NIRMALA ARTS & SCIENCE COLLEGE, MULANTHURUTHY (Affiliated to MG University, Kottayam)

DEPARTMENT OF COMPUTER APPLICATIONS

OUTCOME BASED EDUCATION

PROGRAMME SPECIFIC OUTCOME, COURSE OUTCOMES

Prepared by Faculty members, Department of Computer Applications, Nirmala Arts and Science College, Mulanthuruthy.

PROGRAMME OUTCOMES

PSO No.	Programme Outcomes Upon completion of BCA programme, the students will be able to:
1.	Develop an extensive awareness of the nature, scope, and application of computers and programming languages.
2.	Acquire knowledge and skills in computer and information technology, communication, organization and management.
3.	Identify, formulate, and develop solutions to computational challenges.
4.	Comprehend the professional, ethical, legal, and social issues and responsibilities in the computing profession
5.	Build a strong foundation for an interdisciplinary approach to seek post-graduation
6.	Produce workforce equipped with solid IT and business fundamentals to meet the needs of the industry.
7.	Establish self-employment in application sectors involving information and computer technology

PROGRAMME SPECIFIC OUTCOMES

PSO No.	Expected Programme Specific Outcomes	Cognitive Level	РО
1	Explain the basic computer organization, architecture and hardware concepts.	U	1,2,5,6
2	Design algorithm and programs using C, C++, PHP, JAVA languages	Ар	1,2,3,5,6,7
3	Apply mathematical and statistical tools to identify and solve complex engineering and computing problems.	Ар	3,4,5,6,7
4	Develop soft skills and analytical skills to compose applications for real life environment	Ар	2,4,5,6,7
5	Develop software and mobile applications and employ concepts of ethics and cloud computing.	С	1,5,6,7,2

COURSE OUTCOMES

	COURSE: CA1CRT01- COMPUTER FUNDAMENTALS AND DIGITAL PRINCIPLES						
Categ	Category: Core Lecture Hours: 4 Hrs. Type: Theory						
CO No.	Upon comp	Cognitive Level	PSO				
1	Discuss about computer hardware, software, operations and concepts			U	1		
2	Distinguish various OS and explain the concepts of computer networks			U	1		
3	Express numbers in Binary, Hexadecimal and Octal number systems and solve binary arithmetics			Ар	1,3		
4	Illustrate logic circuits using Boolean algebra			Ар	1,3		
5	Construct Sequentia	l and combinational logic from	m basic gates.	Ар	1,3		

	COURSE: CA1CRT02- METHODOLOGY OF PROGRAMMING AND C LANGUAGE						
Category	r: Core	Lecture Hours: 4 Hrs.	Type: Theory	Credits: 4			
CO No.	<i>Expected Course Outcomes</i> Upon completion of this course, the students will be able to:			Cognitive Level	PSO		
1	Discuss the concepts of programming and methodologies essential for developing good C programs.			U	1,2		
2	Explain the use of character set, data types, operators and input/output operations			U	1,2		
3	Illustrate Flow control statements in C programs			Ар	1,2,3,4,5		
4	Develop C progra types arrays, strue	ams using various constructs a ctures, union and pointers in C	and apply Complex data	Ар	1,2,3,4,5		

	COURSE: CA1CRP01- SOFTWARE LAB 1						
Categ	ory: Core	Lecture Hours: 4 Hrs	Type: Practical	Credits: 2			
CO No.	 Expected Course Outcomes Upon completion of this course, the students will be able to: 				PSO		
1	Associate the fundamentals of C programming in trivial problem solving			U	1,2,3		
2	Write, compile and debug programs in C Language			Ар	1,2,3,4		
3	Apply user defined functions for solving the problem			Ap	1,2,3,4,5		
4	Design programs in pointers	volving decision structures and	l loops, structures and	Ар	1,2,3,4,5		

	COURSE: CA2CRT03- DATABASE MANAGEMNET SYSTEMS						
Categ	ory: Core	Lecture Hours: 4 Hrs	Type: Theory	Credits: 3			
CO No.	Upon completion of	Cognitive Level	PSO				
1	Describe the data base approach			U	1		
2	Discuss the relations, relationship models and relational database schemas in detail			U	1		
3	Practice with the SQL queries			Ар	1,2,3		
4	Explain the Normalization and Indexing Structures for Files			U	1,2,3		
5	Discuss Transaction	Processing and Database Secu	rity	U	1,2,3		

	COURSE: CA2CRT04- COMPUTER ORGANIZATION AND ARCHITECTURE						
Categ	gory: Core	Credits: 3					
CO No.	Expected Course Outcomes Upon completion of this course, the students will be able to:			Cognitive Level	PSO		
1	Describe the fundamental organization of a computer system		U	1			
2	Explain the function	al units of a processor		U	1		

3	Explain addressing modes, instruction formats and program control statements	U	1
4	Distinguish the organization of various parts of a system memory hierarchy	U	1
5	Describe basic concept of parallel computing	U	1,3
6	Describe fundamentals concepts of pipeline and vector processing	U	1,3

	COURSE: CA2CRT05- OBJECT ORIENTED PROGRAMMING USING C++						
Categ	gory: Core	Lecture Hours: 3 Hrs	Type: Theory	Credits: 4			
CO No.	Expected Course Outcomes Cognitive Upon completion of this course, the students will be able to: PSO						
1	Differentiate between object oriented programming and procedural oriented language			U	1,2		
2	Describe data types, constants, control structures and functions in C++			U	1,2,3		
3	Explain the concepts of class, objects, constructors, destructors, inheritance, abstract classes etc.			U	1,2,3,4		
4	Apply C++ features inheritance, Polymore	such as composition of objects rphism etc. in programs	, Operator overloading,	Ар	1,2,3,4		

	COURSE: CA2CRP02- SOFTWARE LAB II						
Categ	gory: Core	Lecture Hours: 5 Hrs	Type: Practical	Credits: 2			
CO No.	Upon compl	Cognitive Level	PSO				
1	Write, compile and c	lebug programs in C++ Langua	ge	Ар	1,2,3,4		
2	Apply user defined functions for solving the problem			Ap	1,2,3,4		
3	Design programs involving decision structures and loops, structures, arrays and pointers			Ap	1,2,3,4,5		
4	Apply DDL commands in SQL to create, modify, and remove database objects			Ap	1,2,3,4		
5	Use Basic SQL queries INSERT, SELECT, DELETE, UPDATE to multiple tables			Ар	1,2,3,4		
6	Practice ordering of rows using ORDER BY option			Ap	1,2,3,4		
7	Manipulate tables using SET operations			Ap	1,2,3,4		
8	Apply complex quer	ies in SQL		Ар	1,2,3,4		
9	Manage views in SQ)L		Cr	1,2,3,4,5		

	COURSE: CA3CRT06- COMPUTER GRAPHICS						
Cate	gory: Core	Lecture Hours: 4 Hrs	Type: Theory	Credits: 4			
CO No.	Upon comp	Cognitive Level	PSO				
1	Discuss about computer graphics system and its application design algorithms and two-dimensional transformations.			U	1		
2	Design line and Circle drawing algorithms two dimensional transformations.			Ар	1,3		
3	Explain two dimensional transformations and techniques of clipping			U	1,3		
4	Explain three dimensional graphics			U	1,3		
5	Describe the basic co	oncepts of Computer Animatio	n	U	1,3		

	COURSE: CA3CRT07-MICROPROCESSORS AND PC HARDWARE						
Categ	gory: Core	Lecture Hours: 3 Hrs	Type: Theory	Credits: 3			
CO No.	Upon comp	Cognitive Level	PSO				
1	Explain the general architecture of a microcomputer system and architecture organization of 8085			U	1		
2	Classify the instruction set of 8085 microprocessor and distinguish the use of different instructions			U	1		
3	Identify different components and their functions on the motherboard			U	1		
4	Explain the operation of hard disk			U	1		
5	Identify the distingu and memory areas.	ishing features of physical men	nory, memory modules	U	1		

		COURSE: CA3CRT08 - C	PERATING SYSTEMS		
Categ	gory: Core	Lecture Hours: 4 Hrs	Type: Theory	Credits: 4	
CO No.	Upon comp	Expected Course Outcom letion of this course, the studer	es nts will be able to:	Cognitive Level	PSO
1	Explain fundamenta	l concepts, structure and desig	n of OS	U	1
2	Identify the type of operating systems used in various real time applications		U	1,3	
3	Describe different approaches to process management		U	1,3	
4	Describe different ap	pproaches to memory managen	nent	U	1,3
5	Describe secondary	storage management and disk	scheduling	U	1,3

		COURSE: CA3CRT09 - DATA	STRUCTURES USING C++		
Categ	ory: Core	Lecture Hours: 4 Hrs	Type: Theory	Credits: 3	
CO No.	<i>Expected Course Outcomes</i> Upon completion of this course, the students will be able to:			Cognitive Level	PSO
1	Describe programm	ing methodologies & classific	ation of Data Structures	U	1,3
2	Develop Data struct C++ as the programmed implementations	ures such as linked list, stack, ramming language and using s s.	queue and tree by using tatic or dynamic	С	1,2,3,4,5
3	Differentiate sorting organizations.	s, searching techniques and un	derstand various file	AP	1,2,3,4
4	Represent and mani	pulate data using non linear da algorithms for various applica	ations.	AP	1,2,3,4
5	Understand differen Structures	t programming methodologies	& classification of Data	U	1,2

		COURSE: CA3CRP0	3 – SOFTWARE LAB III		
Categor	gory: Core Lecture Hours: 6 Hrs Type: Practical Cred			Credits: 2	
CO	Expected Course Outcomes			Cognitive	PSO
No.	Upon completion	of this course, the students	will be able to:	Level	
1	Implement basic	linear and non linear data st	ructures and their major	Ар	1,2,3,4
2	Implement repres	entation of graphs		Ар	1,2,3,4
3	Implement algori	thms for various sorting and	d searching techniques	Ap	1,2,3,4

	CO	URSE: CA4CRT10 - DESIGN AN	D ANALYSIS OF ALGORITHN	ЛS	
Categ	ory: Core	Lecture Hours: 4 Hrs	Type: Theory	Credits: 4	
CO No.	Upon completion of	Expected Course Outcom this course, the students will b	es e able to:	Cognitive Level	PSO
1	Describe various al	gorithm design strategies and a	nalysis of algorithms	U	1,2
2	Explain the divide and conquer method and its applications		U	1,2,3	
3	Analyze the time and space efficiency of the data structure		An	1,2,3	
4	Identity the appropriate data structure for given problem		U	1,2,3	
5	Apply graph and tre	ee traverse technique to various	applications.	Ар	1,2,3
6	Implement dijkstra ⁶ Problem	's algorithm, binary trees, trave	lling Sales person	Ар	1,2,3,4

	COUR	SE: CA4CRT11 - SYSTEM ANALY	SIS & SOFTWARE ENGINEE	RING	
Categ	tegory: Core Lecture Hours: 4 Hrs Type: Theory			Credits: 4	
CO No.	Upon completion of	Expected Course Outcom this course, the students will be	es e able to:	Cognitive Level	PSO
1	Research the state-o developing software	f-the-art, and application of So e.	ftware Engineering in	U	1

2	Analyze different approaches to software developing and testing	An	1
3	Summarize the different testing techniques.	U	1
4	Discuss test cases	U	1
5	Apply system testing and validation in the development life cycle	Ар	1,3,4

		COURSE: CA4CRT12-LI	NUX ADMINISTRATION		
Categ	tegory: Core Lecture Hours: 4 Hrs Type: Theory Credits: 4				
CO No.	<i>Expected Course Outcomes</i> Upon completion of this course, the students will be able to:			Cognitive Level	PSO
1	Describe basic concepts of Linux Operating System.		U	1	
2	Explain various Linux commands.			U	1,3,4
3	Practice shell programming		Ар	1,2,3,4	
4	Describe system ad	ministration		U	1
5	Summarize various	types of servers		U	1,3

		COURSE: CA4CRT13-WEB PR	OGRAMMING USING PH	IP	
Categ	ory: Core	Lecture Hours: 3 Hrs	Type: Theory	Credits: 3	
CO No.	Upon comple	Expected Course Outcomes etion of this course, the students	s will be able to:	Cognitive Level	PSO
1	Explain WWW arch	itecture and fundamentals of H	TML	U	1
2	Explain stylesheets and javascript		U	1	
3	Describe basic progr	ram elements in PHP		U	1,2,3
4	Differentiate PHP G	et and Post methods working		U	1,2,3

4	Describe of MySQL commands	U	1,2,3
5	Apply PHP code snippets to access a MySQL database	Ар	1,2,3,4

		COURSE: CA4CRP04	-SOFTWARE LAB IV			
Categ	gory: Core	Lecture Hours: 6 Hrs	Type: Practical	Crea	dits: 2	
CO No.	Upon com	Expected Course Outco pletion of this course, the stu	omes dents will be able to:		Cognitive Level	PSO
1	Design a basic webs design	ite using HTML and CSS to	lemonstrate responsive we	eb	Ар	1,2,3,4
2	Implement dynamic WebPages with validation using JavaScript objects by applying different event handling mechanism				Ар	1,2,3,4
3	Apply PHP scripts to	o handle html forms			Ар	1,2,3,4
4	Develop PHP progra POST Methods	ams that use various PHP libr	ary functions and GET &		Ар	1,2,3,4
5	Develop simple web connectivity using M	application using server side IySQL	PHP and database		Ар	1,2,3,4
6	Apply file system an	nd process related commands	in Linux in vi-editor		Ар	1,2,3,4
7	Apply Simple Filters	s, Filters using regular expres	sions		Ap	1,2,3,4
8	Develop shell scripts	\$			Ар	1,2,3,4

		COURSE: CA5CRT14-CO	OMPUTER NETWORKS			
Categ	gory: Core Lecture Hours: 3 Hrs Type: Theory Cre			Cre	dits: 4	
CO No.	<i>Expected Course Outcomes</i> Upon completion of this course, the students will be able to:		Cognitive Level	PSO		
1	Explain the concepts of signals and OSI-layer functions.		U	1,3		
2	Discuss the process o and unguided media	f Multiplexing, switching and in networks.	difference between guide	d	U	1,3

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3	Describe, analyse and compare a number of data link, network, and transport layer protocols	U	1,3
4	Explain protocols and services of transport layer and application layer	U	1,3

	COURSE: CA5CRT15-IT AND ENVIRONMENT						
Categ	gory: Core	Credits: 4					
CO No.	<i>Expected Course Outcomes</i> Upon completion of this course, the students will be able to:				PSO		
1	1 Explain the concepts of internet and environment.			U	1		
2	2 Discuss the impact of IT in E-learning.			U	1,3		
3	Describe, cyber ethics, cyber crimes, cyber addictions			U	1,3		
4	Explain e-waste and green computing measures			U	1,3		
5	Describe the concep	ts of Human Rights in coordina	tion with UN system	U	1,3		

	COURSE: CA5CRT16-JAVA PROGRAMMING USING LINUX						
Categ	ory: Core	Credits: 3					
CO No.	Upon compl	Cognitive Level	PSO				
1	Understand the principles and practice of object oriented analysis and design in the construction of robust				1		
2	Develop Java programs comprising more than one class, to address a particular software problem			Ар	1,2,3,4,5		
3	Discuss simple data structures like arrays in a Java program.				1,2,3,4		
4	Describe concept of package, interface, multithreading and File handling in java.				1,2,3,4		
5	Apply JDBC conne	ction in programs		Ар	1,2,3,4		

	COURSE: CA5CRP05 -SOFTWARE LAB V						
Categ	ory: Core	Credits: 2					
CO No.	Upon compl	Cognitive Level	PSO				
1	Write Java applicati structuring.	Ар	1,2,3,4				
2	2 Develop Java program using packages, inheritance and interface.			Ар	1,2,3,4,5		
3	3 Create Multithreaded programs.			Ар	1,2,3,4		
4	Write Java programs to implement error handling techniques using exception handling			Ар	1,2,3,4		
5	Develop Applet and connection	swing based Programs and in	nplement database	Ар	1,2,3,4,5		

	COURSE: CA5CRP06-Software Development Lab I						
Categ	Category: Core Lecture Hours: 6 Hrs Type: Practical			Credits: 2			
CO No.	Expected Course Outcomes Upon completion of this course, the students will be able to:		Cognitive Level	PSO			
1	Design a system based on System Analysis & Software Engineering course using PHP and MY SQL		Cr	1,2,3,4, 5			

	COURSE: CA6CRT17 -CLOUD COMPUTING						
Categ	ory: Core	Credits: 4					
CO No.	<i>Expected Course Outcomes</i> Upon completion of this course, the students will be able to:			Cognitive Level	PSO		
1	Describe Understand the basic about cloud computing			U	1		
2	Discuss cloud computing architecture and types			U	1		
3	Describe cloud application platforms.			U	1		

	COURSE: CA6CRT18 -MOBILE APPLICATION DEVELOPMENT- ANDROID						
Categ	ory: Core	Credits: 4					
CO No.	Upon comple	Cognitive Level	PSO				
1	Discuss about the architecture and features of Android			U	1		
2	Discuss Android us	U	1,2				
3	Apply SQLite Database in Android.			Ар	1,2,3,4		
4	Describe JSON and	XML		U	1,2,3,4		

	COURSE: CA6PETElective DATA MINING						
Categ	ory: Core	Credits: 4					
CO No.	Expected Course Outcomes Upon completion of this course, the students will be able to:			Cognitive Level	PSO		
1	Discuss data mining, classification and major issues			U	1		
2	Discuss Data Warehouse and OLAP technology			U	1		
4	Describe Cluster An	alysis and major clustering me	thods	U	1		

	COURSE: CA6CRP07 –SOFTWARE LAB VI & SEMINAR						
Category: Core Lecture Hours: 6 Hrs Type: Practical Credits: 2							
CO No.	Expected Course Outcomes Upon completion of this course, the students will be able to:			Cognitive Level	PSO		
1	Develop skills in presentation and discussion of research topics in a public forum			Cr	1,2,3,4,5		

	COURSE: CA6CRP08 -SOFTWARE DEVELOPMENT LAB II						
Categ	Category: Core Lecture Hours: 7 Hrs Type: Practical			Credits: 3			
CO No.	<i>Expected Course Outcomes</i> Upon completion of this course, the students will be able to:			Cognitive Level	PSO		
1	Design a system based on System Analysis & Software Engineering course using any platform			Cr	1,2,3,4,5		