



**Dr. MGR-JANAKI COLLEGE
OF ARTS & SCIENCE FOR WOMEN**

SATHYABAMA MGR MALIGAI
11 & 13, Durgabai Deshmukh Road, RA Puram, Chennai - 28

An ISO 9001:2015 CERTIFIED INSTITUTION
Affiliated to the University of Madras



**DR.MGR JANAKI COLLEGE OF ARTS
AND SCIENCE FOR WOMEN**

**DEPARTMENT OF COMPUTER
APPLICATIONS**

SHIFT I & II



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Bachelor of Computer Applications (BCA)

(With effect from the Academic Year 2023-24)

I PREAMBLE

Bachelor of Computer Applications (BCA) is a 3 – Year under Graduate Programme Spread over six semesters. The Course is designed to bridge the gap between IT industries and Academic institutes by incorporating the latest development, into the Curriculum and to give students a complete understanding within a structured framework. The Course helps the students to build-up a successful Career in Computer Science and for pursuing higher studies in Computer Science.

II ELIGIBILITY

A pass in the Higher secondary Examination (Academic Stream) conducted by the Government of Tamil Nadu with Mathematics or Business Mathematics or Computer Science or Computer Application as one of the subjects.

III PROGRAMME OBJECTIVES

PO1	Scientific aptitude will be developed in Students
PO2	Students will acquire basic Practical skills & Technical knowledge along with domain knowledge of different subjects in the Computer Science & humanities stream.
PO3	Students will become employable; Students will be eligible for career opportunities in education field, Industry, or will be able to opt for entrepreneurship.
PO4	Students will possess basic subject knowledge required for higher studies, professional and applied courses.
PO5	Students will be aware of and able to develop solution-oriented approach towards various Social and Environmental issues.
PO6	Ability to acquire in-depth knowledge of several branches of Computer Science and aligned areas. This Programme helps learners in building a solid foundation for higher studies in Computer Science and applications.
PO7	The skills and knowledge gained leads to proficiency in analytical reasoning, which can be utilized in modelling and solving real life problems.
PO8	Utilize computer programming skills to solve theoretical and applied problems by critical understanding, analysis and synthesis.
PO9	Ability to share ideas and insights while seeking and benefitting from knowledge and insight of others.
PO10	Mold the students into responsible citizens in a rapidly changing interdependent society.



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IV Programme Specific Objectives

PSO1	Think in a critical and logical based manner
PSO2	Familiarize the students with suitable software tools of computer science and industrial applications to handle issues and solve problems in mathematics or statistics and realtime application related sciences.
PSO3	Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
PSO4	Understand, formulate, develop programming model with logical approaches to Address issues arising in social science, business and other contexts.
PSO5	Acquire good knowledge and understanding to solve specific theoretical and applied problems in advanced areas of Computer science and Industrial statistics.
PSO6	Provide students/learners sufficient knowledge and skills enabling them to undertake further studies in Computer Science or Applications or Information Technology and its allied areas on multiple disciplines linked with Computer Science.
PSO7	Equip with Computer science technical ability, problem solving skills, creative talent and power of communication necessary for various forms of employment.
PSO8	Develop a range of generic skills helpful in employment, internships& societal activities.
PSO9	Get adequate exposure to global and local concerns that provides platform for further exploration into multi-dimensional aspects of computing sciences.
PSO10	The state of art technologies in conducting a Explain in a scientific and systematic way and arriving at a precise solution is ensured



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V COURSE STRUCTURE

YEAR – I SEMESTER – I

Part	Subject Code	List of Courses	Credit	Hours
Part-I	----	Language Paper-I	3	6
Part-II	100L1Z	English Paper-I	3	6
Part-III	120C1A	Core Course - I: Python Programming	5	4
	120C11	Core Course - II: Python Programming Practical	5	5
	120E1A 120E1B 120E1C	Elective Course - II Generic / Discipline Specific (Any one): Mathematics I Statistics I Financial Accounting I	3	5
	120S1A	Skill Enhancement Course - I: Office Automation *	2	2
Part-IV	100L1L	Basic Tamil-I (Other Language Students) *		
	100L1M	Advanced Tamil-I (Other Language Students) *		
	120B1A	Foundation Course FC: Fundamentals of Computers	2	2
			23	30

* **PART-IV: SEC-I / Basic Tamil / Advanced Tamil (Any one)**

1. Students who have studied Tamil upto XII STD and also have taken Tamil in Part I shall take SEC-I.
2. Students who have **not** studied Tamil upto XII STD and have taken any Language other than Tamil in Part-I shall take **Basic Tamil** comprising of Two Courses (level will be at 6th Std.).
3. Students who have studied Tamil upto XII STD and have taken any Language other than Tamil in Part-I shall take **Advanced Tamil** comprising of Two Courses.

YEAR – I SEMESTER – II

Part	Sub. Code	List of Courses	Credit	Hours
Part-I	----	Language Paper-II	3	6
Part-II	100L2Z	English Paper-II	3	6
Part-III	120C2A	Core Course - III: Object Oriented Programming using C++	5	4
	120C2B	Core Course - IV: Object Oriented Programming using C++ Practical	5	5
	120E2A 120E2B 120E2C	Elective Course - II Generic / Discipline Specific (Any one): Mathematics II Statistics II Financial Accounting II	3	5



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Part-IV	120S2A	Skill Enhancement Course - II: Office Automation Practical *	2	2
	100L2L	Basic Tamil-II (Other Language Students) *		
	100L2M	Advanced Tamil-II (Other Language Students) *		
	120S2B	Skill Enhancement Course - III: Quantitative aptitude	2	2
			23	30

YEAR – II SEMESTER – III

Part	Sub. Code	List of Courses	Credit	Hours
Part-I	----	Language Paper-III	3	6
Part-II	200L3Z	English Paper-III	3	6
Part-III	220C3A	Core Course - V: Data Structures	5	4
	220C31	Core Course - VI: Data Structures Practical	5	5
	220E3A 220E3B 220E3C	Elective Course - III Generic / Discipline Specific (Any one): Mathematics I Statistics I Cost and Management Accounting-I	3	5
	220S31	Skill Enhancement Course - IV: (Entrepreneurial Based): Web Page Design Practical	1	1
Part-IV	220S32	Skill Enhancement Course - V: Desktop publishing Practical	2	2
	----	Environmental Science	-	1
			22	30

YEAR – II SEMESTER – IV

Part	Sub. Code	List of Courses	Credit	Hours
Part-I	----	Language Paper-IV	3	6
Part-II	200L4Z	English Paper-IV	3	6
Part-III	220C4A	Core Course - VII: Java Programming	5	4
	220C41	Core Course -VIII: Java Programming Practical	5	4
	220E4A 220E4B 220E4C	Elective Course - IV Generic/Discipline Specific (Any one): Mathematics II Statistics II Cost and Management Accounting-II	3	5
	220S4A	Skill Enhancement Course -VII: Emotional Intelligence	2	2
Part-IV	220S4B	Skill Enhancement Course -VII: Technical Writing	2	2
	220V4A	Environmental Science	2	1
			25	30



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YEAR – III SEMESTER – V

Part	Sub. Code	List of Courses	Credit	Hours
Part- III	320C5A	Core Course - IX: Operating System	4	5
	320C5B	Core Course - X: Relational Database Management System	4	5
	320C5C	Core Course - XI: Web Technology	4	5
	320C5I	Core Course - XII: Web Technology Practical	4	5
	320E5A 320E5B 320E5C	Elective Course -V: Operations Research / Software Engineering / Agile Project Management	3	4
	320E5D 320E5E 320E5F	Elective Course -VI: Cloud computing / Big Data Analytics / Introduction To Data Science	3	4
Part-IV	320V5A	Value Education	2	2
	320V5B	Internship / Industrial Training (During summer vacation at the end of IV semester)	2	-
			26	30

YEAR – III SEMESTER – VI

Part	Sub. Code	List of Courses	Credit	Hours
Part- III	320C6A	Core Paper - XIII: R-Programming	4	6
	320C6I	Core Paper - XIV: R-Programming Practical	4	5
	320C6B	Core Paper - XV: Computer Networks	4	5
	320E6A 320E6B 320E6C	Elective Course -VII: Mobile Ad-hoc Network / Data Mining and Warehousing / Grid Computing	3	5
	320E6D 320E6E 320E6F	Elective -VIII: Internet of Things and its Applications/ Robotics and Its Applications / Network Security	3	5
Part-IV	320V6A	Professional Competency Skill Course: Mini Project	2	4
Part-V	320V6B	Extension Activity	1	-
			21	30



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II COURSE OBJECTIVES

- Provide strong foundations in fundamentals of Computer Science and applications, inter disciplinary courses and electives for widening the domain expertise.
- Design and develop software-based solutions for real world problems, serving effectively to the requirements of computer field and Society
- Attain sufficient knowledge related to computer domains, possesses technical, soft and hard skills and apply them effectively in team work
- Empower the students with competencies in creative thinking and problem solving, inter-personal communication and managerial skills.

III GRADUATE ATTRIBUTES

- Computational Knowledge
- Problem analysis & Solving
- Design & Development of Solutions
- Modern tool usage
- Communication skills
- Innovation & Entrepreneurship
- Societal & environmental concern

IV COURSE OUTCOMES

After Completion of the course, the students are expected to

- Understand the basic principles and concepts of Computer applications and integrate the knowledge gained in Computer application domain with practical needs of the society and be an ethically and socially responsible Computer Application Professional
- Explore emerging technologies in diverse areas of Computer Application and inculcate skills for successful career, entrepreneurship and higher studies
- Ability to apply the concepts of Computer and practices via emerging technologies and Software development tools.



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V COURSE STRUCTURE:

I SEMESTER						
COURSE CONTENT	COURSE NAME	Ins. Hrs	CREDI TS	MAX. MARKS		
				Ext.	Int.	Total
PART I	Tamil/ Other languages – I	6	3	75	25	100
PART II	BP2-ENG01-Communicative English I	3	3	50	50	100
PART III	BCE-CSC01 - Problem Solving using Python@	6	4	75	25	100
	BCE-CSC02 - Core Practical-I - Problem Solving using Python Lab@	5	2	60	40	100
	BMA-CSA01-Allied I: Mathematics I@	6	5	75	25	100
PART IV	Basic Tamil/Advanced Tamil/NME	-	2	75	25	100
	BP4-EPSC 01-English for Physical Sciences I	4	4	50	50	100
Total Credits			23			
II SEMESTER						
PART I	Tamil/ Other languages – II	6	3	75	25	100
PART II	BP2-ENG02-Communicative English II	3	3	50	50	100
PART III	BSA-CSC03 - Object Oriented Programming Concepts using C ++@	6	4	75	25	100
	BSA-CSC04 - Core Practical-II - C++ programming Lab@	5	3	60	40	100
	BMA-CSA02-Allied II: Mathematics II@	6	5	75	25	100
PART IV	Basic Tamil/Advanced Tamil/Non Major Elective II	-	2	75	25	100
	BP4-EPSC02-English for Physical Sciences II	4	4	50	50	100
Total Credits			23			
III SEMESTER						
PART III	BCA-DSC05 - Data Structures	6	4	75	25	100
	BCA-DSC06 - Java programming	6	4	75	25	100
	BCE-CSC03 - Computer Organization@	6	4	75	25	100
	BCA-DSC08 - Core Practical-III - Data Structures using Java Lab	6	3	60	40	100
	BCA-DSA03-Allied III: Financial Accounting	6	5	75	25	100
PART IV	Soft Skill	2	3	50	50	100
	Environmental Studies	2	Examination will be held in Semester IV			
Total Credits			23			
IV SEMESTER						
PART III	BCE-CSC09 - Computer Network@	6	4	75	25	100
	BSA-CSC15 - Open Source Technologies@	6	4	75	25	100



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	BCA-DSC11 - E-Commerce Technologies	6	4	75	25	100
	BSA-CSC16 - Core Practical-IV - Open Source Technologies Lab@	6	3	60	40	100
	BCA-DSA04-Allied IV: Cost and Management Accounting	6	5	75	25	100
PART IV	Soft Skill	2	3	50	50	100
	Environmental Studies	2	2	75	25	100
	Total Credits		25			
V SEMESTER						
COURSE CONTENT	COURSE NAME	Ins. Hrs	CREDITS	MAX. MARKS		
				Ext.	Int.	Total
PART III	BCE-CSC14 - Software Engineering@	6	4	75	25	100
	BCE-CSC10 - Operating System@	6	4	75	25	100
	BCE-CSC11 - Relational Database Management System@	6	4	75	25	100
	BCE-CSC12 - Core Practical-V - Operating System Lab@	3	3	60	40	100
	BCE-CSC13 - Core Practical-VI - PL/SQL Lab@	3	2	60	40	100
	Elective I Choose any one from the list	5	5	75	25	100
PART IV	Value Education	2	2	75	25	100
	Total Credits		24			
VI SEMESTER						
PART III	BCA-DSC18 - Web Design and Development	6	4	75	25	100
	BCA-DSC19 - Data Mining	6	4	75	25	100
	BCA-DSC20 - Mobile Application Development	6	4	75	25	100
	BCA-DSC21 - Core Practical-VII - Mobile Application Development Lab	3	3	60	40	100
	Elective II- Choose any one from the list	5	5	75	25	100
	BCE-CSC18 - Mini Project@		5	60	40	100
PART V	Extension Activities		1			
	Total Credits		26			
	Total credits (Core, Elective, SBS)		143			



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*NME: Choose Any one From the Other Department

Elective I	
BC A-DSE1A	Principles of Information Security
BSA-CSE1B	Multimedia and its Applications@
BCA-DSE1C	Resource Management Techniques
Elective II	
BSA-CSE2A	Data Analytics using R@
BCE-CSE2B	IOT and its Applications@
BCA-DSE2C	Software Project Management

VI LEARNING OUTCOME

COURSE NAME	COURSE CODE	COURSE OUTCOME	SYLLABUS LINK
Problem solving using python	SE21A	To understand the principles of Python and acquire skills in programming in python	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC01.pdf?489418709
		To develop the emerging applicaytions of relavant field using python	
		Interpret the fundamental python syntax and semantics and be fluent in the use of python control flow statements	
		Able to develop simple turtle graphics programs in python	
Problem solving using python lab	SE211	Understand the numeric or real-life applications problems and solve them	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC02.pdf?1621465496
		Apply a solution clearly and accurately in a program using python	
		Apply the best features available in python to solve the situational problems	
Object Oriented Programming Concepts using C++	SU22A	To write programs using OOP Concepts like Abstraction, Encapsulation, Inheritance and Polymorphism	https://egovernance.unom.ac.in/ugsyllabus/pdf/BSA-CSC03.pdf?1267951829
C++ Programming Lab	SU221	To understand the structure of and model of the C++ Programming Language	https://egovernance.unom.ac.in/ugsyllabus/pdf/BSA-CSC04.pdf?383259882
		To solve problems in C++ demonstrating Object Oriented Concepts	
Data Structures	SZ23A	Implement abstract data types for linear data structures	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSC05.pdf?2003720815
		Apply the different linear and non-linear data structures to problem solutions	
		Critically analyse the various sorting algorithms	
Java Programming	SZ23B	Knowledge of the structure and model of the java programming language	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSC06.pdf?1776768822
		Understand the basic principles of creating java applications with GUI	
		Demonstrate use of string and string buffers, develop multithread programs in java.	



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Computer Organization	SZ23C	· Describe the major components of a computer system and state their function and purpose	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC03.pdf?1924283704
		· Describe the microstructure of a processor	
		· Demonstrate the ability to program a microprocessor in assembly language. · Classify and describe the operation DMA and peripheral Interfaces.	
Data Structures using Java Lab	SZ231	· Write functions to implement linear and non-linear data structure operations.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSC08.pdf?2116286548
		· Suggest appropriate linear and non-linear data structure operations for solving a given problem.	
		· Analyze various sorting methods.	
Financial Accounting	SZ33A	· After finishing this course students are well acquainted with Principles of accounting and well equipped in the system of keeping Financial Accounting Records.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSA03.pdf?103378898
Computer Network	SZ24A	· Analyze different network models	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC09.pdf?1842417833
		· Describe, analyze and compare a number of data link, network and transport layer	
		· Analysing key networking protocols and their hierarchical relationship in the conceptual modellike TCP/IP and OSI	
Open Source Technologies	SZ24B	· To recognize the benefits and features of Open Source Technology and to interpret, contrastand compare open source products among themselves	https://egovernance.unom.ac.in/ugsyllabus/pdf/BSA-CSC15.pdf?219195384
E-Commerce Technologies	SZ24C	· Obtain a general understanding of basic business management concepts.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSC11.pdf?610142408
		· Have complete knowledge about basic technical concepts relating to E-Commerce.	
		· Obtain thorough understanding about the security issues, threats and challenges of ECommerce.	
Open Source Technologies Lab	SZ241	· Students must be able to use appropriate open source tools based on the nature of the problem	https://egovernance.unom.ac.in/ugsyllabus/pdf/BSA-CSC16.pdf?1045857342
		· Students should be able to code and compile different open source software	
Cost & Management Accounting	SZ34A	· To learn the theory and practices of cost accounting.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSA04.pdf?551298584
		· To understands the concepts of management accounting	



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Software Engineering	SU25A	<ul style="list-style-type: none"> •The students should be able to specify software requirements, design the software using tools 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC14.pdf?269706229
		<ul style="list-style-type: none"> •To write test cases using different testing techniques. 	
Operating System	SE25B	<ul style="list-style-type: none"> •Understand the structure and functions of Operating System •Compare the performance of Scheduling Algorithms •Analyze resource management techniques 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC10.pdf?1802311807
Relational Database Management System	SE25C	<ul style="list-style-type: none"> •Describe basic concepts of database system •Design a Data model and Schemas in RDBMS •Competent in use of SQL 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC11.pdf?368368773
		<ul style="list-style-type: none"> •Analyze functional dependencies for designing robust Database 	
Operating System Lab	SZ251	<ul style="list-style-type: none"> •Understand the process management policies and scheduling process by CPU. 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC12.pdf?565829519
		<ul style="list-style-type: none"> •Analyze the memory management and its allocation policies. 	
		<ul style="list-style-type: none"> •To evaluate the requirement for process synchronization. 	
PL/SQL Lab	SZ252	<ul style="list-style-type: none"> · Implement the DDL , DML Commands and Constraints 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC13.pdf?1072400966
		<ul style="list-style-type: none"> · Create, Update and query on the database. 	
		<ul style="list-style-type: none"> · Design and Implement simple project with Front End and Back End. 	
Multi Media	SU45B	To understand the technologies behind multimedia applications.	https://egovernance.unom.ac.in/ugsyllabus/pdf/BSA-CSE1B.pdf?1139827995
Web Design and Development	SZ26A	<ul style="list-style-type: none"> • Ability to Develop and publish Web pages using Hypertext Markup Language (HTML). • Ability to optimize page styles and layout with Cascading Style Sheets (CSS). • Ability to Understand, analyze and apply the role of languages to create a capstone • Website using client-side web programming languages like HTML, DHTML, CSS, XML, JavaScript, and AJAX. 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC13.pdf?1072400966
Data Mining	SZ26B	<ul style="list-style-type: none"> • To have knowledge in Data mining concepts 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSC19.pdf?137701502
		<ul style="list-style-type: none"> • To apply Data mining concepts in different fields 	



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Mobile Application Development	SZ26C	<ul style="list-style-type: none"> • To explain the basics of mobile application development 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSC20.pdf?2142160523
		<ul style="list-style-type: none"> • Develop Android application with User interface, networking and animation. 	
		<ul style="list-style-type: none"> • Use simulator tools to test and publish the application. 	
Mobile Application Development Lab	SZ261	At the end of the course, the student should be able to:	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCA-DSC21.pdf?604928641
		<ul style="list-style-type: none"> • Use Emulator tools to design and develop applications 	
IOT and its Applications	SU46B	<ul style="list-style-type: none"> • Use of Devices, Gateways and Data Management in IoT. 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSE2B.pdf?1522831127
		<ul style="list-style-type: none"> • Design IoT applications in different domain and be able to analyze their performance 	
		<ul style="list-style-type: none"> • Implement basic IoT applications on embedded platform. 	
Mini Project	SZ26Q	<ul style="list-style-type: none"> • The student should gain a thorough knowledge in the problem, he/she has selected and the language / software, he/she is using. 	https://egovernance.unom.ac.in/ugsyllabus/pdf/BCE-CSC18.pdf?329894266



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ASSESSMENT PATTERN

CORE PAPERS, ELECTIVE PAPERS AND EXTRA DISCIPLINARY PAPERS

INTERNAL ASSESSMENT: 25 Marks

EXTERNAL ASSESSMENT: 75 Marks

TOTAL: 100 Marks

INTERNAL ASSESSMENT PATTERN

Attendance (5 Marks)			Seminar	Assignment	Test	Total
90-100	80-90	70-80	(5 Marks)	(5 Marks)	(10 Marks)	25

EXTERNAL ASSESSMENT

End Semester External University Examination: 75 MARKS

Duration 3 Hours

- Part -A-(10X1=10) Answer any 10 out of 12 Questions 1-12
- Part -B-(5X5=25) Answer any 5 out of 7 Questions 13-19
- Part -C-(3X10=30) Answer any 3 out of 5 Questions 20-24

QUESTION PAPER PATTERN

Subject Name	Marks	Total
Language,English, Core, Allied and NME Papers	PART- A: 10 out of 12 = 10 x 2 = 20 marks	75
	PART- B: 5 out of 7 = 5 x 5 = 25 marks	
	PART- C: 3 out of 5 = 3 x 10 = 30 marks	