



MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY
NAAC Accreditation Grade "B"
(With effect from Academic Year: 2017-18)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)

Structure for B.C.A. – CBCS Programme

Semester-III (SY)

COURSE NO.	COURSE TYPE	SUBJECT	CREDIT
BCA-EC-301	ELECTIVE		02
BCA-FC-301	FOUNDATION		02
BCA-CC-301	CORE	Operating System	03
BCA-CC-302	CORE	Data and File Structure	03
BCA-CC-303	CORE	Object Oriented Programming with C++	03
BCA-CC-304	CORE	System Analysis and Design	03
BCA-CC-305	CORE	Practical (Based on BCA-CC-302 & BCA-CC-303)	12
TOTAL			28

Internal Continuous Evaluation:

1. There will be Internal Continuous Evaluation in Theory papers of Core Course.
2. There will be 30 marks for Assignments in Course No: BCA-CC-301, BCA-CC-302, BCA-CC-303, BCA-CC-304



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B.C.A.		Course: Operating System	Course No: BCA-CC-301	
Semester: 03		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
Unit-1	Basic concept of an operating system	9	14	
	<ul style="list-style-type: none"> - Definition and Function of operating systems. - Evolution of operating system: Batch system, Multi programmed system, time sharing and PCs. - Introduction to basic terms & batch processing system: Jobs, Processes files, command interpreter. - Different types of operating system-real time systems, parallel, distributed system. - Operating system structure-monolithic layered, virtual machine & Client server. 			
Unit-2	Process Management	9	14	
	<ul style="list-style-type: none"> - Processes: Definition, Process States , Process Control Block ,Context switching. - Process Scheduling: Definition, Scheduling objectives. - Types of Schedulers ,Scheduling criteria : CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition only) , - Scheduling algorithms : Pre emptive and Non , pre emptive , FCFS – SJF – RR 			
Unit-3	Deadlocks and Threads	9	14	
	<ul style="list-style-type: none"> - Definition, Deadlock characteristics, Deadlock Prevention. - Introduction of Deadlock Avoidance: banker’s algorithm and problem solving, - Deadlock detection and Recovery. - Threads - Concept of multithreads, Benefits of threads – Types of threads. 			
Unit-4	Memory Management – I Basic Memory Management	9	14	
	<ul style="list-style-type: none"> - Definition, Logical and Physical address Map. - Memory allocation: Contiguous Memory allocation – Internal and External fragmentation. - Paging: Principle of operation – Page allocation – Hardware support for paging – Protection and sharing – Disadvantages of paging. 			
Unit-5	Memory Management – II Virtual Memory	9	14	
	<ul style="list-style-type: none"> - Segmentation. - Introduction to Virtual Memory. - Page Replacement policies, Optimal (OPT) , First in First Out (FIFO), Least Recently used (LRU) 			
Reference Books				
<ol style="list-style-type: none"> 1. Silberschatz, Galvin and Gange: Operating System Concepts, Wesley. 2. Tanenbaum A.S., “Modern Operating Systems”, 4th Edition, PHI, 2001 3. Stalling W, “Operating Systems”, 6th edition, Prentice Hall India. 				



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B.C.A.	Course: Data and File Structure	Course No: BCA-CC-302	
Semester: 03	Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100			
Credits: 03	Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Introduction to Data Structure and Sorting Techniques	09	14
	<ul style="list-style-type: none">- Definition of Data Structure, Classification of Data Structure (Linear, Non Linear)- Applications, Aims and Goals of Data Structure, Sparse Matrix.- Representation of Array in Memory: Row-Major and Column-Major order.- Address calculation of elements of one and two-dimensional arrays.- Sorting and Merging Methods: Insertion Sort, Shell Sort, Quick Sort, Merge Sort.		
Unit-2	Linear Data Structure : Doubly Linklist	09	14
	<ul style="list-style-type: none">- Introduction to Linked list and its types.- Introduction of Doubly Linked list.- Advantages and Disadvantages of Doubly linked list.- Application of Doubly linked list.- Different between single and double link list.- Operation on Doubly Linked list.(insert, update, delete, display Algorithm and program)		
Unit-3	Linear Data Structure: Stack	09	14
	<ul style="list-style-type: none">- Definition of Stack, Applications of Stack.- Stack Operations using Array (Push, Pop, Peep, Display)- Stack Operations using Linked List (Push, Pop, Peep, Display) (Algorithm and Program of All Stack Operations using Array and Linked List)- Polish Notation: Conversion of Expression (Prefix, Infix, Postfix) (using hand or stack method)		
Unit-4	Linear Data Structure: Queue	09	14
	<ul style="list-style-type: none">- Definition of Queue, Applications of Queue.- Queue Operations using Array (Insert, Update, Delete, Display)- Queue Operations using Linked List (Insert, Update, Delete, Display) (Algorithm and Program of All Queue Operations using Array and Linked List)- Circular Queue using Array.- Concept of Priority Queue and Double Ended Queue.		
Unit-5	Non Linear Data Structure: Tree and Graph	09	14
	<ul style="list-style-type: none">- Concept of Binary Tree, Representation of Binary Tree: Sequential and Linked List.- Types of Binary Tree : Strictly, Full, Complete, in complete,- Creation of Binary Tree - Binary Tree Traversal : Pre order, In order, Post order (using recursion)Definition of Graph and its terminologies- Representation of Graph : Adjacency Matrix, Adjacency ListDefinition of Tree, Basic Tree Terminology (Root, Node, Degree of Node, Degree of Tree, Leaf Node, Non Terminal Node, Siblings, Level of Tree, Edge, Path, Depth, Forest)		
Reference Books			
<ol style="list-style-type: none">1. Data and File Structure: Trembly & Sorenson.2. Expert in Data Structure With C: R.B.Patel.3. Data Structure using C: Aaron M. Tenenbaum.4. Data Structure through C: G.S.Baluja			



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B.C.A.	Course: Object Oriented Programming with C++	Course No: BCA-CC-303	
Semester: 03	Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100			
Credits: 03	Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Principal Of Object Oriented Programming		
	<ul style="list-style-type: none">- Introduction of OOP, OOP V/s POP- Concept of OOP – Object, Class, Inheritance, Encapsulation, Polymorphism, Abstraction ,Message Passing- Structure Of C++ Program- Tokens in C++- Data type, Constant, Variable, Statement & Operators	09	14
Unit-2	Basic C++ Programming		
	<ul style="list-style-type: none">- Function – Member function, Inline function, Friend function- Constructor – Types of constructor, characteristics of constructor, constructor overloading.- Destructor- Input/output statements- Declaration & Creation of Class and Object	09	14
Unit-3	Operator overloading and Type conversion		
	<ul style="list-style-type: none">- Basic of operator overloading- Types of operator overloading-Unary, Binary- Operator overloading using member function & friend function- Type conversion- Categories of type conversion	09	14
Unit-4	Inheritance		
	<ul style="list-style-type: none">- Basic of inheritance-- Types of inheritance- Single level, multiple, multilevel, hierarchical and hybrid- Constructor in derived class- Concept of Abstract class- Nesting of classes	09	14
Unit-5	Polymorphism		
	<ul style="list-style-type: none">- Basic of Polymorphism-Compile time & Runtime polymorphism- This pointer- Pointers to derived classes- Virtual and Pure virtual function- Virtual constructor and destructor	09	14
Reference Books			
<ol style="list-style-type: none">1. E-Balaguruswami: Object Oriented Programming with C++ Mc Graw-Hill2. Robert Lafore: Object Oriented Programming with C++ Galgotia Publications.3. Rajaraman: Object Oriented Programming with C++ New age International			



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B.C.A.		Course: System Analysis And Design	Course No: BCA-CC-304	
Semester: 03		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
Unit 1	System Concept	9	14	
	<ul style="list-style-type: none"> – Introduction to system – Characteristics and elements of system – Types of system – System analysis – System analyst & its role. – CBIS, Information system and categories of information system. – System users. 			
Unit 2	System Development Strategies	9	14	
	<ul style="list-style-type: none"> – Introduction to SDLC – Phases of SDLC – Application of SDLC Method – Limitation of SDLC Method – Introduction to SSADM 			
Unit 3	Structured System Analysis and Design Method	9	14	
	<ul style="list-style-type: none"> – Need of SSADM – System survey – Structured analysis – Structured design – Advantages of SSADM – System Prototype Method (SPM) 			
Unit 4	Input/ Output Design & Fact Finding Techniques	9	14	
	<ul style="list-style-type: none"> – Input – data capture objectives. – Data verification & Validation – Interactive screen – Output - Design of Output & its Objectives – FFT – Interview, Questionnaire, Record Inspection, Observations. 			
Unit 5	Analysis & Design Tools	9	14	
	<ul style="list-style-type: none"> – DFD, Symbols uses in DFD, Physical & Logical Design – Decision table & tree – Data Dictionary – HIPO chart, Warnier/Orr diagrams – Structured English 			
Reference Book:				
<ol style="list-style-type: none"> 1. James A Senn: Analysis and Design of Information Systems, McGraw Hill Intl. Std. Edn 2. S. Parthasarthy & B. W. Khalkar : System Analysis & Design 1st Edition, Master Ed.Cons. 3. Yourdon E. and Constantine L. L : Structured Analysis & Design Yourdon press NY 				



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B.C.A.	Course: Practical	Course No: BCA-CC-305
Semester: 03	Type of Course: Core Course	
Marking Scheme: External Examination: 100 + Internal Examination: 00 = 100 Marks		
Credits: 12	Practical Sessions per Week: 12	Teaching Hours: 180 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Practical Based on 302	90	50
Unit-2	Practical Based on 303	90	50