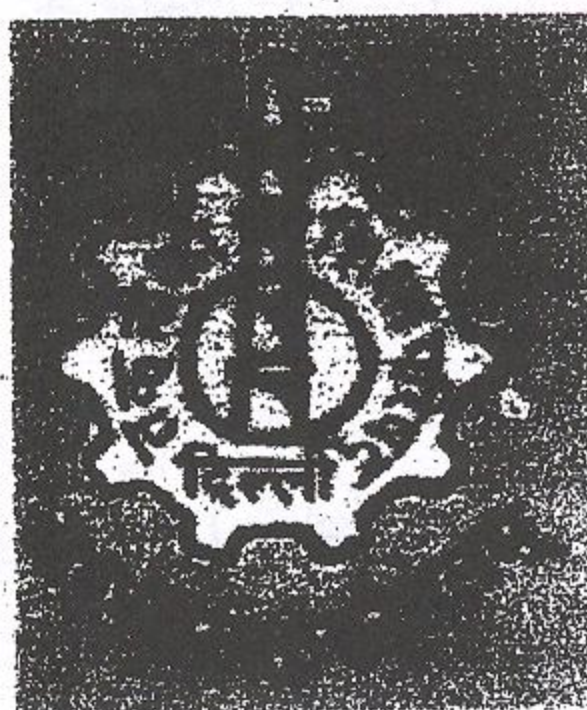


**COURSE CURRICULUM
FOR
DIPLOMA
IN
COMPUTER ENGINEERING**



DEVELOPED BY:

**BOARD OF TECHNICAL EDUCATION,
DELHI**

EFFECTIVE FROM 2005-2006

DATE- FEBRUARY-2005

BOARD OF TECHNICAL EDUCATION, DELHI
STUDY AND EVALUATION SCHEME-SEMESTER SYSTEM
COMPUTER ENGINEERING

TERM-I

ITEM-1											
S.NO	SUBJECT	LTP	EVALUATION SCHEME				EXTERNAL ASSESSMENT				TOTAL MARKS
			INTERNAL ASSESSMENT								
			THEORY	PRACTICAL	WRITTEN MARKS	HOURS	PRACTICALS	HOURS			
1	Communications Skills	3 2 -	50	-	100	3	-	-		150	
2	Applied Maths-I	4 2 -	50	-	100	3	-	-		150	
3	Engineering Drawing	2 - 6	-	50	100	3	-	-		150	
4	Introduction to Information Technology	2 - 8	50	50	-	-	100	3		200	
5	Workshop Practice	- - 6		50	-	-	50	3		100	
	Student Centred Activities	5									
		11 4 25	150	150	300		150			750	

21C5-C5-1
21C5-C5-2
21C5-C5-3

TERM-II

TERM-II									
S.NO	SUBJECT	LTP	EVALUATION SCHEME			EXTERNAL ASSESSMENT			TOTAL MARKS
			INTERNAL ASSESSMENT						
			THEORY	PRACTICAL	WRITTEN MARKS	HOURS	PRACTICALS	HOURS	
1	Applied Maths-II	4 1 -	50 /	-	100 /	3	-	-	150
2	Applied Physics	4 1 3	50 /	50	100 /	3	50 /	3	250
3	Basic Electronics	3 1 4	50 /	50	100 /	3	50 /	3	250
4	Electrical Engg.	3 - 3	50 /	50	100 /	3	50 /	3	250
5	Programming in C	3 1 4	50 /	50	100 /	3	50 /	3	250
	Student Centred Activities	5							
		17 4 19	250	200	500		200		1150

TERM-III

S.NO	SUBJECT	LTP	EVALUATION SCHEME		EXTERNAL ASSESSMENT				TOTAL MARKS
			INTERNAL ASSESSMENT						
			THEORY	PRACTICAL	WRITTEN MARKS	HOURS	PRACTICALS	HOURS	
1	Operating System	3 1 3	50	50	100	3	50		250
2	Digital Electronics	3 1 3	50	50	100	3	50		250
3	Data Structure in C	3 1 3	50	50	100	3	50		250
4	Microprocessor	3 1 3	50	50	100	3	50		250
5	Computer Workshop-I	.. 6		50			50		100
	Student Centred Activities	6							
		12 4 24	200	250	400		250		1100

TERM-IV

S.NO	SUBJECT	LTP	EVALUATION SCHEME		EXTERNAL ASSESSMENT				TOTAL MARKS
			INTERNAL ASSESSMENT						
			THEORY	PRACTICAL	WRITTEN MARKS	HOURS	PRACTICALS	HOURS	
1	Object Oriented Programming	3 1 4	50	50	100	3	50	3	250
2	Computer Organization	3 1 -	50		100	3			150
3	Data Communication	3 1 3	50	50	100	3	50		250
4	Data Base Management System	3 1 3	50	50	100	3	50	3	250
5	Peripheral & Interfaces	3 1 3	50	50	100	3	50	3	250
6	Computer workshop-II	- - 4		50			50	3	100
	Student Centred Activities	3							
		15 5 20	250	250	500		250		1250

Note:

1. A three day awareness camp shall be offered on ecology and environmental during third semester
2. A three day awareness camp shall be offered on entrepreneurship
3. In each semester 2 hours will be devoted towards student centred activities during these periods, student may undertake independent library studies and may contact their teacher for removing their difficulties. In addition, extension lectures may from professionals, Industrial/field Visits, seminar, NCC, hobby clubs and other co-curricular activities can be undertaken.
4. Two days awareness camp shall be offered on emerging area/technology in field of computer & communication in 2nd year.
5. Seminar is to be given by the student on the latest topics and projects undertaken under the guidance of a teacher.

COMPUTER ENGINEERING DETAILED CONTENTS OF VARIOUS SUBJECTS FIRST YEAR

Sr. No.	Subjects	Page No.(s)
Semester—I		05-16
1.1	Communication Skills	6
1.2	Applied Maths-I	8
1.3	Engineering Drawing	10
1.4	Introduction to Information Technology	11
1.5	Workshop Practice	14
Semester-II		17-29
2.1	Applied Maths-II	17
2.2	Applied Physics (Theory)	19
2.3	Basic Electronics	23
2.4	Electrical Engineering	26
2.5	Programming in C	28

CONTENTS

Sr. No.	Particulars	Page No.(s)
1.	Study and Evaluation Scheme	1-4
2.	Detailed Contents of various subjects	5-68
Semester—I		05-16
1.1	Communication Skills /	6
1.2	Applied Maths-I /	8
1.3	Engineering Drawing /	10
1.4	Introduction to Information Technology /	11
1.5	Workshop Practice /	14
Semester-II		17-29
2.1	Applied Maths-II /	17
2.2	Applied Physics (Theory) /	19
2.3	Basic Electronics /	23
2.4	Electrical Engineering /	26
2.5	Programming in C	28
Semester—III		30-38
3.1	Operating System	31
3.2	Digital Electronics	32
3.3	Data Structure in C	34
3.4	Microprocessor	36
3.5	Computer Workshop I	38
Semester-IV		39-49
4.1	Object Oriented Programming	39
4.2	Computer Organization	41
4.3	Data Communication	42
4.4	Data Base Management System	44
4.5	Peripheral & Interfaces	46
4.6	Computer Workshop-II	48

COMMUNICATION SKILLS

L	T	P
3	2	-

Rationale

Diploma holders are supposed to communicate effectively through verbal and written modes. They are also expected to acquire skills in preparing different kinds of reports as globalization has made reporting an essential part of communication (interaction). In view of the above requirements, this subject has been added to develop necessary competencies in written and oral communication. Efforts should be made to arrange practice sessions to encourage active participation in mutual interaction.

Detailed contents

1. Introduction : Definition of communication, its purpose and importance.
2. Methods of communication :
Oral, written and non-verbal (presentation, interview, group discussion, Telephonic communication.
Concept of effective communication and its essentials.
Barriers to communication, techniques of overcoming these barriers
3. Written communication : Drafting of notices with or without agenda, press releases, advertisements, memoranda circulars forces, electronics - mail, complaints, representations, and letters to the editor.
4. Business Correspondence :
Trade Inquiries/Request for Prices and Quotations
Offers and Quotations
Placing orders and their Executions
Claims, Complaints and Adjustments
Business Circulars like launching a new product, Change of premises, Relating to opening new business etc.
5. Letter Writing : Application for employment, covering letter forwarding an application, Preparation of Curriculum Vitae/Resume, Application on prescribed form, preparing job related advertisement.
6. Précis writing : Making précis of an unseen passage of about 200 to 250 words and giving a suitable title also.
7. Report writing : Different types of reports, Essential of a good and effective report, drafting press report/ release/ reporting in letter style and in memo style

Guidelines for Tutorials

1. Telephonic conversation - Making and Receiving Calls
2. Mock Exercises on interview for a job
3. Group discussions on current issues
4. Listening comprehension from Radio or TV talk in English
5. Extempore speech/Declaration contest
6. Presentation of a report with the help of Audio-Visual aids.

REFERENCE BOOKS

1. **Essentials of Business Communication** by Rajendra Pal & J S Korlahalli (Sultan Chand & Sons)
2. **Business Communication** - K.K. Sinha (Galgotia Publishing House)
3. **Communication Techniques/Skills** - R. K. Chadha (Dhanpat Rai Publications)
4. **Applied Indian Communication Techniques** - P Prasad (S.K. Katani & Sons)
5. **A guide to Business Correspondence** - A.N. Kapoor (S. Chand & Company Ltd).

APPLIED MATHS-I

L	T	P
4	1	-

Rationale

Applied mathematics forms the backbone of engineering discipline. Basic elements of permutations and combinations, trigonometry, vectors, complex numbers and statics have been included in the curriculum as foundation course and to provide base for continuing educations to students.

Detailed contents

1. **Determinants & Matrices**
 Determinant (up to 3rd order only) – Expansion of Determinant
 Sarus' diagram
 Row and Column expansion
 Properties of determinant
 Matrices - Types of matrices
 Addition, Subtraction & Multiplication of matrices
 Properties of addition, multiplication and scalar multiplication of matrices
 Inverse of a matrix by adjoint matrix method
 Solution of linear equations by matrix method
2. **Vector Algebra**
 Definition, notation and rectangular resolution of a vector
 Addition and subtraction of vectors and their properties
 Scalar and vector products of two vectors only and their properties
3. **Coordinate Geometry**
 Point : Cartesian and polar co-ordinates and their conversion, distance between two points, internal and external division formulae, co-ordinates of centroid and incentre, Area of triangle, conditions of collinearity of points, simple problems on locus.
 Straight line : Equation of a straight line in various standard forms, angle between straight lines, perpendicular distance formula.
 Circle : The equation of circle in standard and general form, finding the equation of circle when its centre and radius are given any three points on it are given extremities of the diameter are given
 Conics : Definitions of conics -- parabola, ellipse and hyperbola and their standard equations Finding the equation of a parabola when its focus and directrix or focus and vertex are given Finding the equation of an ellipse or hyperbola when focus, directrix and eccentricity are given Given the standard equation of conic, to find its focus, directrix, vertex, axis, eccentricity and the length of latus rectum.
4. **Differential Calculus**
 Limits : Concept of a function, its value and limit, Evaluation of limits, four standard limits only, namely

$\lim_{x \rightarrow 0} \frac{\sin x}{x}$	$\lim_{x \rightarrow 0} (1+x)^{1/x}$
$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$	$\lim_{x \rightarrow 0} \frac{a^x - 1}{x}$

Differentiation: Definition, its physical meaning as rate measure and its geometrical meaning.

Differentiation from first principles of x^n , a^x , $\log^x \sin x$, $\cos x$, $\tan x$ only.

Differentiation of $\cot x$, $\sec x$, $\operatorname{cosec} x$ and of inverse t-ratios.

Differentiation of sum, product and quotient of functions.

Differentiation of function of a function.

Differentiation of implicit functions and parametric equations. Logarithmic differentiation.

REFERENCE BOOKS

1. Applied mathematics for polytechnics (8th Ed.)-H.K.Dass
2. Differential Calculus-Shanti Narayan
3. Determinants-Schaum Series
4. Matrices-Schaum Series
5. Simple course in coordinate Geometry H.K.Dass, H.C. Saxena, M.D. Raisinghoria

ENGINEERING DRAWING

L T P
- - 6

RATIONALE

Engineering Drawing known as the language of engineers is a widely used means of communication among the designers, engineers, technicians, draftsmen and craftsmen in the industry. The transition of ideas into practice without the use of this graphic language is really beyond imagination. The diploma holder is required to read and interpret the designs and drawings, provided to him for actual execution of the job. This course aims at building a foundation for comprehension of this language of engineering profession.

DETAILED CONTENTS

Introduction to instruments & materials used in drawing.

- Plate No.1: Free hand sketching
- Plate No.2: Conventional representation of lines, materials, breaks, electric and electronics symbols.
- Plate No.3: Free hand lettering and numerals in 3, 5 8 & 12 mm series.
Vertical & inclined lettering at 75° , instrumental single stroke lettering in 12 mm.
- Plate No.4: Dimension techniques
- Plate No.5: Three views of an object in 1st angle projection
- Plate No.6: Six views of an object in 1st angle projection
- Plate No.7: Three views of an object in third angle projection
- Plate No.8: Six views of an object in third angle projection
- Plate No.9: Identification of surfaces from different objects including inclined & curved surfaces.
- Plate No.10: Sections - conventional representation of materials, general conventions of revolved & removed sections.
- Plate No.11: Representation of pictorial/isometric view of a simple object
- Plate No.12: Isometric views of simple objects including slant & curved surfaces
- Plate No.13: Isometric of a circle, semicircle, arcs & angles
- Plate No.14: Missing views & lines
- Plate No.15: Scales, diagonal scale, scale of chords.

Reference Books

1. A text book of Engineering Drawing-Surjit Singh

2. Sheet metal shop

Introduction to forging, forging tools, tongs, blowers/pressure blowers, hammers, chisels, punch, anvil, swag-block etc. Forging operations.

- Making sheet metal joints
- Making sheet metal tray or a funnel or a computer chassis
- Preparation of sheet metal jobs valving rolling, shearing, creasing, bending and cornering
- Prepare a lap riveting joint of sheet metal pieces

3. Electric Shop

- Demonstration of tools commonly used in Electric Shop
- Safety precaution, electric shock treatment
- Demonstration of Common Electric material like: wires, fuses, ceiling roses, battens, cleats and allied items.
- Demonstration of Voltmeter, Ammeter, Multimeter and Energy meter
 - Job: Wiring practice in batten wiring, plastic casing-capping and conduit
 - Job: Control of one lamp by one switch
 - Job: Control of one bell by one switch
 - Job: Assemble a Type light
 - Job: Dismantle study, find out fault, repair the fault, assemble and test domestic appliances like electric iron, electric mixer, ceiling and table fan, tube-light, water heater (geyser) and desert cooler.
 - Job: Laying out of complete wiring of a house (Single-phase and Three-phase)

4. Electronics Shop

- Identification, familiarization, demonstration and use of the following electronic instruments:
- Multi-meter digital
- Single beam simple CRO, function of every knob on the front panel
- Power supply, fixed voltage and variable voltage, single output as well as dual output.
- Identification, familiarization and uses of commonly used tools; active and passive components; color code and types of resistor and potentiometers.
- Cut, strip, join and insulate two lengths of wires/cables (repeat with different types of cables/wires)
- Demonstrate and practice the skill to remove components/wires by unsoldering.
- Cut, bend, tin component, leads, inserts, Solder components e.g. resistor, capacitor, diodes, transistors on a PCB

- changing setting like-date ,time ,color (background and foreground)
- using shortcuts
- using online help
- Windows system Tools
- Control Panel.

7. MS-WORD

- File Management:
Opening, creating and saving a document, locating files, copying contents in some different file (s).
- Page Setup:
Setting margins, tab setting, ruler, indenting
- Editing A Document:
Entering text, cut, copy, and paste using toolbars.
- Formatting A Document:
Using different fonts, changing font size and color, 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
- use of headers ,footers :inserting foot note ,endnote ,use of comments
- inserting date ,time ,special symbols ,importing graphic images ,drawing tools
- Tables and border:
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 setup ,printing options
- using find ,replace options
- using tools like:
Spellchecker, 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

8. MS-EXCEL

- Starting excel ,open worksheet ,enter ,edit ,data ,formulas to calculate values ,format data ,create chart ,printing chart ,save worksheet ,switching from another spread sheet
- Menu commands:
Create, format charts, organize, manage data, solving problem by analyzing data, exchange with another applications .Programming with ms-excel, getting information while working
- Work books:
Managing work books (create ,open ,close ,save),working in work books ,selecting the cells ,choosing commands ,data entry techniques ,formula creation and links ,controlling calculations ,working with array
- 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

9. MS-ACCESS:

- Creating a database; table; the table window in designed view, defining fields, primary key fields, planning the table
- Using datasheet view and designed view; modifying the design of a table, making a backup copy.
- Adding and editor:
The access editor, adding and modifying records, moving data among records, adding sample data
- Finding records:
Find options, finds using wild card, find and replace
- Quick sort:
Creating a quick sort, removing a quick sort

10. MS-Power Point

- Preparing presentation:
Creating a new slide, sorting slides, inserting pictures, setting header and footer
- Formatting:
Setting fonts, alignments, slide design, slide layout
- Slide show:
View show, Rehearse timing, action buttons, slide transition, animations skills

11. Internet and its applications

- Log-in to Internet
- Navigation for information seeking on Internet
- Browsing and downloading of information from Internet
- 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
- Configuring MS-Outlook Express

Reference books

1. Fundamental of computer- V. Rajaraman
2. Computers today - SK Basanda
3. MS-Office 2000 for every one -Sanjay Saxena
4. Internet for every one -Alexis Leon and Mathews
5. Computer Fundamentals-P.K.Sinha
6. Fundamental of information Technology-Leon and Leon

- Wiring of a small circuit on a PCB/tag strip involving laying, sleeving and use of identifier tags
- Demonstrate the joining (or connecting) methods/mounting and dismantling method, as well as uses of the items mentioned below:
- Various types of plugs, sockets, connectors suitable for general-purpose audio video use. Some of the such connectors e.g. 2 and 3 pin mains plug and sockets, Banana plugs, sockets and similar male and female connectors and terminal strips.
- Various types of switches such as: normal/miniature, toggle, slide, push button piano key, rotary, SPST, SPDT, DPST, band selector, multi-way Master Mains Switch.
- Exposure to modern soldering and de-soldering processes (Field visits)
- De-solder pump, remove and clean all the components and wires from a given equipment, a PCB or a tag strip.