8. Model Making (4 Periods)

- Cube formation using various material Thermoaccol, Card- board, Form, Wax, POP etc.

9. Development of Surfaces (4 Periods)

- Cube formation

- Ivory sheet, Sun board
- ❖ Models of solid forms
 - Prism, Pyramid, Cylinder, Cone

INSTRUCTIONAL STRATEGY –

- **External exam paper will be set from UNIT-1 only.**
- Student should be encouraged to draw minimum of 2 sketches in their sketch book from the surroundings on every calendar day.
- They should be encouraged to make sculptures to understand the 3-D forms and the Scale of objects with reference to humans and the buildings.
- This is a practical oriented subject. Teacher should arrange visits to some of Model rooms of important buildings. Each student should be given independent exercises to make models.

Model Exercises of Art: (For Unit-2)

Should be given on

- Collage Making
- Architectural Theme based Art Work
- Murals by using various materials
- Making of Illusions
- Making of sculptures

ARCHITECTURAL DRAWING:

- A1 size inked / rendered drawings

RECOMMENDED BOOKS

1. Engineering Drawing by N.D. Bhatt; Publisher Charotar Publishing House Pvt. Ltd., New Delhi
2. Architecture: Form, Space and Order by D.K. Ching
3. Griffin, A.W. and Brunnicardi, V.A., “Introduction to Architectural Presentation Graphics”, Prentice Hall.
4. Building Construction by Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
5. Martin, L. C. (1970). Architectural Graphics. 2nd Ed. Macmillan Pub Co.
6. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera Published by Mac Graw Hill, New Delhi
7. Rendering with Pencil and Ink by Gill Robert W., Published by Thomas and Hudson, New Delhi
8. Architects Data by NeufferD, Published by Oxford BSP Professional Books, New Delhi

HISTORY OF ARCHITECTURE-I

Course Code:	541002
Course Title	History of Architecture - I
No. of Credits	4 (TH:4,T:0,P:0)

RATIONALE

Studying architectural history enriches our understanding of the past, informs the present, and inspires the future. It will help students to understand elementary concept of civilization, used skill, material, technology and built form; Historical context of building forms, significance of sacred & secular spaces.

DETAILED CONTENTS

Unit -1 : World History of Architecture

The study of architectural development with special emphasis on the concept of form and structure.

1. Prehistoric Shelters (8 periods)

Evolutionary stages of man.

- Early settlements and evolution of Settlement patterns
- Life in a pre-historic period

2. Egyptian Architecture (8 periods)

Society

- Prominent structures/ buildings/ architectural style

- Materials used for buildings and construction method
- Script/ Decorations/ Ornamentations

3. Mesopotamian Civilization (8 periods)

Society

- Prominent structures/ buildings/ architectural style
- Materials used for buildings and construction method
- Script/ Decorations/ Ornamentations
- Code of Hammurabi

4. Greek Architecture (8 periods)

Prominent structures/ buildings/ architectural style

- Materials used for buildings and construction method
- Script/ Decorations/ Ornamentations

5. Roman Architecture (8 periods)

Prominent structures/ buildings/ architectural style

- Materials used for buildings and construction method
- Script/ Decorations/ Ornamentations

Unit - 2 : Bharat/indian History of Architecture

The study of Indian Architecture with special emphasis on the concept of form and structure including Buddhist, Hindu and Jain period.

1. Indus Valley Civilization (8 periods)

Geographical and Climatic conditions

- Society

- Construction material and methods
- Town planning and drainage

2. Evolution of Temple Architecture (8 periods)

General characteristics, Planning, Motifs treatment of different parts, construction methods, and materials

- Evolution of temple and its various parts
CHALUKYAN STYLE (Southern style)- Sun temple at Modhera
- Study of Sri Kedarnath temple, Sri Badrinath temple

3. Jain And Buddhist Architecture (8 periods)

General characteristics, Planning, Motifs treatment of different parts, construction methods, and materials and ornamentation.(Dilwara temple at Mount abu, Ranakpur temple, Sanchi stupa at MP)

NOTE:

History of Architecture is to be taught with a view to understanding how different Architectural solutions were evolved (In successive historical periods) within the restraints imposed by prevalent social and religious customs, available building materials, complex structural problems and the limited technology available at the time.

SUGGESTED BOOKS :

1. History of Architecture : Settings and Ritual by Kostof, Spiro, Oxford Press, N.Y.,1995
2. The Bronze Age, Past and Present, Childe, Gordon, Penguin, 1942 (reprints thereafter)
3. The Birth of Civilization in the Near East, Frankfort, Henri, Williams and Norgate,1951
4. Ancient Egypt, Casson, Lionel, (ed.), Time Life Books, Amsterdam, 1987
5. The Wonder that was India., Basham, A.L., Penguin, Delhi, 1992
6. Hindu Art & Architecture, Michell, George, Thames & Hudson, 2007

ENGLISH & COMMUNICATION SKILLS –I

Course Code:	991001
Course Title	English and Communication Skills –I
No. of Credits	3 (TH:3,T:1,P:2)

COURSE OUTCOME

After completing this course, the learner will be able to acquire all the five areas of language learning –listening, speaking, reading, writing. While reading and writing skills are parts of theory component, listening and speaking skills will be transmitted through lessons in the practical component. Understanding skills, on the other hand, shall be gained both in theory and practical sessions .

Learning objectives in different areas are defined as follows:

DETAILED CONTENTS

I - Reading Skills:

After completing this course, the learner will be able to read and comprehend texts from simple to moderate levels of difficulty.

II - Writing Skills:

After completing this course, the learner will be able to

- Write simple to moderately complex sentences.
- Develop a simple idea into a short paragraph.
- Write business and personal letters at a functional level.

- Write specific formats like circulars, notices, press release. memo, agenda and minutes, e-mail, resume.

III - Listening Skills:

After completing this course, the learner will be able to listen and understand

- The spoken communication of fellow workers.
- News broadcast on TV and Radio.
- Lectures available on the internet.
- Films and shows in theatres and on TV.

IV - Speaking Skills:

After completing this course, the learners will be able to communicate ideas with moderate fluency of speech to their fellow-listeners, using moderately correct speech forms and pronunciation so as to be understandable to a mixed English-speaking audience.

V - Understanding Skills:

After completing this course, the learners will be able to interpret the common and technical conversation in the language.

Methodology of Revision

Among the five skills listed in the Objectives of the Course, the two skills of Listening and Speaking will be part of practical classes, and will also be tested through Practical Examination. The two skills of Reading and Writing are

exclusively the theoretical part of the Course. The fifth skill of Communication has both theoretical and practical components.

All the five skills are to be taught in both the Semesters. The basics of each component will be covered in Semester I, and relatively advanced topics to be covered in Semester II.

THEORY

Total Marks 40%

- 1. Literature:** Prose Reading of newspapers, magazines and similar writings is almost a day-to-day requirement for any educated person. To train the learner in reading simple prose texts, we offer a selection of six essays by eminent authors. These essays are chosen both for their content and style. Three of the essayists are from modern India. The content has a contemporary relevance. The style is simple and engaging, and diction is of an average difficulty level. Suggested authors are: Vivekananda, Gandhi . Among the English authors, we have chosen simple and short essays. Suggested essays are: Booker T. Washington-“My Struggle for an Education; Oliver Goldsmith - “The Man in Black”; Stevenson- “A Night Among the Pines”.
- 2. Unseen Comprehension Passage.** Preferably, from popular newspapers and magazines.

Language and Writing Skills : Basics Total Marks: 30%

A. Semester I - Language and Writing Skills: Basics

1. Parts of Speech
 - a) Noun

- b) Pronoun
 - c) Verb
 - d) Adjective
 - e) Adverb
 - f) Preposition, Articles
 - g) Conjunction
 - h) Interjection
2. Tenses
 3. Translation of a simple passage from Hindi to English
 4. Paragraph Writing: Expanding a simple idea into a paragraph.
 5. Letter Writing:
 - a) Business Letters
 - b) Personal Letters
 6. Vocabulary:
 - a) Synonyms
 - b) Antonyms
 - c) Homophones
 - d) One word substitution

III. Communication Skills Total Marks: 30%

A. Semester I - Basics

Foundations of Communication Skills

- a) Importance of Communication
- b) Communication as a Process
- c) Methods of Communication: Verbal and Nonverbal
- d) Channels of Communication: Formal and Informal

ECS SYLLABUS
SEMESTER - I (THEORY)

I. Reading Skills: (18 Periods)

A. Literature: Prose

1. Vivekananda :Hinduism (1893 Chicago)
2. Gandhi : On Education (From Hind Swaraj)
3. Oliver Goldsmith - “The Man in Black”
4. R L Stevenson - “A Night Among the Pines””
5. Booker T. Washington-“My Struggle for an Education”

B. Unseen Comprehension Passage. Preferably from popular newspapers and magazines.

II. Writing Skills: (15 Periods)

Language

1. Parts of Speech
 - a) Noun
 - b) Pronoun
 - c) verb
 - d) Adjective
 - e) Adverb
 - f) Preposition, Articles
 - g) Conjunction
 - e) Interjection
2. Tenses
3. Translation of a simple passage from Hindi to English

4. Paragraph Writing: Expanding a simple idea into a paragraph.
5. Letter Writing:
 - a) Business Letters
 - b) Personal Letters
6. Vocabulary:
 - a) Synonyms
 - b) Antonyms
 - c) Homophones
 - d) One word substitution

III. Communication Skills

(15 Periods)

- a) Importance of Communication
- b) Communication as a Process
- c) Methods of Communication: Verbal and Nonverbal
- d) Channels of Communication: Formal and Informal

SEMESTER - I (PRACTICALS)

(Listening, Speaking and Communication Skills)

I. Phonetics

A. Introduction

B. Basic Sounds of English

1. Vowels and Consonants
2. Phonetic Transcription
3. Rules of Pronunciation
4. Problem Sounds

C. Syllables

D. Word Stress

II. Conversation: Basic Communication

A. Starting a Conversation

1. Greetings
2. Introducing Oneself
3. Introducing Others
4. Leave Taking
5. Thanking, Wishing Well

B. Conversation in a Context

1. Offering - Responding to Offers
2. Requesting - Responding to Requests
3. Congratulating
4. Expressing Sympathy and Condolences
5. Expressing Disappointments
6. Asking Questions - Polite Responses
7. Apologising - Forgiving
8. Complaining
9. Persuading
10. Warning
11. Asking for and Giving Information
12. Giving Instructions
13. Getting and Giving Permission
14. Asking for and Giving Opinion

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted (%)
1	18	40
2	15	30
3	15	30
Total	48	100

Reference/text Book

1. Developing Communication Skills By Krishna Mohan & Meera Banerjee (Trinity Press, New Delhi)
2. Communication Skills By Sanjay Kumar And Pusph Lata (Oxford Univ Press, New Delhi).
3. Wren & Martin High School English Grammar & Composition (S. Chand, New Delhi).
4. English & Communication Skills-1 By Vinit Kumar (Book World, Dehradun)
5. Communication Effectively In English, Book-1 By Revathi Srinivas, Abhisekh Publications, Chandigarh.
6. High School English Grammer And Composition By Wren & martin, S. chand Publication & Company Ltd. Delhi.
7. Communication Technics And Skill By R.K. Chadha; Dhanpat Rai Publications, New Delhi.

APPLIED MATHEMATICS - I

Course Code:	991002
Course Title	Applied Mathematics - I
No. of Credits	4 (TH:3,T:2,P:0)

1. RATIONALE

Mathematics is the core course to develop the competencies of most of the technological courses. The subject Applied Mathematics is being introduced into the diploma course to provide mathematical background to the students so that they can be able to grasp the engineering subjects properly. Applied Mathematics is widely used in every engineering fields. Mathematics is more than too for solving problems; mathematics course can develop intellectual maturity. This course is an attempt to initiate the multi-dimensional logical thinking and reasoning capabilities. It will help to apply the principles of basic mathematics to solve related technology problems. Hence, the course provides the insight to analyze engineering problems scientifically using determinants, matrices, trigonometry, complex number, Derivatives & application of derivatives.

2. COURSE OUTCOMES

The theory practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- a. Apply the concepts of algebra to solve engineering related problems.

- b. Utilize basic concepts of trigonometry to solve elementary engineering problems.
- c. Solve the problems based on limit & derivatives.
- d. Use basic concepts of Set theory to solve engineering related problems.

3. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop LOs in cognitive domain for achieving the COs to attain the identified competency.

Unit – I (Algebra) (25 Periods)

- 1.1 Value of ${}^n P_r$ & ${}^n C_r$ (Without proof), Binomial theorem- (without proof) for positive integral index (expansion, general term, middle term) and for any index (expansion).
- 1.2 Partial fractions- (linear factors, repeated linear factors, non reducible quadratic factors only).
- 1.3 Determinants-Definition, Properties of determinants, Expansion of determinants (of order 2 and 3), Solution of simultaneous equations using Cramer's rule (in 2 and 3 unknowns).
- 1.4 Matrices- Definition of matrix, addition, subtraction, multiplication of matrices (upto 3 order), singular and non singular matrices, Adjoint of a matrix, Inverse of a matrix by adjoint method (up to 3x 3 only).
- 1.5 Sets: Sets and their representation, Empty set, finite and infinite sets, equal sets, subsets, power set, universal set, operation on sets, complement of set.

Unit – II (Trigonometry)

(15 Periods)

- 1.1 Review of ratios of some standard angles (0,30,45,60,90 degrees), T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T-Ratios of multiple angles, sub-multiple angles ($2A$, $3A$, $A/2$).

Unit - III (Complex Number)

(10 Periods)

- 1.1 Definition of complex numbers, Real and imaginary parts, Polar and Cartesian form and their conversion, Conjugate, Modulus and argument of a complex number, Addition, Subtraction, multiplication, division of complex numbers.
- 1.2 De-Moiver's Theorem (statement only) related simple problems, n th root of unity.

Unit – IV (Differential Calculus)

(30 Periods)

- 1.1 Function: Definitions of variables, constants, open & closed intervals.
- 1.2 Definitions & types of functions-simple examples.
- 1.3 Concept & definition of Limit.
- 1.4 Standard limits of algebraic, trigonometric, exponential & logarithmic functions- simple problems. Examine the Continuity of a function at any point (simple problem only).
- 1.5 Differentiation by (first principal) or by definition of differentiation x^n , $\sin x$, $\cos x$, $\tan x$, e^x , $\log_a x$ only .

1.6 Differentiation of sum, product and quotient of functions. Differentiation of function of a function.

1.7 Differentiation of trigonometric inverse functions. Logarithmic differentiation. Exponential differentiation, Successive differentiation (up to third term only).

1.8 Application

(a) Maxima and minima

(b) Equation of tangent and normal to a curve (for explicit functions only)

(c) L' Hospital rule for solving in determinates form $(\frac{0}{0}, \frac{\infty}{\infty})$

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted (%)
1	25	30
2	15	20
3	10	15
4	30	35
Total	80	100

Reference Book/Text Book

1. Higher Algebra By Hall & Knight
2. Plane Trigonometry By S.L. Loney
3. Engineering Mathematics By Sastry (Phi Learning)
4. Engineering Mathematics By B.S. Grewal (Khanna Publishers)
5. Engineering Mathematics By A.B. Mathur (Khanna Publishers)

6. Applied Mathematics-I & II, By M.K. Kanyal (Khanna Publishers, New Delhi)
7. Applied Mathematics-I, By Dr A.K. Sinha, Satyaprakashan, New Delhi
8. Engineering Mathematics, By C.B. Gupta, S.R. Singh, Mukesh Kumar, Mc Graw Hill Education.
9. Applied Mathematics By R.D. Sharma, Dhanpat Rai Publications, New Delhi
10. Engineering Mathematics, Vol-I & II, By S.S. Sabrwal And Sunita Jain, Eagle Prakashan, Jalandher
11. Basic Engineering Mathematics, By Jhon Bird, Newnes Publications.
12. A Text Book Of Engineering Mathematics, By A. Ganesh, G. Balasubramnium.
13. Polytechnic Mathematics, By Dr. D.S. Prakash, S. Chand, Publications, New Delhi.
14. A Text Book Of Engineering Mathematics, By N.P. Bali & Dr. Manish Goyal, Kindly Publication.
15. Engineering Mathematics, By C.B. Guta, S.R. Singh & Mukesh Kumar, Mc Graw-Hill Publications, Delhi
16. Applied Mathematics, By Kapoor, Nav Distributor, Meerut.

COMPUTER FUNDAMENTALS

Course Code:	991005
Course Title	Computer Fundamentals
No. of Credits	3 (TH:2,T:0,P:3)

Aim:

- To understand basics of Computer.
- To Learn various application software's
- To Learn Usage of Computer System in various Domains

Objective:

- Students will be able to understand a computer system that has hardware and software components, which controls and makes them useful.
- Students will be able to understand the operating system as the interface to the computer system and basic functions of an operating system.
- Students will be able to Set the parameter required for effective use of hardware combined with application software's
- Students will be able to Use file mangers, word processors, spreadsheets, presentation software
- Students will be able to use Internet to send mail and surf the World Wide Web.

Unit -1 Computer Introduction (06 Periods)

Introduction about the Data and information, Data Processing definition of computer, Block diagram of

Computer System, Components of Computer, Classification of Computer (Analog and Digital), Computer Generation, Characteristics and Applications of Computer, Input and Output Devices, Printer -Inkjet & Laser Printer, Memory-Primary Memory (RAM, ROM, PROM, EPROM EEPROM & UVEPROM, Secondary Memory Devices (Hard Disk, Optical Disk, PEN Drive, OTG, Magnetic Tape) and Memory Tree, CPU Types, Level of Programming Languages, Overview of Instruction, Program, System Software and Application Software.

Unit - 2: Number System (06 Periods)

Binary, BCD, Grey Code, 3 Excess Code, Octal, Decimal, Hexadecimal Number System, Conversion of Numbers-Decimal to Binary, Decimal to Octal, Decimal to Hexadecimal, Binary to Octal, Binary to Hexadecimal, Octal to Hexadecimal, Hexadecimal to Octal, Floating Point Numbers, Addition and Subtraction of Binary Numbers.

Unit - 3 : Operating System (04 Periods)

Operating System- Definition, Goals and Responsibilities, Window based Operating System, Open Source based Operating System, Single User and Multiuser Operating System, Multi Programming and Real Time Operating System, GUI V/s CUI, Commands of MS DOS (Create, Read, Edit, Display, Copy, Move, Rename and Delete Operations on Files and Directory).

Unit -4 Networks & Internet (04 Periods)

Definition of Network, LAN, MAN, WAN, Network

Devices, Tools and cables (Switch, Router, Modem, RJ45, CAT Cable, OFC, LAN Tester, Crimping Tool) Network Topology, Protocols (HTTP, URL, FTP), Internet, ISP, Web Browser and web server, Email, www, Search Engine.

Unit – 5 : Office Application (08 Periods)

Word- Create, Open, Save, Update Files, Word Art, Clip Art, Insert Images, Header & Footer, Table (Insert, Merge, Split Cells, Border & Shading), Page Layout, Page Setup-Margin, Orientation, Page Background- Watermark, Page Border, Paragraph-Indent, Spacing and Text Alignment, Text Formatting- Text Alignment, Sorting, Find & Replacement, Bullet & Numbering.

Excel- Worksheet, Formatting Cells, Insert Data Patterns Instantly, Format Painter, Hide Rows & Columns, Charts in Excel, Border & Shading, Sort & Filter, Find & Replace, Page Preview & Printing, Formulas, Calculation Sheet, Copy Formula OR Data Between Worksheets, Header & Footer.

PowerPoint – Create Slide, Design Patterns, Animation & Effects in slides, Slide Show.

UNIT - 6 : Role Of IT (04 Periods)

Information Technology- Information, Scope and role of Information Technology, Overview of Cyber Laws & IT Act, Ecommerce, e-Governance, National Informatics Centre, Payment Gateway, Overview of Net-Banking-NEFT & RTGS, Mobile Banking (SBI Buddy, RuPay, UPI,

BHIM, e-Wallet), Introduction of Geographic Information System, Uses of GIS in Engineering, Optical Codes (MICR, OMR, Barcode, QR Code), Impact of computer on society, Applications of IT.

List of Practical's:

1. Working with Windows Latest Version- desktop, start icon, taskbar, Recycle Bin, My Computer and Control panel.
2. Exercise on Printing, Installing a printer driver, Setting up a printer , Default and installed printers, Controlling print queues, Viewing installed fonts, The clipboard and drag and drop.
3. Exercise on Text Formatting in Word document with Paragraph formatting, Bullets, page border and numbering, creating and using macros in a document.
4. Exercise on Page formatting, Page margins, Page size and orientation, Page breaks, Headers and Footers, Introducing tables- Rows and Columns.
5. Exercise on Development of application using mail merge, Mail merging addresses for envelopes and letter, printing addressed envelope and letter.
6. Formatting and customizing data, Formulas, functions and named ranges, creating, manipulating & changing the chart type in Spreadsheet.
7. Exercise on Preparing Presentation Slides- Opening and saving a presentation, Inserting Images, Slide show

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted (%)
1	06	20
2	06	15
3	04	15
4	04	15
5	08	20
6	04	15
Total	32	100

Reference/Text Book

1. Computer Fundamentals By P.k. Sinha (Bpb Publications, New Delhi)
2. Computer Fundamentals By Anita Goel (Pearson Education, New Delhi)
3. Computer Fundamental 5th Edition By P.K. Sinha, Wadsworth, Inc
4. Fundamentals Of Computer By V. Rajaraman, Phi Publication.
5. Fundamental Problems In Computing 5th By D.J. Rosencrantz Springer.
6. Libre Office- The Documentation Foundation By Ron Faile, Jeremy Cartwright, Hal Parker.
7. Microsoft Office 2010 Course Pb (Hindi) Arti Rathore, Bpb Publication.
8. English Communication Skills, By R.K. Tyagi, Nav Distributor, Meerut.

ENGINEERING GRAPHICS-I

Course Code:	991006
Course Title	Engineering Graphics - I
No. of Credits	4 (TH:8,T:0,P:0)

RATIONALE

Engineering Graphics is said to be the language of engineers and technicians. Reading and interpreting engineering graphics is their day-to-day responsibility. The course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering graphics, their reading and interpretation. The emphasis while imparting instructions should be to develop conceptual skills in the students.

Note:

1. First angle projection is to be followed
2. Instruction relevant to various graphics may be given along with appropriate demonstration, before assigning graphic practice to the students
3. S.P. 46.1988 should be followed
4. Minimum of 15 sheets to be prepared by each student

DETAILED CONTENTS

Unit 1. Drawing Office Practice, Lines and Lettering (2 Sheets) (06 Periods)

Graphics instruments and their uses, Sizes and layout of standard graphic sheets and graphic boards, Different types

of lines in engineering graphics as per BIS specifications
Free hand lettering (alphabet and numerals) lower case and upper case, single stroke vertical and inclined at different standard series of 2.5, 3, 5, 7, 10, and 15 mm heights.

Unit 2: Dimensioning (2 Sheets) (06 Periods)

Necessity of dimensioning, Types of dimensioning (chain, parallel and progressive dimensioning) size and location dimensioning Methods of placing dimensioning (Aligned and unidirectional system), use of leader lines. General principles of dimensioning, Dimensioning of overall sizes, circles, thread holes, chamfered surfaces, angles, tapered surface holes equally spaced on PCD, counter sunk hole counter bored holes, cylindrical parts, narrow space and gaps, radii, curves and arches

Unit 3: Geometrical Constructions (4 Sheets) (12 Periods)

Simple geometrical Constructions; Constructions of regular polygons (triangle, square, pentagon, hexagon) and circle, Ellipses (concentric circle method and Intersecting Arcs method ,Directrix and focus method), Parabola (rectangle and tangent method, Directrix and focus method) Hyperbola (Directrix and focus method, Transverse axis and focus method), Cycloids, Epicycloids, Hypocycloids, involutes of regular polygons and circles , Helix: (conical, parallel, Spiral).

Unit 4: Scale (2 sheets) (12 Periods)

Scale – their need and importance, Definition of

representative fraction (R.F), find RF of given scale ,
Construction of plain and diagonal scales

Unit 5: Principle of Projections (6 sheets) (15 Periods)

Principle of orthographic projection and introduction to first angle projection and third angle projection, Projection of points situated in different quadrants, Projection of lines, Lines inclined to one plane and parallel to the other and vice versa (all quadrants); Line inclined to both reference planes (HP and VP) and limited to both ends in same quadrant. Projection of Planes (triangular, square, rectangular, pentagonal, hexagonal and circular) ,Planes perpendicular to one reference plane and parallel to other, planes inclined to one reference plane and perpendicular to other or vice versa (1st & 3rd quadrants), Projection of solids, such as Prism, Pyramid (triangular, square, rectangular, pentagonal hexagonal), Cone, Cube, Cylinder Tetrahedron, Frustum with axis perpendicular to one reference plane and axis inclined to one reference plane and parallel to other reference plane. Orthographic views of given pictorial views (1st and 3rd angle)

Unit 6. Isometric Projections (2 sheets) (15 Periods)

Fundamentals of Isometric projections/views (Theoretical instructions) and Isometric Scales , Isometric views/projections of different types of planes, Isometric views/projections of different types of solids , Isometric views/projections of combination of regular solids like cylinder, cone, cube, prism and pyramid, Conversion of Isometric views from given Orthographic projections.

Unit 7. Symbols and Conventions (2 sheets)

(15 Periods)

Civil engineering sanitary fitting symbols , Electrical fitting symbols for interior installations, Electronic symbols.

Unit 8. Q CAD (for practical's & viva only) (15 Periods)

Introduction of Qcad Window, Drawing Tools, Snap Tools, Drawing Area, Status Line, List Docking Area, Loading and Naming Files, Saving Files, Don't Overwrite, Fileload Auto, Zoom, Grid Scale Adjusts to File, Pen Toolbar, Zoom Auto Tool, Help Menu, Grid Dots Control, Coordinate Display, Mouse Status.Coordinate System- Types of Coordinates, Center of Origin, Drawing Area Rulers, X-Y Coordinates, Polar Coordinates, Polar Angle Measurement, Relative Reference Point

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted (%)
1	6	8
2	6	8
3	20	12
4	20	12
5	30	25
6	16	20
7	15	15
8	15	-
Total	128	100

Reference/Text Book

1. Engineering Drawing By N.D. Bhatt (Charotar Pub House, Anand (Guj))
2. Engineering Drawing And Graphics+ Autocad By Venugopal (New Age Publication, Delhi)
3. Engineering Drawing By R.K. Dhawan (S. Chand Co.)
4. Engineering Drawing By C.M. Verma, Takniki parkashak, Roorkee.
5. A Text Book Of Engineering Drawing By Surjit Singh; Dhanpat Rai And Co., Delhi
6. Engineering Graphics – I By Vivek Goel (Book World, Dehradun)
7. Engineering Drawing By P.S. Gill; S.K Kataria And Sons, Delhi
8. Engineering Drawing By R.B. Gupta; Satya Prakashan, New Delhi.
9. Engineering Drawing, Ansul- S. Agarwal, Nav Distributor, Meerut.
10. Text book Of Engineering Drawing, By Prof. P.J. Shah, S. Chand Publications, New Delhi.

GENERAL WORKSHOP PRACTICE-I

Course Code:	991007
Course Title	General Workshop Practice-I
No. of Credits	4 (TH:0,T:0,P:8)

RATIONALE

Work shop practice is the fundamental exposure to basic skill required for all students pursuing their studies in various diploma-engineering disciplines. The practice experience would help students to understand the intricacies of industrial Working in relatively shorter period of time more over the contents of this Curricula forms a basic link for higher studies of engineering programs

The students are advised to undergo each skill experience with know-how approach giving special emphasis to know-why for the various instructions imparted to them in each shop.

DETAILED CONTENTS (PRACTICALS)

Note: The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced. The students should prepare sketches of various tools/jobs in their practical Notebook.

1. Introduction to Work Shop (20 Periods)

1.1 General Safety rules of workshop

- 1.2 State the General Safety Measures to be observed in Workshop.
- 1.3 State the General housekeeping activities
- 1.4 Prepare a list of general safety Rules to be followed in Workshop

2. Fitting Shop (40 Periods)

- 2.1 Layout of Shop
- 2.2 Sketch & Label Details of shop Layout
- 2.3 Type of jobs produced in fitting shop
- 2.4 Understand the functions of fitting shop
- 2.5 Understand different Metals, Alloys & their Sections
- 2.6 List the Commonly used Metals, Alloys.
- 2.7 State at least Five Sections, Shape & Size of Metals, Alloys.
- 2.8 Use relevant IS Code for commonly used materials with their samples of different Cross sections.
- 2.9 Fitting tools.
- 2.10 Know use of fitting tools, sketch various tools & label their parts.
- 2.11 Classify fitting tools as marking tools, Clamping devices, striking tools, cutting tools etc.
- 2.12 Know the marking out & inspection instruments such as surface plate, marking block, scribe, tri square, Bevel protractor etc.
- 2.13 Fitting operation :- Use of Various fitting tools, inspection & measuring Instruments to produce given jobs.

- 2.14 Choose correct Shape & Size of Blank metal for a given drawing.
- 2.15 Marking as per drawing using correct method, tools & sequence.
- 2.16 Choose correct sequence of operations for the job viz. Sawing, filing, scraping, drilling & Tapping
- 2.17 Select appropriate Tools, inspection and measuring instruments.
- 2.18 Clamping the job in correct position in an appropriate clamping device.
- 2.19 Perform the operation with appropriate body posture, method & precision, exercising personal judgment of need of the force.
- 2.20 Inspect the job as and when necessary.
- 2.21 Introduction to screw threads.
- 2.22 Know common types of screw threads & the terminology used.
- 2.23 Sketch and label details of Metric & Whitworth thread.

3. Carpentry Shop (40 Periods)

- 3.1 Carpentry shop lay out.
- 3.2 Sketch & Label Details of shop Layout.
- 3.3 Type of jobs produced in carpentry shop.
- 3.4 Understand the functions of carpentry shop.
- 3.5 Introduce type of jobs produced by carpenter.
- 3.6 Commonly used raw materials

- 3.7 Know commonly used raw materials & their commercially available size.
- 3.8 Name various type of raw materials used such as Timber: - logs, planks, battens etc. Ply, Teak ply, block board, sun mica, Formica etc.
- 3.9 Carpentry tools: - Know various carpentry tools with their specifications and uses e.g. Different saws, chisels, Files, gauges, scales, hammers, tri squares, planners, vice etc.
- 3.10 Carpentry Joints Introduction of various joints like T, corner, mortise & tenon joints, dovetail, pin, cross half lap joint, etc.
- 3.11 Choose correct shape & size of timber blank for a given job drawing.
- 3.12 Do marking as per drawing using correct method, tools & sequence.
- 3.13 Identify correct operations e.g. sawing, chiseling, planning, grooving etc.
- 3.14 Select appropriate Tool , inspection & measuring Instruments.
- 3.15 Clamping the jobs in correct position in an appropriate clamping device.
- 3.16 Perform the operation with appropriate body posture, method & precision, exercising personal judgment of need of the force
- 3.17 Inspect for size & quality of finish as and when necessary.
- 3.18 Assemble the components produced. Inspect for proper joint quality & take remedial steps.

4. Electric Shop

(28 Periods)

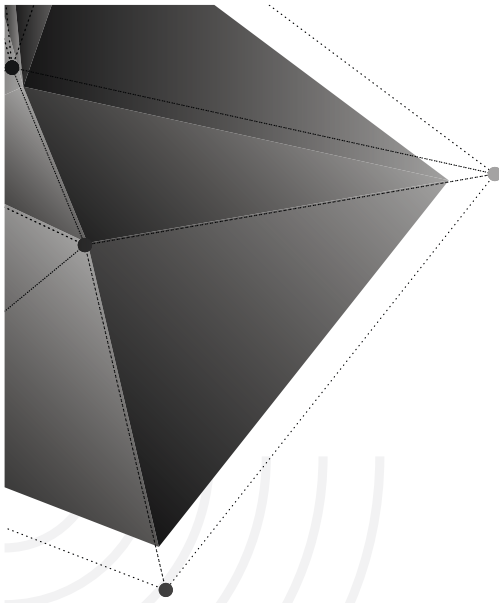
- 4.1 Study, demonstration and identification of common electrical materials such as wires, cables, switches, fuses, ceiling roses, PVC Conduits, PVC Channels and allied items, tools along with electrical instruments such as voltmeter, ammeter and multimeter
- 4.2 Study of electrical safety measures and demonstration about use of protective devices such as fuses, MCBs, ELCBs and relays including earthing
- 4.3 Identification of phase, neutral and earth of domestic
- 4.3 Identification of phase, neutral and earth of domestic appliances and their connection to two pin/three pin plugs.
- 4.4 Preparation of a house wiring circuit on wooden board using fuse, switches, socket, holder, ceiling rose etc. in PVC conduit and PVC casing and capping wiring system
- 4.5 Study of common electrical appliances such as electric iron, electric kettle, ceiling fan, table fan, electric mixer, electric Geyser, gas geyser, desert cooler, Heater, refrigerator, water purifier
- 4.6 Introduction to lead-acid battery, identification of parts and its working.
- 4.7 Installation of inverter with battery and to connect two or more batteries in series and in parallel (knowledge of a.c. and d.c.)
- 4.8 Charging of a battery and testing it with the help of hydrometer and cell tester

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Period Allotted (Hrs)	Marks Allotted (%)
1	20	20
2	40	30
3	40	30
4	28	20
Total	128	100

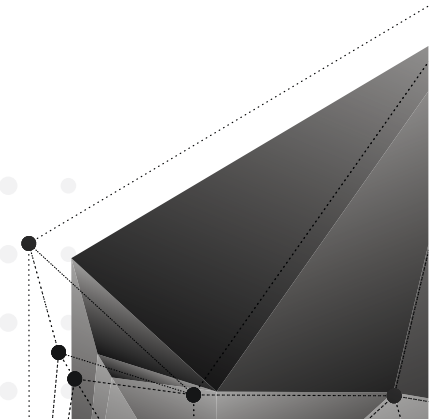
Reference / Text book

1. Workshop Technology by R.S. Khurmi (S. Chand publishers)
2. Workshop Technology by Hajra Chaudhry Part 1 & 2 (Media Promoter, Mumbai)
3. Workshop Technology by T.L. Choudhary (Khanna Publishers, New Delhi)
4. Workshop Technology by Raghuvanshi Part 1 & 2 (Dhanpat Rai & Co.,)
5. Workshop Technology I, II, III, by S.K. Hajra, Choudhary And A.K. Chaoudhary. Media Promoters and Publishers Pvt. Ltd., Bombay
6. Workshop Technology by Manchanda Vol. I, II, III India Publishing House, Jalandhar.
7. Manual on Workshop Practice by K. Venkata Reddy, K.L. Narayana Et Al; Macmillan India Ltd. New Delhi
8. Basic Workshop Practice Manual by T Jeyapooan; Vikas Publishing House (P) Ltd., New Delhi
9. Workshop Technology by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi
10. Workshop Technology by H.S. Bawa, Tata Mcgraw Hill Publishers, New Delhi.



SECOND SEMESTER
(Detailed Syllabus)

'DIPLOMA IN ARCHITECTURE'



ARCHITECTURAL DESIGN-I

Course Code:	542001
Course Title	Architectural Design-I
No. of Credits	6 (TH:2,T:0,P:8)

RATIONALE

This is foundation and first step for the beginners, to enter in the field of Architecture. Students must understand the Design fundamentals and flow process with a focus on anthropometry, basic spatial understanding and simple form explorations.

DETAILED CONTENTS

PART – A : Basic design **20 periods**

- 1. Orientation-** Introduction to the Architecture profession, Role, Architect's act 1972, Council of Architecture (COA), Indian Institute of Architects (IIA), NASA
- 2. Architecture And Space-** Discuss with the students the general principal of design and elements of design through simple drawings and sketching of objects available in nature and surroundings.

PART – B : Architecture Design Theory **30 periods**

- 3. INTRODUCTION** – In terms of Form & Transformation, Order in Architecture, Anthropometry Structure systems.

- **Forms and Transformation-** Additive, Dimensional, Subtractive exercises primarily through 3-D models simple geometry.(eg. Cube)
- **Order in Architecture-** Geometrical, Structural, Dimensional, Material, Spatial orders through observation of surroundings and 2D,3D models.
- **Anthropometry-** Introduction to human dimensions and functions in different posture through MEASURED drawing of a Hostel room/ Class room. draft your own dimension according to anthropometry. Identify basic activities for the assigned body posture and enact them.
- **Structure systems-** Introduction to various type of structures example Trabeated style, Arcaded, Vector active, Form active, Tensile through showing .Make models in groups based on structure. Example ram jhoola, Golden bridge, petrol pump roof etc.

PART - C : Study of Prototype

20 periods

4. Basic concepts of preparing Architectural drawing involving household FURNITURE for Drawing room, Bedroom, Dinning area, Studio stools and tables on scale.
5. Study and Drafting of Prototype standard Planning and circulation of Various type of Bedroom, living Room, Toilet, Kitchen, Dinning Area on Scale and Thumb rule of design these spaces.

Drawings required- Bubble diagram and PLAN on A1 size sheet.

PART - D : Design Problem

30 periods

6. Each student will Study and Design a small simple structures like Bus stop, Milk booth, florist kiosk, Exhibition gate, Marriage hall entry, Hostel room etc.

Drawings required- 1. Case study report & seminar,

2. Bubble diagram/Flow chart/Circulation Plan-1No. and PLAN-1No., SECTION-4 Nos., ELEVATION - 02 Nos. on A1 size Rendered inked drawings with presentation.

PART - E : Model Making

20 periods

7. Model making activity will be done by each student as per above (UNIT-B & D) using appropriate material. Semi-detailed model using white furniture blocks (eg.- white eraser as sample block furniture) will be produced as final output. Model should be made on scale as per drawings.

INSTRUCTIONAL STRATEGY

- Case study should be arranged.
- Drawing and Model making skill will be taught along the subject.
- Group discussion and Seminars may also be organized.
- Site visit to historical/ working sites should be arranged.

ARCHITECTURAL DRAWING:

- A1 size inked / rendered drawings

SUGGESTED BOOKS :-

1. Form Space & Order by Francis D.K.Ching John Wiley & Sons, Latest
2. Building Construction by Rangwala S.C. Charotar Publishing House, Latest
3. Building Drawing by Shah, Kale, Patki Tata Mcgraw Hill Publishing, Latest
4. Towards New Architecture by Le Corbusier
5. Lateral thinking by Edward De Bono
6. Architecture: Scale and proportion by Eugene Ruskin

BUILDING CONSTRUCTION-I

Course Code:	542003
Course Title	Building Construction - I
No. of Credits	3 (TH:1,T:0,P:4)

RATIONALE

To familiarize the students with constituents, properties and uses of traditional building materials used in construction, understand the usage of these traditional building materials in simple building works and the basic building construction practices on site.

DETAILED CONTENTS

UNIT - 1 : Building Materials

1. The study of Constituents, Properties, Uses and Manufacturing process of following elementary building materials: (a) BRICK (b) Stone (c) Lime (d) Cement (e) Concrete.

2. Timber

- Defects
- Seasoning, Preservation
- Different varieties

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. Identification of above mentioned materials.
2. To visit brick kiln/ lime kiln/ cement factory etc. for better understanding and submit report.

UNIT - 2 : Construction Technology

3. Elements of Building

- (a) Element of Building Terminology, Nomenclature of various parts of building from Foundation to Roof/ Parapet.
- (b) Types of bricks (BATS, CLOSERS etc.)
- (c) General principles of construction in brick TOOTHING, Brick on Edge, Brick on End etc.
- (d) Simple Bonds e.g. Stretching bond, English bond & Flemish (single and double) bond in brick work for up to two brick thick walls.

4. Brick Foundation and D.P.C.

- Definition and purpose of foundations, Introduction to different types of foundations.
- Timbering to trenches for foundations.
- Study of simple strip foundations for load bearing walls and piers
- Method of laying D. P. C.

5. Arches & Lintels

Definition & terms used in Arches, construction of Arches in brick and stone. Different types of lintels.

6. Doors & Windows:

- Introduction to joints in carpentry and various types of doors & window,
- Construction of door/window frames.

- Introduction of Batten doors, Ledged and batten doors, Braced and batten doors.
- Details of Panelled doors and Flush doors.
- Details of hardware related to these doors.

7. Types of Roof:

Introduction to different types of roofs, roof covering with their suitability to various functions e.g. flat, couple, close couple, Lean to and double lean to roof. Roof coverings with thatch, slate and tile.

Workshop/Construction Yard Practice & Site Exposure

- Practicing in construction yard by making the examples of brick masonry works etc.
- Site Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

**** Total No OD Construction Plates/ Sheets- At-least 10Nos. (A1 Size)**

REFERENCE BOOKS

1. McKay, W.B., “Building Construction Volume I, II, III and IV”, Longmans, 1955.
3. Ching, Francis D. K. and Adams, Cassandra, “Building Construction Illustrated”, Wiley and Sons, 2000.
4. The Construction of Buildings – Barry Volume I, II, III and IV

5. Chudley, Roy, “Construction Technology”, Longman, 2005.
6. Building Construction_Mitchell (Elementary and Advanced)
7. Rangwala, S. C., “Building Construction”, Charotar Publishing House, 2007
8. Building Construction-Bindra&Arora.
9. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
10. Building Materials by SC Rangwala: Charotar Pub. House, Anand
11. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill
12. Publishers, New Delhi, 2011.
13. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
14. National Building Code of India (Latest Edition), Bureau of Indian Standards.
15. Engineering Materials-Deshpande.
16. Engineering Material-Roy Chowdary
17. Designing with models – Criss. B. Mills.
18. Morris, M., “Architecture and the Miniature: Models”, John Wiley and Sons, 2000.

SOFTWARE APPLICATION IN ARCHITECTURE - I

Course Code:	542004
Course Title	Software Application in Architecture - I
No. of Credits	5 (TH:0,T:0,P:10)

RATIONALE

In the present times an architectural assistant should be capable of drafting drawings on the computer. Due to increasing need for computerized drawings by most architects for their ease of drafting, editing, managing and presentation at the end of the course the students should be able to make 2-D architectural drawings for presentation and construction purposes. The student should get familiar with the latest AutoCAD versions.

DETAILED CONTENTS

Note: Relevant theory may be taught along with practical exercises in each topic.

1. Introduction to AutoCAD (Latest version)

- Starting AutoCAD
- Option to create new drawings
- Units
- Limits
- Zoom
- Pan
- Snap

- Grid
- Ortho
- Commands in the menu
- Save, save as, quit, close, exit.
- Open a new, existing drawing.

Exercise: setting up a new drawing with units, limits etc and creating files and folders.

2. Drawing Commands

- Line
- Polyline/ double line
- Arc
- Ellipse
- Polygon
- Rectangle
- Circle
- Sketch
- Hatch
- Donuts
- Layer and its application
- Purge

Exercise- Making a composition of different geometrical shapes using various drawing commands.

3. Modifying an Existing Drawing

- Redraw and regen all
- Regen auto

- Undo Redo/Oops
- Trim
- Move
- Offset
- Rotate
- Array
- Stretch
- Divide
- Champher
- Erase
- Break
- Copy, multiple copy
- Mirror (Mirror test)
- Change (change properties)
- Extend
- Explode
- Scale
- Fillet

Exercise: (a) Modifying composition made in section 2

(b) Draft plan, elevation and section (Drawings of Design project carried out in Architectural design-I)

4. Making and Inserting Blocks

- Blocks
- Insert block
- Base
- Using library for blocks

- W-block
- X-ref

Exercise: Inserting furniture, fixtures, trees etc. in the plans, sections and elevations made in section 3.

5. Dimensioning and Text

- Dimension type, style, unit
- Dimension utilities
- Dimension variables
- Dimensioning of different elements like (Horizontal, vertical, inclined), Arc, Circle Radius, diameter, continuous dimensioning etc.
- Editing dimension text and updating (adding new text and editing existing text)
- Text style - font types, height, width factor etc. as per plotting paper size.

Exercise: Dimensioning and editing text in composition made in Sections 3 and 4.

6. Plotting Drawings

- Plot command
- Selecting area for plotting.
- Scale of plot, scale to fit .
- Selecting plotting device
- Selecting paper size and type
- Selecting black and white or colored plots
- Selecting appropriate print speed, quality, and Print preview.
- Working in Paper space and plotting

INSTRUCTIONAL STRATEGY

This is a highly practical oriented subject. Efforts should be made by the teachers to procure relevant software and give practical exercises to individual students, so that they develop proficiency in operating computer software as applied to the profession of architecture. Towards the end of the session each student should be given independent computer based project assignment. Experts lecture and field demonstration may be arranged. Special emphasis may be laid on training the students through availing help from the user friendly architectural software so that they develop confidence and are able to work independently.

Recommended books :

1. AutoCAD Manual
2. IntelliCAD Manual
3. AutoCAD Bible Series by Ellen Finkelstein

HISTORY OF ARCHITECTURE-II

Course Code:	542002
Course Title	History of Architecture - II
No. of Credits	4 (TH:4,T:0,P:0)

RATIONALE

Studying architectural history enriches our understanding of the past, informs the present, and inspires the future. It will help students to understand elementary concept of civilization, used skill, material, technology and built form; Historical context of building forms, significance of sacred & secular spaces.

DETAILED CONTENTS

UNIT - 1 : World History of Architecture

The study of architectural development with special emphasis on the concept of form and structure.

1. Early Christian

Development of church plan (Basilica), construction methods, and general architectural characteristics of St. Peter's Rome

2. Byzantine

Centralized plans and construction methods for Dome of St. Sophia church

3. Gothic

Main visual and construction vocabulary of Gothic arch of Notre Dame, Paris

4. Renaissance

- Early Renaissance- General architectural characteristics of Florence cathedral
- Late Renaissance- General architectural characteristics and role of Michael Angleo & Palladio Eg. St Peter's Rome, The building of the Capitoline hill Rome, Villa Capra

5. Modernism/Post Modernism

Introduction, Thoughts and works of

1. Frank Lloyd Wright- Falling water
2. Walter Gropius- the Bauhaus
3. Le Corbusier- Chandigarh secretariat complex
4. Mies van der rohe-“ Less is More”, Farnsworth House
5. Louis Kahn- IIM Ahmadabad
6. BV Doshi, Charls Correa, Raj Rewal

UNIT - 2 : Bharat/Indian History of Architecture

The study of architectural development with special emphasis on the concept of form and structure.

1. Development of Temple Architecture (8 periods)

Architectural features , Planning, Motifs treatment of different parts, construction methods, and materials

- Orissa style- Kendriya mahadev at khajrao, Lingraja temple
- Dravidian style (Southern style)- -shore temple Mahabalipuram, Madurai temple

2. Islamic Architecture

Introduction, Study of following historical building;

1. Taj mahal
2. Red fort Delhi
3. Fatehpur sikri
4. Jama masjid ,Delhi

NOTE: History of Architecture is to be taught with a view to understanding how different Architectural solutions were evolved (In successive historical periods) within the restraints imposed by prevalent social and religious customs, available building materials, complex structural problems and the limited technology available at the time. Historical visit can be arranged for students on institute expenses .

SUGGESTED BOOKS :

1. History of Architecture : Settings and Ritual by Kostof, Spiro, , Oxford Press , N.Y. ,1995
2. The Bronze Age, Past and Present, Childe, Gordon, Penguin, 1942 (reprints thereafter)
3. The Birth of Civilization in the Near East, Frankfort, Henri, Williams and Norgate,1951

4. Ancient Egypt, Casson, Lionel, (ed.), Time Life Books, Amsterdam , 1987
5. The Wonder that was India., Basham, A.L., Penguin, Delhi, 1992
6. Hindu Art & Architecture, Michell, George, Thames & Hudson, 2007
7. The world history of architecture, sir banister flature

SURVEYING

Course Code:	542005
Course Title	Surveying
No. of Credits	5 (TH:3,T:0,P:4)

RATIONALE

Surveying in architecture involves measuring and recording the physical characteristics of a building or land. This process produces records that inform decisions related to construction, engineering, or development. So, when developing townships, residential areas, or public buildings, accurate survey work is essential for successful construction and design.

DETAILED CONTENTS

Module - 1

Introduction Definition, classification, principles of surveying, Units of measurement, Scale, Signs convention.

Module - 2

Chain Survey Instruments used, Types of chain, Instruments for ranging, Setting out angles, Erecting perpendiculars, Selection of station, Methods of taking offset and Obstacles in chaining.

Module - 3

Plane Table Survey Plane table and accessories, Methods of plane table survey, Radiation, Intersection, Traversing and resection.

Module - 4

Compass Survey The prismatic compass, Surveyor compass and its construction and uses, Reduced and whole circle bearing, Magnetic declination, Effect of local attraction.

Module - 5

Levelling & Contouring Definition, Types of level, Booking and reduction of levels, Profile & cross section leveling, Errors in leveling. Characteristics of contours, Direct and indirect methods of contouring, Interpolation, Uses of contours, Calculation of area & volume.

Module - 6

Theodolite Study of instruments, Definition of different terms, Temporary adjustments, Uses, Measuring horizontal and vertical angles, Method of repetition, Extension of lines.

LIST OF PRACTICAL ASSIGNMENTS (Field Exercises & Drawings)

1. To find out horizontal distance between two points and plotting the details on lateral side of chain line using chain, tape, ranging rod & cross staff etc.
2. Two point problem & three point problem.
3. Making L-section & Cross section of a profile.
4. Making grids on ground using theodolite & taking spot level & drawing contour lines.
5. Making a regular polygon in field and finding error of closure using different equipment.

REFERENCE BOOKS :

1. Surveying Volume I & II by Dr. B.C. Punmia
2. Surveying and Leveling (Part – 1) by Kanetkar TP and Kulkarni SV
3. Surveying Volume -1 by Dr. K.R.Arora.

APPLIED MATHEMATICS-II

Course Code:	991002
Course Title	Applied Mathematics-II
No. of Credits	4 (TH:3,T:2,P:0)

1. RATIONALE

Mathematics is the core course to develop the competencies of most of the technological courses. The subject Applied Mathematics is being introduced into the diploma course to provide mathematical background to the students so that they can be able to grasp the engineering subjects properly. Applied Mathematics is widely used in every engineering fields. Mathematics is more than too for solving problems, mathematics course can develop intellectual maturity. This course is an attempt to initiate the multi-dimensional logical thinking and reasoning capabilities. It will help to apply the principles of basic mathematics to solve related technology problems. Hence, the course provides the insight to analyze engineering problems scientifically using integration, application of integration, differential equation, coordinate geometry and statistics.

2. COURSE OUTCOMES

The theory practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- a. Apply the concepts of Integration to solve engineering related problems.

- b. Utilize basic concepts of geometry to solve elementary engineering problems.
- c. Apply the concept of differential equation to solve basic engineering problems.
- d. Use basic concepts of statistics to solve engineering related problems.

3. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop LOs in cognitive domain for achieving the COs to attain the identified competency.

Unit - I : Co-ordinate Geometry (25 Periods)

- 1.1 Equation of straight line in various standard forms (one point slope form, slope intercept form, two point form, intercept form & normal form), inter section of two straight lines, angle between two lines. Perpendicular distance formula.
- 1.2 General equation of a circle and its characteristics. To find the equation of a circle given (i) Centre and radius (ii) Three points on it (iii) Co-ordinates of end points of a diameter.
- 1.3 Equations of conics (ellipse, parabola and hyperbola), simple problems related to engineering (standard forms only).

Unit - II : Integral Calculus (30 Periods)

- 1.1 Integration as inverse operation of differentiation with simple examples.

1.2 Simple Standard integrals and related problems.

1.3 Simple integration by substitution, by parts and by partial fractions (for linear factors only).

1.4 Properties of definite integrals.

1.5 Evaluation of definite integrals (simple problems)-

$$\text{Evaluation of } \int_0^{\pi/2} \sin x \, dx, \int_0^{\pi/2} \cos^n x \, dx, \int_0^{\pi/2} \sin^m x \cos^n x \, dx,$$

using formulae without proof (m and n being positive integers only)

1.6 Applications of integration for :

(a) Simple problem on evaluation of area bounded by a curve and axes.

(b) Calculation of volume of a solid formed by revolution of an area about axes (Simple problems).

(c) Numerical integration by Simpsons's Rule and Trapezoidal Rule (Simple problems).

Unit - III : Ordinary Differential Equations (10 Periods)

1.1 Definition, Order, Degree, Linear and Non-linear differential equations.

1.2 Formation of differential equations (upto second order).

1.3 Solution of first order differential equation-

(a) Variable Separable

(b) Homogeneous

- (c) Reducible to Homogeneous
- (d) Linear differential equation
- (e) Bernoulli's Equation (simple problem)
- (f) Exact differential Equation.

Unit - IV : Statistics (15 Periods)

1.1 Measures of Central Tendency: Mean, Median, Mode

1.2 Measures of Dispersion: Mean deviation, Standard deviation

1.3 Co-efficient of rank correlation.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted (%)
1	25	30
2	30	35
3	10	15
4	15	20
Total	80	100

Reference Book/Text Book

1. Higher Algebra By Hall & Knight
2. Plane Trigonometry By S.L. Loney
3. Engineering Mathematics By Sastry (Phi Learning)
4. Engineering Mathematics By B.S. Grewal (Khanna Publishers)
5. Engineering Mathematics By A.B. Mathur (Khanna Publishers)

6. Applied Mathematics-I & II, By M.K. Kanyal (Khanna Publishers, New Delhi)
7. Applied Mathematics - I, By Dr A.K. Sinha, Satyaprakashan, New Delhi
8. Engineering Mathematics, By C.B. Gupta, S.R. Singh, Mukesh Kumar, Mc Graw Hill Education.
9. Applied Mathematics By R.D. Sharma, Dhanpat Rai Publications, New Delhi
10. Engineering Mathematics, Vol-I & II, By S.S. Sabrwal And Sunita Jain, Eagle Prakashan, Jalandher
11. Basic Engineering Mathematics, By Jhon Bird, Newnes Publications.
12. A Text Book Of Engineering Mathematics, By A. Ganesh, G. Balasubramnium.
13. Polytechnic Mathematics, By Dr. D.S. Prakash, S. Chand, Publications, New Delhi.
14. A Text Book Of Engineering Mathematics, By N.P. Bali & Dr. Manish Goyal, Kindly Publication.
15. Engineering Mathematics, By C.B. Guta, S.R. Singh & Mukesh Kumar, Mc Graw-Hill Publications, Delhi
16. Applied Mathematics, By Kapoor, Nav Distributor, Meerut.

ENVIRONMENTAL SCIENCE & ENERGY MANAGEMENT

Course Code:	992005
Course Title	Environmental Science & Energy Management
No. of Credits	2 (TH:3,T:0,P:0)

RATIONALE

The importance of environment science cannot be disputed. The need for sustainable development is a key to the future of mankind. A diploma holder must have knowledge of different types of pollution caused due to industries, constructional activities and agricultural inputs so that he may help in balancing the ecosystem and controlling pollution by pollution control measures. He should also be aware of various social issues on environment and environment laws related to the control of pollution.

One of the reasons for India not been able to catch up with the desired extent of modernization of industrial processes in light of challenges posed by multinationals is the non-availability of required energy supply. The solution primarily lies in tapping all possible energy generation sources and efficient use of available energy important. Energy management focuses on these aspects. This course will develop awareness amongst the diploma engineers and will enable them to practice the energy management techniques in whatever field they are engaged in.

DETAILED CONTENTS

Unit - 1: Environment, Ecosystem & Natural Resources (11 Periods)

- Definition of Environment.
- Scope of Environment.
- Effects of Environment on human life.
- Concept of ecosystem.
- Components of ecosystem.
- Structure of ecosystem.
- Function of ecosystem.
- Structure of ecosystem.
- Function of ecosystem.
- Aspects, Methods, objectives and principle of sustainable Development.
- Water and forest resources.

Unite: 2 Environmental Pollution, Social issues and the Environment. (12 Periods)

- Air pollution
- Water Pollution
- Soil Pollution
- Marine pollution
- Noise pollution
- Thermal pollution

- Solid waste Management : Nature of wastes, Disposal methods, waste-to-energy, Industrial waste.
- Role of an individual in prevention of pollution.

Unit - 3 : Social Issues and Environment (10 Periods)

- Water conservation, rain water harvesting, water shed management.
- Climate change, global warming, acid rain, ozone layer depletion.
- Disaster management.
- Green Building Technology
- Environment Protection Act.
- Air (prevention and control of pollution) Act.
- Water (prevention and control of pollution) Act.
- Role of Organic farming, bio-fertilizers & bio-pesticides in environment protection.

Unit : 4 Energy Conservation efficiency & energy Audit (10 Periods)

- Energy Conservation and objectives.
- Energy efficiency.
- Energy Conservation in lighting arrangement and appliance used in domestic sector.
- Needs for energy efficient devices.
- Energy efficient motors.
- How to maximize the efficiency of equipments.
- CFL and LED lamps.

- Needs of energy audit.
- Energy Audit methodology.
- About bureau of Energy efficiency and its scheme.

Unit : 5 Renewable Energy (5 Periods)

- Introduction.
- Types of Renewable Energy source.
- Electric vehicle

Recommended Books :

1. Fundamental concept in Environmental Studies, D D Mishra, S Chand & Co Ltd.
2. Environmental Science by Deswal and Deswal, DhanpatRai and Sons Ltd.
3. Handbook of Organic farming by P.D. Gera, Abhishek Publications, New Delhi.
4. Environmental studies by Daniel, Wiley India.M Ajni Reddy, Text book of Environmental Science, BS Publication, Hyderabad.
5. Manual on Energy Efficiency at Design Stage, CII Energy Management Cell
6. Manual on Energy Efficiency in Pumping System, CII Energy Management Cell
7. Manual on Variable Speed Drives for Energy Efficiency CII Energy Management Cell
8. Energy Conservation-case studies in ceramic industry, sugar industry, fertilizer industry, cement industry, CII, Energy Management Cell etc.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Period allotted for lectures and tutorials (Periods)	Marks Allotted (%)
1	11	20
2	12	25
3	10	20
4	10	25
5	5	10
Total	48	100

Recommended Books :

1. Fundamental Concept In Environmental Studies, D.D. Mishra, S. Chand & Co Ltd.
2. Environmental Science By Deswal And Deswal, Dhanpatrai And Sons Ltd.
3. Handbook Of Organic Farming By P.D. Gera, Abhishek Publications, New Delhi.
4. Environmental Studies By Daniel, Wiley India.
5. M. Ajni Reddy, Text Book Of Environmental Science, B.S. Publication, Hyderabad.
6. Manual On Energy Efficiency At Design Stage, CII Energy Management Cell
7. Manual On Energy Efficiency In Pumping System, CII Energy Management Cell
8. Manual On Variable Speed Drives For Energy Efficiency CII Energy Management Cell Energy Conservation- Case Studies In Ceramic Industry, Sugar Industry, Fertilizer Industry, Cement Industry, CII, Energy Management Cell Etc.
