Tilak Maharashtra University
Bachelor of Computer Applications
Syllabus 2020

Semester	First	Teaching Hrs = 40	
Subject Code	BCA-140-20		
Subject Name	Computer Fundamentals Networking		
Examination Scheme			
External Exam		Internal Exam	Total Marks	Credits
60		40	100	4

Course Outcomes (COs)
After learning this course student will be able to

- Knowledge of Basic Hardware and Software
- know different storage devices and Input Output devices
- understand the basics of networking and its concepts

Course Outline

S. No.	Topic	Hours
1	**Chapter-1 Introduction to Computers** What is Computer? Hardware, Software and types of software and data. Characteristics of computers. Basic Block Diagram of PC Input Unit Output Unit Storage Unit Arithmetic Logic Unit Control Unit Central Processing Unit Applications of Computers.	4
2	**Chapter-2 Input Devices, Output Devices and Storage Devices** Input Devices - Keyboard, Mouse, Light Pen, track ball, touch screen, scanners etc. Output Devices - Monitors - Types of monitors - CRT, LCD, LED etc. Printers - Types of printers Impact, non-impact printers. DMP, Inkjet, Laser printers. Printer Interfaces - Parallel, Serial, USB, Wireless and Network Printers. Storage Devices - Primary Storage and Secondary Storage. Primary Storage ROM and RAM. Types of RAM - DDR1, DDR2, DDR3 and DDR4. Hard Disks - Types of Hard Disks controllers - IDE, PATA, SATA, ,SCSI, SAS, SSD etc. CD and DVD Drives, Pen Drives etc.	6
3	**Chapter-3 Number Systems** Number systems: Decimal Number system, Binary Number System, Octal Number System and Hexadecimal Number System. Conversion from Decimal to binary, Decimal to Octal, Decimal to Hexadecimal and Vice versa.	3

4	**Chapter-4 Boolean Algebra and Logic Circuit** Fundamental concept of Boolean Algebra. Logical addition and multiplication and complementation. Basic Logic Gates - NOT (Inverter) Gate, OR Gate & AND Gate. Other gates derived from Basic gates like NAND and NOR gates. Truth tables of gates.		2
5	**Chapter- 5 Computer Software, Programming Languages and software development** System Software and application software. BIOS, Firmware. Types of programming Languages. Machine level, Assembly and High Level Languages. Compilers, interpreters. Program Development Process, Software packages. Freeware, shareware and trial packages.		3
6	**Chapter-6 Introduction to Operating Systems.** What is an Operating System? Functions of an O.S. Types of operating systems like Desktop operating system, Client operating system and Network operating systems. Features of Desktop Operating systems like Multitasking, multiprocessing security backup etc. Features of Network Operating systems like Multiuser, Multitasking, multithreading, Multiprocessing, multiprogramming, security - User level, share level, file level. Additional security levels. Brief Comparative study of all these operating systems with examples. For e.g. Desktop Operating systems like windows 7, 8.1 and 10 and Server operating systems like Windows Server 2008R2, Windows server 2012R2 and 2016 and Red Hat Linux Operating Systems. File system types supported with examples. Features of File systems.		5
7	**Chapter-7 Computer Networks** What is computer Network? Types of Computer Networks -PAN, LAN, MAN, and WAN. Advantages of Network. LAN Topologies - BUS and STAR Components used, Features, advantages and disadvantages of BUS and STAR topologies. Networking Models like Peer to Peer, Client Server Networks, Features , advantages & disadvantages of it. Types of Network services like file server, print server data base server etc. operating systems supported by these networking Models.		4
8	**Chapter-8 Network Devices** - Network Interface cards, repeaters, hubs, switches, routers, modems, ADSL modems, gateways etc.		3
9	**Chapter-9 OSI reference Model.** Introduction. Layers in OSI model. Function of each layer in OSI model.		2
10	**Chapter-10 Network Protocols** What is protocol? List of LAN and WAN protocols. TCP/IP protocol. Working of TCP/IP protocol. IPv4 classes and Addressing techniques.		4

11	**Chapter-11 Wireless Networks** Working of Wireless Networks, Wi-Fi Devices, Wireless Standards like 802.11a/b/g/n, Modes of operations - Peer to Peer and Ad hoc mode. Advantages and disadvantages of Wireless Networks. Wireless Security -WEP, 802.1x, WAP, WTLS, WPA1 and WPA2. 802.15 Bluetooth.		3
12	**Chapter-12 The Internet** Brief history of the Internet. Uses of the Internet. Advantages and disadvantages of the Internet.		1

Books Recommended

- Computer Fundamentals   P.K. Sinha
- Computer Fundamentals   D.P. Nagpal
- Fundamentals of Computers   V. Rajaraman
- IT Essentials   David Anfinson, Ken Quamme
- Computer Networks   Andrew Tanenbaum
- Network Essentials   Emmett Dulaney
- TCP/IP Tutorial & Technical Overview   Adolfo Rodriguez John Karas

Semester	First	Teaching Hrs = 40	
Subject Code	BCA-141-20		
Subject Name	C Programming		
Examination Scheme			**Credits**
External Exam		Internal Exam	Total Marks	
60		40	100	4

Course Outcomes (COs)
After learning this course student will be able to

* Explain the process of problem solving using computer
* Design an algorithmic solution for a given problem
* Write a C program for a given algorithm.
* Trace the given C program manually.
*Write C program for simple applications of real life using structures and files.

Course Outline

S. No.	Topic	Hours
1	**LOGIC DEVELOPMENT** : Variable & Constants, Operators, Programming Constructs, Sequence, Selection Iteration	4
2	**INTRODUCTION TO FLOWCHARTING**: What Are Flowcharts? Types of Flowcharts, Advantages of Flowcharts, Flowchart Symbols, Use Of Symbols, Developing Flowcharts, Flowchart Aesthetics	4
3	**TECHNIQUES:** Flowchart For Computations, Flowcharts For Decision Making, Flowcharts For Loops Predefined Process, Arrays	4
4	**INTRODUCTION TO C** DATA TYPES AND OPERATORS: Instruction in C, Operators, Type Conversions, Operator precedence in C, Data Types Revisited INPUT / OUTPUT: Introduction, Unformatted I/O Functions, Formatted I/O Functions.	4
5	**CONTROL STATEMENTS:** Decision Control Instruction, Loop control or Iteration instructions, Case Control Instructions, Jump Statements	3
6	**FUNCTIONS:** What is a Function? , Why use Functions? Passing Value between Functions, Scope Rule of Functions, Advanced features of Functions	4

7	**ARRAYS AND STRINGS**: Introduction, One Dimensional Array, Two Dimensional Arrays, Strings, String Library Functions, Two Dimensional Arrays of Characters.	4
8	**POINTERS:** Pointers Overview, Pointers and Functions, Pointers and Arrays, Dynamic Memory Allocation, Pointers to Pointers	4
9	**STRUCTURES** Introduction, Declaring a Structure and Union, Array of Structure, Assigning a Structure variable to another variable, Nesting of Structure, Passing a Structure variable to a Function, Pointers and Structures, User defined Data Types.	5
10	**FILE MANIPUALATION**: Introduction, Unformatted High level Disk Input Output functions, Character Input output in Files, Command Line Arguments, String Input Output in Files, Formatted High level Dist I/O Functions, Direct Input Output	4

Books Recommended

- The spirit of C -   Mulish Cooper
- Programming in ANSI C -   Bal guru swami
- Let us C-   Yashwant Kanitkar
- Data Structure Using C -   Tenenbaum

Semester	First	Teaching Hrs = 40	
Subject Code	BCA-142 -20		
Subject Name	Mathematics		

Examination Scheme				Credits
External Exam		Internal Exam	Total Marks	
60		40	100	4

Course Outcomes (COs)
After learning this course student will be able to

* Recognize the importance and value of mathematical thinking, training, and approach to problem solving, on a diverse variety of disciplines.
* be familiar with a variety of examples where mathematics helps accurately explain abstract or physical phenomena
* Recognize and appreciate the connections between theory and applications.
* Independently read mathematical and statistical literature of various types, including survey articles, scholarly books, and online sources.
* Be life-long learners who are able to independently expand their mathematical expertise when needed, or for interest's sake.

Course Outline

1	**Set Theory** Set Concept, Sets and Elements , N o t a t i o n s (s i g n s), Proper and Improper Subsets ,Equality of Sets ,Transitivity of Set Inclusion ,Universal Set ,Complement of a Set ,Union of Sets ,Properties of Union Operation ,Intersection of Sets ,Disjoint Sets ,Properties of Intersection Operation ,Relative Complement of a Set ,De Morgan's Laws ,Distributive Laws of Union and Intersection	5
2	**Functions** Number System ,Basic Operations in Mathematics ,Divisibility Test ,Preliminary Concepts ,Correspondence ,Functions , Types of Functions , Graph of Function	4
3	**Sequences, Progressions and Series** Sequence ,Summation of terms of a sequence ,Arithmetic Progression ,The nth term of A.P. (T_n) ,um of first n terms of A.P. (S_n) ,Geometric Progression., The nth term of G.P. (T_n) ,Sum of first n terms of G.P. (S_n), Harmonic progression (H.P.) ,The three Means ,Properties of means ,Series ,Standard series ,Infinite Geometric series .	6

4	**Permutations and Combinations** Multiplication Principle, Factorial Notation, Permutation ,Permutations of things not all different ,Combination	4
5	**Linear Equations** Determinant, Determinant of 3rd order ,Cramer's rule ,Consistency of equations ,Matrices ,Types of matrices ,Algebra of matrices ,Linear homogeneous equations ,Linear non-homogeneous equations	4
6	**Quadratic Equations** Complex numbers, Solutions of Quadratic Equations, Nature of roots, Quadratic equations with given roots.	6
7	**Probability** Definitions ,Addition theorem on probability ,Conditional probability ,Independent events ,Multiplication theorem ,The probability model	6
8	**Mathematical Logic and Truth Table** Statement OR Proposition, D e f i n i t i o n , Truth Value of Statement Use of Venn – diagram, Logical Connectives , Diagrammatic Representation of Logical connectives , Negation (NOT) ,Conjunction (AND) , Disjunction ,Truth Table , Tautology , Contradiction (Fallacy)	5

Books Recommended

- Mathematics and Statistics: M. L. Vaidya, M. K. Kelkar
- Statistical Analysis: A Computer Oriented Approach
- Introduction to Mathematical Statistics
- Introduction to calculus of finite differences: Richardson C.

Semester	First	Teaching Hrs = 25	
Subject Code	BCA-143 -20		
Subject Name	English		
Examination Scheme			
External Exam		Internal Exam	Total Marks	Credits
30		20	50	2

Course Outcomes (COs)

After learning this course student will be able to

* Read and understand basic expressions and short, simple texts.
* Engage in simple oral communications in order to provide and obtain essential information, using appropriate pronunciation.
* Write basic, simple sentences leading to a paragraph.
* Demonstrate limited control of essential grammatical structures.

1	**SECTION – I**
	
	1. Grammar
	
	• Use of Articles and Prepositions
	• Tense
	• Transformation of Sentences
	• Parts of Speech
	• Idioms and Phrases
	• Vocabulary
	
	  a) Synonyms
	  b) Antonyms
	  c) One Word Substitution
	  d) Homophones & Homonyms
	• Punctuations
	• Common Errors
	
	Spelling in English
		15

2	**SECTION – II** **2.** **2. Composition** • Formal & Informal Writing • Precise • Essay Writing • Report Writing • Reading Comprehension	10

Books Recommended

Reference Books:

* High School English Grammer and Composition – P.C.Wren, H.Martin, N.D.V.Prasada Rao
* Longman Grammer of spoken and written English – Douglab Biber, Stig Johansson, Geoffrey Leech, Susan Conrad, Edward Finegan
* Speaking English Effectively- Mohan Krishna and Singh N.
* A handbook of Business Letter – frailly L.E
* Organised Writing Book – Sarswati V.
* Wiow-nriol.com

Semester	First	Teaching Hrs = 40	
Subject Code	BCA-146-20		
Subject Name	Operating System		

Examination Scheme			Credits
External Exam	Internal Exam	Total Marks	
60	40	100	4

Course Outcomes (COs)
After learning this course student will be able to

* Master functions, structures and history of operating systems
* Master understanding of design issues related to operating systems
* Master various process management concepts including scheduling, synchronization, deadlocks
* Master system resources sharing among the users
* Master concepts of memory management including virtual memory.
* Be familiar with multithreading
* Master issues related to file system interface and implementation, disk management
* Be familiar with various types of operating systems including Unix

S. No.	Topic	Hours
1	**Introduction to Operating System:** Introduction and need of an operating system, evolution of operating system, layered architecture/logical structure of an operating system, OS services, type of OS, introduction to UNIX OS	4
2	**Processes and Process Management:** Process concept and process states, CPU and I/O bound, operating system services for process and thread management, CPU scheduler- short, medium, long-term, dispatcher, scheduling: - preemptive and non-preemptive, scheduling algorithms- FCFS, SJFS, shortest remaining time, RR, priority scheduling, atomic transactions	8
3	**Inter-process Communication and Synchronization, Deadlocks:** Introduction to message passing, race condition, critical section problem, mutual exclusion with busy waiting- disabling interrupts, lock variables, Peterson's solution, TSL instructions, busy waiting, sleep and wake up calls, semaphore, monitors, classical epic problems	8
4	**Memory Management:** Basic hardware and issues, logical and physical address space, address binding, types: contiguous and non-contiguous, paging -concept, TLB translation look aside buffer, inverted page table, segmentation, virtual memory, management of virtual memory: allocation, fetch, page replacement policies	8

5	**File System:** Concepts, attributes, operations, types, structure, file organization &access (sequential, direct, index sequential) methods, memory mapped files, directory structures one level, two levels, hierarchical/tree, acyclic graph, general graph, file system mounting, file sharing, path name, directory operations		6
6	**I/O Systems:** Concepts, functions, input/output devices- block and character, spooling, disk structure & operation, disk attachment, disk storage capacity, disk scheduling algorithm- FCFS, SSTF, scan scheduling, C-scan schedule		6

Reference Books:

- Computer Networks Tanenbum
- Local area Networks Keiser / D. Comer

Semester	First		Teaching Hrs = 25			
Subject Code	BCA-144-20		Practice/Assignment Hrs =5			
Subject Name	Japanese		Total Hrs :-30			
Teaching Scheme			**Examination Scheme**			Credits
Teaching Hrs/Week	Practice/Assignment Hrs/Week	Total Hrs	External Exam	Internal Exam	Total Marks	Credits
3	1	4	30	20	50	2
Course Outcomes (COs) **After learning this course student will be able to** ∗ to gain knowledge of basic Japanese grammar ∗ to acquire basic Japanese language skills like listening, speaking, writing, and reading						

I. Self-Introduction+ Hiragana Letters + Vocabulary   7 hrs

II. Hiragana Letters + Basic Grammar   6hrs

III. Numbers + Vocabulary   6hrs

IV. Greetings+ Vocabulary   6hrs

Reference Book:

- Minna No Nihongo