

Subject Name	L	T	P	Credit
Introduction To Engineering Mathematics With Applications– I	4	0	0	4

Differential calculus

Functions : Introduction of functions, concept of real function, types of functions, applications of functions, composite functions, its domain and range.

Limit : Introduction, fundamental theorems on limits, operation on Limits, functions in the real world Limits, continuity, infinity.

Differentiation : Introduction, the beginning of derivatives, techniques of differentiation, chain rule, derivatives of transcendental (trigonometric) functions, derivatives in the real world, anti differentiation. Expansion of functions, maxima and minima of functions of one variable.

Integral calculus

Integration : Introduction, fundamental theorem of calculus, techniques of integration, substitution rule.

Indefinite Integral : basics of indefinite integral and its properties, substitution, integration using trigonometric identity & integration by parts.

Definite integrals : basics of definite integral and its properties, definite integrals as a limit of a sum, application in summation of series.

Sequences and series

Sequences : introduction, some examples of sequences, limit of a sequence.

Series : Arithmetic progression (AP), examples of AP and insertion of arithmetic means, geometric progression (GP), sum to infinity of a GP, arithmetic-geometric sequence, sum to n terms of special sequences, exponential series, logarithmic series.

Ordinary differential equations

First-order differential equations (Separable, Exact, Homogeneous, Linear), linear differential equations of higher order with constant coefficients. Homogeneous differential equations, Simultaneous linear differential equations.

Algebra of Logic, Boolean Algebra, graph theory and fuzzy Logic

Algebra of Logic: Introduction, logical connectives, elementary operations of logic.

Boolean algebra: Introduction, principle of duality, basic theorems, boolean expressions and functions, switching circuit algebra.

Graph Theory: Introduction, graphs, sub graphs, degree and distance, basic theorems, types of graphs, tree, cycles and network.

Fuzzy Logic: Introduction, elementary concept of fuzzy logic, applications of fuzzy logic.

Text Books

1. Advance engineering mathematics, by Ramana, Tata McGraw hill.
2. Advance engineering mathematics by D. G. Guffy.
3. Engineering mathematics by S S Sastri, PHI.

Subject Name	L	T	P	Credit
Introduction to operating systems and software applications	4	0	0	4

Unit I

Introduction : What is computer, necessity of computer, generation of computer, classification of computer, major components of a computer, control unit, ALU, CPU register, bus architecture, instruction set, binary form of program and instruction, instruction execution process, essential memory concepts memory organizations, memory packages , modules , logical memory organizations , memory considerations , memory types RAM, ROM, PROM, EPROM, the information processing cycle (input, process, output, and storage), introduction to BIOS system.

Unit II

Introduction to operating systems : definition, operating system features, functions of an operating system, types of operating system, different operating systems used today, architecture of operating system, kernel and shell, CPU scheduling, memory management, I/O management, DOS, DOS architecture, boot process, DOS internal and external commands,

Unit III

Introduction of Windows : Architecture of Windows, various features, file and directory management, exploring hard disk, file and directory management, control panel, taskbar, user management, formatting and partitioning and hard drive. device drivers in windows, installation of various software applications

LINUX : History & features of Linux, Linux architecture, file system of Linux, hardware requirements of Linux, various flavors of Linux, Linux standard directories, functions of profile and login files in Linux, Linux kernel and various Linux commands, telnet, vi editor. comparative study of windows and Linux. installation of Linux/Windows OS

Unit IV

Introduction to Software : what is software, types of software, application software system software, examples of application software. software application in E-business, bio-informatics, health care, remote sensing & GIS, multimedia and animation etc. spreadsheets and database packages, introduction to OpenOffice/MS word, MS PowerPoint, ms excel, word processing concepts and terminology, word processing usage. use of spread sheet in business, different terminology of spread sheet, use of presentation software in business, concepts and terminology of presentation software, presentation software application.

Unit V

Computer Networking : introduction, goals, introduction to network protocol and topologies, types of network: LAN, MAN,WAN, ISO-OSI Model, functions of different layers. internetworking concepts, devices, TCP/IP Model. introduction to Internet, working of internet, world wide web, various web browsers and servers, computer security basics: introduction to viruses, worms, malware, trojans, spyware and anti-spyware software, firewall.

Data base Management System : Introduction, file oriented approach and database approach, data models, architecture of database system, data independence, data

dictionary, DBA, introduction to latest technologies, big data, cloud computing, grid computing and nano computing.

Text Books:

1. Fundamentals of Computers : E Balagurusamy, Tata McGraw Hill
2. Basic Computer Engineering : Silakari and Shukla, Wiley India
3. Fundamentals of Computers : V Rajaraman, PHI
4. Working in MS-Office : Ron Mansfield ,Tata McGraw Hill

Reference Books:

1. Information Technology Principles and Application: Ajoy Kumar Ray & Tinku Acharya, PHI.
2. Introduction of Computers : Peter Norton, Tata McGraw-Hill
3. Operating Systems, Silberschatz and Galvin, Wiley India
4. Introduction to PC Hardware and Troubleshooting, Mike Meyers

Subject Name	L	T	P	Credit
Business Communication & Presentation Skills	2	1	2	4

Unit - I Essential of Grammar

Grammar – Applied grammar and usage, parts of speech, articles, tenses, subject-verb agreement, prepositions, active and passive voice, reported speech: direct and indirect, sentence structure, english phonetic symbol/signs, punctuations.

Unit – II Application of linguistic ability

Developing reading & writing: reading comprehension, process, strategy, benefits, active & passive reading, and sq3r reading technique.

Writing: planning, noting & drafting, precise writing, art of summarizing, right word selections, definition of engineering terms.

Unit – III Fundamentals of communication skills

Scope and significance of communication skills, listening, speaking, reading and writing,. process of communication in an organization,, verbal and non verbal communication, barriers to communication, formal and informal channels of communication, need for effective communication, media of communication,

Unit – IV Business correspondence & advanced techniques in technical writing

Business correspondence – business letters, parts & layouts of business letters, application, calling/ sending quotations/ tenders/orders/ complaints.

CV writing, memos, minutes, technical reports, project report and report writing strategies, technical proposals, e-mail etiquette, technical presentations.

Unit – V Employability and corporate skills

Interview skills, group discussion, time management and effective planning, decision making and negotiation skills, people skills, team work, development of leadership qualities, integrated speaking and presentation skills.

Text Book:

1. A practical English Grammar, A.J. Thomson and A.V. Martinet,
2. Business Correspondence and Report Writing, By Sharma, TMH.

References:

3. Living English Structure, W.S. Allen; Longmans
4. English Grammar – Ehrlich, Schaum Series, TMH. .
5. Spoken English for India, R.K. Bansal and IB Harrison Orient Longman.
6. Communication for Science & Engineering, by Dr. Binod Mishra,
7. Business Communication, Dr. R.C. Sharma

Practical

Practice sessions with following language laboratory software:

- Tense Buster,
- Study Skills,
- Business Communication

Exercises to be performed by the students :

- To write a book review
- Student are advised to read at least 3 books (novel, short stories, poems) written in English by authors of Indian origin.
- Students are expected to read actively and critically.
- One book is expected to read in a period of not more than 20 days after which students have to submit a hand – written review briefing the following aspects :
 1. Relevance of the book title to the content
 2. About the main character and other character
 3. Setting of the book
 4. Main Idea/Theme of the book
 5. Write précis and make presentation in consultation with the teacher
 6. Write 3 quotations from the book
 7. Message of the book and the student take away.

Topic to be covered in the Language Laboratory Sessions;

- Self introduction
- Jam session
- Role play activity
- Social & professional etiquettes
- Phonetics symbol and pronunciation
- Listening skills (including listening comprehension)
- Reading skills (including reading comprehension)
- Writing skills (including structuring resume and cover letter)
- Speaking skills
- Body language
- Oral presentation: preparation and delivery using audio – visual aids with stress and body language and voice modulation (topic to be selected by the teacher)
- Individual presentations with stress on delivery and content
- Overcoming stage fright - debates, extempore
- How to discuss in a group - group discussion
- Discussion on recent developments and current debates in the media
- How to prepare for an interview and face it with confidence
- Conducting meeting and conferences
- Exercises on composition & comprehension, reading improvement
- Telephonic etiquettes
- Movies & videos (based on learning English, with Hindi & English subtitle)

Subject Name	L	T	P	Credit
Transition from physics to electronics	2	1	2	4

Unit I

The Circuit abstraction & resistive networks :- Lumped circuit abstraction, limitations of the lumped circuit abstraction, practical two-terminal elements, ideal two-terminal elements, another ideal two-terminal element, Kirchhoff's laws, circuit analysis: basic method, intuitive method of circuit analysis: series and parallel simplification.

Unit II

Network Theorems :- Nodal analysis and mesh analysis, superposition theorem, Thévenin's theorem and Norton's theorem, maximum power transfer theorem.

Unit III

The Digital Abstraction :- Voltage levels and the static discipline, boolean logic, combinational gates, standard sum-of-products representation, simplifying logic expressions, number representation.

Unit IV

MOSFET Switch & Amplifier :- The switch, logic functions using switches, MOSFET switch implementation of logic gates, signal amplification, review of dependent sources, actual MOSFET characteristics, the switch-current source (SCS) MOSFET model, the MOSFET amplifier

Unit V

Energy Storage Elements :- constitutive laws, series and parallel connections, special examples, transformers, energy, charge, and flux conservation

Text Books :

1. Boylestad and Nashelsky: Electronic Devices and Circuit Theory, Pearson Education
2. Anant Agrawal and Jeffrey H. Lang: Foundations of AD Circuits

Reference Books :

3. Donald A Neamen: Electronic Circuits Analysis and Design, TMH
4. M. Mano : Digital Logic and Computer Design, Pearson Education
5. Salivahanan and Ari Vahagan : Digital Circuits and Design, Vikas Publishing House

Practical List

1. To study and verify Kirchoff's current law.
2. To study and verify Kirchoff's voltage law.
3. To study and verify Thevenin's theorem.
4. To study and verify Norton's theorem.
5. To study and verify maximum power transfer theorem.
6. To study various digital logic gates.
7. To study and verify MOS as an inverter.
8. To study and verify MOS as an or gate.
9. To study and verify MOS as an and gate.
10. To study series and parallel connections of resistors.

Subject Name	L	T	P	Credit
Introduction to programming with C	2	1	2	4

Unit 1

The Art of computer programming, why programming?, programming paradigms, high level and low level programming languages, machine and assembly language, the programming process : defining, planning, coding, testing and documenting the program. basic principles of programming, introductory theory of algorithms, features, definition and criteria of an algorithm, representation of an algorithm, time and space complexity of an algorithm pseudo code, flowchart and its types. application of flow chart. flow chart corresponding to pseudo code. examples of flow chart, interpreter, compiler and assembler.

Unit 2

Categories of programming languages : Imperative, functional, logic and object oriented paradigm. history of programming languages.

Introduction to C programming language : the first C program, structure of C program. header files, compilation and execution, receiving input identifiers, data types, constants, arithmetic operations, type conversions and cast, decision making structures, if, if-else, switch, loop control structures, while, do-while, for etc. , nested structures, break and continue.

Functions: function prototype, function definition, functions as building blocks, calling a function, global and local variables, function definition, function arguments return statement. scope rules: local and global variable, formal parameters, call by value and call by reference recursive function. recursion functions algorithms for factorial, fibonacci sequence, tower of Hanoi, storage classes, standard library functions.

Unit 3

Array: Introduction to arrays, initialization of array, operations on array, insertion and access array elements, two dimensional arrays, multi dimensional arrays, passing arrays to functions.

Pointers: Pointer declaration, initialization, operations on pointers, pointers as function arguments, functions returning pointers, pointer arithmetic, pointers and arrays, arrays of pointers, pointers and strings,

Unit 4

Structures: Defining and processing, passing to a function, unions, typedef, array of structure, pointer to structure, pointers within structure..

Strings : Definition, standard library functions, strlen () ,strcpy() , strcat() , strcmp() .

Dynamic Memory Allocation: malloc(), calloc(), realloc(), free() and sizeof operator.

Unit 5

Console Input/output : Types of I/O, console I/O functions, sprintf() and scanf() functions , formatted and unformatted console functions.

Introduction to C preprocessor, definition of preprocessor, macro substitution directives, bitwise operators

Working with files : Data organization, file pointer and their manipulation, file operations: opening a file, reading from a file, closing the file, counting characters, tabs, spaces, a file-copy program, writing to a file. different types of files i.e. text and binary

Text Book :

1. Programming in ANSI C : E Balagurusamy, TMH
2. Let Us C : Yashavant P. Kanetkar, BPB Publications.

References:

1. Fundamental Algorithms (Art of Computer Programming): Knuth, Narosa Publishing House
2. Mastering Algorithms with C : Kyle Loudon, Shroff Publishers
3. Programming with C : K R Venugopal, Sudeep R Prasad, TMH Outline Series.
4. Structured Programming approach using C : Forouzan and Gilberg, Thomson learning publications

Suggested Experiments

1. Write a program in C to evaluate area of triangle.
2. Exchange the values of two variables with and without temporary variable.
3. Write a program to find the greatest of three numbers and print the numbers in ascending order.
4. Write a program in C to find out roots of given quadratic equations.
5. Write C code to compute the real roots of the equation: $ax^2+bx+c=0$.
6. Write a program that counts from one to ten, prints the values on a separate line for each, and includes a message of your choice when the count is 3 and a different message when the count is 7.
7. Write a program that writes your name on the monitor ten times. Write this program three times, once with each looping method.
8. Write a program to find a factorial of given n number using do while statement.
9. Write a program to print a pyramid using for loop.
10. Write a Program for Palindrome.
11. Write a program to print Fibonacci series using recursion.
12. Write a program to print the element of array using pointers.
13. Write a program with three short strings, about 6 characters each, and use "strcpy" to copy "one", "two", and "three" into them. Concatenate the three strings into one string and print the result out 10 times.
14. Write a program that will prompt for a filename for a read file, prompt for a filename for a write file, and open both plus a file to the printer. Enter a loop that will read a character, and output it to the file, the printer, and the monitor. Stop at EOF.
15. Define a named structure containing a string field for a name, an integer for feet, and another for arms. Use the new type to define an array of about 6 items. Fill the fields with data and print them out as follows. A human being has 2 legs and 2 arms. A dog has 4 legs and 0 arms. A Television set has 4 legs and 0 arms. A chair has 4 legs and 2 arms. etc.

16. A bookshop uses a personal computer to maintain the inventory of books that are being sold at the shop. The list includes details such as author, title, isbn number, price, author, stock position. Whenever a customer wants a book, the shopkeeper inputs the title or ISBN number and the system replies whether the book is available or not. If it is not, an appropriate message is displayed. If book is in the list, then the system displays the book details and asks for number of copies. If the requested copies are available, the total cost of the books is displayed, otherwise the message "Requested copies are not in stock" is displayed. Implement using structures.

Note: Number of experiments may be extended to make the better understanding of subject.

Mandsaur University

Subject Name	L	T	P	Credit
Computer hardware and software applications laboratory	0	2	4	4

UNIT I

CPU and memory : Introduction of system overview, introduction to modern cpu concepts, the Intel's CPU, 8086/386/486, Pentium , Core, Core 2, Core 2 Duo, I3, I5, I7 Processor. selecting and installing memory. memory interfacing,

Motherboards : Motherboards, chipset and controllers, BIOS and the boot Process. motherboards sockets and slots, form factor, CMOS , configuring the standard CMOS setup, motherboard BIOS. POST BIOS features, BIOS and boot sequences. power supplies and power management. expansion cards, LAN Card , IDE Card VGA and SVGA Cards, sound card, interface cards, I/O cards, video cards, usb card, internal ports, cables and connector types, interfacing I/O devices, display interface, serial I/O and data communication

UNIT II

Storage devices management : hard disk drive architecture, IDE and SATA devices. CD/DVD drives, SCSI devices, floppy disk, zip drive, backup drive, magnetic recording principles, data and disk organization. track and sector layout, hard drive electronics, CD-ROM drive, construction , DVD drive and decoder. formatting and partitioning of hard disk.

UNIT III

i/o peripherals : ports and connectors, parallel and serial ports, asynchronous communication, serial port signals, video adapters, graphic accelerators, 3D graphics accelerator issues, DirectX. mouse, modems, keyboards, sound cards. drivers installations. CRT, LCD and LED Displays, printers dot -matrix printer, inkjet printer, laser printer introduction and installation. PCI Bus, SCSI Bus and USB architecture. laptop computers.

UNIT IV

Network Components: introduction of network cable like UTP, STP, fiber optics, hub, unmanageable switch, manageable switch, router, modem, WiFi, access point, PCI wireless card, USB wireless device, print server, USB network share, backup device, server hardware etc.

UNIT V

Study of DOS, Windows and Linux operating systems. study of word processing, spreadsheets and presentation software applications, MS-Office or Open office.

Text Book

1. B. Govindarajulu, IBM PC and clones hardware trouble shooting and maintenance, Tata McGraw-Hill
2. MS-DOS 6.22 Russell A. Stultz BPB Publication

Reference Books:

1. Craig Zacker & John Rourke, The complete reference: PC hardware, Tata McGraw-Hill
2. Mike Meyers, Introduction to PC Hardware and Troubleshooting, Tata McGraw-Hill
3. Stephen J. Bigelow, PC Troubleshooting and Repair, Dream tech Press, New Delhi

Suggested Practical List

1. study of Motherboards and its interfacing components.
2. To study various connections, Buses, CPU Slots and ports of Motherboard.
3. Study of Booting Process and BIOS CMOS Setup.
4. Study and practice of internal & external DOS commands.
5. Formatting and partitioning of Hard Disk.
6. Study Serial, Parallel, USB port and their specification and applications, Ethernet port.
7. To study various expansion cards used in a Computer System..
8. To study various cables used in computer communication. Patch Cables , Ethernet Crossover Cables etc.
9. Disassembly and Reassembly of hardware.
10. Installation of Windows Operating System.
11. Install and configuring device drivers and system components.
12. Study and practice essential Windows components, Control Panel, Taskbar, Explorer, Program Manager, Update control center etc.
13. Installation of Linux Operating System.
14. Study and practice of important Linux Commands.
15. Study GUI system and file management in Linux.
16. Installation of Word processing, spreadsheet and presentation software applications.
17. Creation and editing of Text files using MS- word/Openoffice.
18. Creation and operations on spreadsheet using MS-Excel/Openoffice.
19. Creation and editing power-point slides using MS- power point/Openoffice.
20. Study Basic networking, IP Addresses, domain name system.
21. Browsing, Creation and operation of E-Mail and Mail Merge, Social Media and Internet Safety measures
22. Demo practical on various internal and external parts of computer and their interconnection/working.