STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME – M.Sc. Information Technology

Programme Learning Outcomes

Graduates of a Master's Degree of Stella Maris College will have a comprehensive knowledge of their disciplines, with in depth knowledge of the underlying principles and concepts in one or more disciplines as a basis for independent lifelong learning.

PLO.NO.	PROGRAMME LEARNING OUTCOMES At the end of a postgraduate programme students will be able to
1.	Demonstrate mastery in the discipline
2.	Demonstrate deep understanding of the broad principles of science and technology and apply them in varied contexts
3.	Demonstrate knowledge, understanding and professionalism required for the discipline
4.	Demonstrate capability to locate, evaluate, manage, and use information/data and research to develop and guide their own knowledge, learning, and practice
5.	Demonstrate the ability to organise a presentation in a coherent fashion
6.	Demonstrate the literacy and numeracy skills necessary to understand and interpret information/data and communicate according to the context

7.	Draw on multiple, relevant/interrelated fields of study to understand, analyse and solve problems
8.	Exhibit principled decision making and reasoning to identify creative solutions to ethical problems
9.	Practice/act in ways that show a commitment to social justice and the processes of peace/conflict resolution
10.	Demonstrate the skills to appropriately interact with people from a range of cultural, linguistic, and religious backgrounds
11.	Demonstrate an understanding of local, regional, national, and global issues
12.	Identify themselves as agents of change
13.	Demonstrate the ability to solve an issue
14.	Show self-awareness and emotional maturity
15.	Demonstrate career and leadership readiness
16.	Exhibit the ability to work in teams
17.	Demonstrate sensitivity and readiness to share their knowledge and capabilities with the marginalised and oppressed in their communities

PSLO NO.	PROGRAMME SPECIFIC LEARNING OUTCOMES On successful completion of the course, students will be able to
1.	Understand theoretical background knowledge, scientific and technology principles underlying Information Technology
2.	Demonstrate the ability to apply mathematical foundations, algorithmic principles, and computer hardware in creation and maintenance of computer-based systems
3.	Understand, analyse and interpret data
4.	Understand and analyse the current research issues
5.	Demonstrate the ability to define and analyse a problem, identify different strategies and approaches to solve the problem and design, implement, and evaluate the solutions for business/research needs
6.	Show the ability to understand the professional, ethical, legal, and security issues and responsibilities, and the societal impact of computing
7.	Demonstrate the ability to analyse the local and global impact of computing on individuals,organisations and society

8.	Use current techniques, skills, and tools necessary for modern Information Computing Technology
9.	Communicate effectively in both oral and written individually and in team
10.	Show responsibility towards local and global issues
11.	Perceive themselves as agents of change
12.	Demonstrate intercultural and ethical competency
13.	Show self-awareness and emotional intelligence
14.	Demonstrate career and leadership readiness
15.	Show the ability to work in teams

SEMESTER-I

COURSE TITLE	**MAJOR CORE: PROGRAMMING WITH PYTHON**		
CODE	**19CS/PC/PP14**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Comprehend the elements of a program	1,3	R,U
2.	Understand the notion of data types, and higher order data structures such as lists, tuples and dictionaries	5,8	R,U
3.	Understand how Python can be used for application development	1,2,8	U,An,Ap
4.	Identify and repair coding errors in a program	2,5,8	An,Ap,C
5.	Write programs to read and write data from/to files	1,2,5,8	An,Ap,C

R- Remember, U- Understand, Ap – Apply, An – Analyse, E- Evaluate, C- Create

COURSE TITLE	**MAJOR CORE: DISCRETE MATHEMATICS FOR COMPUTER SCIENCE**		
CODE	**19CS/PC/DM14**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, formal logic and predicates.	1,2,3,5	U, R, An, E
2.	Represent problems using logics and truth table	1,2,3,	U, R, E
3.	Solve problems by using set concepts and visualize using Venn diagram	1,3,4,5,6,7,8	U, An, Ap, E
4.	Understand propositional logic, relations, functions and also differentiate one-to-one and “onto” functions.	1,2,3	U, An
5.	Incorporate graphs and trees for the given problem	1,2,3,4,5,8	U, An, Ap, C

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COURSE TITLE	**MAJOR CORE: Software Engineering**		
CODE	**19CS/PC/SE14**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Know software engineering principles	PSLOs 2,3,4	U,An
2.	Apply software life cycle models for software development	PSLOs3,4,7,8	Ap,An
3.	Apply estimation techniques	PSLOs4,5,6,7	Ap,C
4.	Model a software application	PSLOs6,7,8,9	Ap,An,C
5.	Implement project management techniques	PSLOs6,7,8,9 ,10	Ap,An

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COURSE TITLE	**MAJOR CORE: Operating System : Concepts and Applications**		
CODE	**19CS/PC/OC14**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Describe the basic components of an operating system and its services	PSLOs 1,2,5	R,U
2.	Define the concepts of processes and competitive system resource allocation	PSLOs 1	R,U
3.	Outline standard scheduling algorithms for multi-tasking	PSLOs 1,5	R,U,Ap,An, E
4.	Describe process synchronization and understand process utilities	PSLOs 1,5	R,U,Ap
5.	Describe memory management and File management concepts	PSLOs 1,5	R,U,Ap,An

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SEMESTER-II

COURSE TITLE	**MAJOR CORE: DATABASE MANAGEMENT SYSTEMS**		
CODE	**19CS/PC/DB25**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Define the features and Queries of database systems	1, 2, 3	U, R, An, Ap
2.	Normalize database effectively from ER Diagrams	1, 2, 3, 5	U, R, An, Ap
3.	Understand and discuss the importance of relational data modeling and conceptual Modelling	1, 2, 3	U, R
4.	Apply knowledge to new situations	2, 3, 5	An, Ap, E

5.	Describe the transaction processing, concurrency control and recovery control	1, 2, 3	U, R
6.	Understand the use of NOSQL and its approach to the database	1, 2, 3, 6, 9	U, R, Ap

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COURSE TITLE	**MAJOR CORE:DESIGN AND ANALYSIS OF ALGORITHMS**		
CODE	**19CS/PC/AA24**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Apply mathematical concepts to analyse the algorithms	1,2,3	U, An, Ap
2.	Use basic data structures, its operations and the time complexity of each operation	1,2,3,5	U, Ap
3.	Understand various techniques available to solve a problem	1,2,5,8	U, R, An
4.	Find the time complexity of the problem by applying the techniques learnt and observe the optimal solution	1,3,4,5,8	U, An, Ap, E

5.	Distinguish the polynomial and non-polynomial algorithms and their challenges	1,3,4	U, R, An

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COURSE TITLE	**MAJOR CORE: Object Oriented Programming**		
CODE	**19CS/PC/OO24**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Justify the use of Object-Oriented Programming	PSLOs1,2,3,9	U,Ap
2.	Use the right access specifiers to protect the data	PSLOs4,7,9	Ap,An
3.	Apply the different Object-Oriented features	PSLOs3,4,5,6,9	Ap,E,C
4.	Develop applications using Object-Oriented concepts	PSLOs4,5,6,9	An,C
5.	Create applications that are reusable	PSLOs4,5,6,9	An,C

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SEMESTER-III

COURSE TITLE	**MAJOR CORE: NETWORK MANAGEMENT AND ADMINISTRATION**		
CODE	**19CS/PC/NA34**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Demonstrate the purpose of basic system administration	1,5	U, Ap
2.	Install and administer a Linux machine	1,2,5	U,Ap
3.	Manage users and groups	1,2	U, An, Ap
4.	Administer remote access using FTP, SSHand Telnet	1,2,5,8	U, An, Ap
5.	Setup a simple TCP/IP based local area network	1,2,5,8	U, An, Ap, C
6.	Setup a firewall	1,2,5,8	U, An, Ap, C

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COURSE TITLE	**RESEARCH METHODOLOGY**		
CODE	**19CS/PC/RM35**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Develop an understanding of research methods	PSLOs 1,2,6	R,U
2.	Formulate a research problem	PSLOs 3,4	U,An,Ap
3.	Collect and analyse data	PSLOs 3,4	U, An
4.	Effectively write a research paper	PSLOs 1,2,3,5,9	U,Ap,An,C
5.	Present the Paper more professionally.	PSLOs 1,2,3,5,10	U,Ap,C

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COURSE TITLE	**MAJOR CORE: Data Analytics**		
CODE	**19CS/PC/DA34**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Critically analyze and follow the mechanisms to manage and explore	1,3	U,An,R
2.	Understand uncertain and complex data	1,3	U,An
3.	Apply Machine Learning techniques to extract actionable value from data	1,3,4	U,An,Ap
4.	Assess the use of data from acquisition through cleansing, analytics, and visualization	1,3,4,5	U,An,Ap,R
5.	Critically evaluate challenges in data analytics	1,3,4,5	An,Ap
6.	Think critically in decision making by applying analytics	1,3,4,5,8	An,Ap

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COURSE TITLE	**MAJOR CORE: ARTIFICIAL INTELLIGENCE**		
CODE	**19CS/PC/AI35**		
1.	Ability to identify problems that are amenable to solution by AI methods	1,2,3	R,U
2.	Ability to analyse appropriate AI methods to solve a given problem	2,3,4,5	U,An
3.	Ability to formalize a given problem in the language/framework of different AI methods	3,4,5	An,Ap, E
4.	Ability to create basic and advanced plan generation systems and to understand the concepts learning methods	4,5,7	An,Ap,C
5.	An ability to understand the concepts of Ontologies	5,10	U,Ap,E

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SEMESTER - IV

COURSE TITLE	**MAJOR CORE:FORMAL LANGUAGES AND FINITE AUTOMATA**		
CODE	**19CS/PC/FF44**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Understand the core concepts in automata theory and formal languages	1,2,3	U, R
2.	Design grammars and automata (recognizers) for different language classes	1,3,5,7	U, R, An, Ap, C
3.	Identify formal language classes and prove language membership properties	1,2,3,4	U, R, An, E
4.	Apply formal mathematical methods to prove properties of languages, grammars and automata	1,2,3,4,5	U, Ap, C
5.	Understand and analyze the applications of Automata and finite state machines	2,3,4,5,7,8	U, An, Ap, C

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COURSE TITLE	**MAJOR CORE: Cloud Computing : Theory and Practice**		
CODE	**19CS/PC/CT45**		
1.	Describe about cloud, parallel and distributed computing	1,2,3	R,U
2.	Define virtualization and the architecture of cloud computing	2,3,5	R,U,Ap
3.	Demonstrate the need for resource pooling, scaling, capacity planning and load balancing along with their roles in the cloud	2,5,6,7	U,An,Ap
4.	Interpret on securing and storing data over the cloud	6,7,8	An,E
5.	Build a simple application and host it using cloud	1,2,7,8	An,Ap,E,C

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COURSE TITLE	**Dissertation**		
CODE	**19CS/PC/DS48**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Understand and analyze a problem	PSLOs 3,4	R,U,An
2.	Review necessary literatures to define a problem and to understand the problem better	PSLOs 1,3,4	R,U
3.	Select an appropriate tool based on the need	PSLOs 3,5	R,U,An
4.	Develop an application/implement a research problem effectively	PSLOs 5,8	U,An,Ap
5.	Test the accuracy of the result	PSLOs 3,8	U,Ap,C
6.	Document the process in an efficient manner	PSLOs 1,6	U,An,C

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Postgraduate Elective Courses Offered to Parent Department

COURSE TITLE	**Department Elective: UI, UX and Design Thinking**		
CODE	**19CS/PE/XI15**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Understand the Product Development as UX Designers	PSLOs 1,2,3,5,6,9,10	R,U,Ap,An, E
2.	Understand how, and when to use the HTML5 markup tags	PSLOs 1,2,3,5,9	R,U,Ap,An
3.	Effectively use the new CSS3 features to create websites	PSLOs 1,2,3,5,9,10	R,U,Ap,An, E,C
4.	Apply appropriately the JavaScript and its advanced features	PSLOs 1,2,3,5,6,9,10	R,U,Ap,An, E,C

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COURSE TITLE	**CYBER SECURITY**		
CODE	**19CS/PE/CS15**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Explain the major concepts of Cyber Security and Forensics	PSLOs 1,2,3	R,U
2.	Safeguard themselves from cyber crimes	PSLOs 1,3,5,6,9	U,Ap
3.	Demonstrate the use of tools and methods used in cybercrime	PSLOs 5,6,9,10	Ap,An,E
4.	Demonstrate critical thinking and information application related to the discipline of cyber security, to include intelligence, computer forensics, cyber operations and electronic crime	PSLOs 3,5,6,9,10	U,Ap,An,E
5.	Demonstrate understanding of the legal and technical aspects of a cybercrime investigation and the application of computer forensic tools	3,5,10	Ap,An,C

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COURSE TITLE	**Software Testing**		
CODE	**19CS/PE/ST15**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Appreciate the need for software testing	PSLOs 1,4	R, U,An
2.	Write test cases and perform manual testing	PSLOs 4,6	R, U,An,Ap
3.	Create automated test cases	PSLOs 6,7	R, U,An,Ap,C
4.	Use appropriate tools to test the software	PSLOs 6,11	R, U,An,Ap,E
5.	Apply various testing techniques to improve software quality	PSLOs 6,7,11	R, U,An,Ap,E

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COURSE TITLE	**MOBILE COMPUTING**		
CODE	**19CS/PE/MC15**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Illustrate the generations of telecommunication systems in wireless networks	PSLOs 1,2,7	R,U,An
2.	Describe wireless and mobile communications systems and be able to choose an appropriate mobile system from a set of requirements.	PSLOs 3,6,8	R,U,An
3.	Determine the functionality of MAC, network layer and identify a routing protocol for a given Ad hoc network	PSLOs 1,3,4	U,An
4.	Explain the functionality of Transport and Application layers	PSLOs 4,6	U,An
5.	Appraise the quality and performance of mobile applications	PSLOs 4,5,6	U,An

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COURSE TITLE	**MAJOR CORE: ADVANCED TECHNOLOGIES**		
CODE	**19CS/PE/AT15**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Analyse how, and when, to use deep network architecture	1,3	U,An,R
2.	Comprehend the major concepts of BitCoin	1,3	U,An
3.	Discuss and asses real-life use cases of Blockchain technologies	1,3,4	U,An,Ap
4.	Apply the modern technology	1,3,4,5	U,An,Ap,R
5.	Learn the framework of quantum computation	1,3	An,Ap

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COURSE TITLE	**Department Elective: Visual Programming**		
CODE	**19CS/PE/VP15**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Write Object Oriented Programs using C#	PSLOs 1,2,3,4,10	R,U,Ap
2.	Create a web application	PSLOs 1,2,3,4,5,6,7, 9,10	Ap,An,E,C
3.	Effectively use the concept of state management	PSLOs 1,2,3,4,5,6,7, 9,10	Ap,An,E,C
4.	Create persistent applications using LINQ	PSLOs 1,2,3,4,5,6,7, 9,10	Ap,An,E,C
5.	Generate required reports	PSLOs 1,2,34,10	Ap,An,E,C

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COURSE TITLE	**Department Elective: Advanced Database Systems**		
CODE	**19CS/PE/AD15**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Identify the purpose and how to use XML	1,3	R,U,Ap
2.	Write queries that minimizes the response time	1,2,3	R,U,Ap,An
3.	Create secure databases	1,3,4	R,U,Ap
4.	Apply suitable data models to different scenarios	1,2,3,4	R,U,Ap
5.	Collect and manage data from varied sources to provide meaningful business insights	1,3,4,5	R,U,Ap,An

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Postgraduate Elective Courses Offered to Other Departments

COURSE TITLE	**Documentation and Presentation**		
CODE	**19CS/PE/DP23**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Create a document in Word with proper formatting	2,3	R,U,An
2.	Use Word to create personal, academic and business documents following current industry standards	1,7,8	R,U,Ap
3.	Create an effective presentation in Microsoft PowerPoint that is interactive and legible content	1,3,8	U,Ap,An,C
4.	Write a proper journal paper or Publish a book with proper formatting using Latex	1,3.8,9	U,Ap,C
5.	Make use of new word processing tools and work in cloud environment	1,8,9,14	R,U,Ap,C

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COURSE TITLE	**Emerging Trends in Information Technology**		
CODE	**19CS/PE/ET23**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Enumerate the emerging technologies of IT industry	1,2,3	R,U,An
2.	Demonstrate knowledge about the significance of Emerging Technologies	1,2,5	U,An,Ap
3.	Identify areas in which these emerging technologies can be used	1,7,8	U,Ap,An,C
4.	Integrating more than one technology for effective solutions	1,5.8,9	U,Ap,C
5.	Identify research areas of interest from AR, VR, AI and Cloud Computing	1,5,9,14	R,U,Ap,C

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COURSE TITLE	**Multimedia**		
CODE	**19CS/PE/MM23**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Introduction on Multimedia and various file formats.	1,3	R,U,An
2.	Edit images using Photoshop	1,3,5	R,U,Ap
3.	Design their own textures, logos and also to create animations	1,3,8	R,U,Ap
4.	Design and structure a web page with different elements using Dreamweaver	1,.8	R,U,Ap
5.	Create a website using Dreamweaver, Photoshop and Flash	1,3,8	R,U,Ap,C

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COURSE TITLE	**E-Commerce and Content Management Systems**		
CODE	**19CS/PE/EC23**		
CLO NO.	COURSE LEARNING OUTCOMES	PSLOs Addressed	Cognitive Level
1.	Demonstrate an understanding of E-commerce framework	PSLOs 1,3,5	R,U
2.	Describe the role of internet in modern business	PSLOs 1,2,3,5	R,U
3.	Apply appropriate strategies to develop an E-Commerce web site	PSLOs 1,2,3,5,9	R,U,Ap,An, E,C
4.	Implement payment systems appropriately	PSLOs 1,2,3,5,9	R,U,Ap,An, E,C

5.	Analyze security and search engine optimization	PSLOs 1,2,6,9	R,U

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