

2.1 ENGLISH AND COMMUNICATION SKILLS - II

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RATIONALE

The curriculum aims to develop the use of English for three major purposes social interaction, academic achievement and professional use. Listening, speaking, reading, and writing skills can not be thought of as independent skills. They are generally perceived as interdependent where one skill often activates the other skills as well as the paralinguistic skills required for the achievement of effective communication. It is believed that the most effective way to achieve these purposes is through the adoption of a thematic, integrated, content-based approach to teaching and learning.

DETAILED CONTENTS

1. LISTENING

Practical:

- Pre-recorded CDs of famous speeches and dialogues: Comprehension exercises based on the audio
- Note-taking
- Drawing inferences
- Summarizing

Note: Teachers are expected to give necessary demonstrations, instructions and guidelines, while teaching above topics

2. SPEAKING

Practical:

- Voice Modulation: Horizons (pitch, tone, volume, modulation)
- Word stress, rhythm, weak and strong form, pauses, group-sense, falling and rising tones, fluency, pace of delivery, dealing with problem sounds, accent, influence of mother tongue etc.
- Situational Conversation/role-playing with feedback, preferably through video recording
- Telephonic Conversation: Types of calls, agreeing and disagreeing, making and changing appointments, reminding, making complaints and handling complaints, general etiquettes,
- A small formal and informal speech
- Seminar
- Debate

Note: Teachers are expected to give necessary demonstrations, instructions and guidelines, while teaching above topics

3. READING

Theory: (10 hrs.)

- Comprehension, Vocabulary enrichment and grammar exercises based on the following selective readings:

Section-I

- The Portrait of a Lady - Khushwant Singh
- The Lost Child by Mulk Raj Anand
- The Refugees – Pearl S. Buck

Section-II

- Life Sketch of Dr. Abdul Kalam
- Abraham Lincoln's letter to his son's Headmaster

Section-III

- All The World's A Stage – W. Shakespeare
- Say Not, The Struggle Nought Availeth – A.H. Clough
- Pipa's Song – Robert Browning
- A Viewpoint – RP Chaddah

- Comprehension exercises on unseen passages

4. WRITING

Theory: (20 hrs.)

- The Art of Précis Writing
- Correspondence: Business and Official
- Drafting
 - Report Writing: Progress report and Project report
 - Inspection Notes
 - Notices: Lost and found; Obituary; Auction
 - Memos and Circulars
 - Notices, Agenda and Minutes of Meetings
 - Use of internet and E-Mails
 - Press Release
 - Applying for a Job: Resume writing; forwarding letter and follow-up
- Writing Telephonic messages
- Filling-up different forms such as Banks and on-line forms for Placement etc.

Note: Teachers are expected to give practical examples, while teaching above topics

5. VOCABULARY AND GRAMMAR

Theory and Practical exercises on following: (12 hrs.)

- Vocabulary of commonly used words
- Glossary of Administrative Terms (English and Hindi)
- One word substitution
- Idioms and Phrases
- Prefixes and Suffixes
- Punctuation
- Narration
- Forms of verbs: Regular and irregular

6. EMPLOYABLE SKILLS

Theory: (06 hrs.)

Importance of developing employable and soft skills; List and tips for developing of employable skills

Practicals:

- Group discussions
- Presentations, using audio-visual aids (including power-point)
- Interview techniques: Telephonic interviews, Group interviews, face to face interviews
- Mannerism and etiquette etc.

RECOMMENDED BOOKS

1. Spoken English (2nd Edition) by V Sasikumar & PV Dhamija; Published by Tata MC Graw Hills, New Delhi.
2. Spoken English by MC Sreevalsan; Published by M/S Vikas Publishing House Pvt. Ltd; New Delhi.
3. Spoken English –A foundation course (Part-I & Part-II) By Kamlesh Sdanand & Susheela Punitha; Published by Orient BlackSwan, Hyderabad
4. Practical Course in English Pronunciation by J Sethi, Kamlesh Sadanand & DV Jindal; Published by PHI Learning Pvt. Ltd; New Delhi.
5. A Practical Course in Spoken English by JK Gangal; Published by PHI Learning Pvt. Ltd; New Delhi.
6. English Grammar, Composition and Usage by NK Aggarwal and FT Wood; Published by Macmillan Publishers India Ltd; New Delhi.
7. Business Correspondence & Report writing (4th Edition) by RC Sharma and Krishna Mohan; Published by Tata MC Graw Hills, New Delhi.
8. Business Communication by Urmila Rani & SM Rai; Published by Himalaya Publishing House, Mumbai.
9. Business Communication Skills by Varinder Kumar, Bodh Raj & NP Manocha; Published by Kalyani Publisher, New Delhi.
10. Professional Communication by Kavita Tyagi & Padma Misra; Published by PHI Learning Pvt. Ltd; New Delhi.
11. Business Communication and Personality Development by Bsiwajit Das and Ipseeta Satpathy; Published by Excel Books, Delhi

12. Succeeding Through Communication by Subhash Jagota; Published by Excel Books, Delhi
13. Communication Skills for professionals by Nira Konar; Published by PHI Learning Pvt. Ltd; New Delhi.
14. Developing Communication Skills (2nd Edition) by Krishna Mohan & Meera Banerji; Published by Macmillan Publishers India Ltd; New Delhi.
15. Effective Technical Communication By M .Ashraf Rizwi; Published by Tata MC Graw Hills, New Delhi.
16. Basic Communication Skills for Technology by Andrea J Rutherford; Published by Pearson Education, New Delhi
17. English & Communication Skills for students of Science & Engineering by SP Dhanavel; Published by Orient BlackSwan, Hyderabad.
18. Technical Communication- Principles & Practices by Meenakshi Raman & Sangeetha Sharma; Published by Oxford University Press, New Delhi.
19. Technical English by S. Devaki Reddy & Shreesh Chaudhary; Published by Macmillan Publishers India Ltd; New Delhi.
20. Advanced Technical Communication, by Kavita Tyagi & Padma Misra; Published by PHI Learning Pvt. Ltd; New Delhi.
21. Communication Skills for Engineer & Scientist by Sangeeta Sharma & Binod Mishra; Published by PHI Learning Pvt. Ltd; New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	-	-
2	-	-
3	10	22
4	20	40
5	12	26
6	06	12
Total	48	100

2.2 APPLIED MATHEMATICS - II

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RATIONALE

Applied mathematics forms the backbone of engineering students. Basic elements of Differential calculus and integral calculus and statistics have been included in this course. This will develop analytical abilities to apply in engineering field and will provide continuing educational base to the students.

DETAILED CONTENTS

1. Algebra (10 hrs)
 - 1.1 Determinants: Elementary properties of determinants up to 3rd order, consistency of equations, Cramer's rule.
 - 1.2 Matrix: Algebra of matrices, Inverse of a matrix, matrix inverse method to solve a system of linear equations in 3 variables.
 - 1.3 Application of Matrix in computer programming

2. Differential Calculus (24 hrs)
 - 2.1 Definition of function; Concept of limits.

$$\text{Lt}_{x \rightarrow a} \frac{x^n - a^n}{x - a}$$
 Four standard limits

$$\text{Lt}_{x \rightarrow 0} \frac{\sin x}{x}, \quad \text{Lt}_{x \rightarrow 0} \frac{x - a}{a^x - 1}, \quad \text{Lt}_{x \rightarrow 0} (1+x)^{1/x}$$
 - 2.2 Differentiation of x^n , $\sin x$, $\cos x$, $\tan x$, e^x , $\log_a x$ (Please take one example of differentiation by definition)
 - 2.3 Differentiation of sum, product and quotient of functions. Differentiation of function of a function.
 - 2.4 Differentiation of trigonometric inverse functions. Logarithmic differentiation. Exponential differentiation, Successive differentiation (excluding nth order).
 - 2.5. Application of differential calculus in::
 - (a) Rate Measures
 - (b) Errors and increments
 - (c) Maxima and minima
 - (d) Equation of tangent and normal to a curve (for explicit functions only)

3. Integral Calculus (26 hrs)
 - 3.1 Integration as inverse operation of differentiation with simple examples.

- 3.2 Simple integration by substitution, by parts and by partial fractions (for linear factors only)
- 3.3 Evaluation of definite integrals (simple problems)-
 Evaluation of $\int_0^{\pi/2} \sin^n x \cdot dx$, $\int_0^{\pi/2} \cos^n x \cdot dx$, $\int_0^{\pi/2} \sin^m x \cos^n x \cdot dx$
 using formulae without proof (m and n being positive integers only)
- 3.4 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) To calculate average and root mean square value of a function and
 (d) Area by Trapezoidal Rule and Simpson's Rule
4. Statistics and Probability (12 hrs)
- 4.1 Measures of Central Tendency: Mean, Median, Mode with example of daily life.
- 4.2. Measures of Dispersion: Mean deviation, Standard deviation
- 4.3. Probability definition and addition law of probability, theorem and simple numerical problems, General view of normal probability curve (No numericals)
- 4.4. Explanation of different sampling techniques (No numericals)
5. Differential Equations (08 hrs)
- 5.1 Solution of first order and first degree differential equation by variable separation method (simple problems)
- 5.2. Differential equations of homogeneous equation

INSTRUCTIONAL STATREGY

Basic elements of Differential Calculus, Integral Calculus, Co-ordinate geometry and Statistics can be taught in the light of their applications in the field of engineering and technology. By laying more stress on applied part, teachers can also help in providing continuing education base to the students.

RECOMMENDED BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi.
2. Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar
3. Applied Mathematics by Dr. RD Sharma
4. Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain, Eagle Parkashan, Jalandhar
5. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
6. Engineering Mathematics by Dass Gupta
7. Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi
8. Engineering Mathematics, Vol I, II & III by V Sundaram et.al, Vikas Publishing House (P) Ltd., New Delhi

9. Engineering Mathematics by N.Ch.S.N Iyengar et.al, Vikas Publishing House (P) Ltd., New Delhi
10. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
11. Engineering Mathematics, Vol I & II by AK Gupta, Macmillan India Ltd., New Delhi
12. Applied Mathematics-II, Archana Sharma, Lords Publications, Jalandhar
13. Advanced Engineering Mathematics by Peter V.O,neil, University of Alabama 2007 edition, Cengage Learning India Pvt. Ltd. Patparganj, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	10	15
2	24	28
3	26	32
4	12	17
5	08	08
Total	80	100

2.3 APPLIED PHYSICS – II

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RATIONALE

Applied physics includes the study of a large number of diverse topics related to things that go in the world around us. It aims to give an understanding of this world both by observation and prediction of the way in which objects behave. Concrete use of physical principles and analysis in various fields of engineering and technology

DETAILED CONTENTS

1. **Optics** (12 hrs)
 - 1.1 Review of basic optics laws: Reflection and Refraction
 - 1.2 Refractive index and magnification, image formation in lenses, lens formulae (thin lens only), power of lens, total internal reflection and their applications
 - 1.3 Simple concepts of interference, diffraction , Polarization and their applications like Commercial equipment, optic glasses and its manufacturing and use of Polarimeter in sugarcane industry and distilleries (No explanation required).
 - 1.4 Simple and compound microscope, astronomical telescope, magnifying power and its calculation (in each case) and their applications

2. **Electrostatics** (10 hrs)
 - 2.1 Coulombs law, unit charge and electric lines of force
 - 2.2 Electric flux and Gauss's Law, Electric field intensity and electric potential
 - 2.3 Electric field due to point charge, straight charged conductor, plane charged sheet and charged sphere (Inside and outside the sphere)
 - 2.4 Capacitance, types of capacitors, capacitance of parallel plate capacitor, series and parallel combination of capacitors, Dielectric and its effect on capacitance, and dielectric break down
 - 2.5 Pollution, different types of pollution and polluting agents, Use of Electronics in reducing Air and Water pollution e.g. precipitation of microbes and moisture reparation from air and gases in industry (small explanation only)

3. **DC Circuits** (15 hrs)
 - 3.1 Concept of electricity, various applications of electricity
 - 3.2 Current, voltage, resistance, potential difference and e.m.f, power, electrical energy and their units, advantages of electrical energy over other forms of energy and Alternating Current and Direct Current
 - 3.3 Ohm's law and its applications, specific resistance, effect of temperature on resistance, co-efficient of resistance, series and parallel combination of resistors an Resistance, Definitions of Conductance and Super Conductor's
 - 3.4 Kirchhoff's laws, Wheatstone bridge principle and its applications
 - 3.5 Heating effect of current and concept of electric power, energy and their units, related numerical problems and their applications
 - 3.6 Examples of DC Circuits e.g. Various electrical and electronic equipment CRO, T.V., Audio system, Computers (Only examples, no explanations)

4. **Electromagnetism** (10 hrs)
 - 4.1 Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux and their units

- 4.2 Permeability and susceptibility and their applications. Electromagnetic Induction, Lenz's law and its uses like dynamo, Right hand and left hand rules, Magnetic lines of force due to straight conductor, Solenoid and Circular coil. Force on a current carrying rectangular coil placed in magnetic field and its uses in moving coil galvanometer, electric motor (Concept only). Lorentz force, Force on a current carrying conductor (straight and rectangular)
- 4.3 Moving coil galvanometer its principle, construction and working.
- 5. Semiconductor physics (07 hrs)**
- 5.1 Energy bands, intrinsic and extrinsic semiconductors, p-n junction diode and its characteristics
- 5.2 Diode as rectifier – half wave and full wave rectifier, semiconductor transistor pnp and npn (concept only)
- 6. Modern Physics (10 hrs)**
- 6.1 Lasers: concept of energy levels, ionizations and excitation potentials; spontaneous and stimulated emission; lasers and its characteristics, population inversion, types of lasers, Helium- Neon and ruby lasers their engineering and medical applications
- 6.2 Fibre optics: introduction to optical fiber materials, types, light propagation and applications in communication.

LIST OF PRACTICALS (To perform minimum eight experiments)

1. To find the focal length of convex lens by displacement method.
2. To determine the magnifying power of an astronomical telescope
3. To verify ohm's laws by drawing a graph between voltage and current.
4. To verify laws of resistances in series and in parallel connection.
5. To find resistance of galvanometer by half deflection method
6. To measure very low resistance and very high resistance using Wheat Stone bridge
7. To determine the capacity of a parallel plate capacitor by discharging through a voltmeter and also find out the time constant of the given capacitor.
8. To draw characteristics of a pn junction diode and determine knee and break down voltages
9. To find wave length of He Ne semiconductor LASER.
10. Use of CRO in plotting AC/DC

INSTRUCTIONAL STRATEGY

Teacher may use various instructional media like models, charts and graphs while imparting instructions. The field application should be made clear before teaching the basics of waves, sound, light, electrostatics, dc circuits, electromagnetism, and semiconductor physics etc to develop proper understanding of the physical phenomenon. Use of demonstration can make the subject interesting and develop scientific temper in the students.

RECOMMENDED BOOKS

1. Text Book of Physics for Class XI (Part-I, Part-II) N.C.E.R.T
2. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi

3. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
4. Fundamentals of Physics by Resnick, Halliday and Walker, Asian Book Pvt. Ltd., New Delhi
5. Fundamentals of Optics by Francis A. Jenkins & Harvey E White, McGraw Hill International Editions, Physics Series
6. A Text Book of Optics, Subramanian and Brij Lal, S Chand & Co., New Delhi
7. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publishers
8. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
9. Applied Physics I & II by RA Banwait & R Dogra, Eagle Parkashan, Jalandhar
10. Applied Physics Vol II by Jasmer Kaur and Bhupinder Singh, Lords Publications, Jalandhar
11. Basic Electronics and Linear Circuits by NN Bhargava et al Tata Mc Graw Hill Publishers, New Delhi
12. Principles of Electronics by SK Sahdev, Dhanpat Rai and Co, New Delhi
13. Engineering Physics by Vanchna Singh and Sheetal Kumar, Cengage Learning India Pvt. Ltd. Patparganj, Delhi (year 2008)

Suggested Distribution of Marks for Facilitating Paper Setter

Sr No	Topic	Time Allotted (Hrs)	Marks Allotted (%)
1	Optics	12	20
2	Electrostatics	10	15
3	DC Circuits	15	20
4	Electromagnetism	10	20
5	Semiconductor Physics	07	10
6	Modern Physics	10	15
	Total	64	100

2.4 BASICS OF INFORMATION TECHNOLOGY

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RATIONALE

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools of MS Office/Open Office using internet etc. form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

Note:

Explanation of Introductory part should be dovetailed with practical work. Following topics may be explained in the laboratory along with the practical exercises. There will not be any theory examination.

TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION

1. Information Technology – its concept and scope, applications of IT, impact of computer and IT in society.
2. Computers for information storage, information seeking, information processing and information transmission
3. Computer Application in office, book publishing, data analysis, accounting, investment, inventory control, graphics, Air and Railway Ticket reservation, robotics, Military, banks, Insurance financial transactions and many more
4. Elements of computer system, computer hardware and software; data types – numeric data, alpha numeric data; contents of a program, processing
5. Computer organization, block diagram of a computer, CPU, memory
6. Input devices; keyboard, Scanner, mouse etc; output devices; VDU and Printer, Plotter
7. Electrical requirements, inter-connections between units, connectors and cables
8. Secondary storage; magnetic disks – tracks and sectors, optical disk (CD, CD-RW and DVD), primary and secondary memory: RAM, ROM, PROM etc., Capacity; device controllers, serial port, parallel port, system bus
9. Installation concept and precautions to be observed while installing the system and software
10. Introduction about Operating Systems such as MS DOS, Windows, Windows NT etc. as an interface to Computer System
11. Special features, various commands of MS Office/Open Office
12. About the internet – server types, connectivity (TCP/IP, shell); applications of internet like: e-mail and browsing
13. Various Browsers like Internet explorer, Mozilla Firefox, WWW (World wide web); hyperlinks; HTTP (Hyper Text Transfer Protocol); FTP (File Transfer Protocol)
14. Basics of Networking – LAN, WAN, Topologies

15. Ethics and information Technology
16. Future with information Technology

LIST OF PRACTICALS

1. Given a PC, name its various components and peripherals. List their functions
2. Practice in installing a computer system by giving connection and loading the system software and application software
3. Exercises on entering text and data (Typing Practice)
4. Installation of operating System viz. Windows XP, Windows 2007 etc..
Features of Windows as an operating system
 - Start
 - Shutdown and restore
 - Creating and operating on the icons
 - Opening closing and sizing the windows
 - Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file
 - Creating and operating on a folder
 - Changing setting like, date, time, colour (back ground and fore ground)
 - Using short cuts
 - Using on line help
5. Word Processing (MS Office/Open Office)
 - File Management:
 - Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, Giving password protection for a file
 - Page Set up:
 - Setting margins, tab setting, ruler, indenting
 - Editing a document:
 - Entering text, Cut, copy, paste using tool- bars
 - Formatting a document:
 - Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods
 - Aligning of text in a document, justification of document ,Inserting bullets and numbering
 - Formatting paragraph, inserting page breaks and column breaks, line spacing
 - Use of headers, footers: Inserting footnote, end note, use of comments
 - Inserting date, time, special symbols, importing graphic images, drawing tools
 - Tables and Borders:
 - Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table
 - Print preview, zoom, page set up, printing options

- Using Find, Replace options
 - Using Tools like:
 - Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelopes and labels
 - Using shapes and drawing toolbar,
 - Working with more than one window in MS Word,
 - How to change the version of the document from one window OS to another
 - Conversion between different text editors, software and MS word
6. Spread Sheet Processing (MS Office/Open Office)
- Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, create chart, printing chart, save worksheet, switching between different spread sheets
 - Menu commands:
 - Create, format charts, organise, manage data, solving problem by analyzing data, exchange with other applications. Programming with Excel Work Sheet, getting information while working
 - Work books:
 - Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations, working with arrays
 - Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet
 - Creating a chart:
 - Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
 - Using a list to organize data, sorting and filtering data in list
 - Retrieve data with query: Create a pivot table, customising a pivot table. Statistical analysis of data
 - Exchange data with other application: embedding objects, linking to other applications, import, export document.
7. PowerPoint Presentation (MS Office/Open Office)
- a) Introduction to PowerPoint
 - How to start PowerPoint
 - Working environment: concept of toolbars, slide layout, templates etc.
 - Opening a new/existing presentation
 - Different views for viewing slides in a presentation: normal, slide sorter etc.
 - b) Addition, deletion and saving of slides
 - c) Insertion of multimedia elements
 - Adding text boxes
 - Adding/importing pictures
 - Adding movies and sound

- Adding tables and charts etc.
 - Adding organizational chart
- d) Formatting slides
- Using slide master
 - Text formatting
 - Changing slide layout
 - Changing slide colour scheme
 - Changing background
 - Applying design template
- e) How to view the slide show?
- Viewing the presentation using slide navigator
 - Slide transition
 - Animation effects etc.
8. Working with Data Processing (MS Office/Open Office)
- a) Understanding different data types
 - b) Creation of table
 - c) Entering data in a table and modify it.
 - d) Creating simple Queries
9. Internet and its Applications
- a) Log-in to internet
 - b) Navigation for information seeking on internet
 - c) Browsing and down loading of information from internet
 - d) Sending and receiving e-mail
 - Creating a message
 - Creating an address book
 - Attaching a file with e-mail message
 - Receiving a message
 - Deleting a message

INSTRUCTIONAL STRATEGY

Since this subject is practice oriented, the teacher should demonstrate the capabilities of computers to students while doing practical exercises. The students should be made familiar with computer parts, peripherals, connections and proficient in making use of MS Office/Open Office in addition to working on internet. The student should be made capable of working on computers independently

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, 7th edition, Tata Mc Graw Hills, New Delhi
3. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
4. Computers Today by SK Basandara, Galgotia publication Pvt ltd. Daryaganj, New Delhi.
5. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
6. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
8. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
9. On Your Marks - Net...Set...Go... Surviving in an e-world by Anushka Wirasinha, Prentice Hall of India Pvt. Ltd., New Delhi
10. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar

2.5 ARCHITECTURAL DRAWING -II

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RATIONALE

Architectural Drawing forms a core subject for preparing scale drawings, three dimensional views, furniture drawings and layouts.

Teachers are expected to lay considerable stress on practical work so that students attain sufficient skills for preparing good quality architectural drawing.

Teachers are also expected to stress upon appropriate line work, properties, dimensioning and lettering.

DETAILED CONTENTS

1. Reviewing orthographic projections (plans, line projections, solids) (01 sheet)

2. Section of Solids (04 sheets)

Simple geometrical shapes e.g. cube: Elementary building sections Highlighting line intensities for sectional and elevational components. (example: parapet, chajjas in section and elevation behind)

3. Development of surface (03 sheet)

Development of surface such as prism, pyramid, cone, cylinder, cube etc.
Development of surface with an aim to calculate areas

4. Isometric Views (03 sheets)

Conversion of 2D geometrical shapes into 3D isometric views ($30^\circ - 60^\circ$) to realize the potential of each from simple to complex solid to basic building forms

5. Axonometric Views (04 sheets)

Conversion of 2D geometrical shapes into 3D axonometric views at different angles ($45^\circ - 45^\circ$) to realize the potential of each from simple to complex solid to basic building forms. Isometric/axonometric use of any building form, from a given base plan – to be developed as per the student's imagination of the exterior/interior components (with roads, landscape elements)

Note: Minimum No. of sheets = 15

INSTRUCTIONAL STRATEGY

This subject is one of the most important, fundamental and practical subject for diploma in Architectural Assistantship. Teachers should lay emphasis on practical work by the students and give repetitive exercises in free hand sketching, colouring and rendering like sketching, shades and shadows, lettering, printing forms and other important component of architecture. Teachers should lay stress upon perfect line work, properties, dimensioning, lettering and printing by the students in the classroom. Students should maintain portfolio of the work done by them throughout the session. Viva voce examination may be conducted by the teacher on completion of each assignment

RECOMMENDED BOOKS

1. Engineering Drawing – by N.D. Bhatt.
2. Building Construction – Sikka.
3. Engineering Drawing – by G.S. Virdhi.

2.6 HISTORY OF ARCHITECTURE - 1

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RATIONALE

The course on History of Architecture develops appreciation regarding past and current trends in the field of architecture. The knowledge of this course will help the students to understand how political, physical, social, economical and technological change affect the architecture, materials and construction techniques. The course covers broad topics like: pre-historic architecture, important civilizations, (Indian, Egyptian, Greek and Roman), medieval architecture in Europe, and temple architecture and Buddhist architecture in India.

The teacher should try to create interest among the students for this course by organizing site visits to the local old monuments. Audio-visual aids should also be used to explain various architectural developments. While imparting instructions, teacher should stress upon the context of form and space, construction methods structural systems and materials. The teacher should motivate the students to take general reference for form, drawings structural solutions and materials from history, while designing their project.

DETAILED CONTENTS

1. Pre Historical Architecture and Introduction to History of Architecture (04 hrs)
 - 1.1 Importance of history to understand the Architecture.
 - 1.2 Examples of Early shelters, Stone Age, Tumuli, etc. as expression of man's physical and spiritual needs.
 - 1.3 Determinants of built form – geo physical, societal, technological etc. (Early caves, timber huts, stone houses etc).

2. River Valley Civilizations (16 hrs)
 - 2.1 Egyptian Civilization Concept of the Royal Necropolis, locational context and architectural characteristics of public buildings, e.g. Mastabas (mastaba of sakara) pyramids and temples (rock – cut and structural) – one example of each type to be chosen.
 - 2.2 Mesopotamian Civilization the urban context and architecture of public buildings (Ziggurats and palaces) - one example of each.
 - 2.3 Indus Valley Civilization: Grid Iron System
 - 2.3.1 Public Buildings: Granary and Bath

3. Greek Civilization (10 hrs)
 - 3.1 Greek towns, location and characteristics of typical civic spaces such as Agora, Acropolis, Theatres etc.

3.2 Significant characteristics of Greek Architecture such as Materials, construction systems, system of proportioning, Greek orders, architecture of Greek temples – Parthenon at Athens.

4. Roman Civilization (10 hrs)

Significant characteristics of Roman Architecture. Concept of monumentality, materials and construction systems, Roman orders and the Roman Basilica, Pantheon Rome

5. Buddhist Architecture in India (8 hrs)

Building typology – Stupas, Chaityas and Viharas – examples from Ajanta, Ellora and Karle to explain geographical context

Note:

While imparting instructions wherever possible, in this subject, the teachers should organize site visits to the old monuments and buildings with extra-ordinary architectural features. Experts/Guides should be invited to deliver lectures on the relevant themes in order to generate interest in the students. Audio-visual materials available on the subject, in the country and abroad, be procured and presented to the students from time to time to enrich the quality of classroom instructions. Special architectural features of some old/ historical famous Indian and International buildings may be presented to the students as case studies. Students may be encouraged to prepare case studies of at least one famous old/historical building. The teachers and students may visit web sites, relevant to the history of architecture.

INSTRUCTIONAL STRATEGY

While imparting instructions in this subject, the teachers should organize site visits to the old monuments and buildings with extra-ordinary architectural features. Experts/Guides from state and national Archaeology departments may be invited to deliver lectures on the relevant themes in order to generate interest in the students. Audio-visual material available on the subject, in the country and abroad, may be procured and presented to the students from time to time to enrich the quality of classroom institutions. Special architectural features of some old/historical famous Indian and International buildings may be presented to the students as case studies. Students may be encouraged to prepare case studies of at least one famous old/historical building. Web sites, relevant to the history of architecture may be visited by the teachers and students.

RECOMMENDED BOOKS

1. History of Architecture by Sir Banister Fletcher
2. Indian Architecture (Hindu Period) by Percy Brown
3. Indian Architecture (Hindu and Buddhist Period) by Satish Grover
4. Encyclopedia of Architecture.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	4	8
2	16	28
3	10	22
4	10	22
5	8	20
Total	48	100

2.7 ARCHITECTURAL DESIGN - I

L T P
2 - 6

RATIONALE

Diploma holders in Architectural Assistantship find employment with private architects and also majority of them go for self-employment. Therefore, they are required to develop aptitude / skills to design residential, commercial and other public buildings.

Teachers while imparting instructions/giving assignments to students are expecting to teach various elements of design like form function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such related elements. Teachers are also expected to show various types of designs of small buildings to develop an appreciation for this subject.

Teachers should also motivate students to maintain sketch book/portfolio of all the assignments given to the students.

DETAILED CONTENTS

THEORY OF DESIGN (32 hrs)

1. Elements of Design: Line, shape, form, pattern, (11 hrs.)
Textures- Example from history and contemporary situations
2. Principles of Design: Balance, Unity, Symmetry, Rhythm, Harmony etc. (11 hrs)
Examples from history and contemporary situations
3. Role of Colour: Warm and Soft Colours, Colour schemes for various (10 hrs)
Interior/exterior spaces, colour theory.

LIST OF PRACTICALS

The subjects include the elements of Anthropometrics with respect to:

- Human body
- Various activities and human body
- Furniture and fitting (standards)
- Vehicles (all angles movement, parking, turning, sizes etc)
- Street furniture

Note:

- All dimensions in all segments to be related to human figures.
- Dimensions should be resolved from actual measurements.

Minimum of 8 sheets should be made in the semester

1. Introduction to elements and principles of design and their application with examples from nature and everyday activities as well architectural examples.
2. Importance of color in Architecture. The colour wheel, application of colour, colour schemes, psychological effects of colours, effects of colours on buildings. (01 sheet)
3. Proportion of Parts of Human Body (01 sheet)
The proportions of the different parts of the human body during various activities such as standing, working or countertops, sitting in various spaces.
4. Human Activities (02 sheets)
Requirement of space (2-D, 3-D) for various human activities (Single and multiple use of spaces such as queues etc.)
5. Furniture Standards (02 sheets)
Furniture standards (sizes of furniture in domestic and public spaces); Toilet and Kitchen equipment - sizes and standards; Doors and windows - sizes, standards and locations.
6. Furniture layout within a given space such as, child's bedroom , Bachelor's apartment, hostel room (1 sheet plan only)
7. Furniture Layout within a one room office with pantry, toilet and reception (1 sheet plan only)

Note: While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web sites and teachers should develop the design problems/ assignments, which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

Total No. of Sheets = 8

INSTRUCTIONAL STRATEGY

This is one of the most important practical oriented subject for diploma in architectural assistantship. While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rythem, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera
2. Architects Data by Neufert
3. Space, Time and Order by DK Ching
4. Architectural Aesthetics by Sangeet Sharma, Abhishek Publication, 57-59, Sector 17, Chandigarh

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	11	34
2	11	34
3	10	32
Total	32	100