Subject Name	L	T	P	Credit
Business Communication	3	1	-	4

OBJECTIVES: Communication skills are important for many professions but are crucial for students to develop their personality. They must be able to adapt their methods of communication to all regardless of ability or learning style.

- Students will demonstrate competency in communication skills related to production and presentation of messages in multiple formats.
- Students will demonstrate competency in critical thinking skills related to the analysis, interpretation, and criticism of messages.
- Students will demonstrate an understanding of multiple theoretical perspectives and diverse intellectual traditions in Communication.
- Students will demonstrate competency in human relational interaction.
- Students will demonstrate competency in the analysis and practice of ethical communication.
- Students will demonstrate an understanding of the importance of free expression and the responsibilities it entails.

Unit - I Fundamentals of Language & Vocabulary

Applied Grammar and usages - Parts of Speech, Determiners, Tenses, Subject-Verb Agreement, Prepositions, Active and Passive Voice, **Reported Speech**: Direct and Indirect, Sentence Structure, Punctuations.

Vocabulary: Origin of words, affixation, Antonyms, Synonyms, one-word substitute, phrasal verbs, idioms, proverbs and jargons.

Unit – II Application of Linguistic ability

Linguistic techniques, English phonetic symbols or signs, Phonetic Transcription, Writing of Definitions of Related terms, objects, processes and principles, Paragraph writing, Precise writing and noting.

Unit – III Skills of Communication

Scope and Significance of Communication Skills, Process of Communication in an Organisation, Types of Communication: Verbal and Non-Verbal Communication, Formal and Informal Channels of Communication, Barriers to communication, Measures to overcome Barriers, Need for Effective Communication, Listening skills.

Unit – IV Developing Writing Skills

Business Letters: Parts & Layouts of Business Letters, Calling/ Sending Quotations/ Tenders/Orders/ Complaints, Report Writing (Progress, Observation, Survey, Project and Laboratory).

Unit – V Employability And Corporate Skills

Interview skills, Group Discussion, Job Application, CV Writing, Memos and Email writing, Time management and Effective Planning, Negotiation skills, Teamwork, leadership.

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References: A.J. Thomson and A.V. Martinet, A Practical English Grammar, Business Correspondence and Report Writing - By Sharma; TMH. Living English Structure – By W.S. Allen; Longmans

English Grammar – Ehrlich, Schaum Series; TMH. Spoken English for India – By R.K. Bansal and IB Harrison Orient Longman. New International Business English – by Joans and Alexander; OUP. Communication Skills – Dr Neeta Sharma, Effective Technical Communication – Rizvi; TMH. Communication for Science & Engineering, by Dr Binod Mishra, Business Communication by Dr R.C. Sharma.

OUTCOMES:

- Students will be enriched with good vocabulary and diction.
- To know the process of communication and its components.
- To improve the language skills.
- To enhance phonetic competence, comprehension skills, presentation skills, group discussion skills etc.

Subject Name	L	T	P	Credits
Mathematics & Statistics	3	1	-	4

Unit I: SETS AND RELATIONS

Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets. Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation.

Unit II: GRAPH THEORY

Introduction and basic terminology of graphs, Planer graphs, Multi graphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Isomorphism and Homomorphism of graphs.

Unit III: ERRORS AND SOLUTION OF TRANSCENDENTAL EQUATIONS

Errors & Approximations, Solution of Algebraic & Transcendental Equations: Regular Falsi, Newton- Raphson, Solution of simultaneous linear equations by Gauss Elimination, Gauss Jordan, and Gauss- Siedel Iterative methods.

Unit IV: PROBABILITY

Significant digits and rounding of numbers, data collection, Measures of central tendency, measures of dispersion, Mean, Median, Mode, Range, Standard deviation, Mean deviation, Quartile deviation, Coefficient of Range, Coefficient of QD & QV, Coefficient of Variation, Skewness, Dispersion.

Unit V:

Probability and events, probability distributions, Elements of binomial and poisson distribution, Normal distribution curve and properties, Karl Pearson Coefficients of Correlation or covariance, Rank Correlation Methods, Regression, Properties of Regression Coefficients, Curve Fitting (Method of Least Square).

Reference Books:

1. Advance Engg. Mathematics. By Ramana, Tata McGraw hill.
2. Higher Engineering Mathematics by BS Grewal, Khanna Publication.
3. Advance Engineering Mathematics by D. G. Guffy.
4. Engineering Mathematics by S S Sastri. P.H.I.
5. Mathematics for Engineers by S.Arumungam, SCITECH Publuication.
6. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India.
7. Deo, Narsingh, "Graph Theory With application to Engineering and Computer Science.", PHI

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Subject Name	L	T	P	Credits
Computer Fundamental	3	1	-	4

Course Objectives:

- Give students an in-depth understanding of why computers are essential components in business, education and society.

- Gain in-depth knowledge about the general features of a computer

- Learn various types of memory &I/O management schemes.

- Provides knowledge about fundamentals of organization of a computer

- To study different OS and compare their features.

Unit I
Introduction to Computers: Introduction, Characteristics of Computers, Block diagram of computer, Generation of Computers, Types of computers, Mini Computers, Micro Computers, Mainframe Computers, Super Computers etc., Applications of Computers. **Computer Software**: Introduction, Software: Definition, Relationship between Software and Hardware, Software Categories, System Software, Application Software**. Number System**: Decimal, Binary, Octal, Hexadecimal, Conversions of number systems.

Unit II
Basic computer organization: Block diagram of computer, **Input devices**: classification of input devices, **Output devices**: classification of output devices, Printer, types of printers, **Central Processing Unit (CPU)**, Introduction, Elements of CPU: Control Unit (CU), Arithmetic Logical Unit (ALU), Registers, Instruction format Instruction set, Processor Speed, **Memory**: Introduction, memory measuring units, main memory, types of primary memory chips, Secondary storage: Introduction, types of secondary storage devices.

Unit III
SDLC: Software development life cycle, Algorithm: Definition, Characteristics, Advantages and disadvantages, Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages. **Programming Logic Buildings:** Introduction, Logic Buildings using flowchart and algorithms.

Unit IV
Computer Languages: Machine language, Assembly language, High level language, Program Language Translators: Assembler, Compiler, Interpreter, **Programming Languages**: Introduction, Evolution of Programming Languages, Classification of Programming Languages, Generations of Programming Languages, Features of a Good Programming Language, What are the characteristics of a good program, Top-down design, Bottom-up design.

Unit V
Operating System: Introduction, Operating System, Evolution of Operating System, Types of Operating System, Functions of an Operating System, **Dos**–History, Files and Directories, Internal and External Commands, Batch Files, etc. **Networking Basics:** Introduction, Types

of Networks, Topology, Client-Server Concepts.

Reference Books:

1. Computer Fundamental Organization, B. Ram

2. Computer Fundamentals, Anita Goel, Pearson, 2010.

3. Fundamental of Computers – By V.Rajaraman B.P.B. Publications

4. Fundamental of Computers – By P.K. Sinha

5. Computer Today- By Suresh Basandra

6. Computer Networks- By Andrew S. Tanenbaum

Course Outcomes:

- Bridge the fundamental concepts of computers with the present level of knowledge of the students.
- Familiarise operating systems, programming languages, peripheral devices, networking, multimedia and internet
- Understand binary, hexadecimal and octal number systems and their arithmetic.
- Understand how logic circuits and Boolean algebra forms as the basics of digital computer.
- At the completion of this course students will be introduced to the basics of networking and Logic Building concepts of programming.

List of Experiments

1. Study of Hardware devices like keyboard, Mouse, Monitor, CD –ROM etc.

2. Study of Motherboard and its components.

3. Assembling and disassembling a computer.

4. Study of BIOS settings.

5. Formatting and partitioning Hard disk.

6. Installation of Windows Operating system.

7. Installation of Linux Operating system.

8. Installation of various device drivers like printer, scanner, webcam and motherboard etc.

9. How to create virtual machine and dual boot.

10. Installation of utility software like MS-Office, Photoshop, PDF Readers.

11. Study of Computer Network LAN, MAN, WAN and various networking cables and networking devices.

12. Study of IP-Addressing Schemes.

13. Creating LAN using crossover cable and straight through cable.

14. Sharing and Mapping printer, drives and folders in computer network.

15. Making image of a system.

16. Making bootable pen drive.

17. How to extend the RAM space using pen drive.

18. Accessing Remote Computer using team weaver and windows remote desktop.

19. Study of troubleshooting of hardware and software generated problems.

20. Some Dos (Internal & External commands) and Net Commands.

21. Perform these commands internal commands.

    DIR,TYPE,DEL,ERASE,MD,CD,COPY,RMDIR,VER,DATE,TIME,PAT
    H,CLS,RMDIR,VER,DATE,TIME,PATH,CLS,BREAK, SET,EXIT.

22. Perform external commands. APPEND, CHKDISK,ATTRIB,SYS,EDIT.

23. Write an algorithm for adding 2 no.

24. Write an algorithm for swapping two no using third variable.

25. Write an algorithm for swapping two no without using third variable.

26. Write an algorithm for finding simple interest.

27. Write an algorithm for finding area of circle.

28. Write an algorithm for finding whether a given no is even or odd.

29. Write an algorithm for finding largest no among two no.

30. Draw a flowchart for adding 2 no.

31. Draw a flowchart for swapping two no using third variable.

32. Draw a flowchart for swapping two no without using third variable.

33. Draw a flowchart for finding simple interest.

34. Draw a flowchart for finding area of circle.

35. Draw a flowchart for finding whether a given no is even or odd.

36. Draw a flowchart for finding largest no among two no.

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Subject Name	L	T	P	Credits
C Programming & Data Structure	3	1	4	6

Course Objectives:
- The course aims to provide exposure to problem-solving through programming.
- It aims to train the student to the basic concepts of the C-programming language.
- This course involves a lab component which is designed to give the student hands-on experience with the concepts.
- Illustrate the flowchart and design an algorithm for a given problem and to develop C programs using operators.
- Develop conditional and iterative statements to write C programs

Unit I
History of C; Structure of a C program, Data types; Constant & Variable; Operators & expressions; Control Constructs – if-else, for, while, do-while; Case statement; Arrays; Formatted & unformatted I/O; Type modifiers & Storage classes; Ternary operator; Type conversion & type casting; Priority & associatively of operators.

Unit II
Functions; Arguments;Return value; Parameter passing – call by value, call by reference; Return statement; Scope, visibility and life time rules for various types of variable, static variable; Calling a function; Recursion – basics, comparison with iteration, tail recursion, when to avoid recursion examples.

Unit III
Special constructs – Break, continue, exit(), goto & labels; Pointers - & and * operators, pointer expression, pointer arithmetic, dynamic memory management functions like malloc(), calloc(), free(); String; Structure – basic, declaration, membership operator, pointer to structure, referential operator, self referential structures,Union – basic, declaration.

Unit IV
Miscellaneous Features: File handling and related functions; printf & scanf family;C preprocessor –
basics, #Include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef;

Unit V
Data Structure definition,Categories of data structures, Data structure operations, Applications of data structures. **Stack:**Stack, Operations on stack,Polish Notation: Infix, Prefix, Postfix, Conversion from one to another using stack. **Queue:** Queue, Application of Queue, Circular Queue.

Reference Books:

1. Kerninghan & Richie: The C Programming language, PHI
2. Kanetkar Y: Let us C
3. Fundamentals Of Data Structure, By S. Sawhney & E. Horowitz
4. Date Structure : By lipschuists (Schaum's .outline Series Mcgraw Hill publication)

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Course Outcomes:

- Identify situations where computational methods and computers would be useful.

- Given a computational problem, identify and abstractthe programming task involved.
- Approach the programming tasks using techniques learned and writepseudo-code.
- Choose the right data representation formats based on the requirements of the problem.
- Exercise files concept to show input and output of files in C
- Understand basic Structure of the C-PROGRAMMING, declaration and usage of variables
- Exercise conditional and iterative statements to Write C programs

List of Experiments

1. Write a program for simple arithmetic operations?

2. Write a program for finding greatest number among two numbers?

3. Write a program for the greatest number among the three numbers?

4. Write a program for finding an even or odd number?

5. Write a program for finding leap year?

6. Write a program to swap two numbers using a third variable?

7. Write a program to swap two numbers without third variable?

8. Write a program for printing of table which is given by the user?

9. Write a program for printing of table with valid condition?

10. Write a program to print in * in the pattern pyramid?

11. Write a program to print binary number (0, 1) in pyramid pattern?

12. Write a program to find the largest number among two numbers using ternary operator?

13. Write a program to check given number is prime or not?

14. Write a program to generate the Fibonacci series?

15. Write a program for finding sum & average of array element?

16. Write a program to calculate the area of giving the shapes: 1. Circle 2. Triangle 3. Rectangle 4. Square using switch case statement?

17. Write a program to swap two numbers using a third variable to function?

18. Write a program to swap two numbers without using a third variable to function?

19. Write a program for triangle to the given pattern

```
      *
     * *
    * * *
   * * * *
```

20. Write a program for pyramid to the given pattern

```
   *
  * *
 * * *
* * * *
```

21. Write a program for finding reverse number which is given by the user?

22. Write a program for finding the sum of the given number?

23. Write a program to find even or odd number using functions?

24. Write a program to find largest and smallest element from an array?

25. Write a program for finding the sum of two matrices?

26. Write a program for finding the factorial number?

27. Write a program finding factorial using recursion?

28. Write a program finding power of a given number using recursion?

29. Write a program to print Fibonacci series using GOTO?

30. Write a program of special constructs using continue?

31. Write a program of special constructs using break?

32. Write a program to store information of student using structure?

33. Write a program to find the address of a variable using pointer variable?

34. Write a program finding power of a given number?

35. Write a program to connect two strings using string function?

36. Write a program to compare one string to another string using string function?

37. Write a program to calculate the length of string using string function?

38. Write a program to copy one string to another string using string function?

39. Write a program to copy one string to another string without string function?

40. Write a program to calculate the area of a circle using the macro function?

41. Write a program to include user defined header file in C Program.?

42. Write a program to check macros which is defined or not in the program?

43. Write a program to a read one character from the file using file function?

44. Write a program to a write one character to the file using file function?

45. Write a program to append one character to the file using file function?

46. Write a program to read numbers and characters from the file using file function?

47. Write a program to write numbers and characters to the file using file function?

48. Write a program to append numbers and characters to the file using file function?

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Subject Name	L	T	P	Credits
Cloud Computing Concepts-1	3	1	4	6

OBJECTIVES:

- Introduction to Cloud Computing and Key concepts of virtualization.
- Lear about the Growth of Internet and types.
- Study about the Different Cloud Computing services and Cloud Implementation, Programming and Mobile cloud computing.
- To Study of Key components of Amazon Web Services Cloud Backup and solutions

Unit I

Internet Vs Intranet, Growth of Internet, ISP, ISP in India, WORLD WIDE WEB (WWW) - Web server, Introduction: Historical development, Characteristics of cloud computing as per NIST, Cloud Stakeholders, Advantages & Disadvantages of Cloud Computing.

Unit II

Cloud Computing Service Models: IaaS, SaaS, PaaS,Types of Cloud Computing, Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments, Vision of Cloud Computing, Cloud Service Providers.

Unit III

Cloud Deployment Models ,Grid computing, Grid- The Way to cloud, Grid Computing Vs Cloud Computing, Grid Computing and Utility Computing, Types of utility cloud services.

Unit IV

Cloud Computing Architecture: Cloud Reference Model, Cloud Interoperability & Standards, Scalability, High Availability and Fault Tolerance, Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management, Cloud Offerings: Cloud Analytics, Testing Under Control.

Unit V

Overview of cloud applications: ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis ,Satellite Image Processing ,CRM and ERP ,Social networking.

Reference Books:

1. "Cloud Computing for Dummies" (Wiley India Edition), 2010, Bloor R., Kanfman M., Halper F. Judith Hurwitz.
2. "Cloud Computing: Principles and Paradigms", Rajkumar Buyya, James Broberg, Andrzej   M. Goscinski, John Wiley and Sons Publications, 2011.
3. "Cloud Computing: Insights into New-Era Infrastructure", Dr Kumar Sourabh, John

Wiley and Sons Publications, 2011.

4. "Cloud Computing: Black Book", Kailash Jayaswal, Jagannath Kallakurchi, Donald J. Houde Deven Shah, Kogent Learning Solutions, Dreamtech Press.
5. Krutz , Vines, "Cloud Security " , Wiley Pub.
6. "Mastering Cloud Computing", Rajkumar Buyya, C. Vecchiola & S. Thamarai
7. Selvi, McGRAW Hill Publication.

OUTCOMES:

- Define Cloud Computing and memorize the different Cloud service and deployment models.
- Describe importance of virtualization along with their technologies.
- Use and Examine different cloud computing services analyze the components of open stack & Google Cloud platform and understand Mobile Cloud Computing
- Describe the key components of Amazon web Service

List of Experiments

1. Study of Cloud Computing & Architecture.
2. Virtualization in Cloud.
3. To study of cloud computing basics, service and deployments models.
4. Study and implementation of Infrastructure as a Service.
5. Study and installation of Storage as Service.
6. To study and implementation of basic networking devices Like NIC Card, Cables, Switch, Topologies, and Connectors.
7. Study of IP Addressing.
8. Accessing Mobile and computer to each other using Teamweawer
9. Installation of software.
10. To study and implementations of Remoter desktop connection
11. To study and implementation of basic networking commands like ping, tracert, ipconfig etc.
12. To study and implementation of Google Drive.
13. To study of VMware Workstation and Creating Virtual Machine and Installation of Windows7.
14. Create a VM and Installation of Ubantu (Linux OS)
15. Case Study: PAAS (Facebook, Google App Engine)
16. Case study on Amazon EC2.
17. Case study on Microsoft azure.

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Subject Name	L	T	P	Credits
Bridge Course-1	3	1	-	4*

Unit I: Differential Calculus

Concept of real function, its domain and range, modulus function, greatest integer, function and signup function, the graphs of functions, composite functions. Meaning of limit, existence theorem for limits, fundamental theorems on limits (statements only). Continuity, differentiability, Exponential and logarithmic functions, Logarithmic differentiation, Derivative of functions in parametric forms, Second order derivatives.

Unit II: Integral Calculus

Integration as the inverse of differentiation, indefinite integral or anti-derivative, properties of integrals. Fundamental integrals involving algebraic, trigonometric, exponential and logarithmic functions, integration by, substitution, integration by parts, Definite integral, definition as the limit of a sum, fundamental theorem of integral calculus, evaluation of definite integrals. Transformation of definite integrals by substitution, improper integral of the first and second kind and their evaluation.

Unit III: Differential Equations

Definition order and degree, general and particular solution, formation of a differential equation whose general solution is given, solution of differential equation by the method of separation' of variables, homogeneous differential equations, linear differential equations.

Unit IV: Matrices and Determinants

Matrices: Matrix as a rectangular arrangement of numbers, types of matrices, equality of matrices. Addition, scalar multiplication and multiplication of matrices, statement and of non -commutatively and associativity of matrix multiplications (no proof). **Determinants:** Expansion rule**,** minors and cofactors of a determinant, determinant of a matrix, singular and non-singular matrices, application of determinants in the solution of equation and areas of triangle Cramer's rule, adjoint, and inverse of matrices in Solving Simultaneous equations in two or three variables, consistency and inconsistency of equations.
Note : In the treatement, upto 3x3 determinantand matrices should be considered

Unit V: Probability and Statistics

Bivariate frequency distribution, marginal and conditional frequency distribution, relationship between two variable, Scattet diagram, covariance, Karl Pearson's coefficient of correlation, its interpretation and limits, linear regression, relation between regression and correlation, least squares method of equations of lines of regression, point of intersection of lines of regression. **Probability Theory:** Multiplications theorem on probability, Conditional probability, Independent events, Baye's theorem. Random variable and its probability distribution, Bernoulli trials and Binomial distribution.

Reference Books:

1. Mathematics by R. D. Sharma