



Sandip University

Trimbak Road, A/p - Mahiravani, Tal. & Dist. – Nashik, Pin – 422 213

Website : <http://www.sandipuniversity.edu.in> Email : info@sandipuniversity.edu.in

Ph: (02594) 222 541 Fax: (02594) 222 555

School of **Computing Sciences & Engineering** Department of **Computer Science & Applications**

Course Structure for **Undergraduate** Programme of **Bachelor of Computer Application [B.C.A (CTIS)]** Semester - I

Semester	Course I				Course II				Course III				Course IV				Course V				Course VI				Course VII				Course VIII				L	T	P	C	Contact Hours				
	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C	L	T	P	C									
I	XEG101A				XCT101				XCT102				XCT103/ XCT111				XCT104/ XCT112																								
	3			3	3	1		4	3			3	3		4	5	3		4	5																	15	1	8	20	24
	UC				PC				PC				PC				PC																								
	English I				Fundamentals of Mathematics				Computer Fundamentals and Organization				Programming in C				Operating System																								



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School: Computer Sciences and Applications	Programme: BCA- CTIS			
Year : First Year	Semester - I			
Course: English	Course Code: XEG101A			
	L	T	P	C
	3	--	--	3
Theory: 3 Hrs/Week	Max. University Theory Examination:50 Marks			
Max. Time for Theory Exam.:3 Hrs	Continuous Internal Assessment:50 Marks			

Course Objectives

1	This course introduces the students to the beauty of English Language through some of the great works by R.K.Narayan, O’Henry and other writers.
2	Students will get familiarized with few well-written essays and short stories, which will provide them with intricacies of English literature...

Course Outcomes

1	Students will observe different writing styles by reading Essays and Short stories
2	This will kindle their interest towards English literature and motivate them to develop reading skills
3	Students will work on simple subject-verb agreement and sentence formation to master great grammar skills
4	Applies cognizance while comprehending various types of written texts
5	Writes and speaks in English, precisely with clarity and accuracy



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Unit Number	Details	Hours
1	Listening Skills (Only for Internal Assessment) Classroom listening (Teachers' reading of short stories, essays or reports) Vocabulary Word and Sense, Synonyms, Antonyms Lexical webs, Collocations, Affixation (Prefix and Suffix)	10
2	Reading Skills a) The Eyes Have It – Ruskin Bond b) The Astrologer's Day- R. K. Narayan	10
3	Reading and Responding a) Where the Mind is Without Fear – Rabindranath Tagore b) The Road Not Taken- Robert Frost c) Night of the Scorpion – Nissim Ezekiel	15
4	Grammar (LSRW Skills) Parts of Speech Tenses Speaking Skills i)Greetings, ii)Introducing Yourself and Others iii)Asking for Information, iv)Requesting, v)Inviting	15
5	Writing Skills 1. Group Discussion 2. Interview Skills 3. Paragraph Writing 4. Letter 5. Informal/Formal 6. Email Writing	10
Total Hours		60



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Resources	
Recommended Books	<ol style="list-style-type: none">1. Wren and Martin: High School English Grammar and Composition2. G. Radhakrishna, Pillai, K. Rajeevan. Spoken English for You. CIEFL. Emerald Publication.3. K. S. Smita, Annie Pothan. English Conversational Practice. Sterling Publication Pvt. Ltd.4. Dr. Saraswati. Success with Spoken English for Undergraduate5. Tickoo and Subramaniam: A Functional Grammar with Usage and Composition6. Ruskin Bond, Eyes Have It7. R. K. Narayan, The Astrologer's Day8. Rabindranath Tagore, Where the Mind is Without Fear9. Robert Frost, The Road Not Taken10. Nissim Ezekiel, Night of the Scorpion
Reference Books	<ol style="list-style-type: none">1. Murphy, Raymond: Essential English Grammar, Cambridge University Press2. Bygate, M. Speaking. Oxford: Oxford University Press.3. Maison, Margaret M.: Examine Your English4. Fitikides, T.J.: Common Mistakes in English5. McCarthy, Michael: English Vocabulary In Use and Felicity O. Dell



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School: Computer Sciences and Applications	Programme: BCA- CTIS			
Year : First Year	Semester - I			
Course: Fundamentals of Mathematics	Course Code: XCT101			
	L	T	P	C
	3	1	--	4
Theory: 4 Hrs/Week	Max. University Theory Examination:50 Marks			
Max. Time for Theory Exam.:3 Hrs	Continuous Internal Assessment:50 Marks			

Course Objectives	
1	To develop the skills in the areas of Matrices, Sets, relations and functions, Differentiation and Integration.
2	Mathematics concepts serves as a pre-requisite for post graduate courses, specialized studies and research.
Course Outcomes	
1	Students will learn various concepts in Matrices, sets and relation, etc. and develop strong basics in mathematics which is used extensively in all walks of their life, including further education, logic building, and reasoning.

Unit Number	Details	Hours
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1	<ul style="list-style-type: none">• Matrices1. Types of Matrices, Operations of addition2. Scalar Multiplication and Multiplication of Matrices3. Determinant of a Square Matrix, Minors and Cofactors, Transpose, adjoint and inverse of a matrix4. solving system of linear equations, in two or three variables using inverse of a matrix	10
2	<ul style="list-style-type: none">• Sets, relations and functions1. Definition of Set, Type of Sets, Operations on Sets, Venn diagram, Cartesian Product, Relations, Functions.2. Types of function, Some elementary functions with their graphs (Exponential, logarithmic, modulus)3. Limit & continuity of a function (Simple Problems)	10
3	<ul style="list-style-type: none">• Differentiation1. Derivative and its meaning, Differentiation of algebraic,2. trigonometric, exponential & logarithmic functions,3. Rules of Differentiation, Differentiation by Substitution, Higher Order Differentiation, Maxima and Minima of Simple Functions	15



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4	<ul style="list-style-type: none"> • Integration 1. Integral as Anti-derivative process, Indefinite Integrals, 2. Rules of Integration, Integration by substitution, Definite Integration, 3. Properties of Definite Integral, Finding areas of Simple Closed Curves 	15
5	<ul style="list-style-type: none"> • Coordinate Geometry 1. 2D Cartesian Co-ordinate system, Straight line: (Equation & Slope of a line), 2. Circle: Equation of Circle, Equation to Tangent, Conic Sections: Focus, Eccentricity, Directrix, Axis of a conic section, 3. Parabola & Ellipse: (Definitions, equations and shape of curve only) 	10
Total Hours		60

Resources	
Recommended Books	1. Mathematics for BCA by G. C. Sharma & Madhu Jain, Oscar Publication.
Reference Books	2. Mathematics Vol-2 by R. D. Sharma, Dhalpat Raj & Sons 3. The Elements of Co-ordinate Geometry Part-I by S. L. Loney, Book Palace, New Delhi .



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Year : First Year	Semester - I			
Course: Computer Fundamentals and Organization	Course Code: XCT102			
	L	T	P	C
	3	--	--	3
Theory: 3 Hrs/Week	Max. University Theory Examination:50 Marks			
Max. Time for Theory Exam.:3 Hrs	Continuous Internal Assessment:50 Marks			

Course Objectives	
1	The basic knowledge of how a computer works is very important for any fresh networking or operating system professional.
2	The functional knowledge of a computers working and its main building parts are paramount. The computers of today may come with variety of features but the basic working principles remain the same.
3	Students will explore the fundamentals of organization of a computer and the principles and building units of a computer (its hardware). Also, they will be introduced to the basics of networking and MS Office.
Course Outcomes	
1	Students will get an in-depth knowledge about the general features of a computer, which will allow them to understand working of computers, on which they can base their learning and design
2	An insight to the different software and hardware components of a computer will take them a step ahead in terms of what they can accomplish from their learning.



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Unit Number	Details	Hours
1	<ul style="list-style-type: none">• General Features of a Computer <ol style="list-style-type: none">1. General features of a computer, Generation of computers, Personal computer, workstation, mainframe computer and super computers.2. Computer applications – data processing, information processing, commercial3. office automation, industry and engineering, healthcare, education, graphics and multimedia	10
2	<ul style="list-style-type: none">• Computer Organization <ol style="list-style-type: none">1. Computer organization, central processing unit, computer memory – primary memory and secondary memory,2. Secondary storage devices – Magnetic and optical media, Input and output units, OMR, OCR, MICR, scanner, mouse, modem.	10
3	<ul style="list-style-type: none">• Computer Hardware and Software <ol style="list-style-type: none">1. Computer hardware and software, Machine language and high level language, Application software.2. computer program, operating system, Computer virus, antivirus and computer security, Elements of MS DOS3. Windows OS, Computer arithmetic, Binary, octal and hexadecimal number systems, Algorithm and flowcharts, illustrations, elements of a database and its applications,4. Basic Gates (DeMorgans theorems, duality theorem, NOR, NAND, XOR, XNOR gates), Boolean expressions and logic diagrams, Types of Boolean expressions.	15



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4	<ul style="list-style-type: none"> • Module 4: MS Office 1. Word processing and electronic spread sheet, 2. An overview of MSWORD, MSEXCEL and MSPowerPOINT 	15
5	<ul style="list-style-type: none"> • Introduction to Networking 1. Network of computers, Types of networks, LAN, 2. Intranet and Internet, Internet applications, World Wide Web, 3. E-mail, browsing and searching, search engines, multimedia applications 	10
Total Hours		60

Resources	
Recommended Books	<ol style="list-style-type: none"> 1. Alexis Leon and Mathews Leon (1999) : Fundamentals of information Technology, Leon Techworld Pub. 2. Jain, S K (1999) : Information Technology “O” level made simple, BPB Pub 3. Jain V K (2000) “O” Level Personal Computer software, BPB Pub
Reference Books	<ol style="list-style-type: none"> 1. Rajaraman, V (1999): Fundamentals of Computers, Prentice Hall India 2. Hamacher, Computer Organization McGrawhill 3. Alexis Leon: Computers for everyone. Vikas, UBS 4. Anil Madaan : Illustrated Computer Encyclopedia. Dreamland Pub 5. Sinha. Computer Fundamentals BPB Pub.



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School: Computer Sciences and Applications		Programme: BCA- CTIS			
Year : First Year		Semester - I			
Course: Programming in C		Course Code: XCT103			
	L	T	P	C	
	3	--	--	3	
Theory: 3 Hrs/Week		Max. University Theory Examination:50 Marks			
Max. Time for Theory Exam.:3 Hrs		Continuous Internal Assessment:50 Marks			

Course Objectives	
1	Even with the introduction of several high level languages and frameworks, the development of procedural codes is important in several commercial app developments.
2	The object oriented platforms and event driven systems use procedural languages for coding integral command content. C is an important procedural language and was developed initially to write the UNIX operating system.
3	UNIX operating system, C compiler and all UNIX application programs are written in C.
Course Outcomes	
1	Students will learn how to write simple to complex programs using C Language and execute them

Unit Number	Details	Hours
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1	<ul style="list-style-type: none">• Overview of Programming:1. Introduction to computer based problem solving, Program design and implementation issues- Flowcharts & Algorithms, Top down design & stepwise refinement,2. Programming environment – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters	10
	<ul style="list-style-type: none">• Fundamentals of C programming:1. Overview of C, Data Types, Constants & Variables, Operators & Expressions, Control constructs-if then, for, while,2. Arrays- single & multidimensional arrays, Functions-fundamentals – general form, function arguments, return value,3. Basic I/O-formatted and Unformatted I/O, Advanced features- Type modifiers and storage class specifiers for data types, Bit operators, ? operator, &operator, * operator, Type casting, type conversion.	15
3	<ul style="list-style-type: none">• Advanced programming techniques:1. Control constructs- Do while, Switch statement, break and continue, exit() function, go to and label,2. Scope rules- Local & global variables, scope rules of functions,3. Functions-parameter passing, call by value and call by reference, calling functions with arrays, argc and argv, recursion- basic concepts, ex-towers of Hanoi.	10



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4	<ul style="list-style-type: none">• Dynamic data structures in C:1. Pointers- The & and * operator, pointer expression, assignments, arithmetic, comparison, malloc vs calloc, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function retuning pointers,2. Structures- Basics, declaring, referencing structure elements, array of structures, passing structures to functions, structure pointers, arrays and structures within structures,3. Unions – Declaration, uses, enumerated data-types, typedef	15
5	<ul style="list-style-type: none">• Additional features:1. File Handling – The file pointer, file accessing functions, fopen, fclose, puc, getc, fprintf,2. C Preprocessor- #define, #include, #undef, Conditional compilation directives,3. C standard library and header files: Header files, string functions, mathematical functions, Date and Time functions	10
Total Hours		60



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Esources	
Recommended Books	<ol style="list-style-type: none">1. Let us C by Yashwant Kanetkar, 6th Edition, BPB Publication2. The C programming Language by Richie and Kenninghan, 2004, BPB Publication
Reference Books	<ol style="list-style-type: none">1. Rajaraman, V (1999): Fundamentals of Computers, Prentice Hall India2. Hamacher, Computer Organization McGrawhill3. Alexis Leon: Computers for everyone. Vikas, UBS4. Anil Madaan : Illustrated Computer Encyclopedia. Dreamland Pub5. Sinha. Computer Fundamentals BPB Pub.



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School: Computer Sciences and Applications		Programme: BCA- CTIS		
Year : First Year		Semester - I		
Course: Operating System		Course Code: XCT104		
	L	T	P	C
	3	--	--	3
Theory: 3 Hrs/Week		Max. University Theory Examination:50 Marks		
Max. Time for Theory Exam.:3 Hrs		Continuous Internal Assessment:50 Marks		

Course Objectives	
1	The course provides an overview of the Linux Operating System, geared towards new users as an exploration tour and getting started guide
2	It provides examples to help the learners get a better understanding of the Linux system.
3	It also provides the guidelines for the learners to take up vendor certifications.
4	The course explores the basics of Linux, the underlying management of the Linux operating system and its network configuration
5	The complete system services of Linux is explained along with troubleshooting.
Course Outcomes	
1	To enable the students to have a hands on practical exposure to Linux Operating System and make them prepared for the RHCA Certification.



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Unit Number	Details	Hours
1	<ul style="list-style-type: none">• Introduction to Operating System1. Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines.2. History of UNIX, Features & Benefits, Versions of UNIX, Features of UNIX File System,, Commonly Used Commands and getting Started (Login/Logout) .3. Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces.	10
2	<ul style="list-style-type: none">• Process Management – Processes and Threads1. Processes: Process concept, Process scheduling, Co-operating processes, Inter process Communication2. Threads: Introduction to Threads, Single and Multi-threaded processes3. CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling,4. Unix Process Management The Structure of Processes: Process States and Transitions - Layout of system memory - Context of a process.5. Process Control: Process Creation – Signals – Process Termination – Invoking other programs – PID & PPID – Shell on a Shell.	10



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3	<ul style="list-style-type: none">• Process Management – Synchronization and Deadlocks1. Process Synchronization: Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions,2. Monitors, OS Synchronization, Atomic Transactions. Deadlocks: System Model,3. Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.	10
4	<ul style="list-style-type: none">• Storage Management1. Memory Management: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging.2. Virtual Memory Management: Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing,3. File-System Interface: File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics.4. File-System Implementation: File-System structure. Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery.5. Disk Management: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation	15



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5	<ul style="list-style-type: none">• The Unix File System1. Inodes - Structure of a regular file – Directories - Conversion of a path name to an inode - Super block - Inode assignment to a new file - Allocation of disk blocks.2. System calls for the file System: Open – Read - Write Lseek – Close - File creation - Creation of special files - Changing directory and root - changing owner and mode – stat and fstat - pipes - Dup - Mounting and Un mounting file systems - Link and Un link.3. UNIX SYSTEM ADMINISTRATION Common administrative tasks, identifying administrative files configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships,4. Creating and managing groups, modifying group attributes, temporary disabling of user’s accounts, creating and mounting file system, checking and monitoring system performance - file security & Permissions, becoming super user using su.	15
Total Hours		60



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Resources	
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Reference Books	<ol style="list-style-type: none">1. Operating System by William Stallings, 4th Edition, Pearson Education.2. Operating System by H.M.Deitel , 2nd Edition,Pearson Education3. Operating System by Abraham Silberschatz and peter Baer Galvin, 8th Edition, Pearson Education 1989 (Chapter 1,3.1,3.2,3.3,3.4,3.6,4,5,6 (Except 6.8,6.9), 7, 8,9,10,11,13, (Except 13.6) 19 (Except 19.6),20(Except 20.8, 20.9), 22,23).4. Operating Systems by Nutt, 3/e Pearson Education 2004