



Mangalmai Institute of Management & Technology Greater Noida (U.P)



Program B.C.A.								
Program Objectives								
1	To provide the knowledge and enhance the understanding of software technologies.							
2	To prepare for analyze and solve the problem with effective communication.							
3	To make the managerial and technical skills to design the solution of real world problem.							
4	To prepare for investigate complex problem and their solution.							
5	To provide the ethical, social and cultural responsibilities in professional environment.							
6	To prepare the new technology and upgrade their skills for lifelong learning.							
Program Outcomes								
PO1	Ability to demonstrate knowledge of Computer science and its applications in order to enhance basic understanding of various software technologies.							
PO2	Ability to analyze and identify various business and technical problems to further solve problems with effective communication.							
PO3	Ability to adapt analytical, logical and managerial skills with the technical aspects in order to design and deploy reliable software programs and application for real world problems.							
PO4	Ability to investigate complex problems and provide computer-based solutions.							
PO5	Ability to understand and deliver ethical, social and cultural responsibilities in professional environment as an individual and team.							
PO6	Ability to adapt new technologies for upgrading their skills and contributing to a lifelong learning.							
Code. No/ CO	Subjects	Blooms Taxonomy	PO1	PO2	PO3	PO4	PO5	PO6
			(Knowledge)	(Creativity)	(Problem Solving and Design)	(Ethical Practices)	(Communication and Social Skills)	(Lifelong Learning)
YEAR I								
YEAR - First SEM - I								
BCA-101	Mathematics- I							
Course Objective								
1	To enumerate the fundamental knowledge of Determinant of a Matrix.							
2	To understand concept of Limit.							
3	To understand the concept of Differentiation.							
4	To understand the concept of Integration.							
5	To understand the concept of Vectors and its properties.							
CO1	Able to understand the concept of Determinant, Matrices ,physical meaning of Determinant and its properties.	Understanding (K2), Applying (K3)	H	H	M			
CO2	Able to understand the meaning of Limit of a function, continuity of a function and its application.	Understanding (K2), Applying (K3)	H	H	M			
CO3	Able to understand the concept of Derivative of a function and its applications.	Understanding (K2), Applying (K3)	H	H	H			
CO4	Able to solve problem on Integration& its geometrical meaning	Understanding (K2), Applying (K3)	H	H	H			
CO5	Able to understand the concept of Vectors, able to solve problem on Vectors.	Understanding (K2), Applying (K3)	H	H	H			
BCA-101			3.0	3.0	2.6			
BCA-101			0.6	0.6	0.5			
BCA-102	Programming Principle & Algorithm							
Course Objective								



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1	To introduce the basic concept of C Programming.							
2	To describe the various operator used in C Programming.							
3	To learn the concept of decision making and control structure in C programming.							
4	To study the problem solving concepts, algorithm and flowchart.							
5	To learn the concepts of function and recursion in C.							
CO1	Able to define and understand the basic concept of Tokens and Data Types	Remembering K(1), Understand K(2)	H	M	M			M
CO2	Able to define & implement the operator used in C Programming	Understanding K(2), Applying K(3)	H	M	M			M
CO3	Able to implement the Decision making and control structure in C programming	Applying K(3)	H	M	H	M		H
CO4	Able to understand the problem solving concepts, Algorithm and flowchart	Remembering K(1), Understanding K(2)	H	H	H	M		M
CO5	Able to implement the concept of function and Recursion.	Applying K(3)	H	H	H	M		H
BCA-102			3.0	2.4	2.6	2.0		2.4
BCA-102			1.4	1.1	1.2	0.9		1.1
BCA-103	Computer Fundamental & Office Automation							
Course Objective								
1	To study the basic concept of Computer Fundamentals							
2	To apply the design procedure of a problem using algorithms and flowcharts							
3	To study the types and functions of Operating System							
4	To study the concept of windows environment							
5	To study the features of MS Word							
6	To study the features of MS Excel and Access							
CO1	Able to define the basic concept of Computer and its different parts	Understanding (K2), Applying (K3)	H		M			
CO2	Able to understand and implement the concepts of Algorithm and flow chart	Understanding (K2), Applying (K3)	H	M	M			
CO3	Able to understand the about various types of operating systems	Understanding (K2)	H					
CO4	Able to work in windows environment	Understanding (K2)	H	H				H
CO5	Able to create and work using MS Word	Understanding (K2), Applying (K3)	H	H	H			H
CO6	Able to implement the features of MS Excel and Access	Understanding (K2), Applying (K3)	H	H	H			H
BCA--103			3.0	2.8	2.5			3.0
BCA--103			2.2	2.0	1.8			2.2
BCA-104	Principles of Management							
Course Objective								
1	To provide an understanding of basic management concepts, principles and practices.							
2	To enable the students to study the evolution of Management and business ethics.							
3	To describe the management functions of planning, organizing, Forecasting & Communication							
4	To describe the management functions of Motivation, leadership, Controlling and Total Quality Management							
5	To develop the understanding of Organisational changes							



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6	To develop strategic planning and decision-making strategies in an organization							
CO1	Understanding of basic management concepts, principles and practices	Understanding K(2)	H		M		L	L
CO2	Gaining the knowledge of the evolution of Management and business ethics.	Remembering K1, Understanding K2	M	M	M			
CO3	Developing the management functions of planning, organizing, Forecasting & Communication.	Understanding K(2)	M	L				
CO4	Developing the management functions of Motivation, leadership, Controlling and Total Quality Management	Understanding, Applying K(2), K(3)	M		M		M	
CO5	Gaining an understanding of Organizational changes	Understanding K(2)	M	M				H
CO6	Developing strategic planning and decision-making strategies in an organization.	Understanding K(2)	M	L	M			M
BCA-104			2.2	1.5	2.0		1.5	2.0
BCA-104			1.6	1.1	1.5		1.1	1.5
BCA-106	Business Communication							
Course Objective								
1	To understand business communication strategies and principles for effective communication in domestic and international business situations.							
2	To understand and appropriately apply modes of expression, i.e., descriptive, expository, narrative, scientific, and self-expressive, in written, visual, and oral communication							
3	To understand and apply basic principles of critical thinking, problem solving, and technical proficiency in the development of exposition and argument							
4	To underline the nuances of Business communication.							
5	To develop the ability to communicate via electronic mail, Internet, and other technologies for presenting business messages.							
CO1	Understanding business communication strategies and principles to prepare effective communication for domestic and international business situations	Applying (K3)	M			M	M	
CO2	Developing effective verbal and non verbal communication skills	Understanding (K2), Applying (K3)	H				M	H
CO3	To demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary & Grammar	Understanding (K2)	M	H		L	H	H
CO4	Develop an understanding of appropriate organizational formats and channels used in business communications	Understanding (K2), Applying (K3)	M	H		H	H	H
CO5	Gaining an understanding of emerging electronic modes of communication.	Understanding (K2)	L	M				
BCA-106			2.2	2.7		2.0	2.5	3.0
BCA-106			2.2	2.7		2.0	2.5	3.0
EVS-008	Environmental Studies							
Course Objective								
1	To acquire knowledge about natural resources, such as forest, water, mineral food & land resources, with case studies, and different types of energy sources.							
2	To be able to know about the Natural resources and its associated problems							
3	To learn about the concept of ecosystem, structure, function, & energy flow in the ecosystem							



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4	To aware about Biodiversity and it Conservation and toaware of environmental pollution - air, water, thermal, marine, noise & solid waste problems							
5	To learn about social issues for sustainable development and to know how human population affect environment and what are the human rights							
CO1	Able to acquire knowledge about natural resources, such as forest, water, mineral food & land resources, with case studies, and different types of energy sources	Understanding (K2), Applying (K3)	M			H		H
CO2	Able to know about the Natural resources and its associated problems	Understanding (K2)	M			M		M
CO3	Able to learn about the concept of ecosystem, structure, function, & energy flow in the ecosystem	Understanding (K2), Applying (K3), Analysis (K4)	M			L	H	H
CO4	Aware about Biodiversity and it Conservation and to aware of environmental pollution - air, water, thermal, marine, noise & solid waste problems	Understanding (K2)	H		L	H		M
CO5	Able to learn about social issues for sustainable development and to know how human population affects environment and what are the human rights	Understanding (K2), Applying (K3), Analysis (K4)	M		M			H
BCA-008			2.2		1.5	2.0	3.0	2.6
BCA-008			1.5		1.0	1.3	2.0	1.7
BCA-105(P)	Lab - Programming Principle & Algorithm							
Course Objective								
1	To implement the various operator used in C Programming.							
2	To use the concept of decision making and control structure in C programming.							
3	To implement the concepts of function and recursion in C.							
CO1	To implement the various operator used in C Programming.	Applying K(3)	H	H	H			H
CO2	To use the concept of decision making and control structure in C programming.	Applying K(3)	H	H	H			H
CO3	To implement the concepts of function and recursion in C.	Applying K(3)	H	H	H			H
BCA-105(P)			3.0	3.0	3.0			3.0
BCA-105(P)			3.0	3.0	3.0			3.0
BCA-107(P)	Lab - Computer Fundamental & Office Automation							
Course Objective								
1	To understand how to run DIS commands							
2	To understand creation, edition and formatting documents using MS Word							
3	To understand organization, analysis, and management of data using MS Excel							
4	To undersatnd how to prepare powerpoint slides, and integraqtq audio and video using MS PowerPoint							
CO1	Able to run DOS Commands	Applying K(3)	H	H	H			
CO2	Able to create and format using MS Word	Applying K(3)	H	H	H			
CO3	Able to organize and manage data using MS Excel	Applying K(3)	H	H	H			
CO4	Able to create and design PowerPoint Slides	Applying K(3)	H	H	H			
BCA--107(P)			3.0	3.0	3.0			



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BCA--107(P)			3.0	3.0	3.0		
YEAR - First			SEM - II				
BCA-201	Mathematics- II						
Course Objective							
1	To enumerate the fundamental knowledge of Sets						
2	To understand concept of Functions & Relations						
3	To understand the concept of POSET						
4	To understand the concept of Partial Derivative						
5	To understand the concept of Three Dimensional Space						
6	To understand the concept of Multiple Integrals.						
CO1	Able to understand the concept of Sets, algebra of sets, Practical Life examples.	Understanding (K2), Applying (K3)	H	H	M		
CO2	Able to understand the meaning of Functions and Relation, their properties & related practical examples.	Understanding (K2), Applying (K3)	H	H	H		
CO3	Able to understand the concept of POSETS and their properties	Understanding (K2), Applying (K3), Analysis (K4)	M	M	M		
CO4	Able to solve problem on Partial Derivative	Understanding (K2), Applying (K3), Analysis (K4)	H	M	M		
CO5	Able to understand the concept of Three Dimensional Space, geometrical meaning & properties.	Understanding (K2), Applying (K3), Analysis (K4)	H	H	H		
CO6	Able to solve Multiple Integrals Problems & its applications in finding area and volume.	Understanding (K2), Applying (K3), Analysis (K4)	M	H	H		
BCA-201			2.7	2.7	2.5		
BCA-201			2.7	2.7	2.5		
BCA-202	C Programming						
Course Objective							
1	To introduce the arrays and its various types						
2	To describe the use of pointer in programming						
3	To learn the use of string in C programming						
4	To study the use of structure, union and macros						
5	To learn file operations and implement file operation in C programming for a set of problems						
CO1	Able to understand and apply of array in matrix related problems	Understand K(2), Applying K(3)	H	H	H		M
CO2	Able to define and implement Pointers	Understand K(2), Applying K(3)	H	M	M		L
CO3	Able to implement the Strings functions to manage character array	Applying K(3)	H	H	H		M
CO4	Able to understand & implement the importance of Structure, Union and Macros in record based problems	Understand K(2), Applying K(3)	H	H	H		M
CO5	Able to implement the concept of working with files using 'C'	Applying K(3)	H	H	H		M
BCA-202			3.0	2.8	2.8		1.8
BCA-202			1.4	1.3	1.3		0.8
BCA-203	Organization Behavior						
Course Objective							
1	To help the students to understand the behavior of organization & its model						
2	To enable the students to understand the meaning of Motivation, its theories and its effect on employee morale						



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3	To make the students understand the personality types and also determine its theories.							
4	To introduce the meaning of stress and its symptoms.							
5	To familiarize the students with meaning of group and its dynamics							
6	To develop the insight of understanding the meaning of conflict and give its resolution							
CO1	Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization	Understanding (K2), Applying (K3)	M		M			
CO2	Develop practical insights and problem solving capabilities for effectively managing the Organizational processes.	Understanding (K2), Applying (K3)	M	M	M	M		M
CO3	Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization.	Analysis (K4)	M	M	M	M		M
CO4	Develop an understanding of appropriate organizational formats and channels used in business communications	Understanding (K2)	H		H			
CO5	Analyzing the behavior of individuals and groups in organizations.	Understanding (K2), Applying (K3), Analysis (K4)	M	M	M	M		M
CO6	Develop strategies for managing conflict and negotiation in the workplace.	Applying (K3), Analysis (K4)	M	M	M	M		M
BCA-203			2.2	2.0	2.2	2.0		2.0
BCA-203			2.2	2.0	2.2	2.0		2.0
BCA-204	Digital Electronics and Computer Organization							
Course Objective								
1	To study the concept of Boolean algebra and logic gates							
2	To apply the design procedure to construct basic combinational circuits.							
3	Interpretation of various types of memories with their operations.							
4	Analysis of synchronous and asynchronous sequential circuits using flip flops.							
5	To discuss the various Memories.							
CO1	Able to understand the types of logic gates, Boolean algebra. Application of circuit designing techniques	Understanding K(2)	M	L				M
CO2	Understand the concept of Multiplexers, decoders, encoders	Understanding K(2)	M	L	L			M
CO3	Interpretation of various types of memories with their operations.	Understanding K(2)	M	M				M
CO4	Understand the concept of sequential circuits using flip flops. synchronous and asynchronous designing method	Understanding K(2)	M	L				M
CO5	Able to understand I/O management and file system, concepts of protection and security	Understanding K(2)	M	M	L			M
BCA-204			2.0	1.4	1.0			2.0
BCA-204			0.9	0.7	0.5			0.9
BCA-205	Financial Accounting and Management							
Course Objective								
1	To introduce the importance of financial accounting							
2	Explain the fundamental concepts and conventions of the financial accounting system, GAAP and introduction of IndAS.							
3	To prepare the financial statements							
4	To introduce the theory and application of long term sources of funds.							



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5	To study and apply the concept and component of working capital and the knowledge of Cash, Inventory and Receivables Management							
CO1	Develop understanding and fundamental knowledge about Financial Accounting and conceptual knowledge of Indian Accounting Standards (IND-AS)	Understanding (K2), Applying (K3)	M	M	H	M		M
CO2	Understanding of basics of accounting	Understanding (K2), Applying (K3)	H	M	M	M		M
CO3	Understanding the techniques of financial statement analysis and know the usefulness of financial ratios.	Understanding (K2), Applying (K3)	M	M	H	M		M
CO4	Understanding the theory and application of long term sources of funds	Understanding (K2)	H	L	H	M		M
CO5	Understanding the concept and component of working capital and the knowledge of Cash, Inventory and Receivables Management	Understanding (K2), Applying (K3)	M	L	H	M		M
BCA-205			2.4	1.8	2.8	2.0		2.0
BCA-205			2.4	1.8	2.8	2.0		2.0
BCA-206(P)	Lab - C Programming							
Course Objective								
1	To understand and apply the concept of arrays							
2	To apply pointer in programming							
3	To learn the use of string in C programming							
4	To study the use of structure, union and macros							
5	To learn file operations and implement file operation in C programming for a set of problems							
CO1	Able to apply of array in matrix related problems	Applying K(3)	H	H	H			H
CO2	Able to implement Pointers	Applying K(3)	H	H	H			H
CO3	Able to implement the Strings functions to manage character array	Applying K(3)	H	H	H			H
CO4	Able to implement Structure, Union and Macros in record based problems	Applying K(3)	H	H	H			H
CO5	Able to implement the concept of working with files	Applying K(3)	H	H	H			H
BCA-206(P)			3.0	3.0	3.0			3.0
BCA-206(P)			3.0	3.0	3.0			3.0

		YEAR - Second	SEM - III					
BCA-301	Object Oriented Programming using C++							
Course Objective								
1	To differentiate between Procedural Oriented Approach & Object Oriented Programming approach and to understand basic terms and OOP ideas							
2	To identify with the concepts of OOP and dynamic memory allocation.							
3	To be aware of the concepts of Polymorphism and Inheritance.							
4	To understand the idea of Generic Functions and Template.							
5	To comprehend the importance of Files and Exception Handling							
CO1	Able to differentiate between Procedural Oriented Approach & Object Oriented Programming approach and to understand basic terms and OOP ideas	Understanding (K2), Applying (K3)	M		M			M
CO2	Able to identify with the concepts of OOP and Dynamic Memory Allocation.	Understanding (K2), Applying (K3)	M	M	M			



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CO3	Able to aware of the concepts of Polymorphism and Inheritance.	Understanding (K2), Applying (K3)				M		M
CO4	Able to understand the idea of Generic Functions and Template.	Understanding (K2), Applying (K3)	H		H			
CO5	Able to comprehend the importance of Files and Exception Handling	Understanding (K2), Applying (K3)	M			M		
BCA-301			2.3	2.0	2.3	2.0		2.0
BCA-301			1.7	1.5	1.7	1.5		1.5
BCA-302	Data Structure using C & C++							
Course Objective								
1	To learn the concepts of Array and its types							
2	To learn the concepts of stack and queues.							
3	To learn the use of list and its operations.							
4	To learn the concepts of trees and its implementation.							
5	Understand and implement the concept of advanced data structure of B-trees.							
6	Implement appropriate sorting/searching technique for given problem.							
CO1	Able to define array and its types	(Understand K(2), Applying(K3)	M					M
CO2	Able to define the concepts of stack and queues	(Understand K(2), Applying(K3)	H	M	M		L	M
CO3	Able to understand the concept and implement the list and its operations.	(Understand K(2), Applying(K3)	M	L	M			
CO4	Able to understand the concept and implement the trees and its operations.	(Understand K(2), Applying(K3)	H	M	H			
CO5	Able to understand and implement the concept of advanced data structure of B-trees.	(Understand K(2), Applying(K3)	L		M		L	M
CO6	Able to implement appropriate sorting/searching technique for given problem.	(Understand K(2), Applying(K3)	M		M			
BCA-302			2.2	1.7	2.2		1.0	2.0
BCA-302			2.2	1.7	2.2		1.0	2.0
BCA-303	Computer Architecture and Assembly Language							
Course Objective								
1	To study basic computer organization and design							
2	To study the General Register Organization/ stacks organizations instruction formats							
3	To discuss the Computer Arithmetic							
4	Analysis of Input Output Organization							
5	To study the evaluation of Microprocessor							
6	To discuss Assembly language operations							
CO1	Able to understand the concept of Basic Computer Organization and Design	Understanding (K2), Applying (K3)	M					
CO2	Understand the concept of General Register Organization.	Understanding (K2)	H	M	L			M
CO3	Interpretation of computer arithmetic	Understanding (K2)	M	M	M			
CO4	Able to understand the analysis of Input & Output	Understanding (K2)	M	L	H			M
CO5	Able to design and understand the Microprocessor Architecture	Understanding (K2), Applying (K3)	M		L	L	M	L
CO6	Able to understand concept of Assembly Language	Understanding (K2)	M	M	L	L		
BCA-303			2.2	1.8	1.6	1.0	2.0	1.7



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BCA-303			2.2	1.8	1.6	1.0	2.0	1.7
BCA-304	Business Economics							
Course Objective								
1	To introduce students to the basic elements of economics and to enable students to understand how optimum real life decisions are taken by individuals and firms under situations of scarcity							
2	To enable students to understand how optimum decisions are taken by firms under Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly Market Structure							
3	To study the important indicators of the economy and their significance and To understand the functioning of economy at the macro level							
4	To Understand how the economy is regulated Internationally							
CO1	Students will be able to understand and identify the economic variables in general business atmosphere.	Understanding K(2)	H			M	L	
CO2	Apply the knowledge of the mechanics of supply and demand to explain working of markets	Applying (K3)	M			M	M	M
CO3	Apply the principle of Macroeconomics in explaining the behavior of Macroeconomic variables at national as well as global level	Applying (K3)	M	M				
CO4	Students will demonstrate conceptual domain knowledge of international business	Understanding K(2)	M	M		M		M
BCA-304			2.3	2.0		2.0	1.5	2.0
BCA-304			2.3	2.0		2.0	1.5	2.0
BCA-305	Elements of Statistics							
Course Objective								
1	To enumerate the fundamental knowledge of Population, Sample and Data Condensation							
2	To understand concept of Measures of Central Tendency							
3	To understand the concept of Measures of Dispersion							
4	To understand the concept of Permutations and Combinations							
5	To understand the concept of Sample space, Events and Probability							
6	To understand the concept of Statistical Quality Control.							
CO1	Able to understand the concept of Population, Sample Data	Understanding (K2)	M	M	L			
CO2	Able to understand the meaning of Central Tendency	Understanding (K2)	M		M			M
CO3	Able to understand the concept of Dispersion and Variation	Understanding (K2), Applying (K3)	M	M	L			
CO4	Able to understand the concept of Permutation & Combination Problems, Real Life Uses.	Applying (K3)	M	L	H			M
CO5	Able to understand the concept of Probability and its application.	Understanding (K2)						
CO5	Able to understand the concept of Quality Control	Understanding (K2)	M	M	L			
BCA-305			2.0	1.8	1.6			2.0
BCA-305			2.0	1.8	1.6			2.0
BCA-306(P)	Lab - Object Oriented Programming using C++							
Course Objective								
1								
2	To identify dynamic memory allocation.							



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3	To be aware of the concepts of Polymorphism and Inheritance.							
4	To understand the idea of Generic Functions and Template.							
5	To comprehend the importance of Files and Exception Handling							
CO1	Able to differentiate between Procedural Oriented Approach & Object Oriented Programming approach and to understand basic terms and OOP ideas	Applying K(3)	H	H	H			H
CO2	Able to identify with the concepts of OOP and Dynamic Memory Allocation.	Applying K(3)	H	H	H			H
CO3	Able to aware of the concepts of Polymorphism and Inheritance.	Applying K(3)	H	H	H			H
CO4	Able to understand the idea of Generic Functions and Template.	Applying K(3)	H	H	H			H
CO5	Able to comprehend the importance of Files and Exception Handling	Applying K(3)	H	H	H			H
BCA-306(P)			3.0	3.0	3.0			3.0
BCA-306(P)			3.0	3.0	3.0			3.0
BCA-307(P)	Data Structure using C & C++							
Course Objective								
1	To learn the concepts of Array and its types							
2	To learn the concepts of stack and queues.							
3	To learn the use of list and its operations.							
4	To learn the concepts of trees and its implementation.							
5	Understand and implement the concept of advanced data structure of B-trees.							
6	Implement appropriate sorting/searching technique for given problem.							
CO1	Able to APPLY array and its types	Applying K(3)	H	H	H			H
CO2	Able to APPLY the concepts of stack and queues	Applying K(3)	H	H	H			H
CO3	Able to implement the list and its operations.	Applying K(3)	H	H	H			H
CO4	Able to implement the trees and its operations.	Applying K(3)	H	H	H			H
CO5	Able to implement the concept of advanced data structure of B-trees.	Applying K(3)	H	H	H			H
CO6	Able to implement appropriate sorting/searching technique for given problem.	Applying K(3)	H	H	H			H
BCA-307(P)			3.0	3.0	3.0			3.0
BCA-307(P)			3.0	3.0	3.0	0.0	0.0	3.0

		YEAR - Second		SEM - IV				
BCA-401	Computer Graphics & Multimedia Application							
Course Objective								
1	To learn the principles of hardware and software behind the graphical environment and to learn about the design and implementation of graphical object by understanding basic algorithms for scan conversion of different graphical primitives							
2	To learn display technologies like raster scan, random scan, video controller etc. and their comparison							
3	To learn about transformation and modeling of original primitive and their clipped version into dimensional space by understanding the different algorithms, also their differences							
4	To learn different curves and surfaces							



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5	To learn the creation of animated objects and their images by knowing various aspects of media and learn the concept of audio, images, videos and their differences							
CO1	Understand the basics of computer graphics, different graphics systems and applications of computer graphics and implement the various algorithms for scan conversion of different graphical primitives	Understanding (K2), Applying (K3)	M	M	L			
CO2	Understand the basics of display technologies and their comparison	Understanding (K2), Applying (K3)	M		M			M
CO3	Apply geometric transformations on original and clipped graphics objects and their application in composite form in 2D and 3D	Applying (K3)	M	M	L			
CO4	Understand the different curves and surfaces, also implement curves	Applying (K3)	M	L	M	L	M	
CO5	Understand the animation effects for transformation of different shapes and to differentiate between different multimedia systems	Understanding (K2)	M	L	H			M
BCA-401			2.0	1.5	1.8	1.0	2.0	2.0
BCA-401			2.0	1.5	1.8	1.0	2.0	2.0
BCA-402	Operating System							
Course Objective								
1	To study types of Operating System and Virtual Memory							
2	To understand the concept of Scheduling and Process Synchronization							
3	To study the Deadlock and safe sequence of a system							
4	To learn Disc Management							
5	To study the File Management							
CO1	Able to understand the types of operating system, paging and segmentation methods suitable for virtual memory	Understand (K2), Applying (K3)	M		M			
CO2	Understand CPU scheduling and able to understand the problem of process synchronization	Understand (K2), Applying (K3)	H		L			
CO3	Understand the concepts of deadlock	Understand (K2), Applying (K3)	M		M			
CO4	Understand the concept of directory structure and how to manage disk spaces	Understand (K2), Applying (K3)	M					M
CO5	Able to understand I/O management and file system, concepts of protection and security	Understanding K(2)	M		H			M
BCA-402			2.2		2.0			2.0
BCA-402			2.2		2.0			2.0
BCA-403	Software Engineering							
Course Objective								
1	To introduce students with the concept of Software Engineering and software process models							
2	To be able to know about the different types of requirements analysis and able to create software specification document							
3	To introduce students with the basic concepts of Procedural, Architectural and Object Oriented Design							
4	To be able to know about the different types of Software Implementation and should be aware of Coding Standards and guidelines							
5	To be able to know about the Software Maintenance and its types. Also should be able to know about the techniques for maintenance							



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6	To familiarize the student about case tools							
CO1	Able to understand the concept of Software Engineering and software process models for developing software	Understanding (K2)	M	L	M			
CO2	Able to understand the various types of requirements analysis, able to implement software specification document and also able to know about the software cost estimation	Understanding (K2), Applying (K3)	M	M	L			
CO3	Able to understand the basic concepts of Procedural, Architectural and Object Oriented Design.	Understanding (K2), Applying (K3)	H		H			
CO4	Able to understand the different types of Software Implementation and Coding Standards and guidelines	Understanding (K2)	M		M			M
CO5	Able to understand the Software Maintenance and its types and able to understand the techniques for maintenance	Understanding (K2)	M					
CO6	Able to understand the student about case tools	Understanding (K2)	M	M	H			M
BCA-403			2.2	1.7	2.2			2.0
BCA-403			2.2	1.7	2.2			2.0
BCA-404	Optimization Technique							
Course Objective								
1	To enumerate the fundamental knowledge of Linear Programming and Develop and solve transportation model and assignment problem Model							
2	To Develop and solve Queuing Theory and related problems and understand various queuing conditions and identify the best optimal solution using various models							
3	Able to understand replacement theory and find out the best time to replace any product							
4	Able to solve problems based on Inventory Theory Applying							
5	Able to solve the problems related to job sequence and able to interpret results							
CO1	Able to understand the concept of linear programming and solve related problem using LPP methods and analyze the result Understanding	Understanding (K2), Applying (K3)	M		M			
CO2	Able to understand Queuing problem and solve queuing problems.	Understanding (K2), Applying (K3)	M	M	H			
CO3	Able to understand the concept of replacement theory and find out the best time to replace any product	Understanding (K2), Applying (K3)		M	H			M
CO4	Able to solve problems based on Inventory Theory	Applying (K3)	M	L	M	M		
CO5	Do you able to solve the problems related to job sequence and able to interpret results understand	Understanding (K2), Applying (K3), Analysis (K4)	M					
BCA-404			2.0	1.7	2.5	2.0		2.0
BCA-404			2.0	1.7	2.5	2.0		2.0
BCA-406	Mathematics-III							
Course Objective								
1	To enumerate the fundamental knowledge of Complex Number and Complex Valued Function							
2	To understand concept of Sequence and Series of Real Number, and their nature and properties							
3	To understand the concept of Vectors							
4	To understand the concept of Fourier series							
5	To understand the concept of Differential Equation of First Order							
6	To understand the concept of Differential Equation of Higher Order							



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CO1	Able to understand the concept of Complex Number and why complex number needed	Understanding (K2), Applying (K3), Analysis (K4)	M		L			M
CO2	Able to understand the meaning of Sequence and Series and solving problems based on convergences and divergence	Understanding (K2), Applying (K3), Analysis (K4)	M	L	M			
CO3	Able to understand the concept of Vectors Differentiation and its physical interpretation	Understanding (K2), Applying (K3), Analysis (K4)	M	L	M			
CO4	Able to solve problem on Fourier series	Understanding (K2), Applying (K3), Analysis (K4)	M		M	M		M
CO5	Able to understand the concept of derivative, able to solve First Order Differential Equation Problem	Understanding (K2), Applying (K3)	L	L	M			
CO6	Able to solve Higher Order Differential Equation Problem	Understanding (K2), Applying (K3)	M	L	L		L	M
BCA-406			1.8	1.0	1.7	2.0	1.0	2.0
BCA-406	YEAR III		0.4	0.2	0.3	0.4	0.2	0.4
BCA-405(P)	Computer Graphics & Multimedia Application							
Course Objective								
1	To learn the principles of hardware and software behind the graphical environment and to learn about the design and implementation of graphical object by understanding basic algorithms for scan conversion of different graphical primitives							
2	To learn display technologies like raster scan, random scan, video controller etc. and their comparison							
3	To learn about transformation and modeling of original primitive and their clipped version into dimensional space by understanding the different algorithms, also their differences							
4	To learn different curves and surfaces							
5	To learn the creation of animated objects and their images by knowing various aspects of media and learn the concept of audio, images, videos and their differences							
CO1	Understand the basics of computer graphics, different graphics systems and applications of computer graphics and implement the various algorithms for scan conversion of different graphical primitives	Applying K(3)	H	H	H			H
CO2	Understand the basics of display technologies and their comparison	Applying K(3)	H	H	H			H
CO3	Apply geometric transformations on original and clipped graphics objects and their application in composite form in 2D and 3D	Applying K(3)	H	H	H			H
CO4	Understand the different curves and surfaces, also implement curves	Applying K(3)	H	H	H			H
CO5	Understand the animation effects for transformation of different shapes and to differentiate between different multimedia systems	Applying K(3)	H	H	H			H
BCA-405(P)			3.0	3.0	3.0			3.0
BCA-405(P)			3.0	3.0	3.0	0.0	0.0	3.0
YEAR - Third SEM - V								
BCA-501	Introduction to DBMS							
Course Objective								
1	To introduce the needs and uses of database management system							
2	To learn the techniques for designing and building database Information systems							
3	To describe file organization in RDBMS and different types of index & Views.							



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4	To study the data models for relative problems, Practice SQL programming through a variety of database problems.							
5	To design entity relationship diagram into RDBMS and formulate SQL queries on the respect data							
6	To describe the normalization for the development of application and demonstrate the use of concurrency and transactions.							
CO1	Able to understand the needs and uses of database management system.	Understand K(2)	M	L		L		
CO2	Able to understand and demonstrate the techniques for designing and building database Information systems.	Understanding K(2), Applying K(3)	M	L	M			M
CO3	Ability to explain file organization in RDBMS and demonstrate different types of index and Views.	Understand K(2)	H	M	M	L		
CO4	Ability to identify the data models for relative problems, Practice SQL programming through a variety of database problems	Understanding K(2), Applying K(3)	M	L	L		M	
CO5	Ability to design entity relationship and convert ER diagram into RDBMS and formulate SQL queries on the respect data	Understand K(2)	L		L			M
CO6	To describe the normalization for the development of application software and demonstrate the use of concurrency and transactions.	Understanding K(2), Applying K(3)	M	M	M			
BCA-501			2.0	1.4	1.6	1.0	2.0	2.0
BCA-501			0.4	0.3	0.3	0.2	0.4	0.4
BCA-502	Java Programming and Dynamic Webpage Design							
Course Objective								
1	To learn the concepts of Array, String, thread and method of Exception Handling in Java							
2	To learn the Applet concepts							
3	To describe and the concept of Networking and JDBC concepts							
4	To learn the concepts of HTML language							
5	To learn the concepts of servlet and database connectivity							
6	To understand the concepts of JSP							
CO1	Ability to define & implement Arrays, Strings, Vectors, Packages and Exception in Java.	Understand K(2), Applying K(3)	L		M	L		
CO2	Ability to understand & implement the different concepts of applets	Understand K(2), Applying K(3)	H	M			M	M
CO3	Ability to implement the concepts of Networking event handling and JDB Concepts	Understand K(2), Applying K(3)	M	L	M			
CO4	Able to understand & implement the concept of HTML language.	Understand K(2), Applying K(3)	M	M	H		M	
CO5	Ability to implement server-side programs and Access database through Java programs.	Applying K(3)	M		H			M
CO6	Able to implement the knowledge of JSP.	Applying K(3)	M	H	L			
BCA-502			2.0	2.0	2.2	1.0	2.0	2.0
BCA-502			0.4	0.4	0.4	0.2	0.4	0.4
BCA-503	Computer Network							
Course Objective								
1	To introduce students with the concept of Computer Network and its models							
2	To be able to know about the different types of Transmission media and its working							
3	To introduce students with the concepts of Telephone, Protocols and Point to Point controls							
4	To be able to know about the different network devices and it working							



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5	To familiarize the student about OSI Model							
CO1	Able to understand the concept of Computer Network and its Models	Understanding (K2)	M		L			
CO2	Able to understand the various types of Transmission Media, and their working	Understanding (K2)	L	L	M		M	M
CO3	Able to understand the concepts of Telephone, Protocols and Point to Point controls	Understanding (K2)	M		M			
CO4	Able to understand the different types Network Devices	Understanding (K2)	M	M	H		M	
CO5	Able to understand the OSI Model	Understanding (K2)	M		H			M
BCA-503			1.8	1.5	2.2		2.0	2.0
BCA-503			1.8	1.5	2.2		2.0	2.0
BCA-504	Numerical Methods							
Course Objective								
1	To enumerate the fundamental knowledge of solving problems using Numerical Methods							
2	To understand concept of Differentiation and Integration by Numerical Approach							
3	To understand the Numerical Method in solving Linear Equation							
4	To understand the concept of Differential Equation Numerical Method Approach							
CO1	Able to solve the problems where exact solution of some problems is very hard to find, in that case approximate solution is found using Numerical Methods	Understanding (K2), Applying (K3)	M		L			
CO2	Able to solve the problems of Differentiation and Integration using Numerical Methods	Understanding (K2), Applying (K3)	M	M	M		M	M
CO3	Able to solve the problem of System of Linear Equation where approximate solution exist using Numerical Methods	Understanding (K2), Applying (K3)	H		L			
CO4	Able to solve the problem of Differential Equation using Numerical Methods	Understanding (K2), Applying (K3)	M	L	M		M	
BCA-504			2.3	1.3	1.7		2.0	2.0
BCA-504			1.1	0.6	0.8		0.9	0.9
BCA-505(P)	Minor Project							
Course Objective								
1	Able to understand the effects of practises on various targeted student groups							
2	Student help for the exploration, creativity, and measurement of actions that promote involvement							
3	Able to understand the continuous assessment.							
CO1	Understanding the effects of practises on various targeted student groups	Applying K(3)	H	H	H			H
CO2	Student help for the exploration, creativity, and measurement of actions that promote involvement	Applying K(3)	H	H	H			H
CO3	A continuous assessment of the student experience from the first to the last year that includes significant decision-making stages.	Applying K(3)	H	H	H			H
BCA-505(P)			3.0	3.0	3.0			3.0
BCA-505(P)			3.0	3.0	3.0			3.0
BCA-506(P)	Minor Project Viva							
Course Objective								



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1	Able to understand to learn new skills, knowledge, attitudes						
2	Able to understand how real organisations operate projects.						
3	to understand the how various departments interests and know about their activities.						
CO1	Able to get the opportunity to learn new skills, knowledge, attitudes	Applying K(3)	H	H	H		H
CO2	To provide an overview into how real organisations operate projects.	Applying K(3)	H	H	H		H
CO3	to understand the relationship between various departments and activities.	Applying K(3)	H	H	H		H
BCA-506(P)			3.0	3.0	3.0		3.0
BCA-506(P)			3.0	3.0	3.0		3.0
BCA-507(P)	Introduction to DBMS						
Course Objective							
1	To learn the techniques for designing and building database Information systems						
2	To describe file organization in RDBMS and different types of index & Views.						
3	To study the data models for relative problems, Practice SQL programming through a verity of database problems.						
CO1	Able to demonstrate the techniques for designing and building database Information systems.	Applying K(3)	H	H	H		H
CO2	Ability to demonstrate different types of index and Views.	Applying K(3)	H	H	H		H
CO3	Ability to practice SQL programming through a verity of database problems	Applying K(3)	H	H	H		H
BCA-507(P)			3.0	3.0	3.0		3.0
BCA-507(P)			3.0	3.0	3.0		3.0
BCA-508(P)	Java Programming and Dynamic Webpage Design						
Course Objective							
1	To implement the concepts of Array, String, thread and method of Exception Handling in Java						
2	To apply the Applet concepts						
3	To apply Networking and JDBC concepts						
4	To apply the concepts of HTML language						
5	To implement the concepts of servlet and database connectivity						
6	To apply the concepts of JSP						
CO1	Ability to implement Arrays, Strings, Vectors, Packages and Exception in Java.	Applying K(3)	H	H	H		H
CO2	Ability to implement the different concepts of applets	Applying K(3)	H	H	H		H
CO3	Ability to implement the concepts of Networking event handling and JDB Concepts	Applying K(3)	H	H	H		H
CO4	Able to implement the concept of HTML language.	Applying K(3)	H	H	H		H
CO5	Ability to implement server-side programs and Access database through Java programs.	Applying K(3)	H	H	H		H
CO6	Able to implement the knowledge of JSP.	Applying K(3)	H	H	H		H
BCA-508(P)			3.0	3.0	3.0		3.0
BCA-508(P)			3.0	3.0	3.0		3.0
YEAR - Third SEM - VI							
BCA-601	Computer Network Security						
Course Objective							



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1	Understand various security attacks and their protection mechanism and able to apply and analyze various encryption algorithms						
2	Understand various authentication applications						
3	Understand IP Security and Key Management						
4	Understand web security and Secure Electronic Transactions (SET)						
5	Understand Network Management (SNMP Architecture)						
6	Understand System Security						
CO1	Able to understand different security attacks and how they are defended against and able to apply and analyze various encryption algorithms	Understanding (K2), Applying (K3), Analyze (K4)	M		M		L
CO2	Able to know about various authentication applications	Understanding (K2)	L	L	L		
CO3	Able to understand IP Security and Key Management	Understanding (K2)	M		L		
CO4	Able to understand web security and Secure Electronic Transactions (SET)	Understanding (K2)	H	M	L		
CO5	Able to understand SNMP Architecture	Understanding (K2)	M	M	M		M
CO6	Able to understand the system security from Intruders, Viruses and Threats	Understanding (K2)					
BCA-601			2.0	1.7	1.4		1.5
BCA-601			2.0	1.7	1.4		1.5
BCA-602	Information System: Analysis and Design						
Course Objective							
1	To study the concept of System Development Life Cycle						
2	To apply the process modeling with physical logical data flow diagrams						
3	To discuss the proposal of feasibility study and cost study						
4	Analysis of Application Development Methodologies						
5	To study the design and Implementation of Object oriented technology						
6	To discuss managerial issues in Software Projects						
CO1	Able to understand the concept of System Development Life Cycle, Software Quality Metrics	Understanding (K2)	M		M		L
CO2	Understand the concept of process modeling and data modeling using E-R diagram	Understanding (K2)	L	L	L		
CO3	Interpretation of feasibility study and cost estimation	Understanding (K2)	M		L		
CO4	Able to understand the information engineering structured system analysis and design	Understanding (K2)	H	M	L		
CO5	Able to understand and design the applications on OO Platform	Understanding (K2)	M	L	M		
CO6	Able to understand Managerial Issues in Software Projects	Understanding (K2)	M	M	M		M
BCA-602			2.0	1.5	1.5		1.5
BCA-602			2.0	1.5	1.5		1.5
BCA-603	E-Commerce						
Course Objective							
1	To give knowledge of e-commerce with its technology, need, pros & cons, model, impacts, trade life cycle						
2	To give knowledge of business models surrounding e-Commerce including marketing strategies						



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3	To study the concept of Internet architecture and the concept of the process of electronic payment in e-commerce along with different technologies						
4	To understand knowledge of Legal issues and Regulatory policy and security aspects used in e-commerce and mobile commerce						
5	To study the concept of e-Commerce infrastructures and internet security						
CO1	Understand the concept of E-Commerce	Understand K(2)	H	L	M		L
CO2	understand the concepts of Business-to-Business E-Commerce	Understand K(2)	L	M	L		
CO3	Understand the concept Internet architecture and the process of electronic payment in e-commerce along with different technologies	Understand K(2)	H	L	M		L
CO4	Learn about the Understand the Internet Architecture and Electronic Payment System	Understand K(2)	M	L	M		
CO5	Able to understand the infrastructure and internet security	Understand K(2)	M	M	M		M
BCA-603			2.2	1.4	1.8		1.3
BCA-603			2.2	1.4	1.8		1.3
BCA-604	Knowledge Management						
	Course Objective						
1	To understand the design and the clear concepts of knowledge management						
2	To understand the history and evolution of knowledge management						
3	To have a clear understanding about the knowledge, intelligence, experience, common sense and its importance						
4	To entail basic knowledge of knowledge management						
CO1	Able to describe how valuable individual, group and organizational knowledge is managed throughout the knowledge management cycle	Understanding K[2]	M	L	M		
CO2	Able to define the different knowledge types and explain how they are addressed by knowledge management	Understanding K[2]	M		H		
CO3	Able to describe the major roles and responsibilities in knowledge management implementations	Understanding K[2]	L	M	H		
CO4	Able to identify some of the key tools and techniques used in knowledge management applications	Understanding K[2]	M	L	M		
BCA-604			1.8	1.3	2.5		
BCA-604			1.8	1.3	2.5		
BCA-605(P)	Major Project						
	Course Objective						
1	Able to understand the effects of practises on various targeted student groups						
2	Student help for the exploration, creativity, and measurement of actions that promote involvement						
3	Able to understand the continuous assessment.						
CO1	Understanding the effects of practises on various targeted student groups	Applying K(3)	H	H	H		H
CO2	Student help for the exploration, creativity, and measurement of actions that promote involvement	Applying K(3)	H	H	H		H
CO3	A continuous assessment of the student experience from the first to the last year that includes significant decision-making stages.	Applying K(3)	H	H	H		H



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BCA-605(P)			3.0	3.0	3.0			3.0
BCA-605(P)			3.0	3.0	3.0			3.0
BCA-606(P)	Presentation/Seminar based on Major Project							
Course Objective								
1	Able to understand to learn new skills, knowledge, attitudes							
2	Able to understand how real organisations operate projects.							
3	to understand the how various departments intersects and know about their activities.							
CO1	Able to get the opportunity to learn new skills, knowledge, attitudes	Applying K(3)	H	H	H			H
CO2	To provide an overview into how real organisations operate projects.	Applying K(3)	H	H	H			H
CO3	to understand the relationship between various departments and activities.	Applying K(3)	H	H	H			H
BCA-606(P)			3.0	3.0	3.0			3.0
BCA-606(P)			3.0	3.0	3.0			3.0