

**SRI SARADA COLLEGE FOR WOMEN
(AUTONOMOUS)**

SALEM-16

Reaccredited with 'A' Grade by NAAC

Affiliated to Periyar University



SYLLABUS

M.Sc. COMPUTER SCIENCE

For the students admitted from the academic year

2019 – 2020 & Onwards

SRI SARADA COLLEGE FOR WOMEN (AUTONOMOUS), SALEM-16**M.Sc., COMPUTER SCIENCE (CBSC)***(For the candidates admitted from 2019-2020 & onwards)***Total Credits: 90+15***

<u>SEMESTER-I</u>						
S. No	Year	Course	Title	Credit	Hour	Marks
1.	20PCSC1	Core Paper-I	Mobile Computing	5	5	100
2.	20PCSC2	Core Paper-II	.Net Programming	5	5	100
3.	20PCSC3	Core Paper-III	Design and Analysis of Algorithms	5	5	100
4.		Elective-I		4	4	100
5.	20PCSQC1	Core Practical-I	.Net Programming Lab	4	5	100
6.	20PCSQC2	Core Practical-II	Algorithms Lab	5	6	100
Total				28+4*	30	600
Extra Skills						
* Productive preparation for NET/SET/JRF-I(self study 1 credit extra)						
* Articulation and Idea Fixation Skills-6 Hours per Semester(out of college hours 1 Credit extra)						
* Life Skills Promotion-2 Hours per Semester(out of college hours – 1 credit extra)						
* Physical Fitness Practice – 20 Hours per Semester (out of college hours – 1 credit extra)						
<u>SEMESTER-II</u>						
7.	20PCSC4	Core Paper-IV	Open Source Technology	5	5	100
8.	20PCSC5	Core Paper-V	Principles of Compiler Design	5	5	100
9.	20PCSC6	Core Paper-VII	J2EE Programming	5	5	100
10.		Elective-II		4	4	100
11.	20PCSQC3	Core Practical- III	J2EE	4	5	100
12.	20PCSQC4	Core Practical-IV	Python Programming Lab	4	4	100
13.	20PHRSC	Part-IV	Human Rights	2	2	100
14.	20PVENC		Value Education			
Total				29+5*	30	700

Extra Skills

- **Productive preparation for NET/SET/JRF-II(self study 1 credit extra)**
- **Articulation and Idea Fixation Skills-6 Hours per Semester(out of college hours-1 credit extra)**
- **Life Skills Promotion-2 Hours per Semester(out of college hours – 1 credit extra)**
- **Physical Fitness Practice – 20 Hours per Semester (out of college hours – 1 credit extra)**
- **Implant Training – 25 Hours during summer (1 credit extra)**

Major Electives**Elective-I**

1. Internet of Things
2. Software Engineering
3. Bio Informatics

Elective-II

1. Cloud Computing
2. Data Mining
3. Digital Image processing

Elective-III

1. Soft Computing
2. E-Commerce
3. Software Project Management

List of Electives for Elective IV:

1. Data Analytics with R
2. Software Testing
3. AI and Expert System

List of Electives for Elective V:

1. Project using open source
2. Unified Modeling language
3. Genetic Algorithms

List of Extra – Disciplinary Courses offered by Dept. of Computer Science

1. Image Editing and Animation
2. Image Editing Using Photoshop
3. Graphics Designing using Flash

List of Extra – Disciplinary Courses offered by Dept. of Commerce

1. Management Accounting
2. Cost Accounting

Programme Title: M.Sc. Computer Science

Course Title	: CORE PAPER - I	MOBILE COMPUTING	
Course Code	: 20PCSC1	Hours/Week : 5	Credit :5
Semester	: I	Batch : 2020 - 2022	

Course Objectives: The course aims to

- Introduce basis of wireless communication with need for mobile computing
- Explain the role of GSM ,UMTS and satellite system with issues pertaining to handover and security.
- Detail out the strategies related to packet delivery and routing strategies in wireless adhoc networks.
- Teach WAP architecture with XML and WML script and its diverse applications.

Syllabus**Unit I** **No. of Hours : 10**

Introduction: Mobile and Wireless Devices - Simplified Reference Model - Need for Mobile Computing - Wireless Transmission - Multiplexing - Spread Spectrum and Cellular Systems - Medium Access Control – Comparisons.

Unit II **No. of Hours : 15**

Telecommunications System: Telecommunication System – GSM – Architecture - Sessions – Protocols – Handover and Security – UMTS and IMT 2000 – Satellite System.

Unit III **No. of Hours : 15**

Wireless LAN: IEEE 802.11 – Hiper LAN – Bluetooth – MAC Layer – Security and Link Management.

Unit IV **No. of Hours : 10**

Mobile IP: Goals – Packet Delivery – Strategies – Registration – Tunneling and Reverse Tunneling – Adhoc Networks – Routing Strategies.

Unit V **No. of Hours : 10**

Wireless Application Protocol: Wireless Application Protocol (WAP) – Architecture – XML – WML Script – Applications.

Book for Study:

1.Jochen Schiller, “Mobile Communication”, - Pearson Education, Delhi, 2003.

Book for Reference:

1.Sandeep Singhal, “The Wireless Application Protocol: Writing Applications For The Mobile Internet”, Pearson Education, 2001.

Web Resources :

- <http://www.eschoolnews.com/>
- <http://www.radio-electronics.com/>
- <http://www.wapforum.org>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will have the ability to understand the need for mobile computing.	K2
CO2	Students will have the ability to analyze the extensive role and applications of GSM, UMTS and satellite system communications.	K4
CO3	Students will be able to understand wireless LAN architecture and it's applications.	K2
CO4	Students will be able analyze the IP packet delivery with respect to mobile Ad-hoc network.	K4
CO5	Students will be able to evaluate the performance of wireless communication in the past as well as in the future.	K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	S	M	L	L	L	M	L	M	L	L
CO2	L	S	M	S	M	M	M	L	L	M	L
CO3	L	S	M	M	S	M	S	M	L	L	M
CO4	M	S	M	S	L	L	S	L	M	L	S
CO5	L	L	L	S	S	M	S	L	L	L	S

Programme Title: M.Sc. Computer Science

Course Title	: Core Paper-II	.NET PROGRAMMING	
Course Code	: 20PCSC2	Hours/Week : 5	Credit : 5
Semester	: I	Batch : 2020 - 2022	

Course Objectives: The course aims to

- Provide fundamental knowledge in “VB.NET”
- Introduce Windows form & Web form with HTML
- Familiarize various Tools in “VB.NET”
- Acquaint with different Database Connectivity methods in “VB.NET”

Syllabus**Unit I: No. of Hours : 12**

Essential Visual Basic Net: Putting Visual Basic to work- New concept in VB.NET - Upgrading from Visual Basic 6.0 - The NET Framework and the Common Language Runtime - Building VB.NET Applications - The Visual Basic Integrated Development Environment - Coding to get the most from Visual Basic.

Unit II: No. of Hours : 13

Windows Forms: All about Windows Forms - All about Windows MDI Forms Text Boxes - Labels - Buttons - Check Boxes - Radio Buttons - List Boxes - Combo Boxes - Timers - Menus -Menu Items - Context Menus, The build-in dialog boxes - Open file dialogs, save file dialogs - Font dialogs - Colour dialogs.

Unit III: No. of Hours : 15

Object Oriented Programming: Classes And Objects – Fields, Properties, Methods and Events – Classes vs. Object Members – Abstraction, Encapsulation, Inheritance, Polymorphism – Overloading, Overriding, and Shadowing – Constructor & Destructors – An OOP Example – Structures And Modules.

Unit IV: No. of Hours : 15

Web Forms: Web Forms And HTML – Creating a Web Application – Adding Controls to a Web Form – Running a Web Application – Creating a Multi Form Web Project – Handling Client Events – The Control Class – The Web Control Class – Validation Controls – Required Field Validators – Comparison Validators – Range Validators – RegularExpression Validators – Custom Validators – Validation Summaries – Calendars – Ad Rotators.

Unit V: No. of Hours : 20

Data Access With ADO.NET: Accessing Data With Data Adapters and Datasets Working with ADO.NET – Overview of ADO.NET Objects – Simple Binding – Complex

Binding – Binding Data to Controls – Navigating in DataSets – The OleDbConnection class – The SqlConnection class – The OleDbCommand class –The SqlCommand class – The OleDbDataAdapter class – The SqlDataAdapter class – The DataSet class – The OleDbDataReader class – The SqlDataReader class.

BOOK FOR STUDY:

1. “Visual Basic.NET Programming” 2005 Edition – Steven Holzner.

BOOK FOR REFERENCE:

1. Jeffrey R. Shapiro, ”The Complete Reference Visual Basic.NET”, TMH 2002.

Web Resources :

- <http://www.learn-c.org/>
- <http://crasseux.com/books/ctutorial/>
- <http://www.strath.ac.uk/IT/Docs/Ccourse/>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the basic concepts of VB and VB.NET Programming	K1
CO2	Students will have the ability to understand the various tools of VB.NET Programming	K2
CO3	Students will be able to apply different features of OOP Concepts in VB.NET Programming to real time applications	K3,K4
CO4	Students will have the ability to analyze diverse methods of form creation using web with HTML in VB.NET Programming	K4
CO5	Students will have the ability to evaluate different database connectivity methods.	K4,K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	L	L	L	L	L	M	L	M	M
CO2	L	S	S	M	S	L	M	M	M	S	M
CO3	S	L	L	L	M	L	S	M	L	M	M
CO4	M	M	M	S	S	M	M	M	S	S	S
CO5	L	L	M	M	M	M	M	M	L	M	M

Programme Title: M.Sc. Computer Science**Course Title : Core Paper-III DESIGN AND ANALYSIS OF ALGORITHMS****Course Code : 20PCSC3 Hours/Week : 5 Credit : 5****Semester : I Batch : 2020 - 2022****Course Objectives: The course aims to**

- Provide the fundamentals of algorithmic problem solving methods
- Elucidate the perception of divide and conquer methodology
- Explain the concept of Dynamic programming
- Accustom with NP and Hard NP Complete problems

Syllabus**Unit I: No. of Hours: 10**

Introduction-Fundamentals of algorithmic problem solving-Important problem types-Fundamentals of the analysis of algorithm efficiency-analysis frame work-asymptotic notation-Mathematical analysis for recursive and non-recursive algorithms.

Unit II: No. of Hours: 15

Divide and conquer methodology-Merge sort-Quick sort-Binary search-Binary tree traversal-Multiplication of large integers- Strassen's matrix multiplication- greedy method-Prim's algorithm-Kruskal's algorithm-Dijkstra's algorithm.

Unit III: No. of Hours : 15

Dynamic Programming-computing a binomial coefficient- Warshall's and Floyd's algorithm-optimal binary search tree-Knapsack problem- Memory functions.

Unit IV: No. of Hours: 18

Backtracking and Branch and Bound-Backtracking-N-Queen's problem-Hamiltonian circuit problem-Subset sum problem-Branch and bound-Assignment problem-Knapsack problem-Travelling salesman problem.

Unit V: No. of Hours: 17

NP-Hard and NP-Complete problems-P & NP problems-NP-Complete problems-Approximation algorithms for NP-hard problems-Travelling salesman problem-Knapsack problem.

Book for Study:

1. Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education 2003.

Book for Reference:

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, ” Introduction to algorithms” Prentice Hall 1990.

Web Resources :

- https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
- <http://www.facweb.iitkgp.ernet.in/~sourav/daa.html>
- <https://mcastudentsnote.blogspot.in/2012/04/design-and-analysis-of-algorithms.html>
- https://edurev.in/studytube/Analysis-and-Design-of-Algorithms%E2%80%A2-An-algorithm-is/fcfa9723-367f-41ee-9cd7-ca1761f83b5a_p

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the fundamentals of algorithmic Problem solving and algorithm efficiency	K1
CO2	Students will have the ability to understand the perception of divide and conquer methodology	K2
CO3	Students will be able to apply the concepts of dynamic programming	K3,
CO4	Students will have the ability to analyze the notation on backtracking .	K4
CO5	Students will have the ability to evaluate different types of algorithmic methodology.	K4, K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	M	M	L	L	M	M	M	M	S
CO2	S	S	M	M	L	L	S	M	S	S	L
CO3	M	L	L	M	M	L	M	M	M	L	L
CO4	S	S	M	S	S	M	M	L	L	M	M
CO5	M	M	L	S	L	M	M	L	L	M	S

Programme Title: M.Sc. Computer Science

Course Title : Elective-I INTERNET OF THINGS
Course Code : 20PCSEC1 Hours/Week : 4 Credit : 4
Semester : I Batch : 2020 - 2022

Course Objectives: The course aims to

- Provide fundamental knowledge in Internet of Things
- Introduce about Smart objects, Sensors, Actuators
- Familiarize various IoT system Building Blocks
- Acquaint Knowledge of various IoT Industrial Applications

Syllabus

Unit I: No. of Hours : 15

Fundamentals of iot - Evolution of Internet of Things – Enabling Technologies – IoT Architectures: oneM2M, IoT World Forum (IoTWF) and Alternative IoT models – Simplified IoT Architecture and Core IoT Functional Stack – Fog, Edge and Cloud in IoT – Functional blocks of an IoT ecosystem – Sensors, Actuators, Smart Objects and Connecting Smart Objects

Unit II: No. of Hours : 15

IoT protocols - IoT Access Technologies - Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.15.4g, 802.15.4e, 1901.2a, 802.11ah and LoRaWAN – Network Layer: IP versions, Constrained Nodes and Constrained Networks – Optimizing IP for IoT: From 6LoWPAN to 6Lo, Routing over Low Power and Lossy Networks – Application Transport Methods: Supervisory Control and Data Acquisition – Application Layer Protocols: CoAP and MQTT

Unit III: No. of Hours : 12

Design and Development - Design Methodology – Embedded computing logic – Microcontroller, System on Chips – IoT system building blocks – Arduino – Board details, IDE programming – Raspberry Pi – Interfaces and Raspberry Pi with Python Programming.

Unit IV: No. of Hours : 15

Data Analytics and support services - Structured Vs Unstructured Data and Data in Motion Vs Data in Rest – Role of Machine Learning – No SQL Databases – Hadoop Ecosystem – Apache Kafka, Apache Spark – Edge Streaming Analytics and Network Analytics – Xively Cloud for IoT, Python Web Application Framework – Django – AWS for IoT .

Unit V:**No. of Hours : 18**

Case studies – Industrial Applications 9 - Cisco IoT system – IBM Watson IoT platform – Manufacturing – Converged Plantwide Ethernet Model (CPwE) – Power Utility Industry – GridBlocks Reference Model – Smart and Connected Cities: Layered architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control.

BOOK FOR STUDY:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, —IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017

BOOK FOR REFERENCE:

1. ArshdeepBahga, Vijay Madiseti, —Internet of Things – A hands-on approach, Universities Press, 2015
2. Olivier Hersent, David Boswarthick, Omar Elloumi , —The Internet of Things – Key applications and Protocols, Wiley, 2012 (for Unit 2).
3. Jan Ho" ller, VlasiosTsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligence", Elsevier, 2014.
4. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), —Architecting the Internet of Things, Springer, 2011.
5. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, O'Reilly Media, 2011.

Web Resources :

1. <https://www.iotforall.com/what-is-iot-simple-explanation/>
2. <https://www.iotforall.com/internet-of-things-examples-applications/>
3. <https://www.i-scoop.eu/internet-of-things-guide/internet-of-things-examples-cases/>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the basic concepts of IoT	K1
CO2	Students will have the ability to understand the various types of protocols and smart object	K2
CO3	Students will be able to apply different design methodologies in real time applications	K3,K4
CO4	Students will have the ability to analyze diverse methods of data analytics	K4
CO5	Students will have the ability to evaluate different industrial applications of IoT	K4,K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	M	L	L	L	L	L	L	M	M
CO2	L	L	S	M	L	L	L	S	M	M	M
CO3	M	L	S	M	S	L	L	M	M	L	L
CO4	S	M	M	L	S	L	L	L	M	S	S
CO5	M	L	L	M	S	S	L	L	M	M	S

Programme Title: M.Sc. Computer Science

Course Title	ELECTIVE-I:	2. SOFTWARE ENGINEERING	
Course Code	20PCSEC1S1	Hours/Week : 4	Credit : 4
Semester	I	Batch : 2020 - 2022	

Course Objectives: The course aims to

- Introduce basic concept of software engineering.
- Describe the various engineering task in design construction.
- Elaborate the requirement of analysis by using various methods.
- Provide design within the Context of Software Engineering
- Describe the metrics and process metrics that enable software engineers.

Syllabus

Unit – I :

No. of Hours :10

The Evolving Role of Software –Software-The Changing Nature of Software- Legacy Software- Software Myths-Software Engineering-A Layered Technology-A Process Frame Work- The Capability Maturity Model Integration(CMMI)-Process Patterns- Process Assessment- Personal And Team Process Models – Process Technology- Product and Process.

Unit – II :

No. of Hours :8

A Bridge to Design and Construction- Requirements Engineering Tasks-Initiating the Requirements Engineering Process- Eliciting Requirements- Developing Use- Cases- Building the Analysis Model-Negotiating Requirements- Validating Requirements.

Unit – III :

No. of Hours : 12

Requirements Analysis- Analysis Modeling Approaches-Data Modeling Concepts- Object-Oriented Analysis- Scenario- Based Modelling- Flow- Oriented Modeling- Class-Based Modeling- Creating a Behavioural Model.

Unit – IV :

No. of Hours : 15

Design within the Context of Software Engineering- Design Process and Design Quality- Design Concepts-The Design Model- Pattern- Based Software Design- The Golden Rules- User Interface Analysis And Design- Interface Analysis- Interface Design Steps- Design Evaluation.

Unit – V:**No. of Hours : 15**

Metrics in the Process and Project Domains- Software Measurement- Metrics of Software Quality- Integrating Metrics Within the Software Process- Metrics for Small Organisations- Establishing a Software Metrics Program- Business Process Reengineering- Software Reengineering- Reverse Engineering-Restructuring- Forward Engineering- The Economics of Reengineering.

Books for Study:

1. "Software Engineering"-Roger S. Pressman McGraw- Hill International Sixth Edition.

Books for Reference:

1. "Fundamentals of Software Engineering."-Rajib Mall

Web Resources :

http://www.vssut.ac.in/lecture_notes/lecture1428551142.pdf

https://www.tutorialspoint.com/software_engineering/index.htm

<http://ecomputernotes.com/software-engineering/characteristics-and-classification-of-software>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will able to remember the basic concept of software engineering.	K1
CO2	Students will able to remember and understand the different engineering task.	K1&K2
CO3	Students will able to analyze the various methods for requirement analysis.	K4
CO4	Students will able to apply and analyze the context of	K3&K4
CO5	Student will analyzes of Software metrics program.	K3

Mapping of COs with POs & PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO					PSO				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	L	L	M	M	L	M	L	M
CO2	S	S	M	M	M	M	L	L	M	L
CO3	S	M	M	M	S	L	M	M	L	M
CO4	M	S	S	S	M	S	M	L	S	M
CO5	M	M	S	M	M	S	L	L	L	M

Programme Title: M.Sc. Computer Science

Course Title : Elective-I 3. BIO INFORMATICS
Course Code : 20PCSEC1S2 Hours/Week : 4 Credit :4
Semester : I Batch : 2020 - 2022

Course Objectives: The course aims to

- Introduce the concepts of Bio informatics and its importance in medical field. Explore the knowledge about DNA and RNA.
- Describe the large scale DNA sequencing, genetic mapping, micro-array technologies.
- Understand the various databases of bio informatics and their alignment methods.
- Learn the different cluster analysis methods.

Syllabus

Unit – I : No. of Hours :10

Important contributions-Sequencing Development-Aims and tasks of Bioinformatics-Applications of Bioinformatics-Sequence Homology Analysis-Drug Design-Predictive Functions-Medical Areas-Intellectual Property Rights-Challenges and Opportunities-Computer and Programs-Internet-World Wide Web-Browsers-EMBnet and SRS-NCBI.

Unit – II : No. of Hours :8

Background-DNA-RNA-Transcription-Proteins.

Unit – III : No. of Hours : 12

Gxeonomics and Proteomics-Genome Mapping-DNA Sequencing method-Open Reading Frame-Determining Sequence of a Clone –Expressed Sequence Tags-Protein Sequencing-Gene and Protein expression analysis-DNAMicroarrays-Protein Expression Analysis-Gene Discovery-Human Genome Project.

Unit – IV : No. of Hours : 15

Importance of Database-Nucleic acid sequence Database-Protein sequence Databases-Structure databases-Bibliographic Databases and Virtual Library-Specialized Analysis Packages-Use of Databases-Algorithm-Goals and types of Alignments-Study of Similarities-Scoring Mutations, Deletions and Substitutions-Sequence Alignment Methods-Pairwise Alignment-Multiple

Sequence Alignment-Algorithms for Identifying Domains with a Protein Structure-Algorithms for Structural Comparison-Carrying out a sequence search.

Unit – V:

No. of Hours : 15

Cluster Analysis – Types of data in Cluster Analysis – Interval-Scaled Variables – Binary Variables-Categorical,Ordinal,and Ratio-Scaled Variables of Mixed Types – Vector Objects – A Categorization of Major Clustering Methods – Partitioning Methods – Classical Partitioning Methods : k-Means and k-Medoids – Partitioning Methods in Large Databases : From k-Medoids to CLARANS-Hierarchical Methods - Agglomerative and Divisive Hierarchical Clustering – BIRCH: Balance Iterative Reducing and Clustering using Hierarchies –ROCK : A Hierarchical Clustering algorithm for Categorical Attributes – Chameleon : A Hierarchical Clustering algorithm Using Dynamic Modeling – Density Based Methods –DBSCAN: A density-Based Clustering Method Based on Connected Regions with Sufficiently High Density – OPTICS:Ordering points to identify the Clustering Structure – DENCLUE: Clustering Based on Density Distribution Functions – Grid based Methods – STING: Statistical Information Grid– WaveCluster:Clustering Using Wavelet Transformation.

Book for Study:

1. “Basic Bioinformatics”, S.Ignacimuthu, S.J, Narosa pub, 2005.

BOOKS FOR REFERENCE:

1. “Bio informatics”, N.Goutham, 2006
2. “Introduction to Bio informatics”, S.SundraRajan, R.Balaji, 2002.
3. “Bio informatics”- A Beginner’s Guide, Jean – Michel Claverie and Cedric Notredame,2003.

Web Resources :

<https://books.google.co.in/books?isbn=8189866419>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will able to remember the bio informatics and its opportunities	K1
CO2	Students will able to understand how access different molecular DNA and RNA	K2
CO3	Students will able to analyse access different molecular DNA and RNA	K3
CO4	The student apply and analyze the different database of bioinformatics molecular.	K3& K4
CO5	Skill to apply and analyze various clustering algorithms on bio informatics data.	K3& K4

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO					PSO				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	L	M	L	M	L	M	L	M
CO2	M	M	M	M	M	S	L	L	M	L
CO3	S	S	L	L	L	L	M	M	L	M
CO4	L	M	L	S	S	M	M	L	M	S
CO5	M	M	S	M	M	S	S	L	L	M

Programme Title: M.Sc. Computer Science

Course Title : CORE PRACTICAL-I: .NET Programming Lab

Course Code : 20PCSQC1 Hours/Week : 5 Credit 4

Semester : I Batch : 2020 - 2022

Course Objectives: The course aims to

- Introduce “VB.NET” programming concepts
- Familiarize the different forms and controls of “VB.NET”
- Build programs using menus, OOP concepts
- Provide basic knowledge on working with web forms and html.
- Analyze and evaluate different methods of database connectivity in “VB.NET”

Syllabus

1. Programs using windows forms and controls
2. Programs using menus and built-in dialog boxes
3. Programs using OOP concepts
4. Programs using web forms and controls
5. Programs using validation controls
6. Programs using database
7. Program using animation & hyper link
8. Program using databinding
9. Program using datagrid
10. Program using console application

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to understand basic concepts of VB.NET Programming	K2
CO2	Students will be able to apply and implement different forms and controls	K3
CO3	Students will have the ability to analyze and implement OOP concepts	K4
CO4	Students will have the ability to analyze and implement diverse web forms and controls	K4
CO5	Students will be able to implement different database connectivity in forms and controls.	K4, K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	L	L	L	L	M	L	M	M
CO2	s	S	S	M	M	L	M	M	M	S	M
CO3	S	S	M	S	S	M	S	M	L	M	M
CO4	M	L	L	S	M	M	M	M	S	S	S
CO5	S	S	S	M	S	S	M	M	L	M	M

Programme Title: M.Sc. Computer Science

Course Title : CORE PRACTICAL-II: ALGORITHMS LAB

Course Code : 20PCSQC2

Hours/Week : 6

Credit 5

Semester : I

Batch : 2020 - 2022

Course Objectives: The course aims to

- Introduce the important problem types in algorithm concepts.
- Familiarize the different types of divide and conquer methodology.
- Build programs using different types of methodology
- To Understand the basic knowledge on working with fundamentals of algorithmic problem solving methods
- Enhance Problem solving skills

Syllabus

1. Quick Sort
2. Binary Search
3. Binary Tree Traversal
4. Warshall's Algorithm
5. Dijkstra's Algorithm
6. Prim's Algorithm
7. Knapsack Problem- Dynamic Programming
8. Subset Sum Problem- Backtracking
9. Travelling Salesperson Problem- Branch and Bound
10. Strassen's matrix multiplication

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember basic concepts of algorithm concepts	K1
CO2	Students will be able to understand different types of divide and conquer methodology	K2
CO3	Students will have the ability to apply and implement problem solving methods	K3
CO4	Students will have the ability to analyze and implement the dynamic programming concepts	K4
CO5	Students will be able to implement different types of algorithmic methodology.	K4, K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	L	L	M	M	M	M	S
CO2	S	M	S	S	M	L	S	M	S	S	L
CO3	L	S	S	M	M	M	M	M	M	L	L
CO4	L	M	M	S	S	M	M	L	L	M	M
CO5	S	L	M	M	M	S	M	L	L	M	S

Programme Title: M.Sc. Computer Science

Course Title : Core Paper-IV OPEN SOURCE TECHNOLOGY

Course Code : 20PCSC4 Hours/Week : 5 Credit : 5

Semester : II Batch : 2020 - 2022

Course Objectives: The course aims to

- Provide fundamental knowledge in Data Science
- Introduce basic concepts in Python Programming
- Familiarize various working environment like numpy,pandas
- Identify the key issues in Clustering, Validation, Optimization.

Syllabus

Unit I: No. of Hours : 12

Introduction – What is Data science – Motivating Hypothetical : Datasciencester – finding key connectors – A complete Data science example – Data munging - Data science process.

Unit II: No. of Hours : 15

Understanding python's role in data science- Introducing python capabilities - why python - working with numbers and logic - creating and using strings - using conditional and loop statements - storing data using sets, lists, and tuples.

Unit III: No. of Hours : 15

Working with real data - uploading , streaming and sampling data - accessing data in structured flat -file form - managing data from relational databases-interacting with data from nosql databases-accessing data from the web - conditioning your data - juggling between numPy and pandas -validating your data - manipulating categorical variable - dealing with dates in your data - dealing with missing data - slicing and dicing: filtering and selecting data-concatenating and transforming - aggregating data at any level -working with HTML pages - working with raw text - using the bag of words model and beyond -working with graph data.

Unit IV: No. of Hours : 15

Visualizing the data - choosing the right graph – creating advanced scatterplots - plotting time series - plotting geographical data - visualizing graphs – understanding the tools - using the IPython console - using IPython notebook - performing multimedia and graphic integration .

Unit V:**No. of Hours : 18**

Wrangling data - Stretching python's capabilities-exploring data analysis-clustering - Performing Cross – validation, Selection and Optimization .

BOOK FOR STUDY:

1. Joel Grus – Data Science from Scratch First Principles with python – O'Reilly - 2015 .(I Unit)
2. Alberto Boschetti, Luca Massaron - Python Data Science essentials - 2nd Edition – packt publishing Ltd – 2016. (I Unit)
3. John Paul Mueller , Luca Massaron - Python for DataScience for DUMMIES – A Wiley Brand – 2015 . (2 – 5 Units)

BOOK FOR REFERENCE:

1. Jake Vander Plas, Python Data Science Handbook: Essential Tools for Working with Data - O'Reilly Media, 2016.
2. Dr.R.Nageshwara rao – Core Python Programming - Dream etch Press - 2nd Edition – 2016.
3. Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, Abhijit Dasgupta , Practical Data Science Cookbook – Packt publishing – 2014.

Web Resources :

1. <https://dimensionless.in/understanding-different-components-roles-in-data-science/>
2. <https://towardsdatascience.com/the-three-cores-of-data-science-d58af0d7361e>
3. <https://www.tutorialspoint.com/python/>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the basic concepts of DataScience	K1
CO2	Students will have the ability to understand the basic concepts in python.	K2
CO3	Students will be able to apply different working environment for python applications	K3,K4
CO4	Students will have the ability to analyze diverse methods of plotting and understand different tools	K4
CO5	Students will have the ability to evaluate usability of python tools in clustering and classification.	K4,K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO& PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	S	L	L	L	S	L	L	L
CO2	M	S	S	M	L	L	L	L	L	S	L
CO3	M	L	S	M	S	L	L	M	L	L	L
CO4	L	L	L	S	S	M	L	L	M	S	S
CO5	M	L	L	M	S	S	L	L	M	M	S

Programme Title: M.Sc. Computer Science

Course Title : CORE PAPER – V: PRINCIPLES OF COMPILER DESIGN

Course Code : 20PCSC5 Hours/Week : 5 Credit 5

Semester : II Batch : 2020 - 2022

Course Objectives: The course aims to

- Provide the fundamentals of algorithmic problem solving methods
- Elucidate the perception of divide and conquer methodology
- Explain the concept of Dynamic programming
- Accustom with NP and Hard NP Complete problems

Unit I :

Introduction Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens

Unit II:

Basic Data Structures Role of the parser, Writing Grammars – Context – Free Grammars – Top Down parsing – Recursive Descent parsing – Predictive parsing – bottom –up parsing – shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser

Unit III:

Advanced Data Structures Intermediate Languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – procedure calls

Unit IV:

Sorting & Searching Techniques Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole optimization.

Unit V:

Files Introduction – Principal Sources of Optimization – Optimization of basic Blocks– Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing .

BOOKS FOR STUDY

1. Alfred Aho, Ravi Sethi, Jeffrey D.Ullman, “Compilers – Principles, Techniques and Tools”, Pearson Education Asia, 2003

BOOKS FOR REFERENCE

1. Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001
2. Kenneth C. Loudon, « Compiler Construction : Principles and Practices », Thompson Learning, 2003.

WEB RESOURCES

<https://nptel.ac.in/courses/106108113/1>

<http://www.gcebargur.ac.in/principles-compiler-design>

<https://www.pdfdrive.com/principles-of-compiler-design-e58863997.html>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the fundamentals of algorithmic Problem solving and algorithm efficiency	K1
CO2	Students will have the ability to understand Data Structures Role of the parser in writing Grammars.	K2
CO3	Students will be able to apply the concepts of Advance data structures intermediate languages.	K3,
CO4	Students will have the ability to analyze the sorting and searching techniques.	K4
CO5	Students will have the ability to evaluate Principal Sources of Optimization	K4, K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	L	M	L	L	M	M	M	M	S
CO2	S	L	L	M	L	L	S	M	S	S	L
CO3	M	S	L	S	M	L	M	M	M	L	L
CO4	S	S	M	S	S	M	S	L	L	M	M
CO5	M	M	L	S	L	M	M	L	L	M	S

Programme Title: M.Sc. Computer Science**Course Title : CORE PAPER - VI J2EE PROGRAMMING****Course Code : 20PCSC6 Hours/Week : 5 Credit : 5****Semester : II Batch : 2020 – 2022****Course Objectives: The course aims to**

- Teach basis of multitier architecture and J2EE design patterns.
- Give an insight of database connections and JDBC process
- Study the anatomy of Java Servlet and JSP tags.
- Detail out the client side and server side RMI concepts

Syllabus**Unit I No. of Hours : 15**

J2EE Basics: J2EE Multitier Architecture – J2EE Design Patterns & Frameworks: Patterns Concepts – Patterns Catalog.

Unit II No. of Hours : 15

JDBC Objects: The Concept of JDBC – JDBC Driver Types –JDBC Packages - A Brief Overview Of the JDBC Process – Database Connections – Associating the JDBC/ODBC bridge with the database - Statement Objects – Result set – Transaction Processing – JDBC and Embedded SQL: Tables - Inserting data into tables –Updating Tables

Unit III No. of Hours : 20

Java Servlets: Java Servlets and CGI – A Simple Java Servlet – Anatomy of Java Servlet – Reading Data from a Client –Reading HTTP request headers-Sending data to a Client and writing the HTTP response header – Working with Cookies – Tracking Sessions.

Unit IV No. of Hours : 15

JSP: JSP Tags – Tomcat – Request String – User Sessions – Cookies – Session Objects.

Unit V No. of Hours : 10

RMI: RMI Concepts – Server side – Client side.

Book for Study:

1. "The Computer Reference J2EE", Jim Keogh Tata McGraw-Hill Publishing Company Limited, New Delhi.2004.

Chapters 2,4,6,7 (Specific topics only) ,10,11,15.

Book for Reference:

- 1."J2EE.4.Bible" Wiley Publishing Inc, 2003.

Web Resources :

- <http://www.tuturself.com/>
- <http://inf.mit.bme.hu/>
- <http://www.javatpoint.com>
- <http://www.tutorialspoint.com>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the ABC of Programming Languages	K1
CO2	Students will have the ability to understand J2EE multitier and JDBC process in detail	K2
CO3	Students will be able to apply programming to develop JSP and Java Servlet programs	K3
CO4	Students will have the ability to analyze RMI concepts and its Application	K4

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	L	L	S	M	L	M	M
CO2	M	S	S	L	S	M	S	S	M	M	L
CO3	L	M	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	M	M	M	S	S	S	M

Programme Title: M.Sc. Computer Science**Course Title : ELECTIVE -II 1. CLOUD COMPUTING****Course Code : 20PCSEC2 Hours/Week : 4 Credit : 4****Semester : II Batch : 2020 – 2022****Course Objectives: The course aims to**

- Give fundamental knowledge in “Cloud Computing”
- Provide diverse use of Cloud Computing.
- Build knowledge in web usage of Cloud Computing.

Syllabus**Unit I: No. of Hours : 8**

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage- Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

Unit II: No. of Hours : 8

Web-based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Service- On – Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

Unit III: No. of Hours : 12

Centralized Email Communications – Collaborating on Schedules – Collaborating on To – Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

Unit IV: No. of Hours : 20

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing – Collaborating on Databases – Storing and Sharing Files.

Unit V:**No. of Hours : 12**

Collaborating via Web – Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

BOOK FOR STUDY:

1. Michael Miller, “Cloud Computing: Web- Based Applications that Change the Way You Work and Collaborate Online”, Que Publishing, 2011.

BOOKS FOR REFERENCE

1. Kumar Saurabh,” Cloud Computing-Insights into New Era Infrastructure”, Wiley Indian Edition, 2011.

2. Haley Beard,” Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing”, Applications and Data Centres in the Cloud with SLAs, Emereo Pty Limited, July 2008.

Web Resources :

- https://www.tutorialspoint.com/cloud_computing/cloud_computing_pdf_version.htm
- <https://www.thbs.com/downloads/Cloud-Computing-Overview.pdf>
- <https://resources.sei.cmu.edu/library/asset-view.cfm?assetID=28873>
- <http://www.chinacloud.cn/upload/2010-02/10021300131703.pdf>
- <http://aircse.org/journal/nsa/6114nsa03.pdf>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the basic concepts cloud computing	K1
CO2	Students will have the ability to understand the various types and tools of cloud computing	K2
CO3	Students will be able to apply different working features cloud computing	K3,K4
CO4	Students will have the ability to analyze and evaluate web features of cloud computing	K4, K5

Mapping of COs with POs & PSOs : S-STRONG M-MEDIUM L-LIGHT

CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	L	L	L	S	M	L	L	L	L
CO2	L	S	S	L	L		L	L	L	S	M
CO3	L	L	S	S	L	S	L	L	L	L	S
CO4	L	M	S	S	L	S	L	L	M	M	S

Programme Title: M.Sc. Computer Science**Course Title : ELECTIVE –II 2. DATA MINING****Course Code : 20PCSEC2S1 Hours/Week : 4 Credit : 4****Semester : II Batch : 2020 - 2022****Course Objectives: The course aims to**

- Introduce concept of Data Mining and Functionalities.
- Describe the various preprocessing statistical methods and data preparation noiseless data for further analysis.
- Provide basic knowledge on various mining methods and various kinds of Association Rule Mining. Familiarize the classification and prediction in Data mining.
- Elucidate the cluster analysis methods.

Syllabus**Unit – I :****No. of Hours :10**

Motivation - Importance - Definition – Kind of Data – Relational Databases – Data warehouses – Transactional Databases – Advanced Data and Information Systems and Advanced Applications – Data mining Functionalities – Kinds of Patterns – Concept/Class Description : Characterization and Discrimination – Mining Frequent Patterns, Associations, and Correlations – Classification and Predication – Cluster Analysis – Outlier Analysis – Evolution Analysis – Patterns Interestingness – Classification of Data mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Database or Data Warehouse System – Major Issues in Data Mining.

Unit – II :**No. of Hours :8**

Data Pre-processing – Descriptive Data Summarization – Measuring the Central Tendency – Measuring the Dispersion of Data – Graphic Displays of Basic Descriptive Data Summaries – Data cleaning – Missing Values – Noisy Data – Data Cleaning as a process – Data Integration – Data Transformation – Data Reduction – Data Cube Aggregation - Attribute Subset Selection – Dimensionality Reduction – Numerosity Reduction – Data Discretization - Concept Hierarchy Generation for Numerical Data – Concept Hierarchy Generation for Categorical Data.

Unit – III :**No. of Hours : 12**

Mining Frequent patterns, Associations, and Correlations – Basic Concepts – Market Basket Analysis – Frequent Itemsets - Closed Itemsets, and association Rules – Frequent Pattern Mining – Efficient and Scalable Frequent Itemset Mining Methods – The Apriori Algorithm: Finding Frequent Itemset Using Candidate Generation – Mining Frequent Itemsets Using Vertical Data Format –Mining Closed Frequent Itemsets. Mining various kinds of association Association Rules – Mining Multilevel Association Rules – Mining Multidimensional Association Rules –Mining multidimensional Association Rules from Relational Databases and Data Warehouses.

Unit – IV :**No. of Hours : 15**

Classification and Prediction – Issues Regarding Classification and Prediction – Preparing the Data for Classification and Prediction – Comparing Classification and Prediction Methods – Decision Tree Induction – Attribute Selection Measures – Tree Pruning – Scalability and Decision Tree Induction – Bayesian Classification – Bayes’ Theorem – Naïve Bayesian Classification –Bayesian Belief Networks – Training Bayesian Networks – Rule-Based Classification –Using IF-THEN Rules for classification – Rule Extraction from Decision Tree – Rule induction Using Sequential Covering Algorithm – Classification by Backpropagation – A Multilayer Feed-Forward Neural Network – Defining a Network Topology – Backpropagation – Backpropagation and interpretability.

Unit – V:**No. of Hours : 15**

Cluster Analysis – Types of data in Cluster Analysis – Interval-Scaled Variables – Binary Variables-Categorical, Ordinal, and Ratio-Scaled Variables of Mixed Types – Vector Objects – A Categorization of Major Clustering Methods – Partitioning Methods – Classical Partitioning Methods : k-Means and k-Medoids – Partitionng Methods in Large Databases : From k-Medoids to CLARANS-Hierarchical Methods - Agglomerative and Divisive Hierarchical Clustering –BIRCH: Balance Iterative Reducing and Clustering using Hierarchies –ROCK : A Hierarchical Clustering algorithm for Categorical Attributes – Chameleon : A Hierarchical Clustering algorithm Using Dynamic Modeling – Density Based Methods –DBSCAN: A density-Based Clustering Method Based on Connected Regions with Sufficiently High Density – OPTICS:Ordering points to identify the Clustering Structure – DENCLUE: Clustering Based on Density Distribution Functions – Grid based

Methods – STING: Statistical Information Grid– WaveCluster:Clustering Using Wavelet Transformation.

BOOK FOR STUDY:

1. "Data Mining concepts and Techniques"- Jiawei Han and MichelineKamber Publications.

Chapters:1,2,5.1-5.3,6.1-6.67,7.1-7.7

BOOKS FOR REFERENCE:

1. "Data Mining – Introduction and Advanced Topics"- Dunham, Pearson, Education, New Delhi 2003.
2. "Data Mining Techniques" – ArunK.Punjari, University Press India Pvt Ltd., New Delhi 2002.

Web Resources :

- <https://www.springer.com/in/book>
- <https://www.ngdata.com/data-mining-resources/>
- <https://www.tutorialspoint.com/data>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will able to remember and understand the importance of data mining concept and how techniques and automated tools are helps to discover knowledge from massive information repositories or raw data.	K1&K2
CO2	Students will able to Apply pre-processing statistical methods for any given raw data	K1& K3
CO3	Students will have the ability to understand and apply various data mining Methods	K2&K3
CO4	Students will have the ability to understand and analyse the different Classifications and Prediction techniques.	K2&K4
CO5	Student will able to understand and analyze various cluster analysis Methods	K2&K4

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO					PSO				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	L	M	L	S	L	M	M	S
CO2	L	S	L	M	M	S	M	M	M	L
CO3	M	L	M	L	L	M	L	S	L	S
CO4	M	L	S	S	S	L	M	L	M	L
CO5	S	M	S	M	M	S	S	L	M	M

Programme Title: M.Sc. Computer Science

Course Title : ELECTIVE –II 3. DIGITAL IMAGE PROCESSING

Course Code : 20PCSEC2S2 Hours/Week : 4 Credit : 4

Semester : II Batch : 2020 – 2021

Course Objectives: The course aims to

- Provide basic knowledge in digital image processing Introduce image perception views
- Acquaint knowledge in different stages of digital image processing.

Syllabus

Unit I: No. of Hours : 10

Introduction –Problems and applications –Two dimensional systems and mathematical preliminaries – Linear systems and shift invariance-Fourier Transform-Properties-Fourier series –Matrix theory results- Block matrices and kronecker products.

Unit II: No. of Hours : 10

Image perception-Light, luminance, brightness and contrast –MTF of visual systems-Monochrome visual models –Image fidelity criteria- color representation. Digital image sampling and quantization-2D Sampling theory –Image reconstruction from samples. Band limited images- sampling theorem –nuquist rate-Image quantization.

Unit III: No. of Hours : 10

Image enhancement –point processing, Histogram modeling –Special averaging and low pass filtering – Directional smoothing –color image processing, false color and pseudo color.

Unit IV: No. of Hours : 10

Image restoration- Image observation models –Image analysis-edge detection –Boundary extraction-Boundary representation- Region representation. Image segmentation –Detection of discontinuities, edge linking, thresholding, Region-oriented segmentation.

Unit V:**No. of Hours : 20**

Image data compression-Pixel encoding-PCM, entropy coding , run entropy coding, run length, bit plane encoding-predictive techniques-Inter frame coding-coding of two tone images.

BOOKS FOR STUDY:

1. AnilK.jain” Fundamentals of Digital Image Processing”, PHI ,2002.
2. Rafael C Gonzalez,RichardE.Woods,Addison-Wesley, ”Digital Image Processing”,1999.

BOOKS FOR REFERENCE:

1. W.K.Pratt, ”Digital Image Processing”, McGraw Hill.
2. Rosenfield .A, KaK.A.C., ”Digital Picture Processing”, Academic Press, 1982

Web Resources :

http://www.utsa.edu/LRSG/Teaching/EES5053-06/L4_image%20processing.pdf

<http://eeweb.poly.edu/~onur/lectures/lectures.html>

http://www.ent.mrt.ac.lk/~ranga/courses/en5204_2013/L01.pdf

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will have the ability to understand the basic concepts of digital image processing.	K2
CO2	Students will be able to apply different features of digital image processing	K2,K3
CO3	Students will have the ability to analyzed diverse methods of digital image processing	K4
CO4	Students will have the ability to evaluate compression techniques	K4,K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO					PSO				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	M	L	S	L	M	M	S
CO2	L	M	M	M	M	L	M	L	L	L
CO3	M	L	M	L	L	M	L	S	S	S
CO4	M	L	S	S	S	L	M	L	M	L

Programme Title: M.Sc. Computer Science**Course Title : CORE PRACTICAL- III J2EE****Course Code : 20PCSQC3 Hours/Week : 5 Credit :5****Semester : II Batch : 2020- 2022****Course Objectives: The course aims to**

- Introduce the java database connectivity concepts
- Build programs enabling table creation and performing database operations and manipulations in them using JDBC/ODBC concepts
- Get an insight into working with JSP and JavaServlet programs.
- Build an effective client server interface application using RMI concepts.

Syllabus

1. Program using JDBC for creating a table, inserting records and to list out of records.
2. Program using JDBC for deleting records and updating records.
3. Program using java servlet to handle form data.
4. Servlet program to create a table of all the headers it receives along with associated values.
5. Servlet program to pass value from one page to another page.
6. Program in JSP by using session object to create number of visitors hit the page.
7. Program in JSP to create a Cookie and provide client information through that.
8. Program in JSP to find the number of days between two given dates.
9. Program to build a simple Client Server application RMI.
10. RMI program to get the IP address of another client.

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will have the ability to understand about java database connectivity.	K2
CO2	Students will be able to implement and apply java database connectivity for creating tables and performing operations in them	K3
CO3	Students will have the ability to analyze the concepts of JSP and Java servlets.	K4
CO4	Students will be able to evaluate the performance of JSP, Java Servlet and RMI.	K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	L	L	L	S	M	M	M	L
CO2	S	M	M	M	S	M	M	S	S	M	M
CO3	M	L	S	S	L	L	M	S	L	S	L
CO4	S	M	M	M	S	M	S	M	M	L	S

Programme Title: M.Sc. Computer Science

Course Title : CORE PRACTICAL-IV: PYTHON PROGRAMMING LAB

Course Code : 20PCSQC4 Hours/Week : 4 Credit :4

Semester : II Batch : 2020 - 2022

Course Objectives: The course aims to

- Introduce Python programming concepts
- Familiarize the concepts numbers,logics,strings,lists
- Build programs using python basic concepts
- Provide basic knowledge on working with file handling.
- Analze and evaluate different methods of clustering and classification.

Syllabus

1. Program to find a) GCD of two numbers .
b) maximum of a list of numbers.
2. Program to find removing all duplicate elements in the list.
3. Program using Statistical analysis.
4. Program using Functions & Control Structures.
5. Program using File handling.
6. Using the tool for Visualization.
7. Using the tool for Data transformation.
8. Using the tool for Clustering.
9. Using the tool for Classification.
10. Program using Text analysis.

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to understand basic concepts Python programming	K2
CO2	Students will be able to apply and implement functions and controls	K3
CO3	Students will have the ability to analyze and implement visualization concepts	K4
CO4	Students will have the ability to analyze and implement diverse tools for data transformation	K4
CO5	Students will be able to apply, analyze and implement clustering and classification	K3,K4, K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO 1	PSO 2	PSO 3	PSO 4	PSO5
CO1	S	M	L	M	L	M	S	M	L	M	M
CO2	L	S	S	L	L	L	L	S	L	M	L
CO3	L	L	L	M	S	M	L	L	M	M	L
CO4	L	L	L	S	S	L	L	L	M	S	S
CO5	M	L	L	M	S	S	L	L	M	M	S

SRI SARADA COLLEGE FOR WOMEN (AUTONOMOUS), SALEM-16**M.Sc., COMPUTER SCIENCE (CBCS)***(For the candidates admitted from 2019-2020 onwards)*

<u>SEMESTER-III</u>						
S.No	Year	Course	Title	Credit	Hour	Marks
14.	19PCSC7	Core Paper - VII	System Software	5	5	100
15.	19PCSC8	Core Paper – VIII	Network Security	5	5	100
16.	19PCSEC3	Elective – III		4	4	100
17.	19PCSEC4	Elective – IV		4	4	100
18.	19PCSEPC	Elective – V	Mini Project using open source	2	4	100
19.	19PCSQC5	Core Practical – V		2	4	100
20.	19PCOEDC	Extra Disciplinary Course		4	4	100
Extra Skills						
<ul style="list-style-type: none"> * <i>Productive Preparation for NET/SET/JRF-III (Self Study - 1 Credit extra)</i> * <i>Articulation and idea Fixation Skills-6 Hours per Semester(Out of College Hours-1 Credit extra)</i> * <i>Life Skills promotion- 2 hours per semester(Out of College Hours-1 Credit extra)</i> * <i>Physical fitness practice-20 hours per semester(Out of College Hours-1 Credit extra)</i> * <i>Pre preparation for the project-5hours per week(out of college hours)</i> 						
Total				26+4*	30	700
<u>SEMESTER-IV</u>						
21.	19PCSPC	External PROJECT		8	30	100
Extra Skills						
<ul style="list-style-type: none"> * <i>Productive Preparation for NET/ SET/ JRF - IV (Self Study 1 Credit extra)</i> * <i>Articulation and idea Fixation Skills-6 Hours per Semester(Out of College Hours-1 Credit extra)</i> * <i>Life Skills promotion- 2 hours per semester(Out of College Hours-1 Credit extra)</i> * <i>Physical fitness practice-20 hours per semester(Out of College Hours-1 Credit extra)</i> 						
Total				8+4*	30	100
Grand Total				92	120	2100

- *Free and Open Source Software (FOSS) - 2 hours per semester (out of college hours)*

Programme Title: M.Sc. Computer Science**Course Title : CORE PAPER -VII SYSTEM SOFTWARE****Course Code : 19PCSC7 Hours/Week : 5 Credit :5****Semester : III Batch : 2019 - 2021****Course Objectives: The course aims to**

- Provide fundamental knowledge about System Software
- Introduce basic concepts in Assemblers, Loaders, Linkers.
- Familiarize various Concepts like macro processor
- Identify the System Software Tools.

Syllabus**Unit I: No. of Hours : 12**

Introduction- System Software And Machine Architecture - The Simplified Instructional Computer(SIC)-Machine Architecture- Data and instruction formates-addressing modes-instruction sets -I/O and programming..

Unit II: No. of Hours : 15

Assemblers - basic Assembler functions-A simple SIC assembler - Assembler algorithm and data structures - Machine dependent Assembler features - instruction formates and addressing models -program relocation-machine independent assembler features -Literals- Symbol-defining statements -Expressions -one pass Assemblers and Multi pass Assemblers-Implementation examples-MASM Assembler..

Unit III: No. of Hours : 15

Loaders and linkers - basic loader functions-Design of an Absolute Loader-A simple Bootstrap loader - Machine dependent loader features-Relocation-program Linking-Algorithm and data structure for linking loader-Machine -Independent Loader features-Automatic Library search-Loader Options -Loader desion options- Linkage Editors-Dynamic Linking -Bootstrap Loaders - Implementation examples-MSDOS linker.

Unit IV: No. of Hours : 15

Macro processors-basic macro processors functions -Macro Definition and expansion -Macro processor Algorithm and data structures -Machine -independent macro processor features-concatenation -of Macro parameters -Generation of Unique Labels-conditional Macro Expansion-Keyword Macro parameters -Macro within Macro -Implementation examples -MASM Macro processor -ANSIC C Macro language.

Unit V:**No. of Hours : 18**

System software tools -text editors-Overview of the Editing process -User Interface- Editor Structures -Interactive debugging systems-Debugging functions and capabilities- Relationship with other parts of the system -User -Interface Criteria.

BOOK FOR STUDY:

1. Leland L.Beck,"System Software -An Introduction to Systems Programming",3rd Edition,Pearson Education Asia,2000.
2. D.M.Dhamdhere,"Systems Programming and Operating System ",Second Revised Edition,Tata McGraw-Hill,1999.

BOOK FOR REFERENCE:

1. John J.Donovan"Systems Programming ",Tata McGraw-Hill Edition,1972.John R.Levine, Linkers&Loaders-Harcourt India Pvt.Ltd.,Morgon Kaufmann Publishers.2000

Web Resources :

1. <http://www.anyplace-control.com/computer-system-software-resource.html>
2. <http://www.geeksforgeeks.org/system-software/>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the basic concepts of System Software	K1
CO2	Students will have the ability to understand the basic concepts in Assemblers.	K2
CO3	Students will be able to understand and analyze different working environment of Assemblers and Loaders	K2,K4
CO4	Students will have the ability to analyze Macro Processors	K4
CO5	Students will have the ability to evaluate usability System Software Tools.	K4,K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	S	L	L	L	S	L	L	L
CO2	M	S	S	M	L	L	L	L	L	S	L
CO3	M	L	S	M	S	L	L	M	L	L	L
CO4	L	L	L	S	S	M	L	L	M	S	S
CO5	M	L	L	M	S	S	L	L	M	M	S

Programme Title: M.Sc. Computer Science

Course Title : CORE PAPER – VIII: NETWORK SECURITY

Course Code : 19PCSC8 Hours/Week : 5 Credit 5

Semester : III Batch : 2019 - 2021

Course Objectives: The course aims to

- Provide the fundamentals of data encryption standards
- Elucidate the perception of public key cryptography
- Explain the concept of system security
- Accustom with copyrights & patents

Unit-I :

Introduction - Introduction to security attacks -services and mechanism- introduction to cryptography- Classical Encryption Techniques- substitution ciphers and transposition ciphers- cryptanalysis - steganography-stream and block ciphers- Block ciphers- Data Encryption Standard (DES) - strength of DES-differential and linear crypt analysis of DES- block cipher modes of operations- triple DES.

Unit-II :

Public key cryptography- Number Theory concepts-Primality-Modular Arithmetic-Fermat & Euler Theorem-Euclid Algorithm-RSA Algorithm-Elliptic Curve Cryptography-Diffie Hellman Key Exchange-Cryptographic hash functions-Cipher Block Chaining-Secure Hash Algorithm-Digital Signature : Schnorr Digital Signature Scheme-Digital Signature Standard-Kerberos.

Unit-III :

System Security - Intruders-Intruder detection-Password management-Viruses-virus countermeasures-worms-DOS attack- Firewalls . Transport-Level Security : Secure Socket Layer and Transport Layer Security-Wireless Transport Layer Security.

Unit-IV :

Operating system and database security - security methods of Os- Access Control-File Protection mechanism -User authentication-Security policies- models of security-Concept of a Database-Security Requirements- Multilevel database.

Unit-V

Ethical and legal issues in computer security- cybercrime -Computer crime- Copyrights-patents-Information and law-computer crime-Ethical issues-case studies.

BOOKS FOR STUDY:

1. William Stallings , "Cryptography & Network Security" , Person Education,5th edition. New Delhi 2005.
2. Charles P.Pfleeger , shari L.Pfleeger," Security in Computing", Prentice Hall,4th edition.2003.

WEB RESOURCES

<https://www.sans.org/network-security/>

https://www.tutorialspoint.com/information_security_cyber_law/network_security.htm

<https://www.springboard.com/blog/free-cybersecurity-resources/>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the fundamentals of cryptography	K1
CO2	Students will have the ability to understand public key cryptography	K2
CO3	Students will be able to apply the concepts of system security	K3,
CO4	Students will have the ability to analyze the models of security	K4
CO5	Students will have the ability to evaluate the ethical and legal issues in security	K4, K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	L	M	L	L	M	M	M	M	S
CO2	S	L	L	M	L	L	S	M	S	S	L
CO3	M	S	L	S	M	L	M	M	M	L	L
CO4	S	S	M	S	S	M	S	L	L	M	M
CO5	M	M	L	S	L	M	M	L	L	M	S

Course Title	: ELECTIVE : III	SOFT COMPUTING	
Course Code	: 19PCSEC3	Hours/Week : 4	Credit :4
Semester	: III	Batch : 2019 - 2021	

- Provide fundamental knowledge in Soft computing
- Detail about genetic algorithms and fuzzy sets.
- Familiarize various fuzzy logics.
- Acquaint Knowledge of various genetic algorithms and neuro fuzzy system.

Unit - I**No. of Hours : 10**

Introduction – Hard Computing – Features of hard computing – Soft Computing – Features of soft computing – Hybrid Computing – Introduction to Optimization – Example – Classification – Principle – Duality Principle – Traditional Methods of Optimization – Exhaustive search methods – Random walk methods – Steepest Descent method – Drawbacks.

Unit – II**No. of Hours : 15**

Introduction to genetic algorithms – Working cycle – Binary-Coded GA – Crossover or Mutation – A hand calculation – Fundamental theorem of GA – Limitations – GA-parameters setting – Constraints – Advantages – Disadvantages-Some specialized Genetic algorithms – Real coded GA – Cross over Operators – Mutation Operators – Micro-GA-Visualized Interactive GA-Scheduling GA.

Unit – III**No. of Hours : 15**

Introduction to Fuzzy Sets – Crip Sets – Notation – Operations – Properties – Fuzzy Sets – Representaion – Difference between Crip set and Fuzzy set – Definitions – Standard Operations – Properties of fuzzy sets – Fuzzy reasoning and clustering – Fuzzy Logic controller-Two major forms – Hierarchical fuzzy logic controller – Sensitivity analysis – Advantages - Disadvantages – Fuzzy Clustering – Fuzzy C-Means Clustering – Entropy – based Fuzzy Clustering

Unit – IV**No. of Hours : 17**

Fundamentals of Nerual Networks – Biological neuron – Artificial Neuron – A layer of Neurons – Multiple Layers of Neurons – Static vs Dynamic Neural Networks – Training of Neural Networks – Examples of neural networks – Multi-Layer Feed-Forward Neural Network – Radial Basis Function Network – Self-Organizing Map.

Unit – V**No. of Hours : 18**

Combined Genetic algorithms: Fuzzy Logic – Fuzzy-Genetic Algorithms – Genetic – Fuzzy System – Combined Genetic algorithms : Neural Networks- Working Principle of a Genetic-Neural System – Forward Calculation – Combination Neural Networks : Fuzzy logic -Neuro Fuzzy System Working Based on Mamdani Approach – Neuro Fuzzy System Working Based on Takagi and Sugeno’s Approach.

BOOKS FOR STUDY

1. Soft Computing, Dilip Kumar Pratikar, Narosa Publishing House 2009. Chapters 1-11.

BOOKS FOR REFERENCE

1. Soft Computing and Intelligent Systems, Naresh K.Sinha & Madan M .Gupta, Elsevier 1999.
2. Principles of Soft Computing ,S.N. Sivanandam & S.N. Deepa, Wiley India 2007

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the basic concepts of soft computing .	K1
CO2	Students will have the ability to understand the genetic algorithms and fuzzy sets.	K2
CO3	Students will be able to apply fuzzy set operations and neural network concepts.	K3,K4
CO4	Students will have the ability to analyze diverse methods of fuzzy logics.	K4
CO5	Students will have the ability to analyze and evaluate genetic algorithms and neuro fuzzy system..	K4,K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	S	L	L	L	S	L	L	L
CO2	M	S	S	M	M	L	L	L	L	S	L
CO3	M	L	S	M	S	L	L	M	L	L	L
CO4	L	L	L	M	S	M	L	L	M	S	M
CO5	M	L	L	M	S	M	L	L	L	M	S

Programme Title: M.Sc. Computer Science

Course Title	: ELECTIVE -III	2. E-COMMERCE	
Course Code	: 18PCSEC3S1	Hours/Week : 4	Credit : 4
Semester	: III	Batch : 2019 - 2021	

Course Objectives: The course aims to

- Provide fundamental knowledge in “E-Commerce”
- Introduce Business models & payment types.
- Gain knowledge about security and Internet marketing.

Syllabus**Unit I: No. of Hours : 10**

E-Commerce - Benefits, Issues and Constraints, Internet, Intranet Extranet and SCM, Limitations of Internet in E-Commerce.

Unit II: No. of Hours : 8

What is B2B? Supply chain management and B2B, B2B models, Business models.

Unit III: No. of Hours : 12

E-money-Requirement for internet based payments-Types of E-Payments-B2B and E-Payments.

Unit IV: No. of Hours : 15

Security threats- protection and recovery in e-commerce- role of biometric security.

Unit V: No. of Hours : 15

Internet Marketing- Pros and cons of Online Shopping- Internet Marketing Techniques-e-cycle of Internet Marketing.

BOOK FOR STUDY:

1."Electronic commerce from vision to fulfillment"-Elias- M.Awad published by Pearson education. Chapters 1,3,4,9,11,15.

BOOK FOR REFERENCE:

1."E-Commerce", Kamalesh K Bajaj, Debjani Nag, Tata McGraw Hills, 2nd edition.

Web Resources :

- https://www.tutorialspoint.com/e_commerce/index.htm
- https://www.cdu.edu.au/centres/aflf/pdf/Ecommerce_for_beginners.PDF
- <http://www.dynamicwebs.com.au/tutorials/e-commerce.htm>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to understand the basic concepts of E-commerce	K1,K2
CO2	Students will be able to apply different models	K2
CO3	Students will be able to apply and analyze diverse payment methods.	K2, K3
CO4	Students will have the ability to analyze and evaluate different security methods and internet marketing.	K4, K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	L	L	M	L	L	S	L	L	L
CO2	M	L	M	L	M	L	L	M	L	S	L
CO3	M	L	L	M	L	L	L	M	L	L	L
CO4	L	M	M	M	S	M	L	L	M	S	M
CO5	M	L	L	M	S	M	L	L	L	M	S

Programme Title: M.Sc. Computer Science

Course Title : ELECTIVE -III 3. SOFTWARE PROJECT MANAGEMENT

Course Code : 18PCSEC3S2 Hours/Week : 4 Credit : 4

Semester : III Batch : 2019 - 2021

Course Objectives: The course aims to

- Introduce project management.
- Describe determination of estimation and risk of resource management in software project.
- Provide advanced knowledge for monitoring and organizing the team member for task allocation.
- Familiarize various planning activity of software quality.
- Enlighten testing of the project by applying techniques and methodologies that ensure whether right things are done in right way.

UNIT:I

No. of Hours :10

SPM: Introduction-Project planning-Project evaluation-election of an appropriate project approach.

UNIT: II

No. of Hours :10

Software effort estimation-Activity planning-Risk management-Resource allocation.

UNIT: III

No. of Hours :15

Monitoring and control -Managing people and organizing teams-Small projects.

UNIT:IV

No. of Hours :15

Software Quality: introduction-Establishment-Software Quality Assurance Planning-Overview-Purpose and Scope-SQA management-Documentation Standards, Practices, Conventions and Metrics.

UNIT:V

No. of Hours :10

Reviews and Audits-Tests-tools-Techniques and methodologies - Training-Risk management.

Books for Study:

1. "Software Project Management", BOB Huges Mike Cotterell, 2ndedn, McGraw Hill.
2. "Software Quality", Mordechai Ben, Menachem/Garry S.Marliss, Vikas. 1997 (Unit V)

Books for Reference:

1. "Quality Software Project management, Futrell, Person Education India.
2. "Software Project management, Royce, Person Education India.
3. "Basics of Software Project management", NIT, Prentice-Hall of India.
4. "Software Project management from concept to Deployment", Drew bire and Mike Harwood, Wiley Dreamtech.
5. "An Introduction to Software Quality Assurance and its implementation".,DarrellInce.

Web Resources :

1. <https://www.guru99.com/>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will able to remember the fundamental software project management.	K1
CO2	Students will able to remember, understand various task involve in software project management.	K1
CO3	Students will have ability to analyzing the task for the team and organizing team.	K4
CO4	Students will have the ability to understand and apply various aspect of software quality	K4
CO5	Student will able to analyze and apply right things doing for success of software project	K2 & K3

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	L	L	L	L	L	M	L	L	L
CO2	M	M	L	L	M	L	L	M	L	S	L
CO3	L	L	L	M	M	L	L	M	L	L	L
CO4	L	M	M	M	S	M	L	L	M	S	M
CO5	M	L	L	M	S	M	L	L	L	M	S

Programme Title: M.Sc. Computer Science

Course Title	: ELECTIVE -IV	DATA ANALYTICS WITH R	
Course Code	: 19PCSEC4	Hours/Week : 4	Credit : 4
Semester	: III	Batch : 2019 – 2021	

Course Objectives: The course Aims to

- Provide fundamental knowledge in “Big data Analytics” Introduce
- Exploratory Data Analysis using R Coding
- Gain knowledge about Visualizing.

Unit - I

Introduction to Big data Analytics – overview – State of the Practice in Analytics – Key Roles for the New Big Data Echo system – Examples of Big Data Analytics : Data Analytics Lifecycle – Overview - Phase1 Discovery – Phase2 Data Preparation – Phase3 Model Planning – Phase4 Model Building – Phase5 Communicate Results – Phase6 Operationalize.

Unit - II

Review of Basic Data Analytic Methods Using R : Introduction to R – Exploratory Data Analysis – Statistical Methods for Evaluation : Advanced Analytical Theory and Methods: Clustering – K-Means – Advanced analytical Theory and Methods: Association Rules – Apriori Algorithm – Evaluations of Candidate Rules – Applications of Association Rules – Evaluation and Testing – Diagnostics.

UNIT-III

Advanced Analytical Theory and Methods : Regression –Linear Regression – Logistic Regression – Additional Regression Modelas – Advanced Analytical Theory and Methods: Classification – Decision Trees – Naïve Bayes – Diagnostics of Classifiers – Additional Classification Methods.

UNIT-IV

Advanced Analytical Theory and Methods : Time Series Analysis- Overview – ARIMA Model – Additional Methods – Advanced Analytical Theory and Methods : Text Analysis

UNIT-V

Visualizing and Manipulation Data using R – Histogram and bar plots – Scatter plots – Box Plot –Line Plot – Application – Outlier detection – Formatting Plots.

BOOK FOR STUDY

- 2) Data Science and Big Data Analytics, EMC Education Services, Wiley Publishers,
- 3) Learning Predictive Analytics with R, Eric Mayor, PACKET Publishing, 2015
- 4) Frank Ohlhorst, Big Data Analytics Turning Big Data Into Big Money, Wiley Publishers, 2012 (UNITS I,II)

BOOK FOR REFERENCE

- 1) 1 . Beginning R- The Statistical Programming Language. Dr. Mark Gardener, Wiley India Private Limited, Edition 2014 (UNITS III,IV,V)

WEB RESOURCES

<https://analyticstraining.com/best-free-resources-on-r/>

<https://www.dataschool.io/resources/>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to understand the ABC of Data Analytics	K1
CO2	Understand the basics in R programming in terms of constructs, control statements, string functions	K2
CO3	Understand the use of R for Big Data analytics	K3
CO4	Learn to apply R programming for Data analytical Theory and Methods.	K4
CO5	Able to appreciate and apply the R programming from a statistical perspective	K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	L	L	S	M	L	M	M
CO2	M	S	S	L	S	M	S	S	M	M	L
CO3	L	M	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	M	M	M	S	S	S	M
CO5	M	M	L	S	M	S	S	S	M	S	M

Programme Title : M.Sc. Computer Science**Course Title : ELECTIVE -IV 2. SOFTWARE TESTING****Course Code : 19PCSEC4S1 Hours/Week : 4 Credit : 4****Semester : III Batch : 2019 - 2021****Course Objectives: The course aims to**

- Study the fundamental concepts of software testing which includes objectives, process, criteria, strategies, and methods
- Describe the various testing types and level of testing.
- Provides knowledge on transaction flow testing and data flow testing techniques so that the flow of the program is tested as well
- Learn the Domain testing and path testing, logic based testing to explore the testing process easier.
- Describe specialized testing guidelines for specialized environments, architectures, and applications that are commonly encountered by software engineers.

Syllabus**UNIT I****No. of Hours :8**

Purpose of Software testing - Some Dichotomies - a model for testing - Playing pool and consulting oracles - Is complete testing possible - The Consequence of bugs - Taxonomy of bugs.

UNIT II**No. of Hours :12**

Software testing Fundamentals - Test case Design - Introduction of Black Box Testing and White Box testing - Flow Graphs and Path test - Path testing Basics - Predicates, Path Predicates and Achievable Paths - Path Sensitizing - Path Instrumentation - Implementation and Application of Path Testing.

UNIT III**No. of Hours :10**

Transaction Flow testing - Transaction Flows - Techniques - Implementation comments - Data Flow Testing - Basics - Strategies - Applications, Tools and effectiveness - Syntax Testing - Overview - Grammar for formats - Implementation and Application - Testability Tips.

UNIT IV**No. of Hours :15**

Logic Based Testing - Motivational Overview - Decision tables - Path Expressions - KV Charts – Specifications - States, State Graphs and transition Testing - State Graphs- Good & Bad states.

UNIT V**No. of Hours :15**

Testing GUIs - Testing Client - Server Architecture -Testing for Real-time System -A Strategic Approach to Software Testing - Issues - Unit Testing - Integration testing - Validation testing - System testing - The art of Debugging.

Books for Study:

1. "Software Testing Techniques", Boris Beizer, Dreamtech Press, Second Edition 2003. Chapter 1- 5 , 9 - 11.
2. "Software Engineering - A Practitioner's Approach", Roer.S.Pressman ,Mc-Graw Hill. 5th edition, 2001. Chapter 16 & 17.

Books for Reference:

1. "Software Testing Principles and Practices", Naresh Chauhan, Oxford Higher Education.
2. "The Art of Software Testing", Myers and Glenford.J., John-Wiley & Sons, 1979.
3. "Testing Computer Software", Comkaner, Jack Falk, Hung Quoc Nguyen, International Thomas on Computer Press, Second Edition.

Web Resources :

1. <http://www.softwaretestinghelp.org/best-software-testing-online-training-course/>
2. <http://testingeducation.org/wordpress/>
3. http://www.ittoday.info/Articles/Software_Testing_Techniques.htm

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will able to remember and understand the concept of software testing and its essentials.	K1 &K2
CO2	Ability to understand various bugs and correcting them after knowing the consequence of the bugs.	K2
CO3	Student will ability to understand and apply the testing techniques such as data flow testing and data transaction flow testing.	K2 & K3
CO4	Student will able to apply and analyze various familiar testing techniques such as domain testing, path testing and logic based techniques.	K3& K4
CO5	Student will have an ability to analyze and apply various software testing methods and modern software testing tools for their testing projects.	K3& K4

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	L	L	L	L	M	L	L	L	L
CO2	M	S	L	L	L	L	L	L	L	S	M
CO3	L	L	M	S	L	S	L	L	L	L	S
CO4	L	M	M	M	L	S	L	L	M	M	S

Programme Title: M.Sc. Computer Science

Course Title : ELECTIVE -IV 3. AI AND EXPERT SYSTEM
Course Code : 19PCSEC4S2 Hours/Week : 4 Credit : 4
Semester : III Batch : 2019 - 2021

Course Objectives: The course aims to

- Introduce basis of problem solving and artificial intelligence
- Acquire knowledge of various state space search methods.
- Know the use of predicate calculus in problem solving.
- Identify the ways of building an expert system

Syllabus**Unit- I No. of Hours : 10**

Problem solving and AI - Puzzles and Games - Problem States and operators Heuristic programming - state space representations - state descriptions - graph notations – nondeterministic programs.

Unit- II No. of Hours : 12

State space search methods - breadth first and depth first search - heuristic - admissibility - optimality of algorithms - performance measures - problem reduction representations - AND/OR graphs and higher level state space.

Unit- III No. of Hours : 15

Problem reduction search methods - cost of solution trees - ordered search - alpha beta and minimum procedure - theorem proving in predicate calculus - syntax, semantics, Herbrand universe variables, qualifiers, unification, resolvents.

Unit- IV No. of Hours : 13

Predicate calculus in problem solving - answer extraction process - resolution - Automatic program writing - predicate calculus - proof finding methods.

Unit-V No. of Hours : 10

Expert Systems: Expert systems and conventional programs expert system organization - knowledge engineering: knowledge representation techniques - knowledge acquisition - acquiring knowledge from experts - automating knowledge acquisition -Building an expert system - difficulties in developing an expert system.

Book For Study

1. "Artificial Intelligence Programming", E. Charnail, C.K Reiesbeck and D.V Medermett, ice Erlbaum Associates, N.J, 1980

Books for Reference

1. "Principles of Artificial Intelligence", NJ Nilson, Tiega Press, Polo Alto, 1980
2. Elain Rich and Kevin Knight, "Artificial Intelligence", McGraw Hill, 1991

Web Resources :

- <http://www.techopedia.com/>
- <http://www.britannica.com/>
- <http://www.expertsystem.com>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will have the ability to understand the method of problem solving using artificial intelligence	K2
CO2	Students will have the ability to apply various state space search techniques.	K3
CO3	Students will be able to analyze various problem reduction methods	K4
CO4	Students will be able to evaluate the performance of artificial and expert systems	K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	L	L	M	L	M	L	L	L	L
CO2	M	L	L	L	L	M	L	L	L	S	M
CO3	M	L	M	L	L	S	L	L	L	L	S
CO4	L	L	L	M	L	S	L	L	M	L	S

Programme Title: M.Sc. Computer Science

Course Title	: Core Practical -V	R Programming Lab	
Course Code	: 19PCSCQC5	Hours/Week : 4	Credit : 4
Semester	: III	Batch : 2019 – 2021	

Course Objectives: The course Aims to

- Expand R by installing R packages.
 - Read Structured Data into R from various sources.
 - Understand the different data types in R.
 - Understand the R coding..
 - Analyze and visualize different Data Analytical methods in “R”
1. To get the input from user and perform numerical operations (MAX, MIN, AVG, SUM, SQRT, ROUND).
 2. To perform data import/export (.CSV, .XLS, .TXT) operations using data frames.
 3. To get the input matrix from user and perform Matrix addition, subtraction, multiplication, inverse transpose and division operations using vector concept.
 4. To perform statistical operations (Mean, Median, Mode and Standard deviation).
 5. To perform data pre processing operations
 - i) Handling Missing data
 - ii) Min - Max normalization
 6. To perform dimensionality reduction operation using PCA.
 7. To perform Simple Linear Regression and Multi Linear Regression.
 8. To perform K - Means clustering operation and visualize it.
 9. To diagnose any disease using KNN classification.
 10. To perform market basket analysis using Apriori algorithm.

Course Outcomes (CO):

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to understand the R Studio Environment.	K1
CO2	Students will Understand the basics in R programming in terms of constructs, control statements, string functions	K2
CO3	Understand and Apply Pre-processing operations on various Data.	K3
CO4	Learn to apply R programming for Data analytical Theory and Methods.	K4
CO5	Student will Able to apply the R programming for a statistical perspective	K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	L	L	S	M	L	M	M
CO2	M	L	S	L	S	M	S	S	M	M	L
CO3	L	M	S	S	M	S	L	S	M	S	M
CO4	L	S	S	S	M	M	M	S	S	L	M
CO5	M	M	L	S	M	S	M	M	M	L	M

Programme Title: M.Sc. Computer Science

Course Title : ELECTIVE -V 1. PROJECT USING OPEN SOURCE
Course Code : 19PCSEPC Hours/Week : 4 Credit : 2
Semester : III Batch : 2019 - 2021

Course Objectives: The course aims to

- Provide knowledge of open source software
- Gain skill of project planning
- Familiarize the design phase of software.
- Implementing their idea for creating software project.
- Ensure testing of project.

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the computing concepts.	K1
CO2	Students will have the ability to understand the various domains in open source software.	K2
CO3	Students will be able to apply design phase of project.	K3, K4
CO4	Students will have the ability to analyze their project	K4
CO5	Students will have the ability to evaluate their project during software testing.	K4,K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	L	L	M	S	M	L	L	L	M
CO2	L	M	S	L	S	L	L	M	L	S	M
CO3	M	S	S	S	L	S	L	L	M	L	S
CO4	M	S	M	M	M	S	L	L	M	L	S

Programme Title: M.Sc. Computer Science

Course Title : ELECTIVE -V 2. UNIFIED MODELLING LANGUAGE

Course Code : 19PCSEPCS1 Hours/Week : 4 Credit : 2

Semester : III Batch : 2019 - 2021

Course Objectives: The course aims to

- Provide basic knowledge in UML.
- Familiarize the Concepts about use cases and activity diagram.
- Gathering ideas in designing pattern of UML.

Syllabus

Unit I: No. of Hours : 8

Introducing the UML - understanding object orientation-working with object orientation- working with relationships-understanding aggregations, composites, interfaces, relations.

Unit II: No. of Hours : 8

Introducing use cases - working with use case diagrams - working with state diagrams - working with sequence diagrams - working with collaboration diagrams.

Unit III: No. of Hours : 12

Working with activity diagrams - working with component diagrams - working with deployment diagrams - extending understanding the foundations of the UML - Fitting the UML into a development process.

Unit IV: No. of Hours : 20

Introducing the case study - programming a domain analysis - gathering system requirements - developing the use cases - getting into interactions and state changes.

Unit V: No. of Hours : 12

Designing look, feel and deployment- Understanding design patterns - modeling embedded systems-shaping the future of the UML

BOOK FOR STUDY:

1. "UML in 24 hours by Joseph Schmuller", Sams Techmedia Publications

BOOKS FOR REFERENCE:

1. "Applying UML and Patterns", Craig Larman, Pearson Education
2. "Real Time UML" Bruce Powel Douglass, Pearson Education
3. "UML Distilled" Martin Fowler with Kendall Scott, Grady Booch, Ivar Jacobson, James Rumbaugh, Pearson Education

Web Resources :

- <https://people.eecs.ku.edu/~hossein/Teaching/Fa13/810/Readings/UML-diagrams.pdf>
- <https://creately.com/blog/diagrams/uml-diagram-types-examples/>
- <http://stlab.istc.cnr.it/documents/swe0910/UMLBasics.pdf>
- http://www.pvpsiddhartha.ac.in/dep_it/lecturenotes/OOAD/unit-2.pdf

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will have the ability to understand the basic concepts of UML	K2
CO2	Students will be able to apply usecase diagram and activity diagram.	K3
CO3	Students will have the ability to analyze and evaluate case study and designing patterns in UML.	K4,K5

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	L	L	S	M	L	M	M
CO2	M	S	S	L	S	M	S	S	M	M	L
CO3	L	M	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	M	M	M	S	S	S	M

Programme Title: M.Sc. Computer Science

Course Title	: ELECTIVE -V	3. GENETIC ALGORITHMS	
Course Code	: 19PCSEPCS2	Hours/Week : 4	Credit : 2
Semester	: III	Batch : 2019 - 2021	

Course Objectives: The course aims to

- Introduce basis of evolutionary computation with the application of genetic algorithm
- Explain the role of genetic algorithms in scientific modelling.
- Detail out the strategies of implementing genetic algorithm

Unit I**No. of Hours : 10**

Over View-Evolutionary Computation-Biological Terminology-Elements & Genetic Algorithm- Genetic Algorithm And Traditional Search Methods-Applications of Genetic Algorithm-Simple Genetic Algorithm-Applications of Genetic Algorithm-Genetic Algorithms In Problem Solving- Evolving Computer Programs-Data Analysis & prediction-Evolving Neural Networks.

Unit II**No. of Hours : 15**

Genetic Algorithms in Scientific Model : Modeling Interactions between Learning and Evolution - Modeling Sexual Selection - Ecosystems - Measuring Evolutionary Activity - Theoretical Foundations : Schemas Two Armed Bandit Problem - Royal Roads - Exact Mathematical Models Statistical - Mechanics - Approaches.

Unit III**No. of Hours : 15**

Implementing Genetic Algorithm: Genetic Algorithm Usage - Encoding a problem - Adapting the encoding - Selection methods - Genetic Operations - Parameters for Genetic Algorithms, Walsh Transform: Basic Properties - Twist an Transform of Mixing - Spectrum of dM- Walsh Basis - Computing with Heuristic: Selection - Mixing -Fixed Points.

Unit IV**No. of Hours : 10**

Inverse Heuristic: Selection - Mixing - Focused Heuristics: Lyapunov's Criterion - Selection - Mixing - Linear Fitness: Cross over - Monotone Selection - Hyperbolicity.Peturbation Arguments: Small Perturbations: Transient Behavior: Large Populations - Logarithmic Convergence.

Unit V**No. of Hours : 10**

Asymptotic Behavior: Fixed Point Graph - Transition Probabilities - Unstable fixed points - Asymptotic approximation- Geometric Invariance : Elementary Invariance - Proportional selection and GA surface- Quotients: Equivalence - Operators- Models: Natural and Invariant Representatives - Linear Heuristics-Schemata: Definition - Mixing - Selection.

Books For Study:

1. "An Introduction to Genetic Algorithms" ,Melanie Mitchell, PHI Pvt. Ltd., 2004.
2. "The Simple Genetic Algorithm", Michael D. Vose, PHI Pvt. Ltd, 2004

Books For Reference:

1. "Neural Networks, Fuzzy Logic and Genetic Algorithms - Synthesis and Applications", S.Rajasekaran, G.A. Vijayalakshmi Pai, PHI Pvt. Ltd 2005.
2. "Genetic Algorithms, Optimization and Machine Learning", D.E. Gold Berg, Addition Wesley 2000.

Web Resources :

- <http://www.interactivearchitecture.org/>
- <http://www.brainz.org/>
- <http://www.towardsdatascience.com>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will have the ability to understand the need for evolutionary computing	K2
CO2	Students will have the ability to analyze the vital role and applications of genetic algorithms.	K4
CO3	Students will be able to evaluate the performance of genetic algorithms	K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

CO \ PO & PSO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	L	L	S	M	L	M	M
CO2	M	S	S	L	S	M	S	S	M	M	L
CO3	L	M	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	M	M	M	S	S	S	M

Programme Title: M.Sc. Computer Science

Course Title : EDC IMAGE EDITING AND ANIMATION

Course Code : 19PCSQEDC Hours/Week : 4 Credit :4

Semester : III Batch : 2019- 2021

Course Objectives: The course aims to

- Introduce the basic concepts of photoshop.
- Perform image editing with various tools of photoshop
- Get an insight into working with banner and poster creation.
- Build an effective animation for any real time application

Practical Syllabus

1. Poster Creation.
2. Banner Creation.
3. Wall Writing.
4. Create letterhead.
5. Designing ads .
6. Changing Color.
7. Text Masking.
8. Business Card .
9. Simple Animation.
10. Animation for any real time application.

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will have the ability to understand about photoshop tools	K2
CO2	Students will be able to implement and apply photo editing,layer masking in text and shape.	K3
CO3	Students will have the ability to analyze the concepts and steps for doing poster and banner creation	K4
CO4	Students will be able to evaluate performance in the applicability of various features of Photoshop and flash	K5

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	L	L	L	S	M	M	M	L
CO2	S	M	M	M	S	M	M	S	S	M	M
CO3	M	L	S	S	L	L	M	S	L	S	L
CO4	S	M	M	M	S	M	S	M	M	L	S

Programme Title: M.Sc. Computer Science

Course Title : EDC 2. GRAPHICS DESIGNING USING FLASH
Course Code : 19PCSQEDCS1 Hours/Week : 4 Credit : 4
Semester : III Batch : 2019 - 2021

Course Objectives: The course aims to

- Explain the basic features of Macromedia Flash
- Create, manipulate, and edit text and graphics to obtain desired graphical outcomes.
- Understand, create, and edit symbols, filters and instances in 3D spaces.
- Creating objects from simple shapes with the selection tool and create tween animation.
- Design, create, and edit a flash based navigation menus and interactive movies.
- Design, create, edit, and manipulate animation using several animation tools and techniques.
- Explain and utilize components to create interactivity.

Syllabus

1. Create simple animation using draw tool.
2. Animate the text using with changing colors.
3. Animate : Ball bouncing
3. Design and animate Scrolling new.
4. Animate : cloud moving
5. Animate : Rain fall – using masking
6. Animate : Water Flow – using riffle effect
7. Animate : Saving Money
8. Design and animate Advertisement for Commercial product.
9. Create Animation file using audio and video clippings.
10. Animate : Bell using action script.
11. Create presentation of leaders theirs with key notes.
12. Create presentation any morel of the story using draw line diagram and using pictures.

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Student will able to remember and understand several flash tools and tactics.	K1 & K2
CO2	Demonstrate the ability to effectively utilize the timeline and motion tween affects to produce animation.	K4
CO3	Student will able to apply layer masking features and ripple effects.	K3
CO4	Student will able to analyze import and export of audio and video files.	K4
CO5	Students will have the ability to analyze creativity in animation by apply various animation effect.	K3 & K4

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	L	L	S	M	L	M	M
CO2	M	S	M	L	S	M	S	S	M	M	L
CO3	L	M	S	S	M	S	M	S	M	S	M
CO4	S	S	S	S	M	M	M	S	S	S	M

Programme Title: M.Sc. Computer Science

Course Title : EDC 3. PHOTO EDITING AND ANIMATION

Course Code : 19PCSQEDCS2 Hours/Week : 4 Credit :4

Semester : III Batch : 2019- 2021

Course Objectives: The course aims to

- Introduce the work area basics of photoshop
- Perform selection with photo editing
- Working with layer masking,blending layers,photo and banner creation.
- Study the basics of flash tools.
- Build an effective animation for any real time application

Syllabus

Unit I

No. of Hours : 10

Work area basics-using palettes and menus-tools-selection tools gallery-crop and slice tools gallery-retouching tools gallery-drawing and type tools gallery-painting tools gallery.Brush tools-gradient tools-paint bucket tools and drawing shapes.Working with files-to magnify by dragging-navigator palette.To match zoom and locations in images-cropping-cloning and repairing.

Unit II

No. of Hours : 10

Rulers and grids-getting images into photoshop-color models-choosing colors-color management-hue/saturation command-the shadow highlight command-selecting tools-layer effects and styles-masking layer-blending layers and channels.

Unit III

No. of Hours : 10

Introduction to flash-background color-frame rate-ruler units flash tools-arrow tool-sub select tool-line tool-lasso tool-pen tool-text tool-oval & rectangle tool-ink & paint bucket tool-free & fill transform-brush tools -pencil tools-eraser tools-eye,hand & zoom tool-file options.

Unit IV

No. of Hours : 10

Timeline-understanding timeline-keyframes-creating a layer-types of layers-flash objects-graphic-movie clip-masking.

Unit V

No. of Hours : 10

Application of photo editing &animation:poster creation-banner creation-wall writing-create letterhead-designing ads-changing color-text masking-business card-simple animation-animation for any real time application,

BOOK FOR REFERENCE

1. "Adobe Photoshop 7.0", Techmedia, BPB, 2009.
2. "Macromedia Flash Developers guide", P, S, Woods, TMH, 1899.

WEB RESOURCES

1. <https://www.digitalartsonline.co.uk/features/illustration/best-photoshop-tutorials/>
2. <http://www.freeadobeflashtutorials.com/>
3. <https://www.digitalartsonline.co.uk/tutorials/photoshop/designing-app-in-photoshop/>

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to remember the basic concepts of editing & animation	K1
CO2	Students will have the ability to understand powerful tools and its usage.	K2
CO3	Students will be able to apply creativity in designing applications	K3
CO4	Students will have the ability to analyze the importance of the tools.	K4

Mapping of COs with POs&PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	L	S	L	L	L	S	L	L	L
CO2	M	S	S	M	M	L	L	L	L	S	L
CO3	M	L	S	M	S	L	L	M	L	L	L
CO4	L	L	L	M	S	M	L	L	M	S	S
CO5	M	L	L	M	S	S	L	L	L	M	S

Programme Title: M.Sc. Computer Science**Course Title : PROJECT****Course Code : 19PCSEPC****Hours/Week : 30****Credit : 8****Semester : IV****Batch : 2019 - 2021****Course Objectives: The course aims to**

- Provide knowledge of the working environment.
- Gain more about software development ideas.
- Familiarize the concepts of Software design phases.
- Implementing their technical skills for software project.
- Ensure testing and running of project.

Course Outcomes (CO) :

CO Number	CO Statement	Knowledge Level
CO1	Students will be able to Understand the various domains in software developments..	K2
CO2	Students will be able to apply design phase of project.	K3
CO3	Students will have the ability to evaluate their project during software testing.	K4,K5

Mapping of COs with POs & PSOs : S-STRONG M-MEDIUM L-LIGHT

PO & PSO CO	PO						PSO				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	L	L	M	S	M	L	L	L	M
CO2	L	M	S	L	S	L	L	M	L	S	M
CO3	M	S	S	S	L	S	L	L	M	L	S