B.Sc IT &CT

DEPARTMENT OF IT & CT
BOARD OF STUDIES

DATE: 05/12/2020

No	NAME OF THE MEMBER		SIGNATURE
1.	MR. R. KANAGARAJ	CHAIRMAN	
2.	Dr. P. NITHYA	UNIVERSITY NOMINEE	
3.	Dr. B. KALPANA	SUBJECT EXPERT	
4.	MR. R. MAHESH KUMAR	MEMBER	
5.	MS. G. DEEPALAKSHMI	MEMBER	Online Meet
6.	MS. S. GEETHA PRIYA	MEMBER	
7.	MR. P. DEEPAN BABU	MEMBER	
8.	MS. P. PREETHA	MEMBER	
9.	MS. C. VENI	MEMBER	
10	MR. B. PRAKASH	MEMBER	
11	MR. B. KRISHNA ADITHYA	MEMBER	

Minutes of the Meeting

The Syllabus for 5th semester of B.Sc (IT) and B.Sc (CT) degree programme admitted for the academic year 2019-2020 were presented by the Chairman of Board of Studies.

AGENDA

1. Welcome by Chairman
2. Approval of 5th Semester syllabus for 2019 – 2020
3. Vote of Thanks

B.Sc (IT) and B.Sc (CT)

Board Members

Approved

- 5th Semester syllabus for 2019 – 2020
- New course Bio-Informatics Syllabus

Suggested

- Include Login and Password Controls in Unit 5 of .Net Programming for B.Sc (IT) and B.Sc (CT)
- Include IndustrialXP and Unified Process concepts in Software Engineering for B.Sc (IT) and B.Sc (CT)
- Modify the Bio-Informatics course by adding Micro Array Analysis in Unit – 2 of B.Sc (IT)
- Add Case Studies like Smart Home Applications in IOT for B.Sc (IT) and B.Sc (CT)
- Include 4th Generation RAMP concepts in Mobile Computing for B.Sc (IT) and B.Sc (CT)

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The Syllabus for 6th semester of B.Sc (IT) and B.Sc (CT) degree programme admitted for the academic year 2019-2020 were presented by the Chairman of Board of Studies.

AGENDA

1. Welcome by Chairman
2. Approval of 6th semester syllabus for 2019 – 2020
3. Vote of Thanks

B.Sc (IT) and B.Sc (CT)

Board Members

Approved

- 6th semester syllabus for 2019 – 2020
- New course Artificial Intelligence and Expert Systems, Mobile Application Development Syllabus

Suggested

- Add Discussion forum and Hash Tag in PHP Programming for B.Sc (IT) and B.Sc (CT)
- Restructure the Unit 2 in Python Programming for B.Sc (IT) and B.Sc (CT)
- Modify the Artificial Intelligence and Expert Systems by adding Expert Systems Concepts, Case Studies and Robotics in Unit-5 for B.Sc (IT)
- Frame Big Data analytics by including HBase, Hadoop, Map Reduce and applications of Bigdata in Social Media for B.Sc (IT) and B.Sc (CT)

B.Sc Computer Technology Board
Scheme of Examination (CBCS and OBE Pattern)
For the Candidates admitted during the Academic Year2019-2020 onwards

Part	Sub Code	Subject Title	Ins.Hrs/Week	Dur. Hrs.	CIA	CE	Total	Credit
					Examination			
SEMESTER I								
I	19LATA01/ 19LAHI01/ 19LAFR01 19LAMY01	Language – I Tamil/Hindi/Malayalam/French	5	3	30	70	100	3
II	19ENG001	English –I	5	3	30	70	100	3
III	19BCT101	Core 1 – Programming in C	6	3	30	70	100	4
III	19BCTP01	Core Lab 1 - C Lab	6	3	40	60	100	4
III	19BCTID1	**IDC 1** – Numerical Methods and Statistics	6	3	30	70	100	4
IV	19UFCA01	**Foundation Course I** : EVS #	2	2	-	50	50	2
		Total	**30**				**550**	**20**
SEMESTER II								
I	19LATA02/ 19LAHI02/ 19LAFR02/ 19LAMY02	Language –II Tamil/Hindi/Malayalam/French	5	3	30	70	100	3
II	19ENG002	English – II	5	3	30	70	100	3
III	19BCT201	Core 2 - Object Oriented Programming with C++	6	3	30	70	100	4
III	19BCTP02	Core Lab 2 - C++ Lab	6	3	40	60	100	4
III	19BCTID2	**IDC 2** – Discrete Mathematics	6	3	30	70	100	4
IV	19UFCA02	**Foundation Course II**: Value Education #	2	2	-	50	50	2
		Total	**30**				**550**	**20**
SEMESTER III								
III	19BCT301	Core 3 – Java Programming	5	3	30	70	100	4
III	19BCT302	Core 4 - Data Structures	5	3	30	70	100	4
III	19BCT303	Core 5 - Computer Organization and Architecture	5	3	30	70	100	4
III	19BCTP03	Core Lab 3 – Java Programming Lab	5	3	40	60	100	4
III	19BCTID3	**IDC 3** – ERP	5	3	30	70	100	4
IV	19BCTSB1/ 19BCTSB2	**SBC I** - Web Design / Office Automation #	3	3	-	75	75	3
IV	19BTA001 \19ATA001/ 19EDC002	**EDC 1 :**BT – 1/AT - 1 / Communicative English #	2	2	-	50	50	2

1

		Total	30				625	25

SEMESTER IV

III	19BCT401	Core 6 – RDBMS	5	3	30	70	100	4
III	19BCT402	Core 7 – Embedded System	5	3	30	70	100	4
III	19BCT403	Core 8 – Operating System	5	3	30	70	100	4
III	19BCTP04	Core Lab 4 - RDBMS Lab	5	3	40	60	100	4
III	19BCTID4	**IDC 4** – Operations Research	5	3	30	70	100	4
IV	19BCTSB3/ 19BCTSB4	**SBC II Lab** - Web Design Lab / Office Automation Lab #	3	3	-	75	75	3
IV	19BTA002/ 19ATA002/ 19BCTED1	**EDC 2** : BT - 2/AT -2/Mathematical Aptitude#	2	2	-	50	50	2
V	19NSS001/ 19NCC001/ 19SPT001/ 19EXT001	NCC/NSS/Sports/Extension Activities@			50		50	2
		Total	30				675	27

SEMESTER V

III	19BCT501	Core 9 - .Net Framework	5	3	30	70	100	4
III	19BCT502	Core 10 – Computer Networks	5	3	30	70	100	4
III	19BCT503	Core 11 – Software Engineering	5	3	30	70	100	4
III	19BCT504	Core 12 – PC Hardware	5	3	30	70	100	4
III	19BCTP05	Core Lab 5 - Net Framework Lab	5	3	40	60	100	4
III	19BCTE01/ 19BCTE02/ 19BCTE03	**Elective I :** IOT/ Mobile Computing / Cloud Computing	5	3	30	70	100	4
		Total	30				600	24

SEMESTER VI

III	19BCT601	Core 13 - PHP Programming	5	3	30	70	100	4
III	19BCT602	Core 14 – Information Security	5	3	30	70	100	4
III	19BCTP06	Core Lab 6 - PHP Lab	5	3	40	60	100	4
III	19BCTE04/ 19BCTE05/ 19BCTE06	**Elective II :** Big Data Analytics / Data Mining and Warehousing/ Python Programming	5	3	30	70	100	4
III	19BCTE07/ 19BCTE08/ 19BCTE09	**Elective III :** Software Testing/ Computer Graphics & Multimedia/ Mobile Application Development	5	3	30	70	100	4
III	19BCTPR1	Project and Viva Voce	5	3	50	50	100	4
		Total	30				600	24
						Total	3600	140

For Candidates admitted from the Academic year 2019 - 2020 onwards
No Continuous Internal Assessment (CIA) only Comprehensive Examination (CE)

B.Sc.(Computer Technology) Degree Examination - Syllabus for candidates admitted from the academic year 2019 – 2020 onwards

FIFTH SEMESTER
PART III: CORE 9: .NET FRAMEWORK

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective: To impart knowledge on .NET programming Using C#.

Unit I: (12 Hours)
Getting started with .Net Frame work 4.5: – Evolution of .Net – Benefits of .Net Framework - Architecture of .Net Framework 4.5– Introducing Visual Studio 2012: Installing Visual Studio 2012-Exploring Visual Studio 2012 Ultimate IDE-Performing Basic IDE Operations.

Unit II: (12 Hours)
Introducing C# 5.0 in VS 2012: Need of C# –Creating Simple C# 5.0 Console Application – Identifiers and Keywords – Data Types, Variables and Constants – Namespaces-The System Namespace– Constructors and Destructors – Static Class and Static Class Member –Object-Oriented Programming: – Encapsulation – Inheritance – Polymorphism – Abstraction – Interfaces- Exception Handling: Exception Handling.

Unit III: (12 Hours)
Introducing Windows Presentation Foundation: Understanding WPF 4.5 Architecture-Exploring WPF 4.5 Designer Interface-Working with Dialog Boxes in WPF Applications. Working with WPF 4.5 Controls: Adding WPF Controls-Introducing Different type of Controls in WPF-Using WPF Controls.

Unit IV: (12 Hours)
Data Access with ADO.Net : – Understanding Databases – Understanding SQL – Understanding ADO.Net – Data Reader- Creating Connection String – Creating a Connection to a Database – Creating Command Object – Working with Data Adapters – Using DataReader to Work with Databases.

Unit V: (12 Hours)
ASP.NET 4.5 Essentials:Describing the ASP.NET Technologies-Descring the ASP.NET Lifecycle-Creating a Simple ASP.NET Web Application- Creating a Simple ASP.NET Web Site. Web Forms: Standard Controls: The Control Class-The HiddenField Control-The FileUpload Control-The Hyperlink Control. Navigation Controlls: The TreeView Control-The Menu Control-login and password controls.

Course Outcome:

       CO1: Understand the Evolution,Architecture and .Net IDE.

       CO2:Develop Console Application and Demonstrate knowledge of Object-Oriented concepts design using C#.

       CO3: Understanding and Using WPF Controls.

       CO4: Design and Implement Database Connectivity using ADO .NET.

CO5: Understanding ASP .NET Technologies and to Implement the Controls.

CO/PO & PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3
CO 1	M							M
CO 2		H				H		
CO 3			M				L	
CO 4				L				
CO 5					M			

Text Book:
1. .Net 4.5 Programming (6 in 1) Black Book, Kogent, DreamTech Press.

Reference Book:
1. Tanweer Alam, "Net Framework And C# Programming", A.B. Publication.

2. "Mastering C# and .NET Framework",Marino posadas, Packt Publishing Limited.

B.Sc(Computer Technology) Degree Examination-Syllabus for Candidates admitted from the Academic Year 2019-2020 Onwards

FIFTH SEMESTER
PART III: CORE 11: SOFTWARE ENGINEERING

Maximum CIA : 30
Maximum CE :   70
Total HOUR: 60

Course Objective:
To facilitate the Students to learn Software Engineering through understanding the software and its process models, Agile Development, Design develop correct and robust software products

Unit I: (12 Hours)
The Nature of Software - Defining Software - Software Application Domain - Legacy Software, The Changing Nature of Software.Software Engineering: Defining the Discipline - The Software Process - Software Engineering Practice - Software Development Myths - How it all starts

Unit II: (12 Hours)
Software Process Structure: A Generic Process Model - Defining Framework Activity - Identifying a Task Set - Process Pattern - Process Assessment and Improvement. Process Models: Prescriptive Process Models - Specialized Process Models - The Unified Process - Personal and Team Process Models - Process Technology - Product and Process

Unit III: (12 Hours)
Agile Development: What is Agility? Agility and the Cost of Change - What is an Agile Process? Extreme Programming - The XP Process, Industrial XP, Other Agile Process Models - Scrum - Dynamic Systems Development Method - Agile Modeling - Agile Unified Process. A Tool Set for the Agile Process.

Unit IV: (12 Hours)
Object Oriented Methodologies: Rumbaugh et al.'s Object Modeling Techinique – The Booch Methodology – The Jacobsons et al. Methodologies. Unified Modeling Language: Introduction – Static and Dynamic Models – Why Modeling? Introduction to the Unified Modeling Language – UML Diagrams – UML Class Diagram – Use-Case Diagram.

Unit V: (12 Hours)
UML Dynamic Modeling: UML Interaction Diagrams – UML Sequence Diagram – UML Colloboration Diagram – UML Statechart Diagram – UML Activity Diagram – Implementation Diagram. Model Management: Packages and Model Organization – UML Extensibility – UML Meta-Model.

Course Outcome:

CO1. Learns and understands the basis of Software and changing nature

CO2. Understands software development through traditional and specialized process development

CO3. Learns the industrial usage development life cycles through Agile

CO4. Understands the software engineering design through object oriented principles and static representation

CO5. To learns the role of software design oops with dynamic representation

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1	H					H		
CO2		H				H		
CO3			H				H	
CO4				H				
CO5					H			H

TEXT BOOKS:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Tata McGraw Hill, Eight edition,2015. [Unit I, II, III]

2. Ali Bahrami, "Object Oriented Systems Development", Tat Mc Graw Hill, 2008.[Unit IV, V]

REFERENCE BOOKS:

1. Mark C. Layton, Steven J. Ostermiller, Dean J. Kynaston, "Agile Project Management For Dummies", John Wiley & Sons, incl, 3rd Edition, 2020.

B.Sc.(Computer Technology) Degree Examination - Syllabus for candidates admitted from the academic year 2019 – 2020 onwards

FIFTH SEMESTER
PART III: Elective 1: IOT

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective:
To enable the student to understand the importance of IoT based communication technologies, IoT Protocols andEmerging Applications of IoT.

Unit I: (12 Hours)
Demystifying the IoT Paradigm: IoT Is Strategically Sound - Brewing and Blossoming Trends in IT Space - Envisioning the IoT Era - Device-to-Device/ Machine-to-Machine Integration Concept - Aspect of Device-to-Cloud (D2C) Integration - Emergence of IoT Platform as a Service (PaaS) - Key Application Domains - Emerging IoT Flavors.

Unit II: (12 Hours)
Realization of IoT Ecosystem Using Wireless Technologies: Architecture for IoT Using Mobile Devices - Mobile Technologies for Supporting IoT Ecosystem - Energy Harvesting for Power Conservation in IoT System - Mobile Application Development Platforms - Mobile Use Cases for IoT - Low Power Wide Area Networking Technologies - Weightless.

Unit III: (12 Hours)
Infrastructure and Service Discovery Protocols: Layered Architecture for IoT - Protocol Architecture of IoT - Infrastructure Protocols - Routing Protocol - Bluetooth Low Energy - Device or Service Discovery for IoT - Protocols for IoT Service Discovery - Prominent IoT Service Discovery Products.

Unit IV: (12 Hours)
Integration Technologies and Tools for IoT Environments: IoT Portion for Smarter Enterprises and Environments - Sensor and Actuator Networks - IoT Device Integration Concepts, Standards, and Implementations - Device Integration Protocols and Middleware - Protocol Landscape for IoT.

Unit V: (12 Hours)
IoT Physical Devices & Endpoints :-What is an IoT device?- Exemplary Device : Rasberry Pi-About the board – Linux on Rasberry Pi-Rasberry Pi Interfaces- Other IoT Devices Case studies illustrating IoT Design: Introduction-Home Automation-Cities-Environment-Agriculture-Productivity Applications.

Course Outcome:

CO1: Understand and recognize the factors that contribute to the emergence of IOT.
CO2: Able to realize the revolution of Internet in Mobile devices and Cloud.
CO3: Able to understand the building blocks of IOT Architecture and its protocols.
CO4: Examine the business environments and device integrations concepts.
CO5: Identify different IOT Oriented Systems, and connect with programming interface.

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1				L		M		
CO2	M				M		H	
CO3		L			M	M		
CO4			H				H	
CO5			H		M			M

Text Book:
1. Pethuru Raj, Anupama C. Raman, The Internet of Things - Enabling Technologies, Platforms, and Use Cases, CRC Press, Taylor and Francis Group, 2017.(unit-I-Unit IV)
2. ArshdeepBahga, Vijay Madisetti ,"Internet of Things –A hands-on approach" Hyderabad Universities Press 2015.(Unit-V)

Reference Book
1. David Easley and Jon Kleinberg, "Networks, Crowds, and Markets: Reasoning About a Highly Connected World" Cambridge University Press - 2010.

B.Sc. (Computer Technology) Degree Programme - Syllabus for candidates admitted from the Academic Year 2019 – 2020 onwards

FIFTH SEMESTER
PART III: ELECTIVE I: MOBILE COMPUTING

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective : To provide an overview of mobile computing and its application development .To impart the basic knowledge of operations systems , databases requires for MANET and its protocols

Unit I: (12 Hours)
Introduction to mobile computing and wireless networking – what is Mobile computing ? – MC vs wireless networking – mobile computing applications – characteristics – structure – cellular mobile communication – GSM – GSM services – System archtitecute of GSM – GSM security – GPRS- GPRS services – GPRS architecture – UMTS - UMTS architecture – Software Defined Radio

Unit II: (12 Hours)
Mobile Internet Protocol – Mobile IP – Packet delivery – overview of Mobile IP – desirable features – key mechanism – route optimization – Dynamic Host Configuration Protocol (DHCP) – Mobile Transport layer – overview of TCP/IP – Terminologies – Architecure – operation of TCP – application layer of TCP – adaptation of TCP window – improvement in TCP performance – Mobile databases – Issues in transaction processing – transaction processing environment – transaction processing in mobile environment – data replication – mobile transaction model – rollback process – query processing – recovery

Unit III: (12 Hours)
Operating Systems for Mobile computing – basic concepts – special constraints and requirements of Mobile OS – A Survey of commercial mobile OS – comparative study of mobile OS - Mobile Ad Hoc Networks -basic concepts – characteristics – applications – MANET design issues – Routing – essential of traditional routing protocols – LSP – DV protocol – Routing in MANET – popular MANET routing protocols – VANETs – security issues in MANET – attacks on ad hoc networks .

Unit IV: (12 Hours)
Wireless sensor networks – WSN vs MANET – applications – architecture of Sensor node – challenges in design of an effective WSN – characteristics of sensor networks – WSN routing protocols – classification based on protocol operation – classification based on network structure – directed diffusion – rumor routing – sequential assignment routing – low energy adaptive clustering hierarchy – power efiicient gathering in sensor information system – geographic and energy aware routing – geographic adaptive fidelity – target coverage – clustered wireless sensor networks – 4G networks – ramp up features

Unit V: (12 Hours)
Mobile application development and protocols – mobile devices as web clients – WAP-J2ME – Configuration – Android application development – SDK – features – android application components – android software stack structure – advantages of android – Mobile commerce – applications of M-commerce – structure – Pros and Cons – mobile payment systems – security issues.

Course Outcome:
   CO1. To understand the basic structures of mobile communication
   CO2. To understand the basic concepts of protocols required and the transaction process in mobile databases.
   CO3. Demonstrate knowledge of operating systems and protocols for MC to solve real time problems
   CO4. Analyze and illustrate how routing algorithms play vital role in problem solving
   CO5. Illustrate the construction of learning and designing an android app.

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1		M						
CO2	H					L		
CO3		H					H	
CO4				M		H		
CO5			H		M			M

Text Book :
   1. Prasant Kumar Pattnaik and RajibMall,"Fundamentals of Mobile Computing " second edition, 2016 by PHI learning PVT Ltd, Delhi

Reference Books
   1. Asoke K Talukder, Roopa R Yavagal. (2005), Mobile Computing, TMH
   2. Jochen Schiller, (2008), Mobile Communication, Second Edition, Pearson Education Asia

B.Sc. (Computer Technology) Degree Examination- Syllabus for candidates admitted from the academic year 2019-2020 onwards
SIXTH SEMESTER
PART- III: CORE 13 - PHP PROGRAMMING

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective: To impart the knowledge on Web Application Development using of PHP and MYSQL

Unit I: (12 Hours)
The Building Blocks of PHP: Variables - Data Types - Operators and Expressions - Constants – Flow Control Functions in PHP: Switching Flow - Loops - Code Blocks and Browser Output - Working with Functions: What Is a Function? - Calling Functions - Defining a Function - Returning Values from User-Defined Functions - Variable Scope - Saving State between Function Calls with the static Statement - More About Arguments - Testing for the Existence of a Function

Unit II: (12 Hours)
Working with Arrays: What Are Arrays? - Creating Arrays - Some Array-Related Functions - Working with Objects: Creating an Object - Object Inheritance - Working with Strings, Dates, and Time: Formatting Strings with PHP - Investigating Strings in PHP - Manipulating Strings with PHP - Using Date and Time Functions in PHP - Other String, Date, and Time Functions - Working with Forms: Creating a Simple Input Form - Accessing Form Input with User-Defined Arrays - Combining HTML and PHP Code on a Single Page - Using Hidden Fields to Save State - Redirecting the User - Sending Mail on Form Submission - Working with File Uploads

Unit III: (12 Hours)
Working with Cookies and User Sessions: Introducing Cookies - Setting a Cookie with PHP - Deleting a Cookie with PHP - Session Function Overview - Starting a Session - Working with Session - Passing Session IDs in the Query String - Destroying Sessions and Unsetting Variables - Using Sessions in an Environment with Registered Users - Working with Files and Directories: Including Files with include( ) - Validating Files - Creating and Deleting Files - Opening a File for Writing, Reading, or Appending - Reading from Files - Writing or Appending to a File - Working with Directories - Opening Pipes to and from Processes Using popen( ) - Running Commands with exec( ) - Running Commands with system( ) or passthru( )

Unit IV: (12 Hours)
Working with Images: Understanding the Image-Creation Process - Necessary Modifications to PHP - Drawing a New Image - Getting Fancy with Pie Charts - Modifying Existing Images - Image Creation from User Input - Using Images Created by Scripts –Understanding the Database Design Process: - The Importance of Good Database Design - Types of Table Relationships - Understanding Normalization - Following the Design Process

Basic SQL Commands - MySQL Data Types - Table Creation Syntax - Using the INSERT Command -Using the SELECT Command - Using WHERE in Your Queries - Selecting from Multiple Tables - Using the UPDATE Command to Modify Records - Using the REPLACE Command - Using the DELETE Command -Frequently Used String Functions in MySQL - Using Date and Time Functions in MySQL -Using Transactions and Stored Procedures in MySQL: What Are Transactions? - What Are Stored Procedures? Interacting with MySQL Using PHP: MySQL Versus MySQLiFunctions - Connecting to MySQL with PHP - Working with MySQL Data

Creating a Simple Discussion Forum – Designing the Database Tables – Creating an Include file for common functions – creating the input Forms and Scripts – Displaying the Topic List – Displaying the Posts in a Topic – Adding Posts to a Topic – Creating an Online Storefront – Planning and Creating the Database Tables – Displaying Categories of Items – Displaying Items.

Course Outcome:

CO1: Learns and understands the PHP basic syntax for variables types and conditional structures.
CO2: Understand the handling of arrays and also creation of PHP scripts to handle forms.
CO3: Able to understand cookies, session and also analyze to work with files and directories
CO4: Learn and understand to work with images and chart presentation.
CO5: Analyze and solve various database task using PHP and MYSQL language.

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1	M	H				M		
CO2			M				M	
CO3			H				H	
CO4		M						L
CO5					H		H	

Text Book:
  1. Julie C. Meloni, "PHP MYSQL and APACHE", Pearson Education, 2016,Reprint, India

Reference Books:
  1. Lynn Beighley, Michael Morrison (2009),"Head First PHP & MySQL",1st edition, O'Reilly Media, Inc.

  2. Robin Nixon (2012), "Learning PHP ,MYSQL,Java script and CSS",2nd edition, O'Reilly media inc.,

  3. Steve Holzner (2014)"PHP: The Complete Reference ", Reprint ,Mc Graw Hill Publications.

DEPARTMENT OF IT & CT
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3. Vote of Thanks

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- New course Bio-Informatics Syllabus

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- Modify the Bio-Informatics course by adding Micro Array Analysis in Unit – 2 of B.Sc (IT)
- Add Case Studies like Smart Home Applications in IOT for B.Sc (IT) and B.Sc (CT)
- Include 4th Generation RAMP concepts in Mobile Computing for B.Sc (IT) and B.Sc (CT)

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BOARD OF STUDIES

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B.Sc (IT) and B.Sc (CT)

Board Members

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- New course Artificial Intelligence and Expert Systems, Mobile Application Development Syllabus

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- Restructure the Unit 2 in Python Programming for B.Sc (IT) and B.Sc (CT)
- Modify the Artificial Intelligence and Expert Systems by adding Expert Systems Concepts, Case Studies and Robotics in Unit-5 for B.Sc (IT)
- Frame Big Data analytics by including HBase, Hadoop, Map Reduce and applications of Bigdata in Social Media for B.Sc (IT) and B.Sc (CT)

Part	Sub Code	Subject Title	Ins.Hrs/Week	Dur. Hrs.	CIA	CE	Total	Credit
					Examination			
SEMESTER I								
I	19LATA01/ 19LAHI01/ 19LAFR01 19LAMY01	Language – I Tamil/Hindi/Malayalam/French	5	3	30	70	100	3
II	19ENG001	English –I	5	3	30	70	100	3
III	19BIT101	Core 1 – Programming in C	6	3	30	70	100	4
III	19BITP01	Core Lab 1 - C Lab	6	3	40	60	100	4
III	19BITID1	IDC 1 – Numerical Methods and Statistics	6	3	30	70	100	4
IV	19UFCA01	Foundation Course I : EVS #	2	2	-	50	50	2
		Total	**30**				**550**	**20**
SEMESTER II								
I	19LATA02/ 19LAHI02/ 19LAFR02/ 19LAMY02	Language –II Tamil/Hindi/Malayalam/French	5	3	30	70	100	3
II	19ENG002	English – II	5	3	30	70	100	3
III	19BIT201	Core 2 - Object Oriented Programming with C++	6	3	30	70	100	4
III	19BITP02	Core Lab 2 - C++ Lab	6	3	40	60	100	4
III	19BITID2	IDC2- Discrete Mathematics	6	3	30	70	100	4
IV	19UFCA02	Foundation Course II: Value Education #	2	2	-	50	50	2
		Total	**30**				**550**	**20**
SEMESTER III								
III	19BIT301	Core 3 – Java Programming	5	3	30	70	100	4
III	19BIT302	Core 4 - Data Structures	5	3	30	70	100	4
III	19BIT303	Core 5 - Computer Organization & Architecture	5	3	30	70	100	4
III	19BITP03	Core Lab 3 – Java Programming Lab	5	3	40	60	100	4
III	19BITID3	IDC 3– ERP	5	3	30	70	100	4
IV	19BITSB1/ 19BITSB2	SBC I - Web Design / Office Automation #	3	3	-	75	75	3
IV	19BTA001 \19ATA001/ 19EDC002	EDC 1: BT – 1/AT - 1 /Communicative English #	2	2	-	50	50	2
		Total	**30**				**625**	**25**

SEMESTER IV

III	19BIT401	Core 6 – Middleware Technologies	5	3	30	70	100	4
III	19BIT402	Core 7 – Computer Networks	5	3	30	70	100	4
III	19BIT403	Core 8 – Operating System	5	3	30	70	100	4
III	19BITP04	Core Lab 4 - Middleware Technologies Lab	5	3	40	60	100	4
III	19BITID4	IDC 4- Operations Research	5	3	30	70	100	4
IV	19BITSB3/ 19BITSB4	SBC II Lab – Web Design Lab / Office Automation Lab #	3	3	-	75	75	3
IV	19BTA002/ 19ATA002/ 19BITED1	EDC 2 : BT - 2/AT -2/ Microprocessor and its applications #	2	2	-	50	50	2
V	19NSS001/ 19NCC001 19SPT001/ 19EXT001	NCC/NSS/Sports //Extension Activities@			50		50	2
		Total	**30**				**675**	**27**

SEMESTER V

III	19BIT501	Core 9 - .Net Framework	5	3	30	70	100	4
III	19BIT502	Core 10 – Mobile Computing	5	3	30	70	100	4
III	19BIT503	Core 11 – Software Engineering	5	3	30	70	100	4
III	19BIT504	Core 12 – RDBMS	5	3	30	70	100	4
III	19BITP05	Core Lab 5 - Net Framework Lab	5	3	40	60	100	4
III	19BITE01/ 19BITE02/ 19BITE03	Elective I - IOT / Bio – Informatics / Data Mining and Warehousing	5	3	30	70	100	4
		Total	**30**				**600**	**24**

SEMESTER VI

III	19BIT601	Core 13 - PHP Programming	5	3	30	70	100	4
III	19BIT602	Core 14 – Information Security	5	3	30	70	100	4
III	19BITP06	Core Lab 6 - PHP Lab	5	3	40	60	100	4
III	19BITE04/ 19BITE05/ 19BITE06	Elective II - Big Data Analytics / Artificial Intelligence and Expert Systems / Python Programming	5	3	30	70	100	4
III	19BITE07/ 19BITE08/ 19BITE09	Elective III – Software Testing / Mobile Application Development /Multimedia	5	3	30	70	100	4
III	19BITPR1	Project and Viva Voce	5	3	50	50	100	4
		Total	**30**				**600**	**24**
		Total					**3600**	**140**

For Candidates admitted from the Academic year 2019 - 2020 onwards
No Continuous Internal Assessment (CIA) only Comprehensive Examination (CE)
@ No Continuous Internal Assessment (CIA) and Comprehensive Examination (CE)
IDC- Inter disciplinary Course, EDC – Extra Disciplinary Course, SBC – Skill Based Courses

B.Sc.(Information Technology) Degree Examination - Syllabus for candidates admitted from the academic year 2019 – 2020 onwards

<div align="center">

FIFTH SEMESTER
PART III: CORE 9: .NET FRAMEWORK

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<div align="right">

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

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Course Objective: To impart knowledge on .NET programming Using C#.

Unit I: (12 Hours)
Getting started with .Net Frame work 4.5: – Evolution of .Net – Benefits of .Net Framework - Architecture of .Net Framework 4.5– Introducing Visual Studio 2012: Installing Visual Studio 2012-Exploring Visual Studio 2012 Ultimate IDE-Performing Basic IDE Operations.

Unit II: (12 Hours)
Introducing C# 5.0 in VS 2012: Need of C# –Creating Simple C# 5.0 Console Application – Identifiers and Keywords – Data Types, Variables and Constants – Namespaces-The System Namespace– Constructors and Destructors – Static Class and Static Class Member –Object-Oriented Programming: – Encapsulation – Inheritance – Polymorphism – Abstraction – Interfaces- Exception Handling: Exception Handling.

Unit III: (12 Hours)
Introducing Windows Presentation Foundation: Understanding WPF 4.5 Architecture-Exploring WPF 4.5 Designer Interface-Working with Dialog Boxes in WPF Applications. Working with WPF 4.5 Controls: Adding WPF Controls-Introducing Different type of Controls in WPF-Using WPF Controls.

Unit IV: (12 Hours)
Data Access with ADO.Net : – Understanding Databases – Understanding SQL – Understanding ADO.Net – Data Reader- Creating Connection String – Creating a Connection to a Database – Creating Command Object – Working with Data Adapters – Using DataReader to Work with Databases.

Unit V: (12 Hours)
ASP.NET 4.5 Essentials:Describing the ASP.NET Technologies-Descring the ASP.NET Lifecycle-Creating a Simple ASP.NET Web Application- Creating a Simple ASP.NET Web Site. Web Forms: Standard Controls: The Control Class-The HiddenField Control-The FileUpload Control-The Hyperlink Control. Navigation Controlls: The TreeView Control-The Menu Control-login and password controls.

Course Outcome:

CO1: Understand the Evolution,Architecture and .Net IDE.

CO2:Develop Console Application and Demonstrate knowledge of Object-Oriented concepts design using C#.

CO3: Understanding and Using WPF Controls.

CO4: Design and Implement Database Connectivity using ADO .NET.

CO5: Understanding ASP .NET Technologies and to Implement the Controls.

CO/PO & PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3
CO 1	M							M
CO 2		H				H		
CO 3			M				L	
CO 4				L				
CO 5					M			

Text Book:
1. .Net 4.5 Programming (6 in 1) Black Book, Kogent, DreamTech Press.

Reference Book:
1. TanweerAlam, "Net Framework And C# Programming", A.B. Publication.

2. "Mastering C# and .NET Framework",Marino posadas, Packt Publishing Limited.

B.Sc. (Information Technology) Degree Examination - Syllabus for candidates admitted from the Academic Year 2019 – 2020 onwards

FIFTH SEMESTER
PART III : CORE 10: MOBILE COMPUTING

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective : To provide an overview of mobile computing and its application development .To impart the basic knowledge of operations systems , databases requires for MANET and its protocols

Unit I: (12 Hours)
Introduction to mobile computing and wireless networking – what is Mobile computing ? – MC vs wireless networking – mobile computing applications – characteristics – structure – cellular mobile communication – GSM – GSM services – System archtitecute of GSM – GSM security – GPRS- GPRS services – GPRS architecture – UMTS - UMTS architecture – Software Defined Radio

Unit II: (12 Hours)
Mobile Internet Protocol – Mobile IP – Packet delivery – overview of Mobile IP – desirable features – key mechanism – route optimization – Dynamic Host Configuration Protocol (DHCP) – Mobile Transport layer – overview of TCP/IP – Terminologies – Architecure – operation of TCP – application layer of TCP – adaptation of TCP window – improvement in TCP performance – Mobile databases – Issues in transaction processing – transaction processing environment – transaction processing in mobile environment – data replication – mobile transaction model – rollback process – query processing – recovery

Unit III: (12 Hours)
Operating Systems for Mobile computing – basic concepts – special constraints and requirements of Mobile OS – A Survey of commercial mobile OS – comparative study of mobile OS - Mobile Ad Hoc Networks -basic concepts – characteristics – applications – MANET design issues – Routing – essential of traditional routing protocols – LSP – DV protocol – Routing in MANET – popular MANET routing protocols – VANETs – security issues in MANET – attacks on ad hoc networks .

Unit IV: (12 Hours)
Wireless sensor networks – WSN vs MANET – applications – architecture of Sensor node – challenges in design of an effective WSN – characteristics of sensor networks – WSN routing protocols – classification based on protocol operation – classification based on network structure – directed diffusion – rumor routing – sequential assignment routing – low energy adaptive clustering hierarchy – power efiicient gathering in sensor information system – geographic and energy aware routing – geographic adaptive fidelity – target coverage – clustered wireless sensor networks – 4G networks – ramp up features

Unit V: (12 Hours)
Mobile application development and protocols – mobile devices as web clients – WAP-J2ME – Configuration – Android application development – SDK – features – android application components – android software stack structure – advantages of android – Mobile commerce – applications of M-commerce – structure – Pros and Cons – mobile payment systems – security issues.

Course Outcome:
   CO1. To understand the basic structures of mobile communication
   CO2. To understand the basic concepts of protocols required and the transaction process in mobile databases.
   CO3. Demonstrate knowledge of operating systems and protocols for MC to solve real time problems
   CO4. Analyse and illustrate how routing algorithms play vital role in problem solving
   CO5. Illustrate the construction of learning and designing an android app.

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1		M						
CO2	H					L		
CO3		H					H	
CO4				M		H		
CO5			H		M			M

Text Book:
   1. Prasant Kumar Pattnaik and RajibMall,"Fundamentals of Mobile Computing " second edition, 2016 by PHI learning PVT Ltd, Delhi
Reference Books
   1. Asoke K Talukder, Roopa R Yavagal. (2005), Mobile Computing, TMH
   2. Jochen Schiller, (2008), Mobile Communication, Second Edition, Pearson Education Asia

B.Sc(Information Technology) Degree Examination - Syllabus for candidates admitted from the Academic Year 2019 – 2020 onwards
FIFTH SEMESTER
PART III: CORE 11: SOFTWARE ENGINEERING

Maximum CIA : 30
Maximum CE :   70
Total HOUR: 60

Course Objective:
To facilitate the Students to learn Software Engineering through understanding the software and its process models, Agile Development, Design develop correct and robust software products

Unit I: (12 Hours)
The Nature of Software - Defining Software - Software Application Domain - Legacy Software, The Changing Nature of Software.Software Engineering: Defining the Discipline - The Software Process - Software Engineering Practice - Software Development Myths - How it all starts

Unit II: (12 Hours)
Software Process Structure: A Generic Process Model - Defining Framework Activity - Identifying a Task Set - Process Pattern - Process Assessment and Improvement. Process Models: Prescriptive Process Models - Specialized Process Models - The Unified Process - Personal and Team Process Models - Process Technology - Product and Process

Unit III: (12 Hours)
Agile Development: What is Agility? Agility and the Cost of Change - What is an Agile Process? Extreme Programming - The XP Process, Industrial XP, Other Agile Process Models - Scrum - Dynamic Systems Development Method - Agile Modeling - Agile Unified Process. A Tool Set for the Agile Process.

Unit IV: (12 Hours)
Object Oriented Methodologies: Rumbaugh et al.'s Object Modeling Techinique – The Booch Methodology – The Jacobsons et al. Methodologies. Unified Modeling Language: Introduction – Static and Dynamic Models – Why Modeling? Introduction to the Unified Modeling Language – UML Diagrams – UML Class Diagram – Use-Case Diagram.

Unit V: (12 Hours)
UML Dynamic Modeling: UML Interaction Diagrams – UML Sequence Diagram – UML Collaboration Diagram – UML Statechart Diagram – UML Activity Diagram – Implementation Diagram. Model Management: Packages and Model Organization – UML Extensibility – UML Meta-Model.

Course Outcome:
    CO1. Learns and understands the basis of Software and changing nature
    CO2. Understands software development through traditional and specialized process
        development

CO3. Learns the industrial usage development life cycles through Agile
CO4. Understands the software engineering design through object oriented principles and static representation
CO5. To learns the role of software design oops with dynamic representation

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1	H					H		
CO2		H				H		
CO3							H	
CO4				H				
CO5								H

Text Books:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Tata McGraw Hill, Eight edition,2015. [Unit I, II, III]
2. Ali Bahrami, "Object Oriented Systems Development", Tat Mc Graw Hill, 2008.[Unit IV, V]

Reference Books:

1. Mark C. Layton, Steven J. Ostermiller, Dean J. Kynaston, "Agile Project Management For Dummies", John Wiley & Sons, incl, 3rd Edition, 2020.

B.Sc.(Information Technology) Degree Examination - Syllabus for candidates admitted from the academic year 2019 – 2020 onwards

FIFTH SEMESTER
PART III: ELECTIVE 1: IOT

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective:
To enable the student to understand the importance of IoT based communication technologies, IoT Protocols and Emerging Applications of IoT.

Unit I: (12 Hours)
Demystifying the IoT Paradigm: IoT Is Strategically Sound - Brewing and Blossoming Trends in IT Space - Envisioning the IoT Era - Device-to-Device/ Machine-to-Machine Integration Concept - Aspect of Device-to-Cloud (D2C) Integration - Emergence of IoT Platform as a Service (PaaS) - Key Application Domains - Emerging IoT Flavors.

Unit II: (12 Hours)
Realization of IoT Ecosystem Using Wireless Technologies: Architecture for IoT Using Mobile Devices - Mobile Technologies for Supporting IoT Ecosystem - Energy Harvesting for Power Conservation in IoT System - Mobile Application Development Platforms - Mobile Use Cases for IoT - Low Power Wide Area Networking Technologies - Weightless.

Unit III: (12 Hours)
 Infrastructure and Service Discovery Protocols: Layered Architecture for IoT - Protocol Architecture of IoT - Infrastructure Protocols - Routing Protocol - Bluetooth Low Energy - Device or Service Discovery for IoT - Protocols for IoT Service Discovery - Prominent IoT Service Discovery Products.

Unit IV: (12 Hours)
Integration Technologies and Tools for IoT Environments: IoT Portion for Smarter Enterprises and Environments - Sensor and Actuator Networks - IoT Device Integration Concepts, Standards, and Implementations - Device Integration Protocols and Middleware - Protocol Landscape for IoT.

Unit V: (12 Hours)
IoT Physical Devices & Endpoints :-What is an IoT device?- Exemplary Device : Rasberry Pi-About the board – Linux on Rasberry Pi-Rasberry Pi Interfaces- Other IoT Devices Case studies illustrating IoT Design: Introduction-Home Automation-Cities-Environment-Agriculture-Productivity Applications.

Course Outcome:
 CO1: Understand and recognize the factors that contribute to the emergence of IOT.

9

CO2: Able to realize the revolution of Internet in Mobile devices and Cloud.
CO3: Able to understand the building blocks of IOT Architecture and its protocols.
CO4: Examine the business environments and device integrations concepts.
CO5: Identify different IOT Oriented Systems, and connect with programming interface.

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1				L		L		
CO2	M				M		M	
CO3		L			M		M	
CO4			H					M
CO5			H		M			H

Text Book:
1. Pethuru Raj, Anupama C. Raman, The Internet of Things - Enabling Technologies, Platforms, and Use Cases, CRC Press, Taylor and Francis Group, 2017.(unit-I-Unit IV)
2. ArshdeepBahga, Vijay Madisetti ,"Internet of Things –A hands-on approach" Hyderabad Universities Press 2015.(Unit-V)

Reference Book
1. David Easley and Jon Kleinberg, "Networks, Crowds, and Markets: Reasoning About a Highly Connected World" Cambridge University Press - 2010.

B.Sc (Information Technology) Degree Programme - Syllabus for candidates admitted from the Academic Year 2019 – 2020 onwards
FIFTH SEMESTER
PART III: ELECTIVE I: BIO-INFORMATICS

Maximum CIA: 30
Maximum CE: 70
Total HOUR: 60

Objective:
On successful completion of the course the students should have, understood the bioinformatics and Genome information resources. Understood the pair wise alignment, multiple sequence alignment, RNA structure, proteomics.

Unit I: (12 Hours)
Introduction – Importance of Bioinformatics – Biological Sequence / Structure – Deficit – Genome Projects – Status – Sequence analysis – Homology and analogy. EMBNET – NCBI – Virtual Tourism. Primary Sequence Databases: Biological data base – Primary Sequence Database – Composite Protein Sequence Database – Secondary database – Composite protein – Pattern database – structure and classification of database.

Unit II: (12 Hours)
Genome Information Resources. DNA Sequences data base – Specialised genomic Resources. DNA Sequence analysis. Why analyse DNA? – Gene structure – Features of DNA sequence analysis – Issues in the interpretation and EST search – Approach of Gene hunting – Cell CDNA libraries and ESTs – Approaches to EST analysis – Effect of EST data on DNA data base examples of EST analysis- Micro Array analysis – introduction – techniques

Unit III: (12 Hours)
Data Base Searchers and Pair Wise Alignment : Data base searching – Alphabets and Complexity – Comparing Two Sequences – Sub-Sequence – Identity and Similarity – Dot plots – Simple alignment – Gaps – Scoring Matrices – Dynamic Programming – BLAST and its relative – FASTA and related algorithms – Alignment scores and statistical significance of database sequences. Global and local Alignments: Algorithms – Similarities – Semi global alignment.

Unit IV: (12 Hours)
Multiple Sequence Alignment: Goal – Definition – Consensus – Complex – Methods – Database of multiple Alignment – searching database with multiple alignment. Methods of Photo Genetics : Distance Based Methods – Based Methods – Comparison.

Unit V: (12 Hours)
RNA Structure: Amino Acids – Polypeptide Composition Algorithm – Modeling protein folding prediction – RNA Sequence Structure. Proteomics: Classification – Techniques – Inheritors – Drying Design – Structures – XRay Crystal – NMR – Empirical Methods and prediction techniques.

Course Outcome:

CO1. To understand the basic importance of bioinformatics and biological databases
CO2. To understand the information on DNA sequence databases, approaches to analyse
CO3. Demonstrate knowledge of alignment using various algorithms to solve problems for database searchers.
CO4. Analyse and illustrate the various methods used in multiple sequence alignment
CO5. Identifies RNA structure using various techniques

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1		H					L	
CO2	M					M		
CO3		L					H	
CO4				H		H		
CO5			M	H				M

Text Book:
1. T.K. Attwood, D.J. Parry-Smith, "Introduction to Bioinformatics", Pearson Education Asia, 2013.

Reference Book:

1. Dan E. Krane, Michale L. Raymer, "Fundamental Concepts of Bioinformatics", Pearson Education Asia, 2011.

B.Sc. (Information Technology) Degree Examination- Syllabus for candidates admitted from the academic year 2019-2020 onwards
SIXTH SEMESTER
PART- III: CORE 13 - PHP PROGRAMMING

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective: To impart the knowledge on Web Application Development using of PHP and MYSQL

Unit I: (12 Hours)
The Building Blocks of PHP: Variables - Data Types - Operators and Expressions - Constants – Flow Control Functions in PHP: Switching Flow - Loops - Code Blocks and Browser Output - Working with Functions: What Is a Function? - Calling Functions - Defining a Function - Returning Values from User-Defined Functions - Variable Scope - Saving State between Function Calls with the static Statement - More About Arguments - Testing for the Existence of a Function

Unit II: (12 Hours)
Working with Arrays: What Are Arrays? - Creating Arrays - Some Array-Related Functions - Working with Objects: Creating an Object - Object Inheritance - Working with Strings, Dates, and Time: Formatting Strings with PHP - Investigating Strings in PHP - Manipulating Strings with PHP - Using Date and Time Functions in PHP - Other String, Date, and Time Functions - Working with Forms: Creating a Simple Input Form - Accessing Form Input with User-Defined Arrays - Combining HTML and PHP Code on a Single Page - Using Hidden Fields to Save State - Redirecting the User - Sending Mail on Form Submission - Working with File Uploads

Unit III: (12 Hours)
Working with Cookies and User Sessions: Introducing Cookies - Setting a Cookie with PHP - Deleting a Cookie with PHP - Session Function Overview - Starting a Session - Working with Session - Passing Session IDs in the Query String - Destroying Sessions and Unsetting Variables - Using Sessions in an Environment with Registered Users - Working with Files and Directories: Including Files with include( ) - Validating Files - Creating and Deleting Files - Opening a File for Writing, Reading, or Appending - Reading from Files - Writing or Appending to a File - Working with Directories - Opening Pipes to and from Processes Using popen( ) - Running Commands with exec( ) - Running Commands with system( ) or passthru( )

Unit IV: (12 Hours)
Working with Images: Understanding the Image-Creation Process - Necessary Modifications to PHP - Drawing a New Image - Getting Fancy with Pie Charts - Modifying Existing Images - Image Creation from User Input   - Using Images Created by Scripts –Understanding the Database Design Process: - The Importance of Good Database Design - Types of Table Relationships - Understanding Normalization - Following the Design Process

Unit V: (12 Hours)
Basic SQL Commands - MySQL Data Types - Table Creation Syntax - Using the INSERT Command -Using the SELECT Command - Using WHERE in Your Queries - Selecting

from Multiple Tables - Using the UPDATE Command to Modify Records - Using the REPLACE Command - Using the DELETE Command -Frequently Used String Functions in MySQL - Using Date and Time Functions in MySQL -Using Transactions and Stored Procedures in MySQL: What Are Transactions? - What Are Stored Procedures? Interacting with MySQL Using PHP: MySQL Versus MySQLiFunctions - Connecting to MySQL with PHP - Working with MySQL Data ==Creating a Simple Discussion Forum – Designing the Database Tables – Creating an Include file for common functions== – creating the input Forms and Scripts – Displaying the Topic List – Displaying the Posts in a Topic – Adding Posts to a Topic – Creating an Online Storefront – Planning and Creating the Database Tables – Displaying Categories of Items – Displaying Item.

Course Outcome:

 CO1: Learns and understands the PHP basic syntax for variables types and conditional structures.
 CO2: Understand the handling of arrays and also creation of PHP scripts to handle forms.
 CO3: Able to understand cookies, session and also analyze to work with files and directories
 CO4: Learn and understand to work with images and chart presentation.
 CO5: Analyze and solve various database task using PHP and MYSQL language.

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1	M	H						M
CO2				M		H		
CO3			H				M	
CO4		M						L
CO5					H	H		

Text Book:
        1. Julie C. Meloni, "PHP MYSQL and APACHE", Pearson Education, 2016,Reprint, India

Reference Books:
        1. Lynn Beighley, Michael Morrison (2009),"Head First PHP & MySQL",1st edition, O'Reilly Media, Inc.

        2. Robin Nixon (2012), "Learning PHP ,MYSQL,Java script and CSS",2nd edition, O'Reilly media inc.,

        3. Steve Holzner (2014)"PHP: The Complete Reference ", Reprint ,Mc Graw Hill Publications.

B.Sc. (Information Technology) Degree Programme - Syllabus for candidates admitted from the Academic Year 2019 – 2020 onwards

SIXTH SEMESTER
PART III:ELECTIVE II: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective: To impart artificial intelligence principles, techniques and its history. To assess the applicability, strengths, and weaknesses of the basic knowledge representation, problem solving, and learning methods and to develop intelligent system in solving real time problems

Unit I: (12 Hours)
Introduction – What is AI? Acting humanity-Thinking humanity-thinking rationally- acting rationally – foundations of AI –History of AI – Intelligent Agents – Agents and Environments – Good Behavior- nature of environment – structure of agent – agent program – simple reflex agents- model based reflex agents – goal based agents – utility based agents

Unit II: (12 Hours)
Problem solving – problem solving agents – example problems – searching for solutions – uninformed search strategies – breadth first search – depth first search – depth -limited search – iterative deepening depth first search - comparing – avoiding repeated states – searching with partial information – sensorless problems – contingency problems – Informed search and exploration – informed search strategies – heuristic functions – local search algorithms and optimization problems – local search in continuous spaces – online search agents and unknown environments.

Unit III: (12 Hours)
Knowledge and reasoning – logical agents – knoeledge based agents – Wumpus world – logic – propositional logic – very simple logic – reasoning patterns in propositional logic – effective propositional inference – agent based on propositional logic – Planning – planning problem – planning with state space search – partial order planning – planning graphs – planning with propositional logic – analysis of planning approaches – planning and acting in real world – time schedules and resoruces – hierarchical task network planning – planning and acting in nondeterministic domains – conditional planning – execution monitoring and replanning – continuous planning – multiagent planning

Unit IV: (12 Hours)
Learning – forms of learning – inductive learning – learning decision trees – ensemble learning – knowledge in learning – a logical formulation of learning – explanation based learning – learning using revelance information – inductive logic programming – Statistical learning methods – learning with complete data – learning with hidden variable – EM algorithm – instance based learning - neural networks – kernel machines – Reinforcement learning – passive reinforcement learning – active reinforcement learning – generalization in reinforcement learning

Expert System Definition – Features of an expert system – Organization – Characteristics – Prospector – Knowledge Representation in expert systems – Expert system tools – MYCIN – EMYCIN. Case Study : Schneider Electric – Improving agriculture and farming with AI - Robotics – introduction – robot hardware – robotic perception – planning to move – planning uncertain movements – moving – dynamics and control – potential field control – reactive control – robotic software architectures – application domains – AI present and future – agents components – agent architecture.

Course Outcome:

CO1. Evaluate Artificial Intelligence (AI) methods and describe their foundations.

CO2. Apply basic principles of AI in solutions that require problem solving, knowledge representation and learning.

CO3. Demonstrate knowledge of reasoning and knowledge representation for solving real world problems

CO4. Analyse and illustrate how search algorithms play vital role in problem solving

CO5. Illustrate the construction of learning and designing a system

CO / PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1	H					M		
CO2		M				H		
CO3		H					L	
CO4				H		H		
CO5			H		M			M

Text Book :
1. ArtificalIntelligence : A Modern Approach , 4th edition 2020, Stuart J.Russell and Peter Norvig, Pearson Education, Prentice Hall.
2. Poole, D. and Mackworth, A. 2010. Artificial Intelligence: Foundations of Computational Agents, Cambridge University Press.

Reference Books
1. Ric, E., Knight, K and Shankar, B. 2009. Artificial Intelligence, 3rd edition, Tata McGraw Hill.
2. Luger, G.F. 2008. Artificial Intelligence -Structures and Strategies for Complex Problem Solving, 6th edition, Pearson.

B.Com CS

VLB JANAKIAMMAL COLLEGE OF ARTS AND SCIENCE

AUTONOMOUS

Board of Studies Meeting

Department of B. Com CS

The minutes of the 16th meeting of Board of Studies held on 08.01.2022 at 10.00 am at the department.

Members Present:

S. No	Name	Category
1	Dr.N.Latha	Chairman
2	Dr.S.David Soundararajan	University Nominee
3	Dr.T.Senthilkumar	Subject Expert
4	Dr. P.Gurusamy	Subject Expert
5	Mr.N. Naveen Kumar	Industrial Expert
6	Mr.S.Manivarma	Member
7	Dr.R.Francina PracilaMary	Member
8	Mrs.S.Rukshana Begum	Member
9	Ms.T.S.Veena	Member
10	Dr.K.Baby Saranya	Member
11	Ms.P.Suganya	Member
12	Ms.S.Sarathamani	Member
13	Ms.S. Kiruba	Alumni

The HoD and Chairman of the department of B. Com CS welcomed and introduced all the members and appreciated them for their continuous support, contribution for the development of academic standard and enrichment of the syllabus.

The items of the agenda were taken one by one for discussion and the following resolutions were passed.

Item 16.1(a): To consider and approve the syllabi for II semester for the students admitted during the academic year 2021-2022.

The chairman presented the detailed scheme and syllabus for the II semester for the students admitted from the academic year 2021-2022 onwards. The details of changes made also presented as follows.

Changes Made:

Course	Code	Reason
Law of Insurance – resolved to update the IRDA Act	21BCS202	As per the revision of the act, it is mandatory to update the IDRA Act

New Course Introduced

Course	Code	Reason
Nil		

After discussion the following resolution was passed with the above changes and modifications.

Resolution:

> **Resolved to approve the syllabus for the II semester for the students admitted from the academic year 2021-22 onwards,**

Item 16.1(b) : To consider and approve the changes, if any, in the syllabi for IV semester for the students admitted during the academic year 2020-2021.

The Chairman presented the detailed syllabus for the IV semester for the students admitted from the academic year 2020-2021 onwards. The details of changes made also presented as follows.

Changes Made:

Course	Code	Reason
No Changes		

After discussion the following resolution was passed with the above changes and modifications.

Resolution:

> **Resolved to approve the syllabus for the IV semester for the students admitted from the academic year 2020-21 onwards,**

Item 16.1(c) : To consider and approve the changes, if any, in the syllabi for VI semester for the students admitted during the academic year 2019-2020.

The Chairman presented the detailed syllabus for the VI semester for the students admitted from the academic year 2019-2020 onwards. The details of changes made also presented as follows.

Changes Made:

Course	Code	Reason
No Changes		

After discussion the following resolution was passed with the above changes and modifications.

Resolution:

> **Resolved to approve the syllabus for the IV semester for the students admitted from the academic year 2020-21 onwards,**

Item 16.2: To approve the panel of examiners for question paper setting, Practical examination and evaluation of answer scripts for the even semester of the academic year 2021-2022.

The Chairman presented the panel of examiners for question paper setting, practical examination and evaluation of answer scripts for the even semester of the academic year 2021-2022.

Resolution:

> **Resolved to approve the panel of examiners for question paper setting, practical examination and evaluation of answer scripts for the even semester of the academic year 2021-2022.**
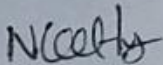
Item 16.3: To consider and approve any other item brought forward by the Chairman and the members of the board.

No other item was brought forward.

Finally the Chairman thanked all the members for their cooperation and contribution in enriching the syllabus with active participation in the meeting and sought the same spirit in the future also. The meeting was closed with formal vote of thanks proposed by Dr. R. Francina Pracila Mary.

N(cell)

(Dr. N Latha)   (Dr.S.David Soundararajan)

Chairman   **University Nominee**
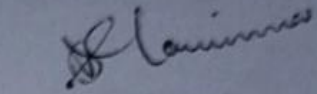
(Dr.T.Senthilkumar)

Subject Expert

(Dr. P.Gurusamy)

Subject Expert

(Mr.S.Manivarma)
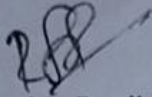
Member

(Mr.N. Naveen Kumar)

Industrial Expert
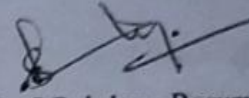
(Mrs.S.Rukshana Begum)
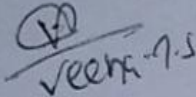
Member

(Dr.R.Francina PracilaMary)
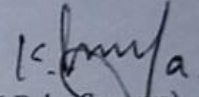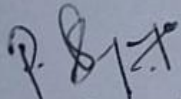
Member

(Dr.K.Baby Saranya)

Member

(Ms.T.S.Veena)

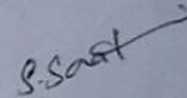**Member**

(Ms.P.Suganya)

Member
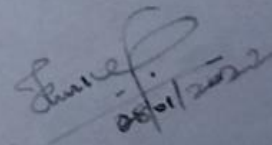
(Ms.S.Sarathamani)

Member

(Ms.S. Kiruba)

Alumni

Signature of the Principal

VLB JANAKIAMMAL COLLEGE OF ARTS AND SCIENCE

(AUTONOMOUS)

BCOM CS

Scheme of Examination (CBCS with OBE pattern)

For the candidates admitted from the academic year 2021-2022 onwards

Part	Sub Code	Subject Title	Ins.Hrs/ Week	Dur. Hrs.	CIA	CEE	Total	Credit
		SEMESTER I						
I	21LATA01/ 21LAHI01/ 21LAMY01/ 21LAFR01	Language – I Tamil I /Hindi I /Malayalam I /French I	5	3	50	50	100	3
II	21ENG001	English –I	5	3	50	50	100	3
III	21BCS101	Core 1 - Fundamentals of Accounting	6	3	50	50	100	4
III	21BCS102	Core 2 - Management Concepts	6	3	50	50	100	4
III	21BCSA01	Allied 1- Managerial Economics	6	3	50	50	100	4
IV	21UFCA01	Foundation Course I : EVS	2	2	-	50	50	2
		Total	30				550	20
		SEMESTER II						
I	21LATA02/ 21LAHI02/ 21LAMY02/ 21LAFR02	Language –II Tamil II/Hindi II/Malayalam II/French II	5	3	50	50	100	3
II	21ENG002	English – II	5	3	50	50	100	3
III	21BCS201	Core 3 - Financial Accounting - I	6	3	50	50	100	4
III	21BCS202	Core 4 - Law of Insurance	6	3	50	50	100	4
III	21BCSA02	Allied 2 – Fundamentals of Information Technology	6	3	50	50	100	4
IV	21UFCA02	Foundation Course II: Value Education	2	2	-		50	2

VLBJCAS

							50		
			Total	30				550	20

SEMESTER III

III	21BCS301	Core 5- Financial Accounting -II	6	3	50	50	100	4	
III	21BCS302	Core 6 -Elements of Business Laws	5	3	50	50	100	4	
III	21BCS303	Core 7- Company Law and Secretarial Practice –I	5	3	50	50	100	4	
III	21BCS304	Core 8 - Principles of Marketing	4	3	50	50	100	4	
III	21BCSA03	Allied 3- Business Mathematics	5	3	50	50	100	4	
III	21BCSSBI/ 21BCSSB2	SBC 1 Corporate Practice- I/ Entrepreneurial Development	3	3	30	45	75	3	
IV	21BTA001/ 21ATA001/ 21BCSOE1	OEC 1: Basic Tamil-I/ Advanced Tamil-I / Multi media	2	2	-	50	50	2	
		Total	30				625	25	

SEMESTER IV

III	21BCS401	Core 9 - Corporate Accounting-I	6	3	50	50	100	4	
III	21BCS402	Core 10- Company Law and Secretarial Practice –II	5	3	50	50	100	4	
III	21BCS403	Core 11 -General Law	5	3	50	50	100	4	
III	21BCS404	Core 12 - Corporate Communication	4	3	50	50	100	4	
III	21BCSA04	Allied 4 - Business Statistics	5	3	50	50	100	4	
III	21BCSSB3/ 21BCSSB4	SBC 2- Corporate Practice -II /Securities Management	3	3	30	45	75	3	
IV	21BTA002/ 21ATA002 21OEC002	OEC 2: Basic Tamil-II / Advanced Tamil-II / Communicative English	2	2	—	50	50	2	
V	21NSS001/ 21NCC001/ 21SPT001/	SOC 1: NCC/NSS/Sports/Extension Activities	—	—	50	-	50	2	

	21EXT001							
		Total	30				675	27

SEMESTER V

III	21BCS501	Core 13 - Corporate Accounting-II	6	3	50	50	100	4
III	21BCS502	Core 14- Cost Accounting	5	3	50	50	100	4
III	21BCS503	Core 15 - Industrial and Labour Laws	5	3	50	50	100	4
III	21BCS504	Core 16 - Corporate Governance	4	3	50	50	100	4
III	21BCSP01	Core Lab 1- Ms Office and Tally	5	3	50	50	100	4
III	21BCSE01/ 21BCSE02/ 21BCSE03	Elective 1 - Taxation –I/ Financial Management / Organizational Behavior	5	3	50	50	100	4
III	21BCSITI	Institutional Training	-	-	-	-	-	-
		Total	30				600	24

SEMESTER VI

III	21BCS601	Core 17 - Accounting For Management	6	3	50	50	100	4
III	21BCS602	Core 18 - Corporate and Economic Law	5	3	50	50	100	4
III	21BCS603	Core 19 - Securities Law and Financial Markets	5	3	50	50	100	4
III	21BCSE04/ 21BCSE05/ 21BCSE06	Elective 2- Taxation –II/ Investment Management/ Retail Business Management	5	3	50	50	100	4
III	21BCSE07/ 21BCSE08/ 21BCSE09	Elective 3 - Auditing Practice and Principles/ Working Capital Management/ Business Environment	5	3	50	50	100	4
III	21BCSPR1	Project and Viva Voce	4	3	50	50	100	4
		Total	30				600	24
		Total					3600	140

List of Skill Based Courses

S.No.	Sem	Code	Subject Title	Credits
1	III	21BCSSB1	Corporate Practice I	3
2	III	21BCSSB2	Entrepreneurial Development	3
3	IV	21BCSSB3	Corporate Practice II	3
4	IV	21BCSSB4	Securities Management	3

List Elective Courses

S.No	Sem	Code	Subject Title	Credits
Elective I				
1	V	21BCSE01	Taxation –I	4
2	V	21BCSE02	Financial Management	4
3	V	21BCSE03	Organizational Behavior	4
Elective II				
4	VI	21BCSE04	Taxation –II	4
5	VI	21BCSE05	Investment Management	4
6	VI	21BCSE06	Retail Business Management	4
Elective III				
7	VI	21BCSE07	Auditing Practice and Principles	4
8	VI	21BCSE08	Working Capital Management	4
9	VI	21BCSE09	Business Environment	4

List of Open Elective Courses

S.No	Sem.	Subject Code	Subject Name	Credits
1	III	21BTA001	Basic Tamil-I	2
2	III	21ATA001	Advanced Tamil-I	2
3	III/IV	21OCE002	Communicative English	2
4	III	21BAEOE1	PC Software	2
5	III	21BBAOE1	Multimedia and its Applications	2
6	III	21BAC0E1	Multimedia and its Applications	2

7	III	21BCMOE1	Aptitude and Logical Reasoning	2
8	III	21BCCOE1	Human Resource Management	2
9	III	21BCSOE1	Multi Media	2
10	III	21BCIOE1	E Business	2
11	III	21BCPOE1	Web Designing	2
12	III	21BHMOE1	Communicative Hindi - I	2
13	III	21BVCOE1	E-Commerce	2
14	IV	21BTA002	Basic Tamil-II	2
15	IV	21ATA002	Advanced Tamil-II	2
16	IV	21BAEOE2	Introduction to Information Security	2
17	IV	21BCAOE1	Banking Theory	2
18	IV	21BSCOE1	Management Information System	2
19	IV	21BITOE1	Microprocessor and its Applications	2
20	IV	21BCTOE1	Mathematical Aptitude	2
21	IV	21BMAOE1	Basics if Internet	2
22	IV	21BESOE1	Web Designing	2
23	IV	21BHMOE2	Communicative Hindi - II	2
24	IV	21BCDOE1	Introduction to Research	2
25	IV	21BVCOE2	Basics of Sound and Acoustics	2

List of Extra Credit Courses

S.No	Sem.	Subject Code	Subject Name	Credits
1	III	21BCSAC1	Corporate Ethics and Sustainability	2
2	IV	21BCSAC2	Intellectual Property Rights Law and Practice	2
3	V	21BCSAC3	Swayam /MOOC /NPTEL courses (any one)	2

Summary

Part	No of Papers	Total Credits	Total Marks
I Language	2	6	200
II English	2	6	200
III –Core (Theory)	19	76	1900
III –Core (Lab)	1	4	100
III – Allied	4	16	400
III – Elective	3	12	300
III – SBC	2	6	150
III –Project	1	4	100
IV –Foundation Course	2	4	100

SEMESTER – II

PART III - CORE 4: LAW OF INSURANCE

Course code	Course name	Category	Lecture(L)	Tutorial(T)	Practical(P)	Credits
21BCS202	Law of Insurance	Core 4	60	12	0	4

Preamble: To focus on key aspects of Management Concepts	
Prerequisite : Basic Knowledge in Law of Insurance	
Course outcomes (COs):	

On successful completion of this course the students will be able to:

CO Number	Course Outcome (Co) Statement	Blooms Taxonomy knowledge level
CO1	Understanding the nature, principles and regulatory frame work of insurance	K1
CO2	Understanding the various Insurance policies and procedure of claiming insurance.	K2
CO3	Understand the significance of insurance market structure, LIC Plans , Policies and provisions.	K4
CO4	Understanding the nature, principles of Property and casualty Insurance, policy serving process.	K4
CO5	Identifying various types of risk, factors, evaluation and avoidance.	K2

Mapping with Program Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10
CO1										S
CO2								S		
CO3									M	
CO4					M					
CO5									M	M

S – Strong; L – Low; M – Medium

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Syllabus:

Unit	Course content	Hours	E-Contents/ E-Resources
I	Insurance Generic Overview – Meaning and Definition of Insurance – Purpose and Need of Insurance – The Business of Insurance – Pooling of Rises and Resources – Contract of Insurance – Condition Necessary for a Contract – principles and practices of an insurance contract – important terminology parties in insurance contract – Role of Insurance in Economic Development – IRDA Act ,1999.	15	YouTube Videos
II	Types of Insurance – (Personal , Commercial , Health , Life , Etc) – History of Insurance – Types of Insurance Companies – Business Units in an Insurance Company – Insurance Regulators in India – Reinsurance Concepts.	15	PPT
III	Life Insurance – Insight to Insurance – Important Terminologies in a Life Insurance Policy – Parties in a Life Insurance Policy – Individual Life Insurance Plans – Supplementary Benefits – Policy Provisions – Ownerships Rights – Life Insurance Policy Life Cycle (New Business & Underwriting , Policy Servicing , Claims , Etc.,) , Popular Life Insurance Plans in India.	14	PPT
IV	Property and Casualty Insurance – Non – Life Insurance Concepts – Hazards, Perils, Catastrophe, Property Damage & Business Interruption, Policy , Exclusions , Indemnity , Deductibles , Retention , Salvage , Subrogation , Insurance Providers – Co-Insurance, Captive Insurance – Underwriting Process – Policy Servicing Process – Claims Process – Property Insurance Plans .	14	YouTube Videos
V	Risk Management – Concept of Risks – Risks Management- Basic Concepts - (Hazards, Perils, Assets, Etc) – Types of Risks - Risk Identification – Sources of Risks – Factors affecting Risks - Risk Evaluation – Risk Avoidance.	14	NPTEL
	Total	72	

Text Book.
M.N. Mishra, Insurance Principles and Practice, 3rd Edition, Sultan Chand and Company Ltd Publications, Year- 2016, New Delhi.

Reference Books:
1. N.Vinayakam, P.L.Mani, K.L.Nagarajan, Principles and Practice of Insurance, 8th Edition, S.Chand & Company Ltd., Year- 2012, New Delhi.
2. P.Periysamy, Principles and Practice of Insurance, Himalaya Publication House.,

Websites
1. https://www.youtube.com/watch?v=0GyKxRYx1tQ
2. https://www.youtube.com/watch?v=dEVulKf1wYs
3. https://open.umn.edu/oen

Learning Methods (*):
Assignment/Seminar/Industrial Visit

B.Sc CS

Details of the program where syllabus revision was carried out

Programme Code	Programme Name	Course Code	Course Name
B.Sc	B.Sc Computer Science	19BSC601	Web Technologies
		19BSCP06	Web Technologies Lab
		21BSCP02	Object Oriented Programming with C++ Lab
M.Sc	M.Sc Computer Science	21MSC201	Advanced Software Engineering

Department of Computer Science

XV - BOS meeting - 12.05.2021

Minutes of meeting

The Draft Regulations, Schemes, Syllabus Content, CBCS, out comes Based Education patterns for
B.Sc Computer Science.
M.Sc Computer Science.
For the students to be admitted from the academic year 2019-2020 onwards in these autonomous courses, were presented by the Chairman of the Board of Studies for persual and approval of the Board.
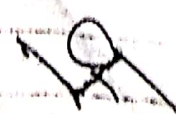
Agenda

1. Welcome Address by the chairman

2. Approval for Scheme, Syllabus (Semester VI)

3. Approval of Guidelines & Regulation

4. Approval Of List of Examination

5. Vote of Thanks.

6. Any other Matter.

B.SC (Computer Science)
2019-2020 onwards.

1. The content of "Application Development in Java" (15BSC601) is revised and renamed as "Web Technologies" (19BSC601)

2. The content of Practical Paper "Application Development in Java Lab" (15BSCP06) is revised and renamed as "Web Technologies Lab" (19BSCP06)

3. The paper (15BSCE06) "Network Security and Cryptography" was removed from Elective-II and introduced as the core paper (19BSC602) - "Network Security & Cryptography"

M.Sc (Computer Science)
No changes in the Academic Year (2019-2020)

Head of the Department
Department of Computer Science
VLB Janakiammal College of Arts and Science
Kovilpudur, Coimbatore-641 042.

Principal

Department of Computer Science

XV . BOS meeting . 12.05.2021

S.NO	Member	Signature	Remarks
1.	Mr. Y. Murugesan		chairman
2.	Dr. M. Devapriya		University Nominee
3.	Dr. J. Vijigripsy		Subject Experts
4	Mr. K. Mohan		Industrial Expert
5	Mr. R. Rajkumar		Alumni
6.	Dr. T. Premalatha	ONLINE MODE	member
7.	Ms. A. Deepa		Member
8	Ms. M. Kayalvizhi		Member
9.	Mr. J. Ramkumar		Member
10.	Mr. S. Samson Dinakaran		Member
11.	Ms. S. Ranjani		member
12.	Ms. Nithya		Member

COMPUTER SCIENCE BOARD
SCHEME OF EXAMINATIONS (CBCS and OBE PATTERN)
For Candidates admitted during the academic year 2019-2020 onwards
Programme: B.Sc Computer Science

Part	Sub Code	Subject Title	Ins.Hrs/Week	Dur. Hrs.	CIA	CE	Total	Credit
		SEMESTER I						
I	19LATA01/ 19LAHI01/ 19LAMY01/ 19LAFR01	Language – I Tamil-I/ Hindi-I/ Malayalam-I/ French-I	5	3	30	70	100	3
II	19ENG001	English –I	5	3	30	70	100	3
III	19BSC101	Core 1- Digital Principles and C Programming	6	3	30	70	100	4
III	19BSCP01	Core Lab I – Digital Principles and C Programming lab	6	3	40	60	100	4
III	19BSCID1	**IDC 1:**Numerical Methods and Statistics	6	3	30	70	100	4
IV	19UFCA01	**Foundation Course I : EVS #**	2	2	-	50	50	2
		Total	30				550	20
		SEMESTER II						
I	19LATA02/ 19LAHI02/ 19LAMY02/ 19LAFR02	Language –II Tamil-II/ Hindi-II/ Malayalam-II/ French-II	5	3	30	70	100	3
II	19ENG002	English – II	5	3	30	70	100	3
III	19BSC201	Core 2 : Object Oriented Programming with C++	6	3	30	70	100	4
III	19BSCP02	Core Lab 2 – Object Oriented Programming with C++ Lab	6	3	40	60	100	4
III	19BSCID2	**IDC 2 :** Discrete Mathematics	6	3	30	70	100	4
IV	19UFCA02	**Foundation Course II: Value Education #**	2	2	-	50	50	2
		Total	30				550	20
		SEMESTER III						
III	19BSC301	Core 3: Data Structures and Algorithm	5	3	30	70	100	4
III	19BSC302	Core 4: Java Programming	5	3	30	70	100	4
III	19BSC303	Core 5 : Computer Networks	5	3	30	70	100	4
III	19BSCP03	Core Lab 3: Java Programming Lab	5	3	40	60	100	4
III	19BSCID3	**IDC 3 :**Operation Research	5	3	30	70	100	4
IV	19BSCSB1/ 19BSCSB2	**SBC I** Multimedia Lab/ Python Lab	3	3	-	75	75	3
IV	19BTA001/ 19ATA001/ 19EDC002	**EDC 1:** Basic Tamil-I/Advanced Tamil-I /Communicative English	2	2	-	50	50	2
		Total	30				625	25

SEMESTER IV

III	19BSC401	Core 6 : Data Base Management System	5	3	30	70	100	4
III	19BSC402	Core 7: PHP Programming	5	3	30	70	100	4
III	19BSC403	Core 8: Operating Systems	5	3	30	70	100	4
III	19BSCP04	Core Lab 4: PHP Programming Lab	5	3	40	60	100	4
III	19BSCID4	IDC 4 :Business Accounting	5	3	30	70	100	4
IV	19BSCSB3/ 19BSCSB4	SBC II : Linux Lab / Oracle Lab	3	3	-	75	75	3
IV	19BTA002/ 19ATA002/ 19BSCED1	EDC 2: Basic Tamil-II /Advanced Tamil-II /Business Communications.	2	2	-	50	50	2
V	19NCC001/ 19NSS001/ 19SPT001/ 19EXT001	NCC/ NSS/ Sports @dilute/ Extension Activities	-	-	50	-	50	2
		Total	**30**				**675**	**27**

SEMESTER V

III	19BSC501	Core 9: Software Engineering	5	3	30	70	100	4
III	19BSC502	Core 10: .Net Programming	5	3	30	70	100	4
III	19BSC503	Core 11: PC Hardware	5	3	30	70	100	4
III	19BSC504	Core 12: Computer Graphics	5	3	30	70	100	4
III	19BSCP05	Core Lab 5: .Net Programming Lab	5	3	40	60	100	4
III	19BSCE01/ 19BSCE02/ 19BSCE03	Elective I: Open Source Technologies / System Software / Unified Modeling Language	5	3	30	70	100	4
		Total	**30**				**600**	**24**

SEMESTER VI

III	19BSC601	Core 13: Web Technologies	5	3	30	70	100	4
III	19BSC602	Core 14: Network Security and Cryptography	5	3	30	70	100	4
III	19BSCP06	Core Lab 6: Web Technologies Lab	5	3	40	60	100	4
III	19BSCE04/ 19BSCE05/ 19BSCE06	Elective II: Data Mining/ Artificial Intelligence/ Information Security	5	3	30	70	100	4
III	19BSCE07/ 19BSCE08/ 19BSCE09	Elective III: Mobile Computing/ Cloud Computing/ Internet of Things	5	3	30	70	100	4
III	19BSCPR1	Project and Viva Voce	5	3	50	50	100	4
		Total	**30**				**600**	**24**
						Total	**3600**	**140**

\# No Continuous Internal Assessment (CIA) , only Comprehensive Examination (CE)
@ No Continuous Internal Assessment (CIA) and Comprehensive Examination (CE)
IDC- Inter disciplinary Course,
EDC – Extra Disciplinary course ,
SBC – Skill Based Course

B.Sc (Computer Science) Degree Examination-Syllabus for Candidates admitted from the academic year 2019 – 2020 onwards.

SIXTH SEMESTER
PART III - CORE 13: WEB TECHNOLOGIES

Maximum CIA: 30
Maximum CE: 70
Total Hours: 60

Course Objective:
To provide the necessary knowledge to design and develop dynamic, database-driven application using J2EE.

Unit- I   (12 Hours)
Java Remote Method Invocation: Remote method Invocation concept – Server side – Client side. Classic Memories: JDBC - Introduction to JDBC - Structured Query Language - The JDBC APIs - Library Application Using JDBC.

Unit- II   (12 Hours)
The Big Picture: Java EE Architecture, The Many Variations of Java EE Applications. Java Servlets and Web Applications: Foundations of the Web Tier: The HTTP Protocol - Introducing Java Servlets - Example Java Servlet Application: Photo Application - Understanding the Java Servlet API - Web Applications - Java Servlets: The Good and the Bad.

Unit- III   (12 Hours)
Dynamic Web Pages: JSP - JSP Runtime Architecture - A JSP Clock - JSP Syntax - JSP Directives - Using Java Beans from JSPs - The Java Environment for JSPs - JSP Standard Tags - Custom Tag Libraries.

Unit- IV   (12 Hours)
The Fundamental of Enterprise Beans – Introduction to Enterprise Beans- Hello Enterprise Beans- Flavors of Enterprise Beans- Exposing Enterprise Beans – Finding Enterprise Beans- EJB Lifecycle- Packaging Enterprise Beans- Banking Example.

Unit-V   (12 Hours)
Java Server Faces Life cycle: Introduction to JSF - The MVC design pattern - Facelets - The request processing lifecycle. Building JSF Forms: Create, Retrieve, Update and Delete - A basic create entity JSF form - JSF Custom Tags - Displaying a list collection objects - JSF and CDI Scopes

Course Outcome:
CO 1: Invoke the remote methods in an application using Remote Method Invocation (RMI)
CO 2: Learn to access database through Java programs, using Java Data Base Connectivity
CO 3: Create dynamic web pages, using Servlets and JSP.

CO/ PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO 1	H					M		
CO 2		H					H	
CO 3				M			L	
CO 4			L					M
CO 5					L	H		

Text Book:

1. Tom Pender, UML 2 BIBLE, Wiley India Pvt ,Reprint 2018.
Unit 1: Chapter 2
Unit 2: Chapter 4.
Unit 3: Chapter 5,6.
Unit 4: Chapter 7
Unit 5: Chapter 8,9

Reference Books:

1. Grady Booch, James Rumbaugh, IvarJacobson, The Unified Modeling Language User Guide, Pearson Education, 2017.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, Wiley-Dreamtech India Pvt. Ltd, 2019.

B.Sc (Computer Science) Degree Examination – Syllabus for Candidates admitted from the academic year 2019 – 2020 onwards.

SIXTH SEMESTER
PART III - CORE LAB 6: WEB TECHNOLOGIES LAB

Maximum CIA: 40
Maximum CE: 60
Total Hours: 60

Course Objective:

To equip the students to learning and development of client/ server and web based application using Java with Enterprise Edition

1. Create a Window based Distributed application using RMI to perform Arithmetic and Relational operations with different servers, and create client interface to process.
2. Develop a JDBC application to perform CRUD operations for College Management System for any one object.
3. Create a web application using Servlet and HTML formatting tags to display user Bio-data by specifying user information, academic detail, area of interest and extra-curricular activities
4. Create a JSP Application to collect the user information during registration and validate the textboxes using Jscript.
5. Design a JSP Application to maintain the customer complaints and its status using Servlet as a backdrop.
6. Create an application to maintain the sports meet details using RMI.
7. Develop an application to collect the enquiry details in Car Showroom.
8. Create an application to maintain the details of the external visitors in a company.
9. Create an application to maintain doctors information using EJB
10. Develop an application to collect and uphold the event schedules by implementing Entity Beans
11. Design a JSF application with JDBC to help bank employees for Customer registration, updation and view the customer with validation.
12. Design a web application using JSF for online examination application form, read the various values from user and display in second page.

Course Outcome:

CO 1: Preserve portability and ease of administration for a servlet application by parameterizing servlet code, using initialization parameters, properties files, and JNDI.
CO 2: Explain the use of directives on JSPs and outline the principal directives.
CO 3: Implement simple JSPs that use Java code in declarations, expressions and scriptlets.
CO 4: Use JavaBeans to implement effective interactive JSP applications
CO 5: Design a JSF using both the traditional and Facelets approach.

CO/ PO & PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO 1	H						L	
CO 2		M				L		
CO 3				H				M
CO 4			M			M		
CO 5					H			H

B.Sc Computer Science Board
Scheme of Examination (CBCS with OBE Pattern)
For the Candidates admitted during the Academic Year 2021-2022 onwards

Part	Sub Code	Subject Title	Ins.Hrs/Week	Dur. Hrs.	CIA	CE	Total	Credit
		SEMESTER I						
I	21LATA01/ 21LAHI01/ 21LAMY01/ 21LAFR01	Language – I Tamil-I/ Hindi-I/ Malayalam-I/ French-I	5	3	50	50	100	3
II	21ENG001	English – I	5	3	50	50	100	3
III	21BSC101	Core 1- Digital Principles and C Programming	6	3	50	50	100	4
III	21BSCP01	Core Practical 1 – Digital Principles and C Programming Lab	6	3	50	50	100	4
III	21BSCA01	Allied 1 – Numerical Methods and Statistics	6	3	50	50	100	4
IV	21UFCA01	Foundation Course 1 : EVS	2	2	-	50	50	2
		Total	30				550	20
		SEMESTER II						
I	21LATA02/ 21LAHI02/ 21LAFR02/ 21LAMY02	Language – II Tamil-II/ Hindi-II/ Malayalam-II/ French-II	5	3	50	50	100	3
II	21ENG002	English – II	5	3	50	50	100	3
III	21BSC201	Core 2 : Object Oriented Programming with C++	6	3	50	50	100	4
III	21BSCP02	Core Practical 2 – Object Oriented Programming with C++ Lab	6	3	50	50	100	4
III	21BSCA02	Allied 2- Discrete Mathematics	6	3	50	50	100	4
IV	21UFCA02	Foundation Course II: Value Education	2	2	-	50	50	2
		Total	30				550	20
		SEMESTER III						
III	21BSC301	Core 3: Data Structures and Algorithm	5	3	50	50	100	4
III	21BSC302	Core 4: Java Programming	5	3	50	50	100	4
III	21BSC303	Core 5: Computer Networks	5	3	50	50	100	4
III	21BSCP03	Core Practical 3: Java Programming Lab	5	3	50	50	100	4
III	21BSCA03	Allied 3 – Operations Research	5	3	50	50	100	4
III	21BSCSB1/ 21BSCSB2	SBC 1 Practical - Scripting Languages Lab/ Software Testing Lab	3	3	30	45	75	3
IV	21BTA001/ 21ATA001/2 1OEC002	OEC 1: BT – 1/AT – 1 / Communicative English	2	2	-	50	50	2
		Total	30				625	25

SEMESTER IV

III	21BSC401	Core 6 : Relational Data Base Management System	5	3	50	50	100	4
III	21BSC402	Core 7: PHP Programming	5	3	50	50	100	4
III	21BSC403	Core 8: Operating Systems	5	3	50	50	100	4
III	21BSCP04	Core Practical 4: PHP Programming Lab	5	3	50	50	100	4
III	21BSCA04	Allied 4- Business Accounting	5	3	50	50	100	4
III	21BSCSB3/ 21BSCSB4	SBC II Practical –Linux Lab / RDBMS Lab	3	3	30	45	75	3
IV	21BTA002/ 21ATA002/ 21BSCOE1	OEC 2 : BT - 2/AT -2/ Management Information System	2	2	-	50	50	2
V	21NSS001/ 21NCC001 21SPT001/ 21EXT001	SOC 1: NCC/NSS/Sports //Extension Activities			50		50	2
		Total	**30**				**675**	**27**

SEMESTER V

III	21BSC501	Core 9: Software Engineering	5	3	50	50	100	4
III	21BSC502	Core 10: .Net Programming	5	3	50	50	100	4
III	21BSC503	Core 11: PC Hardware	5	3	50	50	100	4
III	21BSC504	Core 12: Computer Graphics	5	3	50	50	100	4
III	21BSCP05	Core Practical 5: .Net Programming Lab	5	3	50	50	100	4
III	21BSCE01/ 21BSCE02/ 21BSCE03	Elective I – Data Mining/ Introduction to Data Science/ Artificial Intelligence	5	3	50	50	100	4
		Total	**30**				**600**	**24**

SEMESTER VI

III	21BSC601	Core 13: Python Programming	5	3	50	50	100	4
III	21BSC602	Core 14: Network Security and Cryptography	5	3	50	50	100	4
III	21BSCP06	Core Practical 6: Python Programming Lab	5	3	50	50	100	4
III	21BSCE04/ 21BSCE05/ 21BSCE06	Elective II: Software Design Tools/ XML Programming/ Information Security and Cyber Laws	5	3	50	50	100	4
III	21BSCE07/ 21BSCE08/ 21BSCE09	Elective III: Mobile Computing/ Virtualization and Cloud/ Internet of Things	5	3	50	50	100	4
III	21BSCPR1	Project and Viva Voce	5	3	50	50	100	4
		Total	**30**				**600**	**24**
						Total	**3600**	**140**

PART III - CORE PRACTICAL 2: OBJECT ORIENTED PROGRAMMING WITH C++ LAB

Course code	Course name	Category	Lecture (L)	Tutorial(T)	Practical(P)	Credits
21BSCP02	Object Oriented Programming with C++ Lab	Core Lab 2	12	0	60	4

Preamble: Basic understanding of computer programs and object oriented concepts.

Prerequisite: Knowledge about object oriented programming language

Course outcomes (COs):

On successful completion of this course the students will be able to:

CO Number	Course Outcome (Co) Statement	Blooms Taxonomy knowledge level
CO1	Define the different programming paradigm such as procedure oriented and object oriented programming methodology and conceptualize elements of OO methodology	K2
CO2	Illustrate and model real world objects and map it into programming objects for a legacy system.	K3
CO3	Identify the concepts of inheritance and its types and develop applications using overloading features.	K1
CO4	Discover the usage of pointers with classes	K4
CO5	Explain the usage of Files, templates and understand the importance of exception Handling	K2

Mapping with Program Outcomes:

CO/ PO & PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1							M			
CO 2					S					
CO 3										S
CO 4								M		

CO 5												H		

S – Strong; L – Low; M – Medium

Syllabus:

Sno	Program	Hours	E-Contents/ E-Resources
1	Write a C++ program using class to process shopping list for a Departmental store.	6	YouTube Videos /PPT
2	Develop a C++ program using constructors and destructors	6	YouTube Videos/PPT
3	Construct a C++ program using friend functions	6	YouTube Videos/PPT
4	Construct a C++ program using string functions	6	YouTube Videos/PPT
5	Construct a C++ program using inline functions	6	YouTube Videos/PPT
6	Construct a C++ program using overloaded operators.	6	YouTube Videos/PPT
7	Develop a C++ program that illustrates the single inheritance	6	YouTube Videos/PPT
8	Construct a C++ program using hierarchical inheritance.	6	YouTube Videos/PPT
9	Construct a C++ program using virtual function.	6	YouTube Videos/PPT
10	Design a C++ program using exception handling mechanism	6	YouTube Videos/PPT
11	Develop a C++ program that illustrates the role of abstract classes.	6	YouTube Videos/PPT
12	Prepare a C++ program using file operations	6	YouTube Videos/PPT
	Total	72	

Text Books:

1. D.Ravichandran, Programming with C++, Third Edition, McGraw Hill Education(India) Pvt Ltd, 2016,Chennai.

Reference Books:

1. Ashok N. Kamthane, Object Oriented Programming with ANSI &Turbo C++, 1st Indian Print, Pearson Education, Reprint 2017, New Delhi.
2. Balagurusamy, Object Oriented Programming with C++, 4th Edition, TMCH, Reprint 2018, New Delhi.

Websites

www.topcoder.com

www.coderbyte.com

www.codechef.com

Learning Methods (*):
Assignment/Case-Study.

M.Sc CS

VLB JANAKIAMMAL COLLEGE OF ARTS AND SCIENCE

AUTONOMOUS
Board of Studies Meeting
Department of Computer Science

The minutes of the 16th meeting of Board of Studies held on 08.01.2022 at 10.00 am at the department.

Members Present:

S.No	Name	Category
1	Mr.V.Murugesan	Chairman
2		University Nominee
3	Dr.V.Kumutha	Subject Expert
4.	Dr.Manivasagam	Subject Expert
5.	Mr.N.Balamurali	Industrial Expert
6.	Dr.T.Premalatha	Member
7.	Mrs.A.Deepa	Member
8.	Mrs.M.Kayalvizhi	Member
9.	Dr.S,Samson Dinakaran	Member
10.	Mrs.S.Ranjani	Member
11.	Mr.I.Sudhakar	Member
12.	Mrs.J.Sathya	Alumni

The HoD and Chairman of the Department of Computer Science welcomed and introduced all the members and appreciated them for their continuous support, contribution for the development of academic standard and enrichment of the syllabus.

Further Chairman informed the inability of the following member/s to attend the meeting and requested to grant leave of absence.

1. The University Nominee was not nominated and we request to nominate a vice chancellor nominee member to our board of studies.

The items of the agenda were taken one by one for discussion and the following resolutions were passed.

Item 16.1(a): To consider and approve the syllabi for II semester for the students admitted during the academic year 2021-2022.

The chairman presented the detailed scheme and syllabus for the II semester for the students admitted from the academic year 2021-2022 onwards. The details of changes made also presented as follows.

B.Sc Computer Science:

Changes Made:

Course	Code	Reason
Object Oriented Programming with C++ Lab	21BSCP02	The Content of "Object Oriented Programming with C++"(19BSCP02) is revised based on the syllabi .

M.Sc Computer Science:

Changes Made:

Course	Code	Reason
Advanced Software Engineering	21MSC201	The contents of Advance Software Engineering (19MSC201) is revised and updated based on the industrial needs.

New Courses Introduced:

Course	Code	Reason
Python Programming Lab	21MSCP03	It helps to develop the web application and also currently trend in IT industries.

After discussion the following resolution was passed with the above changes and modifications.

Resolution:

Resolved to approve the syllabus for the II semester for the students admitted from the academic year 2021-22 onwards,

Item 16.1(b): No Changes in the syllabi for IV semester for the students of B.Sc Computer Science and M.Sc Computer Science admitted during the academic year 2020-2021.

After discussion the following resolution was passed with no changes and modifications.

Resolution:

Resolved to approve the syllabus for the IV semester for the students admitted in B.Sc Computer Science and M.Sc Computer Science from the academic year 2020-21 onwards,

Item 16.1(c) : No changes in the syllabi for VI semester for the students of B.Sc Computer Science admitted during the academic year 2019-2020.

After discussion the following resolution was passed with no changes and modifications.

Resolution:

Resolved to approve the syllabus for the VI semester for the students admitted in B.Sc Computer Science from the academic year 2019-20 onwards.

Item 16.2: To approve the panel of examiners for question paper setting and evaluation of answer scripts for the even semester of the academic year 2021-2022.

The Chairman presented the panel of examiners for question paper setting and evaluation of answer scripts for the even semester of the academic year 2021-2022.

Resolution:

Resolved to approve the panel of examiners for question paper setting and evaluation of answer scripts for the even semester of the academic year 2021-2022.

Item 16.3: To consider and approve any other item brought forward by the Chairman and the members of the board.
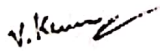
No other item was brought forward.

Finally the Chairman thanked all the members for their cooperation and contribution in enriching the syllabus with active participation in the meeting and sought the same spirit in the future also. The meeting was closed with formal vote of thanks proposed by Dr.T.Premalatha.
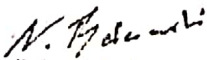

(Mr.V.Murugesan)   (Name)
Chairman   **University Nominee**

(Dr.V.Kumutha)   (Dr.K.Manivasagam)
Subject Expert   **Subject Expert**
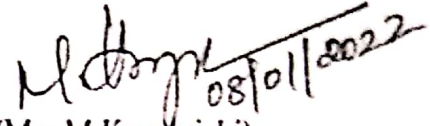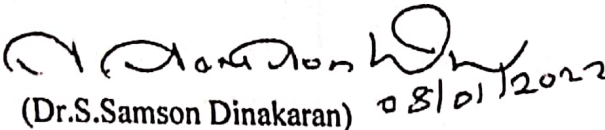
(Mr.N.Balamurali)   (Dr.T.Premalatha) 08/01/22
Industrial Expert   **Member**

(Mrs.A.Deepa)

Member

(Dr.S.Samson Dinakaran)   08/01/2022

Member

(Mr.I.Sudhakar)

Member

(Mrs.M.Kayalvizhi)   08/01/2022
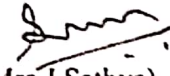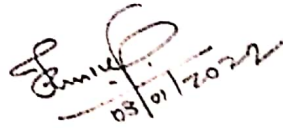
Member

(Mrs.S.Ranjani)

Member

(Mrs.J.Sathya)

Alumni

08/01/2022

Signature of the Principal

M.Sc Computer Science Board
Scheme of Examination (CBCS with OBE Pattern)
For the Candidates admitted during the Academic Year 2021-2022 onwards

Part	Sub Code	Subject Title	Ins.Hrs/Week	Dur. Hrs.	CIA	CE	Total	Credit
						Examination		
SEMESTER I								
III	21MSC101	Core 1:Design and Analysis of Algorithms	5	3	50	50	100	4
III	21MSC102	Core 2:Advanced Operating Systems	5	3	50	50	100	4
III	21MSC103	Core 3:Research Methodology	5	3	50	50	100	4
III	21MSC104	Core 4:Object Oriented Analysis and Design	5	3	50	50	100	4
III	21MSC105	Core 5:Principles of Compiler Design	5	3	50	50	100	4
III	21MSCP01	Core Practical 1:Object Oriented Analysis and Design Lab	5	3	50	50	100	4
		Total	30				600	24
SEMESTER II								
III	21MSC201	Core 6:Advanced Software Engineering	5	3	50	50	100	4
III	21MSC202	Core 7:Networking and Communication Technologies	5	3	50	50	100	4
III	21MSC203	Core 8:Advanced Java Programming	5	3	50	50	100	4
III	21MSCP02	Core Practical 2:Advanced Java Programming Lab	5	3	50	50	100	4
III	21MSCE01/ 21MSCE02/ 21MSCE03	Elective I : Distributed Computing/ Grid Computing/ Mobile Computing	5	3	50	50	100	4
III	21MSCP03	Core Practical -3:Python Programming Lab	5	3	50	50	100	4
		Total	30				600	24
SEMESTER III								
III	21MSC301	Core 9:Internet of Things	5	3	50	50	100	4
III	21MSC302	Core 10:Information Security	5	3	50	50	100	4
III	21MSC303	Core 11:Data Mining and Warehousing	5	3	50	50	100	4
III	21MSC304	Core 12:Web Technology	5	3	50	50	100	4
III	21MSCP04	Core Practical -4 :Web Technology Lab	5	3	50	50	100	4
III	21MSCE04/ 21MSCE05/ 21MSCE06	Elective II: Bioinfomatics /Neural Networks and Fuzzy logic/Soft Computing	5	3	50	50	100	4
		Total	30				600	24
SEMESTER IV								
III	21MSC401	Core 13:Data Science	5	3	50	50	100	4

III	21MSCP05	Core Practical -5:Data Mining using R Lab	3	3	50	50	100	4
III	21MSCE07/ 21MSCE08/ 21MSCE09	Elective III: Computer Simulation and Modeling/ Digital Image Processing/ Parallel Processing	5	3	50	50	100	4
III	21MSCPR1	Project and Viva Voce	-	3	100	100	200	6
		Total	13				500	18
					Total		2300	90

List of Elective Courses

S.No	Sem.	Subject Code	Subject Name	Credits
			Elective I	
1	II	21MSCE01	Distributed Computing	4
2	II	21MSCE02	Grid Computing	4
3	II	21MSCE03	Mobile Computing	4
			Elective II	
4	III	21MSCE04	Bioinfomatics	4
5	III	21MSCE05	Neural Networks and Fuzzy logic	4
6	III	21MSCE06	Soft Computing	4
			Elective III	
7	IV	21MSCE07	Computer Simulation and Modeling	4
8	IV	21MSCE08	Digital Image Processing	4
9	IV	21MSCE09	Parallel Processing	4

List of Extra Credit Courses

S.No	Sem.	Subject Code	Subject Name	Credits
1	II	21MSCAC1	Multimedia and its Applications	2
2	III	21MSCAC2	ERP Applications in Business	2
3	IV	21MSCAC3	MANET	2

Summary of the Programme

Part	No.of Papers	Total Credits	Total Marks
III – Core	13	52	1300
III – Core Lab	5	20	500
III – Elective	3	12	300
III – Project	1	6	200
Total	**22**	**90**	**2300**

SEMESTER – 2

PART III - CORE 6: ADVANCED SOFTWARE ENGINEERING

Course code	Course name	Category	Lecture(L)	Tutorial(T)	Practical(P)	Credits
21MSC201	Advanced Software Engineering	Core 6	50	10	0	4

Preamble: Contribute a direct participation in the specification, analysis, design and development of software product.

Prerequisite: To enable the students to learn the concepts of software engineering, web engineering, Component based software engineering.

Course outcomes (COs):

On successful completion of this course the students will be able to:

CO Number	Course Outcome (Co) Statement	Blooms Taxonomy knowledge level
CO1	Ability to analyze, design, verify, validate, implement, apply, and maintain software systems	K4
CO2	Ability to design a system, component, or process to meet desired needs within realistic constraints	K6
CO3	Ability to identify, formulate, and solve engineering problems	K2
CO4	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	K3
CO5	Ability to work in one or more significant application domains	K5

Mapping with Program Outcomes:

CO/ PO & PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1						S				
CO 2										M
CO 3							S			
CO 4									M	
CO 5								M		

S – Strong; L – Low; M – Medium

Syllabus:

Unit	Course content	Hours	E-Contents/ E-Resources
I	Software and software engineering: Evolving Role Software – Software – Changing Nature of Software – Software Myths - Agility - Agility and the Cost of Change - Agile Process.	12	YouTube Videos
II	System Engineering: Computer Based Systems – System Engineering Hierarchy – Requirements Engineering: Requirements Engineering Tasks – Eliciting Requirements - Design Engineering Design within the Context of Software Engineering.	12	PPT/ YouTube Videos
III	Web Engineering: Attributes of Web Based Systems and Applications – Web APP Engineering Layers – Web Engineering Process – Web Engineering Best Practices Formulation and planning for Web Engineering.	12	YouTube Videos /PPT
IV	Advanced Topics in Software Engineering: Formal Methods – Basic Concepts – Mathematical Preliminaries – Mathematical Notations – Formal Specification Languages – Object Constraint Language – Z Specification Language – Ten Commandants of Formal Methods – Cleanroom Software Engineering.	12	PPT/ YouTube Videos
V	Component Based Software Engineering – Engineering of Component Based Systems – CBSE Process – Domain Engineering – Component Based Development – Classifying and Retrieving Components – Business Process Reengineering - Software Reengineering –Reverse Engineering – Restructuring – Forward Engineering.	12	YouTube Videos
	Total	**60**	

Text Book:

1.Roger S. Pressman, Software Engineering – A practitioner's Approach, McGraw Hill International Edition, 6th Edition, Reprint 2019.

Reference Books:

1.Kassem A. Saleh, Software Engineering, J. Ross Publishing, Reprint 2018.
2.Jibitesh Mishra, Software Engineering, Pearson Education, Reprint 2018

Websites
www.unf.edu
www.courseera.org
www.udemy.com

Learning Methods (*):
Assignment/Seminar/Case-Study.