

Department of Computer Applications  
Nesamony Memorial Christian College, Marthandam  
M.C.A.  
**Course Outcome**

| <b>Semester – I M.C.A.</b> |  |                    |               |              |  |
|----------------------------|--|--------------------|---------------|--------------|--|
| <b>Part</b>                | <b>Course Name</b>                                       | <b>Course Code</b> | <b>Credit</b> | <b>Hours</b> | <b>Course Outcome</b>  |
| Part - A                   | Core Course - I :<br><b>Discrete Mathematics</b>         | VCAC11             | 4             | 5            | <b>CO1</b> Understand the concepts of relations and functions distinguish among normal forms<br><b>CO2</b> Analyze and evaluate the recurrence relations<br><b>CO3</b> Distinguish among various normal forms and predicate calculus<br><b>CO4</b> Solve and know various types of matrices<br><b>CO5</b> Evaluate and solve various types of graphs   |
|                            | Core Course – II:<br><b>Advanced Python Programming</b>  | VCAC12             | 4             | 5            | <b>CO1</b> Comprehend the programming skills in python and develop applications using conditional branches and loop<br><b>CO2</b> Create Python applications with strings and functions<br><b>CO3</b> Understand and implement the Object Oriented Programming paradigm with the concept of objects and classes, Inheritance and polymorphism<br><b>CO4</b> Evaluate the use of Python packages to perform numerical computations and data visualization<br><b>CO5</b> Design interactive web applications using Django  |
|                            | Core Course – III:<br><b>Linux and Shell Programming</b> | VCAC13             | 4             | 4            | <b>CO1</b> Understand, apply and analyze the concepts and methodology of Linux shell programming<br><b>CO2</b> Comprehend, impart and apply fundamentals of control structure and script controls<br><b>CO3</b> Understand, analyse and evaluate the functions, graphical desktop interface and editors<br><b>CO4</b> Collaborate, apply and review the concepts and methodology of regular expression and advanced gawk<br><b>CO5</b> Comprehend, use and illustrate the advance concepts such as alternate shell script, data connectivity and bash scripting using python |
|                            | Core Lab – I:<br><b>Advanced Python Programming Lab</b>  | VCAL11             | 3             |              | <b>CO1</b> Comprehend the programming skills in Python and write scripts<br><b>CO2</b> Create python applications with elementary data items, lists, dictionaries and tuples<br><b>CO3</b> Implement the Object Oriented Programming concepts such as objects and classes, Inheritance and polymorphism  |

|                             |  |        |   |   |  |
|-----------------------------|--|--------|---|---|--|
|                             |  |        |   |   | <p><b>CO4</b> Assess the use of Python packages to perform numerical computations and perform data visualization</p> <p><b>CO5</b> Create interactive web applications using Django</p>  |
|                             | Core Lab – II:<br><b>Linux and Shell Programming Lab</b> | VCAC12 | 3 |   | <p><b>CO1</b> Understand, apply and analyze the concepts and methodology of Linux shell programming</p> <p><b>CO2</b> Comprehend, impart and apply fundamentals of control structure and script controls</p> <p><b>CO3</b> Understand, analyse and evaluate the functions, graphical desktop interface and editors</p> <p><b>CO4</b> Collaborate, apply and review the concepts and methodology of regular expression and advanced gawk</p> <p><b>CO5</b> Comprehend, use and analyze the advance concepts such as alternate shell script, dy and bash scripting using Postgre SQL</p> |
|                             | Elective – I:<br><b>Advanced OS</b>                      | VCAE11 | 3 | 4 | <p><b>CO1</b> Understand the design issues associated with operating systems</p> <p><b>CO2</b> Master various process management concepts including</p> <p><b>CO3</b> Scheduling, deadlocks and distributed file systems</p> <p><b>CO4</b> Prepare Real Time Task Scheduling</p> <p><b>CO5</b> Analyze Operating Systems for Handheld Systems</p> <p><b>CO6</b> Analyze Operating Systems like LINUX and IOS</p>   |
|                             | Elective –II:<br><b>Advanced Computer Networks</b>       | VCAE14 | 3 | 4 | <p>On the successful completion of the course, student will be able to</p> <p><b>CO1</b> Understand fundamental underlying principles of computer networking</p> <p><b>CO2</b> Understand details and functionality of layered network architecture.</p> <p><b>CO3</b> Apply mathematical foundations to solve computational problems in computer Networking.</p> <p><b>CO4</b> Analyze and evaluate performance of various communication protocols.</p> <p><b>CO5</b> Compare and create new routing algorithms</p>   |
| <b>Semester – II M.C.A.</b> |  |        |   |   |  |
| Part - A                    | Core Course –IV:<br><b>Advanced Java Programming</b>     | VCAC21 | 4 | 5 | <p>On the successful completion of the course, student will be able to</p> <p><b>CO1</b> Understand the advanced concepts of Java Programming</p> <p><b>CO2</b> Understand JDBC and RMI concepts</p> <p><b>CO3</b> Apply and analyze Java in Database</p> <p><b>CO4</b> Handle different event in java using the delegation event model, event listener and class</p> <p><b>CO5</b> Design interactive applications using Java Servlet, JSP and JDBC</p>   |
|                             | Core Course -V:<br><b>Advanced Data Structures</b>       | VCAC22 | 4 | 5 | <p>On the successful completion of the course, students will be able to</p> <p><b>CO1</b> Understand various ADT concepts</p> <p><b>CO2</b> Familiar with implementation of ADT models with Python language and understand how to develop ADT for the various real-time problems</p>   |

|                              |   |         |   |   |   |
|------------------------------|---|---------|---|---|---|
|                              |   |         |   |   | <b>CO3</b> Apply with proper ADT models with problem understanding<br><b>CO4</b> Apply and analyze right models based on the problem domain<br><b>CO5</b> Evaluate modern data structures with Python language  |
|                              | Core Lab –III:<br><b>Advanced Java Programming</b>                      | VCAL21  | 3 |   | On the successful completion of the course, student will be able to<br><b>CO1</b> Understand to the implement concepts of Java using HTML forms ,JSP & JAR<br><b>CO2</b> Capable of implementing JDBC and RMI concepts<br><b>CO3</b> Able to write Applets with Event handling mechanism<br><b>CO4</b> Create interactive web based applications using servlets and JSP   |
|                              | Core Lab –IV:<br><b>Advanced Data Structures Lab</b>                    | VCAL22  | 3 |   | <b>CO1</b> Strong understanding in various ADT concepts<br><b>CO2</b> To become a familiar with implementation of ADT models<br><b>CO3</b> Apply sort and tree search algorithms<br><b>CO4</b> Evaluate the different data structure models<br><b>CO5</b> Learn how to develop ADT for the various real-time problems   |
|                              | Elective –III:<br><b>Artificial Intelligence &amp; Machine Learning</b> | VCAE21  | 3 | 4 | On the successful completion of the course, student will be able to<br><b>CO1</b> Demonstrate AI problems and techniques<br><b>CO2</b> Understand machine learning concepts<br><b>CO3</b> Apply basic principles of AI in solutions that require problem solving inference, perception,<br><b>CO4</b> knowledge representation, and learning<br><b>CO5</b> Analyze the impact of machine learning on applications<br><b>CO6</b> Analyze and design are all world problem for implementation and understand the dynamic behavior of a system |
|                              | Elective –IV:<br><b>Internet of Things</b>                              | VCAE24  | 3 | 4 | On the successful completion of the course, student will be able to<br><b>CO1</b> Understand about Io T, its Architecture and its Applications<br><b>CO2</b> Comprehend the Io T evolution with its architecture and sensors<br><b>CO3</b> Assess the embedded technologies and develop prototypes for the Io T products<br><b>CO4</b> Evaluate the use of Application Programming Interface and design an API for Io T in real-time<br><b>CO5</b> Design Io T in real time applications using today’s internet & wireless Technologies     |
|                              | SEC – I:<br><b>Web Development using PHP</b>                            | VCASE21 | 2 | 4 |   |
| <b>Semester – III M.C.A.</b> |   |         |   |   |   |
| Part - A                     | Core Course –VI:<br><b>Dot NET</b>                                      | WCAM31  | 4 | 5 | On the successful completion of the course, students will be able to<br><b>CO1</b> Understand and learn .NET Framework and C# .NET  |

|          |   |             |   |   |   |
|----------|---|-------------|---|---|---|
|          | <b>Technologies</b>                             |             |   |   | <b>CO2</b> Apply the concepts to develop the applications for real-time problem in C# .NET and ASP .NET<br><b>CO3</b> Analyse the feasibility of using .NET for real time problems  |
|          | Core Course -VII:<br><b>Big Data Analytics</b>  | WCAM32      | 4 | 4 | On the successful completion of the course, students will be able<br><b>CO1</b> Understand, illustrate and evaluate the concepts and techniques of Data Science, Big Data Analytics and its tools<br><b>CO2</b> Collaborate, apply and review the computing for big data in Hadoop , and No SQL environment.<br><b>CO3</b> Comprehend, implement and review the concepts of data science and big data analytics projects using Map Reduce, and Mongo DB<br><b>CO4</b> Understand, use and analyze the concepts of big data analytics projects using HIVE database.<br><b>CO5</b> Illustrate, develop and review the concepts of Pig database in Hadoop environment. |
|          | Core –VIII:<br><b>Mobile Computing</b>          | WCAM33      | 4 | 4 | <b>CO1</b> Understand the basic concepts of Mobile and Wireless Communication<br><b>CO2</b> Understand the basic concepts of Spread Spectrum. Analysing the concepts of Medium Access Control.<br><b>CO3</b> Analyse the concepts of Global System for Mobile Communication and Satellite Communications. Understanding the basic concepts of Wireless LAN<br><b>CO4</b> Understand the basic concepts of Wireless LAN. Evaluate the performance of Mobile Network Layer<br><b>CO5</b> Understand the basic concepts of Wireless Application Protocol and create a Mobile App with real time application. Analysing the concepts of Routing Protocols in MANET      |
|          | Core Lab –V:<br><b>Dot NET Technologies Lab</b> | WCAL31      | 3 |   | <b>CO1</b> Get a strong understanding of .NET Visual Studio platform<br><b>CO2</b> Become a strong knowledge in C# .NET.<br><b>CO3</b> Getting real-time application developing using .NET Cloud Technologies   |
|          | <b>Mini Project</b>                             | WCAP31      | 6 |   |   |
|          | Elective –V:<br><b>Research Methodology</b>     | WCAE32      | 3 | 4 |   |
| Part - B | SEC -II :<br><b>Social Networks</b>             | WCASE3<br>1 | 2 | 3 | On the successful completion of the course, students will be able<br><b>CO1</b> Understand, impart and summarize the concepts of Social media, Social networking and Webcasts<br><b>CO2</b> Comprehend, design and develop a Word Press Powered Website<br><b>CO3</b> Understand, implement and perform evaluation of Social Networking and Micro-Blogging  |

|                                  |  |        |    |  |   |
|----------------------------------|--|--------|----|--|---|
|                                  |  |        |    |  | <b>CO4</b> To collaborate, implement and analyze the Widgets and Badges in social networking environment<br><b>CO5</b> To understand, illustrate and perform evaluation of web optimization for social networks |
|                                  | Internship/ Industrial<br>Visit/Field<br>Visit/Research<br>Knowledge<br>Updation<br>Activity |        | 2  |  |   |
| <b>Semester – IV      M.C.A.</b> |  |        |    |  |   |
| Part - C                         | <b>Project with Viva Voce:-</b>  | WCAP41 | 16 |  |   |
|                                  | <b>Extension Activity:-</b>  |        | 1  |  |   |
|                                  |  |        |    |  |   |
|                                  |  |        |    |  |   |