



**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**

**PG DEPARTMENT OF INFORMATION
TECHNOLOGY**



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**M.Sc.InformationTechnology
Curriculum and Syllabus
(with effect from the AcademicYear2023-24)**

REGULATIONS ON LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK FOR POSTGRADUATE EDUCATION	
Programme	M.Sc.,Information Technology
Programme Code	
Duration	PG-Two Years
Programme Outcomes (POs)	<ul style="list-style-type: none">● The broad objective of the programme is to prepare students for challenging careers in academia and/or computing industry by providing healthy environment for teaching, learning and research in the core and applied areas of the discipline.● The programme aims to provide an understanding of advanced Information and Computing Technologies.● To keep a balance between fundamental concepts, core areas of information technology and specialized skills required to adapt to the needs of the dynamically evolving industry.● To be able to pursue quality research in the emerging areas of Information Technology.● The intent is on providing a strong foundation in theory along with a clear technology focus.● To learn and evaluate a range of computing technologies, systems and application services.● To design,analyze,develop and evaluate high-ends systems.● To undertake challenging projects and work as active researchers.● To identify and learn about recent research and industry trends.● To equip the student with a basic knowledge of other domains, disciplines and skills, a social and environmental consciousness and a strong value base.
Programme Specific Outcomes (PSOs)	<ul style="list-style-type: none">● Implement the concept of theory and technology with the design and analysis techniques for solving the complex problems in Information Technology.● Be curious towards learning new and emerging technologies and adapt quickly to changes.● Design, execute and evaluate computing projects in academia and industry using current technologies.● Know the contextual knowledge in information technology and communicate effectively with stakeholders and with the society at large for enhancing the quality of life.● Be honest in upholding the ethical principles and social responsibilities along with socio-economic innovations.



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**PROGRAMME OUTCOMES (PO) - PROGRAMME
SPECIFIC OUTCOMES (PSO) MAPPING**

PROGRAMME SPECIFIC OUTCOMES (PSO)					
	PO1	PO2	PO3	PO4	PO5
PSO1	3	3	3	3	3
PSO2	3	3	3	3	3
PSO3	3	3	3	3	3
PSO4	3	3	3	3	3
PSO5	3	3	3	3	3

Level of Correlation between PO's and PSO's

Assign the value

1–Low

2–Medium

3– High

0–No Correlation



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METHODS OF EVALUATION

Internal Evaluation	Continuous Internal Assessment Test	25Marks
	Assignments/Snap Test / Quiz	
	Seminars	
	Attendance and Class Participation	
External Evaluation	End Semester Examination	75Marks
Total		100Marks

METHODS OF ASSESSMENT

Remembering (K1)	The lowest level of questions require student store call information from the course content Knowledge questions usually require students to identify information in the textbook.
Understanding (K2)	Understanding of facts and ideas by comprehending organizing, comparing, translating, interpolating and interpreting in their own words. The questions go beyond implore call and require students to combine data together
Application(K3)	Students have to solve problems by using / applying a concept learned in the classroom. Students must use their knowledge to determine a exact response.
Analyze (K4)	Analyzing the question is one that asks the students to breakdown something in to its component parts. Analyzing requires students to identify reasons causes or motives and reach Conclusions or generalizations.
Evaluate (K5)	Evaluation requires an individual to make judgment on something. Questions to be asked to judge the value of an idea, a character, a work of art, or a solution to a problem. Students are engaged in decision-making and problem-solving. Evaluation questions do not have single right answers.
Create (K6)	The questions of this category challenge students to get engaged in creative and original thinking. Developing original ideas and problem solving skills



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Course	Number of Credits	Hours Per Week	Examination Duration (hrs)	Marks		
				I.A	ESE	Total
SEMESTER-I						
438C1A:Core– I Theory Python Programming	4	5	3	25	75	100
438C1B:Core – II Theory Web development Using WordPress	4	5	3	25	75	100
438C1C: Core – III Practical Python Programming Practical	3	5	3	40	60	100
438C1D:Core– IV Practical Web development Using WordPress Practical	3	5	3	40	60	100
Elective – I Theory(Anyone) 438E1A: Digital Computer Architecture 438E1B: Operating System 438E1C:Design and Analysis of Algorithms	3	5	3	25	75	100
Elective – II Theory (Any one) 438E1D: Software Engineering 438E1E:Object Oriented Analysis and Design 438E1F:SoftwareProject Management	3	5	3	25	75	100
	20	30				



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Course	Number of Credits	Hours Per Week	Examination Duration (hrs)	Marks		
				I.A	ESE	Total
SEMESTER-II						
438C2A:Core –V Theory C++and Data Structure	4	5	3	25	75	100
438C2B: Core – VI Theory Relational Data Base Management System	4	5	3	25	75	100
438C2C: Core – VII Practical Data Structure using C++Practical	4	5	3	40	60	100
438C2D:Core–VIII Practical Relational Data Base Management System Practical	3	4	3	40	60	100
Elective – III Theory(Any one) 438E2A: Data Science438E2B: Net With C# Programming 438E2C:BiometricTechniques	3	5	3	25	75	100
Elective – IV Theory (Anyone) 438E2D: Natural Language Processing 438E2E:DataVisualization 438E2F:CloudComputing	3	4	3	25	75	100
438S2A:SEC-I - Fundamentals of Human Rights	2	2	3	25	75	100
	23	30				



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Course	Number of Credits	Hours Per Week	Examination Duration (hrs)	Marks		
				IA	ESE	Total
SEMESTER-III						
538C3A:CoreIX Theory Web Technology and Advanced Java	4	4	3	25	75	100
538C3B:Core X Theory Machine Learning	4	4	3	25	75	100
538C3C:Core XI Theory Computer Networks	3	4	3	25	75	100
538C3D: Core XII Practical Web Technology and Advanced Java Practical	3	5	3	40	60	100
538C3E:Core XIII Practical Machine Learning Practical	3	5	3	40	60	100
Elective-V (Anyone) 538E3A: Research Methodology 538E3B:Internetof Things 538E3C:Trends in Computing	3	4	3	25	75	100
538S3A:SEC-II-Linux and Shell Programming	2	4	3	25	75	100
538S3B: Internship Industrial Activity	2	-	-	-	100	100
	24	30				



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Course	Number of Credits	Hours Per Week	Examination Duration (hrs)	Marks		
				I.A	ESE	Total
SEMESTER -IV						
538C4A: Core -XIV Theory Computer Vision	4	5	3	25	75	100
538C4B:Core -XV Project with Viva voce	14	16		20	60+20	100
Elective – VI (Any one) 538E4A: Intelligent Systems 538E4B:IntroductiontoRobotics 538E4C:Virtual and Augmented Reality	3	5	3	25	75	100
Skill Enhancement/ Professional Competency Skill(Any one) 538S4A: UML Practical 538S4B: Documentation and Interview skills for Software Engineers	2	4	3	40	60	100
538V4A:ExtensionActivity	1					
	24	30				
Total Credits	91					

Component wise Credit Distribution

Credits	Sem I	Sem II	Sem III	Sem IV	Total
Part A	14	15	17	18	64
Part B					
(i)Discipline–Centric/Generic Skill	6	6	5	3	20
(ii)Soft Skill		2		2	4
(iii)Summer Internship/Industrial Training			2		2
Part C				1	1
Total	20	23	24	24	91



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**MASTER OF INFORMATION TECHNOLOGY (MSC IT)
(WITH EFFECT FROM THE ACADEMIC YEAR 2022-23)**

PROGRAMME OUTCOMES:

- The broad objective of the programme is to prepare students for challenging careers in academia and/or computing industry by providing healthy environment for teaching, learning and research in the core and applied areas of the discipline.
- The programme aims to provide an understanding of advanced Information and Computing Technologies.
- To keep a balance between fundamental concepts, core areas of information technology and specialized skills required to adapt to the needs of the dynamically evolving industry.
- The intent is on providing a strong foundation in theory along with a clear technology focus.
- To learn and evaluate a range of computing technologies, systems and application services.
- To design, analyze, develop and evaluate high-end systems.
- To undertake challenging projects and work as active researchers.
- To identify and learn about recent research and industry trends.
- To equip the student with a basic knowledge of other domains, disciplines and skills, a social and environmental consciousness and a strong value base.

PROGRAMME SPECIFIC OUTCOMES:

- Implement the concept of theory and technology with the design and analysis techniques for solving the complex problems in Information Technology.
- Be curious towards learning new and emerging technologies and adapt quickly to changes.
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COURSE OF STUDY AND SCHEME OF EXAMINATIONS:

FIRST SEMESTER

Course components	Name of Course	Ins. Hour	Credits	Exam.	Max.Marks		
					IA	UE	TO
Core-1	C++ and Data Structure	5	4	3	25	75	100
Core-2	Computer Architecture	5	4	3	25	75	100
Core-3	Relational Database Management System	5	4	3	25	75	100
Elective-1	Elective-I: Choose any one	4	3	3	25	75	100
Core-4	Practical-I:Data Structure using C++ Lab	4	2	3	40	60	100
Core-5	Practical- II:RDBMS Lab.	4	2	3	40	60	100
SoftSkill-1	Communication Skills for Software Engineers	2	2	3	40	60	100

SECOND SEMESTER

Course components	Name of Course	Hour	Credits	Exam.	Max.Marks		
					CIA	UE	Tot.
Core-6	Design & Analysis of Algorithms	5	4	3	25	75	100
Core-7	Programming in Java	5	4	3	25	75	100
Elective-2	Elective-II: Choose anyone	4	3	3	25	75	100
Elective-3	Elective-III: Choose any one	4	3	3	25	75	100
Core-8	Practical-III: Java Programming Lab	4	2	3	40	60	100
Core-9	Practical-IV: Based on Elective III Lab.	4					
Core-9A	Practical-IV: Based on Elective III Lab. Web Technology Lab						
Core-9B	Practical-IV: Based on Elective III Lab. Python Programming Lab						
Core-9C	Practical-IV: Based on Elective III Lab. Mobile Application Development Lab.						
SoftSkill-2		2	2	3	40	60	100
SoftSkill-3	Team Project	2	2	3	40	60	100
Internship Training							



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THIRD SEMESTER

Course components	Name of Course	Ins. Hours	Credits	m. Duratio	Max. Marks		
					CIA	UE	Tot
Core-10	Computing Networks	4	4	3	25	75	100
Core-11	Operating Systems	4	4	3	25	75	100
Core-12	Machine Learning	4	4	3	25	75	100
Extra-Disciplinary	Information Security	4	4	3	25	75	100
Elective	Elective-IV	4	3	3	25	75	100
Core-13	Practical-V: Machine Learning Lab.	4	2	3	40	60	100
Core-14	Mini Project	4	2	3	40	60	100
Soft Skill-4	Document Preparation Skills for Software Engineers	2	2	3	40	60	100
Internship**	During summer vacation 4to6 weeks of I Year		2			100	100

** Internship will be carried out during the summer vacation of the first year and marks ShouldbesenttotheUniversitybytheCollegeandthesamewillbeincludedintheThird Semester Marks Statement.

FOURTH SEMESTER

Course components	Name of Course	Credits	m. Duratio	Max.Marks		
				CIA	UE	Total
Core-15	Project & Viva-Voce	20	-	20	60+	100
					20	

- Elective – I Data Warehousing & Data Mining/E-Commerce/Agile Software Engineering
 Elective – II Cloud Computing /Software Testing/Big data Analytics
 Elective-III Web Technology/Python Programming/Mobile Application Development
 Elective – IV Internet of Things / Computer Vision/ Data Visualization

LIST OF SOFT SKILL COURSES

1. Communication Skills for Software Engineers-I
2. Communication Skills for Software Engineers-II
3. Personality Development and other Soft Skills for Software Engineers



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4. Document Preparation and Interview skills for Software Engineers
5. Team Project

LEARNING OUTCOME INDEX: MAPPING OF PROGRAM OUTCOME WITH COURSES

Table1															
Program Outcomes	Core Courses														
	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	CO 7	CO 8	CO 9	CO10	CO11	CO12	CO13	CO14	CO15
Outcomes 1	X		X			X					X			X	X
Outcomes 2		X			X			X	X			X		X	
Outcomes3	X			X			X			X	X		X		
Outcomes 4		X			X	X		X	X			X			X
Outcomes 5	X		X				X		X				X		
Outcomes 6		X		X	X			X		X		X		X	X
Outcomes 7	X		X			X	X		X		X		X		X
Outcomes 8	X			X		X	X			X		X			
Outcomes 9		X	X	X	X			X	X		X		X	X	X

CO_i – ith Core Course

Table2		
Program Outcomes	Extra-Disciplinary Courses	
	Course1	Course2
Outcomes 1	X	
Outcomes 2		X
Outcomes3	X	
Outcomes 4		X



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Outcomes 5		X
Outcomes 6	X	
Outcomes 7	X	
Outcomes 8		X
Outcomes 9	X	X

Table3												
Program Outcomes	Elective Courses											
	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	CO 7	CO 8	CC 9	CO10	CO11	CO12
Outcomes 1	X		X			X					X	
Outcomes 2		X			X			X	X	X		X
Outcomes3	X		X	X			X			X	X	
Outcomes 4		X			X			X	X			
Outcomes 5	X		X			X	X			X	X	
Outcomes 6		X		X	X			X				X
Outcomes 7	X		X			X	X		X	X		X
Outcomes 8				X		X	X					X
Outcomes 9		X	X		X			X	X		X	



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Program Outcomes	SoftSkillCourses				
	Course1	Course2	Course3	Course4	Course5
Outcomes 1	X		X	X	
Outcomes 2		X		X	X
Outcomes3		X			
Outcomes 4	X				X
Outcomes 5		X	X		
Outcomes 6	X			X	X
Outcomes 7	X		X		
Outcomes 8		X		X	X
Outcomes 9	X	X	X		



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Course Name	Course Code	Course Outcome	LINK
MSc Information Technology	PSB	This course introduces the basic concepts Computer Architecture, Operating System, Computer networks, Database Management System, Mobile Computing, Information Security, Software Testing and the programming skills of C++ and Data Structures, Visual Programming, Advanced Java and Internet Technology.	
SEMESTER - I			
Python		Explain the basic concepts in python language.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438C1A.pdf?565543825
	438C1A	Apply the various datatypes and identify the usage of control statements, loops, functions and modules in python for processing the data	
		Analyze and solve problems using basic constructs and techniques of python.	
		Assess the approaches used in the development of interactive application.	
		To build real time programs using python	
Python - Practical		Understand the significance of control statements, loops and functions in creating simple programs.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438C1C.pdf?963817427
		Apply the core data structures available in python to store, process and sort the data	
	438C1C	Analyze the real time problem using suitable python concepts	
		Assess the complex problems using appropriate concepts in python	
		Develop the realtime applications using python programming language	
Web Development using Word Press		Identify the tools which will be suitable for the requirement of the webpage.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438C1B.pdf?373206525
		Implement Java script and Style Sheets effectively in the Web Pages	
	438C1B	Analyze the different tools and built-in functions available to be applied in the webpage	
		Rate the design and effectiveness of the Web Pages created.	
		Design and publish a website using Wordpress	
Web Development		Identify the tools which will be suitable for the requirement of the webpage.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438C1D.pdf



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using Word Press – Practical		Implement Javascript and StyleSheets effectively in the WebPages	?1725735391
	438C1D	Analyze the different tools and built-in functions available to be applied in the webpage	
		Rate the design and effectiveness of theWebPages created.	
		Design and publish a website using Wordpress	
Digital Computer Architecture		Demonstrate the fundamental concept of binary representation and codes, combinational circuits, Instruction formats, register operations and memory organization	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438E1A.pdf?330807411
	438E1A	Explain the various types of flip flops, different types of microoperations, as well as the addressing modes in the instruction set	
		Apply the various number conversion systems and simplification of equations using K-map	
		Analyze the various design of combinational circuits and flip flops to design a computer	
		Distinguish the major components of a computer including CPU, memory, I/O and storage	
Software Project Management		Understanding of project management fundamentals such as project planning, risk management and quality assurance.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438E1D.pdf?634550134
		Choose the appropriate scheduling and testing techniques to build a quality product.	
	438E1F	Apply different cost estimation techniques and quality measures for software development.	
		Differentiate various software development models and methodologies, planning activities and scheduling methods.	
		Asses the importance of software project documentation and identify the methods to create project documentation, including requirements documents, design documents, and project plans.	
SEMESTER - II			
C++ and Data Structure		Learn Object Oriented concepts, C++ language.	



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		Learn and analyze various problems using C++ program.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438C2A.pdf?254763625
	438C2A	Learn to choose appropriate data structure as applied to specified problem definition.	
		Learn to handle operations like searching, insertion, deletion, traversing mechanism.	
		Able to use linear and non-linear data structures like stacks, queues, and linked list	
Practical – I: Data Structure using C++ Lab		Be able to design and analyze the time and space efficiency of the data structure	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438C2C.pdf?1459050097
	438C2C	Be capable to identify the appropriate data structure for given problem	
		Have practical knowledge on the applications of data structures	
Relational Database Management System		Classify the modern and futuristic database applications based on size and complexity	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438C2B.pdf?1403043102
		Map ER model to Relational model to perform database design effectively	
	438C2B	Write queries using normalization criteria and optimize queries	
		Compare and contrast various indexing strategies in different database systems	
		Appraise how advanced databases differ from traditional databases.	
Practical – II: RDBMS Lab.		Use typical data definitions and manipulation commands.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438C2D.pdf?631480804
		Design applications to test Nested and Join Queries	
	438C2D	Implement simple applications that use Views	
		Implement applications that require a Front-end Tool	
		Critically analyze the use of Tables, Views, Functions and Procedures	
Design and Analysis of Algorithms		To define the term Algorithm in the context of problem solving. To make students	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438E1C.pdf?61187140
		Understand the design and analysis process of algorithms for simple problems.	
	438E1C	Understand various algorithm design methods, apply them for problem solving	
		Analyze the complexity for simple problems.	
		Study algorithm design methods for	



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		complex problems and compare and analyze			
SEMESTER - III					
Computing Networks		Learn and understand the basic concepts of networking and its applications. To understand well established layered architectures in computer networks	https://egovernance.unom.ac.in/syllabuspg2324/pdf/538C3C.pdf?873526384		
		Understand the concepts of the transmission medium, modulation and multiplexing techniques			
		Learn and understand well established error detection and correction codes and various protocols used in dealing with point to point and broad cast communications systems data			
	538C3C	link layer.			
		Comprehend the design issues and to assess the routing and congestion control algorithms.			
		Enumerate the transport layer service, conceptualize the internet transport protocols and the network security.			
	Operating Systems			Analyze various scheduling algorithms.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/438E1B.pdf?1406278729
		438E1B		Understand deadlock, prevention and avoidance algorithms.	
				Compare and contrast various memory management schemes.	
				Understand the functionality of file systems.	
Machine Learning		Recognize the characteristics of machine learning strategies.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/538C3B.pdf?1909346056		
		Apply various supervised learning methods to appropriate problems.			
		Identify and integrate more than one technique to enhance the performance of learning.			
	538C3B	Create probabilistic and unsupervised learning models for handling unknown pattern.			
		Analyze the co-occurrence of data to find interesting frequent patterns.			
		Preprocess the data before applying to any real-world problem and can evaluate its performance.			



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Machine Learning Lab.		Understand the implementation procedures for the machine learning algorithms.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/538C3E.pdf?731148789
		Design Java/Python programs for various Learning algorithms.	
	538C3E	Apply appropriate data sets to the Machine Learning algorithms.	
		Identify and apply Machine Learning algorithms to solve real world problems.	
		be capable of confidently applying common Machine Learning algorithms in	
		practice and implementing their own;	
Information Security		Test and evaluate security in systems and networks	https://egovernance.unom.ac.in/ugsyllabus/pg/MIT-SY.pdf?t=1865360360
		Use methods for planning and designing secure systems	
		Apply techniques and tools for secure system deployment and operation	
		Perform continuous testing, assessment and updating of system security	
		Evaluate vulnerability of an information system and establish a plan for risk management.	
		Demonstrate how to secure a network. Evaluate a company's security policies and	
		procedures.	
Computer Vision		Ability to understand the computer vision pipeline.	https://egovernance.unom.ac.in/syllabuspg2324/pdf/538C4A.pdf?976466666
		Ability to build solutions using computer vision algorithms.	
		Identify basic concepts, terminology, theories, models and methods in the field of	
		computer vision	
	538C4A	Describe known principles of human visual system	
		Describe basic methods of computer vision related to multi-scale representation,	
		edge detection and detection of other primitives, stereo, motion and object	
		recognition	
	Suggest a design of a computer vision system for a specific problem	https://egovernance.unom.ac.in/ugsyllabus/pg/MIT-SY.pdf?t=1611641332	
Mini Project	Apply the software engineering principles on a real software project		
	Develop a software product using the methodologies applied in the industry.		



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QUESTION PAPER PATTERN

Subject Name	Marks	Total
Language, English, Core, Allied and NME Papers	PART- A: 10 out of 12 = 10 x1 = 10 marks	75
	PART- B: 5 out of 7 = 5 x 5 = 25 marks	
	PART- C: 3 out of 5 = 4 x 10 = 40 marks	