M.Sc Computer Science

PROGRAMME OUTCOMES

- Ability to design, implement, and evaluate a computational system to meet desired needs within realistic constraints.
- Ability to function effectively on team to accomplish shared computing design, evaluation, or implementation goals.
- An understanding of professional, ethical, legal, security, and social issues and responsibilities for the computing profession.
- Ability to analyze impacts of computing on individuals, organizations, and society.
- Recognition of the need for and ability to engage in continuing professional development.
- Ability to apply design and development principles in the construction of software systems of varying complexity.

PROGRAMME SPECIFIC OUTCOMES

- Exhibit proficiency through latest technologies to business and personal situations in demonstrating the ability for work efficacy as a part of team and apply professional behaviour and ethics.
- Pursue higher studies and research by exploring the various motivation factors in the computing discipline associated with the program to function efficiently and effectively in the modern and challenging society.
- Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success
- Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity
- Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR – 639 005

M.SC- COMPUTER SCIENCE - COURSE STRUCTURE UNDER CBCS SYSTEM

(For the candidates admitted from the year 2016-2017 onwards)

SEMESTER	COURSE	SUBJECT TITLE	SUBJECT CODE	INSTR. HOURS WEEK	CREDIT	EXAM HOURS	MARKS INT	MARKS ESE	TOTAL
I	Core Course – I	Advanced Java Programming	P16CS1C1	6	5	3	25	75	100
	Core Course - II	J2EE Programming Lab	P16CS1C2P	6	5	3	40	60	100
	Core Course – III	Data Mining Concepts and Techniques	P16CS1C3	6	5	3	25	75	100
	Core Course – IV	Advanced Operating System	P16CS1C4	6	5	3	25	75	100
	Elective Course - I	Object Oriented Systems Design	P16CS1E1	6	5	3	25	75	100
				30	25				500
II	Core Course – V	Mobile Computing	P16CS2C5	6	5	3	25	75	100
	Core Course – VI	Mobile Computing Lab	P16CS2C6P	6	5	3	40	60	100
	Core Course – VII	Advanced Microprocessors & Micro Controllers	P16CS2C7	6	5	3	25	75	100
	Core Course – VIII	Cryptography and Network Security	P16CS2C8	6	5	3	25	75	100
	Elective Course - II	Principles of Compiler Design	P16CS2E2	6	5	3	25	75	100
				30	25				500
III	Core Course – IX	Grid Computing	P16CS3C9	6	5	3	25	75	100
	Core Course – X	Web Development Lab	P16CS3C10P	6	5	3	40	60	100
	Core Course - XI	Principles of Software Testing	P16CS3C11	6	5	3	25	75	100
	Core Course - XII	Embedded System	P16CS3C12	6	5	3	25	75	100
	Elective Course - III	Research Methodology	P16CS3E3	6	5	3	25	75	100
				30	25				500
IV	Core Course - XIII	Open Source Technologies	P16CS4C13	4	3	3	25	75	100
	Core Course - XIV	Open Source Technologies Lab	P16CS4C14P	6	3	3	40	60	100
	Elective Course - IV	Human - Computer Interaction	P16CS4E4	5	3	3	25	75	100
	Elective Course - V	Soft Computing	P16CS4E5	5	3	3	25	75	100
	Project Work	Project Work	P16CS4PW	10	3	3	**	**	100
				30	15				500
	TOTAL			120	90				2000

** Dissertation – 80 Marks and Viva Voce Examinations – 20 Marks

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE –I- SEMESTER – CORE COURSE -I

(For the candidates admitted from the year 2016 -17 onwards)

ADVANCED JAVA PROGRAMMING

- To remember the basic concepts of OOPs and HTML tags.
- To develop the knowledge for Networking and Event handling.
- Working with Windows, Graphics and Text.
- To learn AWT controls, Layout managers and Menus.
- To gain the knowledge of Java Beans and Swings.

UNIT I

Introducing Classes and Methods: - Class fundamentals – Methods - Constructors, Packages and Interfaces: Packages- Importing Packages – Interfaces, The Applet Class: Applet Basics – Applet Architecture – An Applet skeleton – The HTML Applet Tag – getDocumentBase() and getCodeBase().

UNIT II

Networking: Networking Basics- Java and the Net- InetAddress- TCP/IP Client Sockets – URL – TCP/IP Server Sockets- Datagrams, – Event Handling: The Delegation Handling Mechanisms – Delegation Event Model – Event Class – Event Listener Interfaces.

UNIT III

Introducing the AWT: Working with windows, Graphics and Text: AWT Classes-window fundamentals- working with Frame Windows- Working with Graphics- Working with color and fonts, Using AWT Controls, Layout Managers and Menus: Control Fundamentals - Labels – Buttons – Check Box Group - Choice Controls – Using Lists – Understanding Layout Managers – Menu bars and Menus – Dialog Boxes – File Dialog.

UNIT IV

Java Beans : What is Java Bean?- - Advantages of Java Bean- Application Builder Tools- Using the Bean Developer Kit- JAR files-Introspection – Developing a Simple Bean Using the BDK- Using Bound Properties – Using Bean Info Interface- Constrained Properties – persistence –customizes – The Java Beans API - Using Bean builder – A Tour of Swing: Applet – Icons and Labels – Text Fields – Buttons – Combo boxes – tabbed Panes – Scroll panes – trees – Tables .

UNIT V

Servlets : Background - The life cycle of a Servlet – Using Tomcat for servlet Development – A simple Servlet – The Servlet API – The javax.servlet Package – Reading Servlet parameters – Javax.Servlet.HTTP package - Handling HTTP requests and responses – using Cookies – Session Tracking – Security Issues.

TEXT BOOK:

1. The Complete Refernce Java2 , Herbert Schildt, Fifth Edition, Tata Mcgraw Hill

REFERENCES:

1. Patrick Naughton " Complete Reference Java 2" Tata McGraw Hill , 2003
2. Elliotte Rustry Harold " Java Network Programming" 'O' Ralley Publications, 2000
3. E.Balagurusamy " Programming with Java" Tata McGraw Hill, 2rd Edition, 2008.

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Sl. No.:

Subject Code: P16CS1C2P

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – I SEMESTER – CORE COURSE - II

(For the candidates admitted from the year 2016 -17 onwards)

J2EE PROGRAMMING LAB

- To implement classes, functions, constructors and destructors.
- To develop user defined package and interfaces in java.
- To know, how to connect a database using JDBC connections.
- To learn how to transfer files from server to client.
- To develop a java program using Swing and Java beans.

1. Program to implement simple classes to understand objects, member functions and constructors
2. Program to develop User defined Packages in Java
3. Program to implement Interfaces
4. Program to implement AWT
5. Program to Implement Applet
6. Write a Java program using any five Controls
7. Write a Program to Transfer file from server to client
8. Program using Swing
9. Program to Implement Java Beans
10. Develop a Chat program in Java
11. Write a java networking program to implement a simple Server that listens to a client Input.
12. Write a Java program to Insert, Delete, records from a table using JDBC concept.
13. Write a Java program to Update and select records from a table using JDBC concept.
14. Write a Java server program which instantiate two remote objects, register them with naming service, and waits for clients to invoke methods on the remote objects.
15. Develop a Java Program using Servlet

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – I SEMESTER – CORE COURSE - III
(For the candidates admitted from the year 2016 -17 onwards)
DATA MINING CONCEPTS AND TECHNIQUES

- Students can be well versed in all data mining algorithms, methods of evaluation.
- Impart the knowledge to students on accumulate the data from large dataset and analyze for an specific application
- Make the students to hope up with the emerging technologies using data mining.
- Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results

UNIT I
Introduction:- Data mining- definition, importance, motivation , kinds of data; data mining functionalities; 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
Data Pre-processing:- Descriptive Data summarization, Data cleaning, Data Integration and transformation, Data Reduction, Data Discretization and concept Hierarchy Generation- Mining Frequent Patterns, Associations, and Correlations:- Basic Concepts- Efficient and Scalable Frequent Item set Mining Methods - Mining Various Kinds of Association Rules - From Association Mining to Correlation Analysis - Constraint- Based Association Mining

UNIT III
Data Warehouse and OLAP Technology:- Definition-Data Warehouse Architecture-From Data Warehouse to Data Mining
Classification and Prediction:- Definition, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Other Classification Methods:- Genetic Algorithms, Rough Set Approach, FuzzySet Approaches. Prediction:- Linear Regression, Nonlinear Regression, Other regression Based methods.

UNIT IV
Cluster Analysis:- Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods , Hierarchical Methods , Grid-Based Methods, Model- Based Clustering Methods.
Graph Mining- Social Network Analysis – Multirelational Data Mining.

UNIT V
Web Mining:- Web Mining Definition- Web Content Mining- Web Structure Mining- Web Usage Mining – Text Mining- Unstructured Text- Episode Rule Discovery for Texts
– Hierarchy of Categories- Text Clustering.

TEXT BOOKS:-
1. Jiawei Han, Micheline Kamber, and Jian Pei, Data Mining: Concepts and Techniques, 3rd ed., Morgan Kaufmann, 2011
2. Arun K.Pujari, "Data Mining Techniques", Universities Press (India) Private Limited, First edition , 2001.

REFERENCE:

1. Introduction to Data Mining with case studies by GK Gupta, PHI pvt. Ltd., Third printing 2009.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – I SEMESTER – CORE COURSE - IV
(For the candidates admitted from the year 2016 -17 onwards)
ADVANCED OPERATING SYSTEM

- Student will be able to understand the basic components of a operating system and the interactions among the various components.
- To understand various issues in Inter Process Communication.
- To study the need for special purpose operating system with the advent of new emerging technologies.
- Identify use and evaluate the storage management policies with respect to different storage management technologies.

UNIT I

Operating system structures: System components-Operating system services-System calls-System programs-System structure-Virtual machines-System design and implementation-System generation.
Processes: Process concept-Process scheduling- Operations and processes-Cooperating processes- Interprocess communication- Communication in client server systems.

UNIT II

Threads: Overview-Multithreading model-Threading issues-Pthreads-Solaris 2threads-Window 2000 threads- Linux threads-Java threads.
CPU scheduling: Basic concepts- Scheduling criteria-Scheduling algorithms-Multiple processor scheduling-Real time scheduling-Algorithm evaluations-Processor scheduling models.

UNIT III

Process synchronization: Background-The critical section problem-Synchronization hardware-Semaphores-Classic problems of synchronization-Critical regions-Monitors-OS synchronization-Atomic transactions.
Deadlocks: System model-Deadlock characterization-Methods for handling deadlocks- Deadlock prevention-Deadlock avoidance-deadlock detection-Recovery from deadlock.

UNIT IV

Memory Management: Background-Swapping-Contiguous memory allocation-Paging-Segmentation –Segmentation with paging.
Virtual memory: Background –Demand paging-Process creation-Page replacement-Allocation of frames-Thrashing-Operating-system examples-Other consideration.

UNIT V

Distributed Systems: Distributed system structure-Background-Topology-Network types-Communication-Communication protocols-Robustness-Design issues-An Example: Networking. Stateful Versus Stateless service.
Distributed Coordination: Event ordering - Mutual exclusions – Atomicity -Concurrency control - Deadlock handling - Election Algorithm-Reaching agreement.

TEXT BOOK:

1. "Operating system concepts", Silberschatz, Galvin, Gagne, Wiley Publications, 6th Edition.

REFERENCE:

1. William Stallings, "Operating System", Second edition, Maxvell McMillan, International Editions 1997.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – I SEMESTER – ELECTIVE COURSE - I
(For the candidates admitted from the year 2016 -17 onwards)
OBJECT ORIENTED SYSTEMS DESIGN

- Understanding the insight and knowledge into analyzing and designing software using different object-oriented modeling techniques.
- Specify, analyze and design the use case driven requirements for a particular system.
- Explore and analyze different analysis and design models.
- Ability to deliver robust software components.

UNIT I
OBJECT BASIS: Object Oriented Philosophy - Object - Object State, behaviors and methods. Encapsulation and information hiding Class hierarchy -polymorphism, Object relationships and association - aggregation, object containment - Meta classes – Object Oriented System Development Life Cycle

UNIT II
OBJECT ORIENTED METHODOLOGIES: Introduction - Rumbaugh et al.'s Object Modeling - Booch Methodology - Jacobson et al. Methodology – Patterns - Frame works - Unified approach.

UNIT III
OBJECT ORIENTED ANALYSIS: Business Object Analysis - Use case driven approach - Use case model – Developing effective communication . Object analysis – Approaches for identifying classes - Noun phrase approach – Common class patterns approach – Classes, Responsibilities and Collaborators
IDENTIFYING OBJECT RELATIONSHIPS AND METHODS: Introduction – Associations , Super – sub class relationship,   A – part – of relationship – Aggregation – Introduction to UML diagrams.

UNIT IV
OBJECT ORIENTED DESIGN: Object Oriented design process - Design axioms – corollaries - design patterns - designing classes – Design philosophy – The Process – class visibility – Refining attributes – Designing methods and protocols

UNIT V
SOFTWARE QUALITY ASSURANCE: Introduction Quality assurance tests   -Testing strategies – Test cases – Test plan – continuous testing
SYSTEM USABILITY AND MEASURING USER SATISFACTION: - Introduction – usability testing – User satisfaction test – case study

TEXT BOOK:
1. Ali Bahrami, "Object Oriented Systems Development" Irwin-McGraw Hill, New Delhi, International editions.

REFERENCE:
1. Grady Booch, "Object Oriented Analysis and Design with applications", II edition, Addition Wesley.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – II SEMESTER – CORE COURSE - V

(For the candidates admitted from the year 2016 -17 onwards)

MOBILE COMPUTING

- Offers insight into the mobile-to-network access technologies including HSPA, LTE, 3G+, 4G, and 5G, and mobile-computing technologies.
- Includes numerous examples of devices, mobile application development languages, computing environment, and operating systems.
- Contains topics on mobile databases, security protocols, mobile ad hoc and wireless sensor networks, and application server, client-server, enterprise server, and cloud-server based computing.
- Provides programs and sample codes for building successful mobile applications.

UNIT - I : Why Android? -The Open Handset Alliance -The Android Execution Environment - Creating an Android Development Environment -Hello, Android - HelloWorld - Writing HelloWorld -Running HelloWorld- The Project Root Folder - The Source Folder (src) - The Resource Folder (res) - First Steps: Building and Running the MicroJobs Application - Digging a Little Deeper: What Can Go Wrong? Running an Application on the T- Mobile Phone - Initialization Parameters in AndroidManifest.xml - Initialization in MicroJobs.java.

UNIT - II : Debugging Android – The Tools – Eclipse Java Editor - The Debugger - Logcat - Android - Debug Bridge (adb) - DDMS: Dalvik Debug Monitor Service - Traceview - The ApiDemos Application Application Setup in the Manifest File - Test Your Application - Attach an End User License Agreement If Desired- Si gnin g Your Application - Retesting Your Application - Publishing on Android Market - Signing Up As an Android Developer

UNIT III : Persistent Data Storage: SQLite Databases and Content Providers - Databases Basic Structure of the MicroJobsDatabase Class - Reading Data from the Database - Modifying the Database - Content Providers - Introducing NotePad - Content Providers -Consuming a Content Provider - Location and Mapping - Location- Based Services - Mapping - The Google Maps Activity -The MapView and MapActivity -Working with MapViews - MapView and MyLocationOverlay Initialization -Pausing and Resuming a MapActivity - Controlling the Map with Menu Buttons - Controlling the Map with the KeyPad -Location Without Maps -The Manifest and Layout Files - Connecting to a Location Provider and Getting Location Updates Updating the Emulated Location

UNIT - IV : Building a View -Android GUI Architecture -The Model -The View -The Controller- Putting It Together -Assembling a Graphical Interface - Wiring Up the Controller- Listening for Key Events - Alternative Ways to Handle Events - A Widget Bestiary -Android Views TextView and EditText -Button and ImageButton- Adapters and AdapterViews - CheckBoxes, RadioButtons and Spinners -ViewGroups - Gallery and GridView - ListView and ListActivity - ScrollView - TabHost - Layouts -Frame Layout - LinearLayout - TableLayout - AbsoluteLayout -RelativeLayout

UNIT - V : Drawables - Telephony State Information and Android Telephony Classes -Operations Offered by the android.telephony Package -Package Summary -Limitations on What Applications Can Do with the Phone - Example: Determining the State of a Call -Android Telephony Internals --Inter-Process Communication and AIDL in the android.internal.telephony Package - The android.internal.telephony Package - The android.internal.telephony.gsm Package – Exploring Android Telephony Internals – Android and VoIp.

Text Book:

1. Android Application Development - R.Roger, J.Lombardo, Z.Mednieks and B.meike, O'Reilly, shroft publishers and Distributors Pvt Ltd, New Delhi, 2010.

Reference:

1. Rajkamal, "Mobile Computing", Oxford University Press,2012.

Sl. No.: [ ]   Subject Code: P16CS2C6P

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – II SEMESTER – CORE COURSE - VI

(For the candidates admitted from the year 2016 -17 onwards)

MOBILE COMPUTING LAB

- ANDROID Application Development Lab needed to implement rich Android applications for the Android mobile platform.
- Student will build the code, compile, execute, and debug mobile applications using the Java for Android programming language and Eclipse to develop programs using advanced programming concepts.

1. Create an Application which deals with the Android Content Providers.

2. Create Application using Android Layouts.

3. Create Application using Android Views.

4. Create Application using Android Events.

5. Create an Application which uses Files.

6. Create an Application which uses Preference and Notifications.

7. Create Application to Create, Modify and Query an SQLite Database.

8. Create an Application for Querying web services and Parsing response.

9. Create Application which uses the concept of Services and Background threats.

10. Creating Android Audio and Video Application.

11. Create an Application which uses Map-Activity and points the locations onto the Map Locations.

12. Create an Application with One-Time and Long Running Background Task as Service.

13. Create an Application with Repeating Alarms.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – II SEMESTER – CORE COURSE - VII

(For the candidates admitted from the year 2016 -17 onwards)

ADVANCED MICROPROCESSORS AND MICROCONTROLLERS

- To create less expensive and less complex circuitry
- It allows electronic automation in situations where a full-sized computer is not needed
- To crate automatically managed inventions and appliances
- Ability to execute big and generic applications

Unit – I:

The Processors:8086/8088: Register Organisation of 8086 – Architecture – Signal Descriptions of 8086 – Physical Memory Organisation – General Bus Operation – I/O Addressing Capability – Special Processor Activities – Minimum Mode 8086 System and Timings – Maximum Mode 8086 System and Timings.

Unit – II:

8086/8088 Instruction Set and Assembler Directives: Machine Language Instruction Formats – Addressing Modes of 8086 – Instruction set of 8086/8088.

Assembly Language Programs: Addition of two numbers – Addition of a Series of 8-Bit numbers – Find out the Largest number – Find the Even and Odd numbers – Move a String of Data Words.

Unit – III:

80286-80287- A Microprocessor with Memory Management and Protection: Salient Features of 80286 – Internal Architecture of 80286 – Signal Descriptions of 80286 – Real Addressing Mode – Protected Virtual Address Mode (PVAM)

Unit – IV:

80386-80387 and 80486 – The 32 Bit Processors: Salient Features of 80386DX – Architecture and Signal Descriptions of 80386 – Register Organisation of 80386 – Addressing Modes – Data Types of 80386 – Real Addressing Mode of 80386 – Protected Mode of 80386 – Segmentation – Paging.

Unit – V:

An Introduction to Microcontrollers 8051 and 80196: Intel's Family of 8-bit Microcontrollers – Architecture of 8051 – Signal Descriptions of 8051 – Register Set of 8051 – Instruction Set of 8051.

Text Book: "Advanced Microprocessors and Peripherals" by A.K. Ray and K.M.Bhurchandi, Tata McGraw Hill, New Delhi 2002.

Reference Book: "Microprocessor and Microcontrollers", A. Nagoor Kani, 2nd Edition, McGraw Hill Publication.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – II SEMESTER – CORE COURSE - VIII

(For the candidates admitted from the year 2016 -17 onwards)

CRYPTOGRAPHY AND NETWORK SECURITY

- To learn the basics of security goals and cryptographic attack.
- To understand the concepts of Mathematics of cryptography.
- To know the knowledge of traditional symmetric-key.
- To understand the concepts of Advanced Encryption Standard (AES) and Data Encryption Standard (DES).
- To learn the concepts of RSA Cryptosystem and Security of application layer.

Unit –I:

Introduction: Security Goals - Cryptographic Attack - Service and Mechanism – Techniques – The Rest of the Book – Mathematics of Cryptography: Inter Arithmetic – Modular Arithmetic – Matrices – Linear Congruence.

Unit – II:

Traditional symmetric-Key Ciphers: Introduction – Substitution Ciphers – Transposition Ciphers – Stream and Block Ciphers – Introduction to Modern Symmetric-Key Ciphers: Modern Block Ciphers – Modern Stream Ciphers.

Unit – III:

Data Encryption Standard(DES): Introduction – DES Structure – DES Analysis – Security of DES – Multiple DES – Conventional Encryption Algorithms – Examples of Block Ciphers Influenced by DES – Advanced Encryption Standard (AES): Introduction – Transformations – Key Expansion – The AES Ciphers – Examples – Analysis of AES.

Unit IV:

Asymmetric-Key Cryptography: Introduction – RSA Cryptosystem – Rabin Cryptosystem – ElGamal Cryptosystem – Elliptic Curve Cryptosystems – Security at the Application Layer: PGP and S/MIME: E-Mail-PGP – S/MIME.

Unit V:

Security at the Transport Layer: SSL and TLS: SSL Architecture – Four Protocols – SSL Message Formats – Transport Layer Security – Security at the Network Layer: IPSec: Two Modes – Two Security Protocols – Security Association - Security Policy – Internet Key Exchange (IKE) – ISAKMP.

Text Book: "Cryptography and Network Security " by Behrouz A.Forouzan, Debdeep Mukhopadhyay, 2nd Edition, McGraw-Hill Companies, Inc., New York,2010.

Reference Book:

William Stallings, "Cryptography and Network Security – Principles and Practice". PHI, Third edition 2003.

1. Johannes A. Buchnan, "Introduction to Cryptography". Springer – Verlag
2. Atul Kahate, "Cryptography and Network Security", TMH.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – II SEMESTER – ELECTIVE COURSE - II

(For the candidates admitted from the year 2015 -16 onwards)

PRINCIPLES OF COMPILER DESIGN

- To learn working of compiler and non compiler applications.
- State and scrutinizing the lexical, syntactic and semantic structures of advanced language features.
- Understanding the techniques of Diminishing the memory using code optimization
- To know about compiler generation tools and techniques

UNIT **I**

Introduction to compiler : compilers and translators – structure of a compiler – Finite state automation and lexical analysis – the role of the lexical analyzer - A simple approach to the design of lexical analyzer – regular expressions- Finite automata (NFA , DFA) - regular expression to finite automata – minimizing the number of states of DFA - a language for specifying lexical analyzers- implementation of lexical analyzer.

UNIT **II**

Context free grammars - Deviation and parse trees – Parser – Shift–reduce parsing – Operator–precedence parsing – Top–Down –parsing - Predictive parsers.

UNIT **III**

Syntax directed translation : syntax directed translation scheme- Implementation of syntax–Directed Translators – Intermediate Code – postfix notation – parse trees and syntax – Three – address codes, Quadruples and triples – Translation of assignment statements.

UNIT **IV**

Symbol tables: contents of symbol table - Data structure for symbol tables – Run time storage administration: Implementation of a simple stack allocation Scheme - Implementation of block structured languages – error detection and recovery : Errors – Lexical phase error – syntactic phase error- semantic errors.

UNIT **V**

Code optimization: principle sources of optimization – Loop Optimization – DAG representation of basic blocks – Value numbers and algebraic laws – code generation: Object Programs – problems in code generation – A machine model- A simple code Generation.

TEXT BOOK:

1. Alferd V. Aho, Jeffery D. Ullman, "Principles of Compiler Design" Pearson Education, New Delhi 2002. (chapters 1,3-57,9-12,15)

REFERENCES:

1. William A. Barrett, Rodney M. Bates, David A. Gustafson and John D. Couch –"Compiler Construction Theory and Practice", Galgotia Publication Co., 1990
2. Jean – Paul Trembley and Paul G. Soreson – "Thee theory and Practice of Complier Writing" McGraw Hill 1985.

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – III SEMESTER – CORE COURSE - IX

(For the candidates admitted from the year 2016 -17 onwards)

GRID COMPUTING

- Enables the virtualization of distributed computing resources
- Discovery and scheduling of tasks and workflow.
- Data communications distributing the problem data where and when it is required
- Provisioning and distributing application codes to specific system nodes
- Application partitioning that involves breaking the problem into discrete pieces

UNIT-l

   Introduction to High Performance Computing: Early Grid Activities, Current Grid Activities, Grid Business Areas, Grid Applications. Grid Computing Organizations and Their Roles: Developing Grid Standards & Best Practice Guidelines , Developing Grid Computing Toolkits & Frameworks, Grid-Based Solutions to Solve Computing, Data, and Network Requirements, Building and Using Grid-Based Solutions Commercially.

UNIT-ll

   Grid Computing Anatomy: The Grid Problem, The Grid Computing Roadmap: Autonomic Computing, Business on demand and infrastructure virtualization, Service orientation Architecture and Grids, Semantic Grids. Open Grid Service Architecture (OGSA), Some Sample use cases that drive the OGSA, The OGSA platform components,

UNIT-lll

   Open Grid Services Infrastructure (OGSI): Introduction , Grid services, A High level introduction to OGSI, Technical details of OGSI specification, Introduction to Service Data concepts, Grid service-Naming and change management recommendation, OGSA Basic Service.

UNIT-IV

   The Grid Development Toolkits: GlobusGT3 Toolkit: Architecture: GT3 Architecture model, Globus GT3 Toolkit: Programming Model: Introduction service programming model ,

UNIT-V

   Golbus GT3 Toolkit: Implementation. GlobusGT3 Toolkit: Hi: Acme search service implementation in top-down approach, GlobusGT3 Toolkit: High-Level Services: Resources Discovery and Monitoring, Resources Allocation Data Management, Information Services, Index Services, Resource Information Provider Service, Resource Management Services, Data Management Services.

TEXT BOOK:

1.JoshyJoseph, CraigFellenstein-Grid Computing, Pearson Education,2004.

REFERENCES:

1.AhmarAbbas-Grid Computing-A Practical Guide to Technology and Applications, Firewall Media, 2006.

2.Vladimir Silva – Grid Computing for Developers,DreamtechPress,2006.

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – III SEMESTER – CORE COURSE - X

(For the candidates admitted from the year 2016 -17 onwards)

WEB DEVELOPMENT LAB

- Skill to create functionality in the web pages by using programming languages
- To create applications, websites, services, products that run through the internet
- It's a field that provides many opportunities for hands-on learning
- To interact with new tools and learn new skills

1. Develop a package for demonstrating an application using java with JDBC connectivity.

2. Develop a package for our department student profile maintenance system.

3. Develop a web site for e-commerce applications such as flipkart, snapdeal, shopclues

4. Develop web pages for displaying current events and schedules for department activities.

5. Develop web pages for performing network services (Airtel, Aircel and vodaphone).

6. Develop the digital library for our department.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – III SEMESTER – CORE COURSE - XI
(For the candidates admitted from the year 2016 -17 onwards)
PRINCIPLES OF SOFTWARE TESTING

- Design test cases suitable for a software development for different domains.
- Identify suitable tests to be carried out.
- Prepare test planning based on the document.
- Document test plans and test cases designed.
- Use of automatic testing tools.
- Develop and validate a test plan

UNIT-I

Software Development Life Cycle Models: Phases of software project- Quality, Quality Assurance, and Quality Control-Testing, verification, and validation-Process model to represent different phases-Life cycle models. Types of testing: White box testing: What is white box testing?-Static Testing-Structural testing-Challenges in white box testing.

UNIT-II

Black box testing: What is Black box testing?-Why is Black box testing?-When to do Black box testing?-How to do Black box testing? - Integration testing: What is integration testing?-Integration testing as a type of testing-Integration testing as a phase of testing-scenario testing-defect bash.

UNIT-III

System and Acceptance testing: System testing overview-Why is system testing done?-Functional versus nonfunctional testing-Functional system testing-Non-functional testing-Acceptance testing
Performance testing: Introduction-Factors governing performance testing-Methodology for performance testing-Tools for performance testing- Process for performance testing

UNIT-IV

Regression testing: What is Regression testing?- Types of regression testing-When to do regression testing?-How to do regression testing?-Best practices in Regression testing.
Ad Hoc testing: Overview of Ad hoc testing- Buddy testing- Pair testing- Exploratory testing-Iterative testing- Agile and extreme testing- Defect seeding

UNIT-V

Testing of object oriented systems: Introduction-Primer on object oriented software- Differences in OO testing.
Usability and accessibility testing: What is usability testing? - Approach to usability-When to do usability testing?-How to achieve usability?-Quality factors for usability-Aesthetics testing-accessibility testing-Tools for usability-Usability lab setup-Test roles for usability.

TEXT BOOK:
1. Srinivasan Desikan, Gopalaswamy Ramesh, "Software testing" Principles and Practices, Pearson Education, New Delhi,2006.

REFERENCES:
1. Introducing Software Testing – Louis Tares, Addison Wesley Publication, First Edition.
2. Software Testing, Ron Patton, SAMS Tech Media, Indian Edition 2001 Software Quality Producing practical, Consistent software – Mordechai Ben – Menachem, Gary S. Marliss, Thomson Learning, 2003.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – III SEMESTER – CORE COURSE - XII

(For the candidates admitted from the year 2016 -17 onwards)

EMBEDDED SYSTEMS

- An Embedded system is one that has computer hardware and software embedded in it as one of its components.
- Simpler programming, when comparing to C/C++ or assembly. Rich and Useful APIs (one standard and several custom)
- A multiprocessor system consists of a multiple number of processors, including multi-core processors, which share main memory and I/O devices.
- An embedded system is a special computer system that is designed to perform dedicated functions with real-time computing constraints.
- Here, a symbolic execution framework is utilized to achieve test target coverage for control system hardware and software.

UNIT – I

Introduction to Embedded systems – processor in the system – software embedded into a system – structural units in a processor – processor, memory selection, Memory devices - Allocation of memory to program segments and blocks and memory map of a system.

UNIT – II

Device drivers – Interrupt servicing mechanisms – context and periods for context switching - Programming concepts and Embedded programming in C and C++: Software programming in ALP and in high level language 'C' – 'C' program elements: Header source files and preprocessor directives – Macros and functions: Data types – data structures – modifiers – statements – loops and pointers – Embedded programming in C++ and Java.

UNIT – III

Program modeling concepts in single and multiprocessor systems – software – development process: modeling process for software analysis – programming model for event controlled or response time constrained real time program- modeling of multiprocessor systems. Multiple processes – sharing data by multiple tasks and routines – inter process communications.

UNIT – IV

Real time operating systems: OS services – IO sub systems – Real time and embedded operating systems – Interrupt routines in RTOS environment – RTOS task scheduling models, Interrupt latency and response times of the task as performance metrics – performance metrics in scheduling models.

UNIT – V

Hardware Software code design: Embedded system project management – Embedded system design and Co-design Issues – Design Cycle – uses of target system – use of software tools for development – use of scopes and logic analysers for system hardware tests – issues in embedded system design.

Text Books:
1. Embedded systems – Architecture, Programming and Design By Raj Kamal – TMH, 2007.

REFERENCE:
1. Mohamed Ali Maszidi & Janice Gillispie Maszidi, " The 8051 Microcontroller and Embedded System", Pearson Publishers

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – III SEMESTER – ELECTIVE COURSE - III

(For the candidates admitted from the year 2016 -17 onwards)

RESEARCH METHODOLOGY

- To inculcate in the research knowledge in the student mind.
- Identify the appropriate parameters for a particular application
- A system of methods used to help students in a particular area of study or activity
- Develop the skills to solve complex real world problems for decision support
- Choose the appropriate technologies, algorithms, and approaches for the related issues
- Improve overall application performance due to technology that can balance resources

UNIT I

Research Methodology: An Introduction : Meaning of Research – Objectives of Research – Motivation in Research – Types of Research – Research Approaches – Significance of Research – Research Methods versus Methodology – Research and Scientific Method – Importance of knowing How Research is Done – Research Process – Criteria of Good Research – Problems Encountered by Researchers in India.

Defining the Research Problem: What is Research Problem? – Selecting the Problem – Necessity of Defining the Problem – Technique involved in Defining a Problem – An Illustration –Conclusion.

UNIT II

Methods of Data Collection: Collection of Primary Data – Observation Method – Interview Method – Collection of Data through questionnaires – Collection of Data through Schedules – Difference between Questionnaires and Schedules – Some other Method s of Data Collection – Collection of Secondary Data – Selection of Appropriate Method for Data Collection – Case Study Method.

Processing and Analysis of Data: Processing Operations – Some Problem in Processing – Elements / Types of Analysis – Statistics in Research – Measures of Central Tendency – Measures of Dispersion – Measures of Asymmetry – Measures of Relationship – Simple Regression Analysis – Multiple Correlation and Regression – Partial Correlation – Association in Case of Attributes – Other Measures.

UNIT III

Introduction: Cloud Computing at a Glance, Historical Developments, Building Cloud computing Environments, Computing Platforms and Technologies. Principles of Parallel and Distributed Computing: Eras of computing, Parallel Vs Distributed Computing, Elements of Parallel and Distributed Computing, Technologies for Distributed Computing.

UNIT IV

Virtualization: Introduction, Characteristics, Taxonomy of Virtualization Techniques, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Example.

UNIT V

Analytics – Nuances of big data – Value – Issues – Case for Big data – Big data options Team Challenge – Big data sources – Acquisition – Nuts and Bolts of Big data. Features of Big data – Security, Compliance, auditing and protection – Evolution of Big data – Best practices for Big Data Analytics – Big data characteristics – Volume, Veracity, Velocity, Variety – Data Application and Integration tools.

TEXT BOOKS:
1. Kothari C.R., "Research Methodology - Methods and Techniques", Second Revised Edition, New Age International Publishers Ltd., New Delhi, 2005.
2. Rajkumar Buyya, Christian Vecehiola and S. Thamarai Selvi, " Mastering Cloud Computing", MGH New Delhi, 2013.
3. Frank J Ohlhorst, "Big Data Analytics: Turning Big Data into Big Money" Wiley and SAS Business Series, 2012.

REFERENCES:
1. Mohamed Kantardzic, "Data mining concepts, models, methods, and algorithms", Siley Interscience, 2003
2. Micahel Miller, "Cloud Computing", Pearson Education, 2012.
3. Berkb Eurht and Armando J. Escalante, "Handbook of Cloud Computing", Springer 2010.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – IV SEMESTER – CORE COURSE - XIII

(For the candidates admitted from the year 2016 -17 onwards)

OPEN SOURCE TECHNOLOGIES

- Students are exposed to use free open source software environment.
- Understanding of server side programming in an effective manner.
- Inculcate to the students to use appropriate database for real time applications.
- To develop the design aspect of new emerging technologies using PHP.

UNIT I

Introduction : Open Source – Open Source vs. Commercial Software – What is Linux? - Free Software – Where I can use Linux? Linux Kernel – Linux Distributions

UNIT II: LINUX

Introduction: Linux Essential Commands – File system Concept - Standard Files - The Linux Security Model - Vi Editor - Partitions creation - Shell Introduction - String Processing - Investigating and Managing Processes - Network Clients - Installing Application

UNIT III: APACHE

Introduction - Apache Explained - Starting, Stopping, and Restarting Apache - Modifying the Default Configuration - Securing Apache - Set User and Group - Consider Allowing Access to Local Documentation - Don't Allow public html Web sites - Apache control with .htaccess

UNIT IV: MySQL

Introduction to MY SQL - The Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - Table Joins - Loading and Dumping a Database.

UNIT V: PHP

PHP Introduction- General Syntactic Characteristics- PHP Scripting - Commenting your code - Primitives, Operations and Expressions - PHP Variables - Operations and Expressions Control Statement - Array – Functions - Basic Form Processing - File and Folder Access - Cookies - Sessions - Database Access with PHP - MySQL - MySQL Functions - Inserting Records - Selecting Records - Deleting Records - Update Records.

TEXT BOOK:

1. "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", James Lee and Brent Ware, Dorling Kindersley(India) Pvt. Ltd, 2008

REFERENCE:

1. "Setting up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Eric Rosebrock, Eric Filson, Published by John Wiley and Sons, 2004.

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – IV SEMESTER – CORE COURSE -XIV

(For the candidates admitted from the year 2016 -17 onwards)

OPEN SOURCE TECHNOLOGIES LAB

- Students can know about the important of Linux library functions and system calls
- To Understand, analyze and apply the role of languages like HTML,PHP ,Linux, Mysql and Apache
- Build web applications using PHP with Mysql
- Effectively use software development tools including libraries, preprocessors, compilers, linkers, and make files

1. Demonstrate Basic Linux commands.
2. Write Linux Shell Script Program to find Area of Square, Rectangle, Circle
3. Write Linux Shell Script Program to print your Address 'n' times
4. Write Linux Shell Script Program to reverse a number
5. Write Linux Shell script Program to accept a character and check whether it is an
   a. Lower case alphabet
   b. Upper case alphabet
   c. A digit
   d. Special symbol
   e. Vowel
   Using case control structure
6. Write a program to containing colours and colour codes generated by mixing PHP with HTML.
7. Build the program to convert rupees to dollar's value converter using PHP.
8. Write the program in PHP to processing a member registration form.
9. Write a PHP script to find the value in an array.
   a. Removing duplicate   d. Sorting arrays
   b. Randomizing reversing arrays   e. Merging arrays
   c. Searching arrays   f. comparing arrays
10. Create a web form for the user to enter his or her date of birth to find the age.

11. Write a program to encrypt the plain text using PHP.

12. To create the photo gallery in PHP.

13. Adding a employees to a database and display employee list using PHP and MySQL.

14. To create personal to do list using PHP.

15. Build a login form in PHP using MySQL.

16. Write a program to tracking previous visit to a page.

17. Design a web form for place on order validating input using PHP.

GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE –IV SEMESTER – ELECTIVE COURSE -IV

(For the candidates admitted from the year 2016 -17 onwards)

HUMAN - COMPUTER INTERACTION

- Outline and use of **HCI** design principles, standards and guidelines
- Describe the human computer interaction with other fields.
- Students know about the social mechanisms that are used by people to communicate and collaborate.
- Students to think constructively and analytically about how to design and evaluate interactive technologies.
- To know the main principles of a user-centered approach.

UNIT I

Introduction: Cognitive Psychology and Computer Science-Capabilities of Human- Computer Interaction(HCI)-Goals of Human-Computer Interaction(HCI)-Roles of Human, Computer and Interaction in HCI-Basic User Interfaces-Advanced User Interfaces-Justification of Interdisciplinary Nature-Standard Framework of HCI-HCI Design Principles-Interface Levels in HCI- Steps in Designing HCI Applications- Graphical User Interface Design- Popular HCI Tools-Architecture of HCI Systems-Advances in HCI- Overview-HCI Sample Exercises.

UNIT II

Usability Engineering: Introduction-HCI and Usability Engineering-Usability Engineering Attributes- Process of Usability-Need for Prototyping

Modeling of Understanding Process: Introduction-Goals, Operators, Methods and Selection Rules(GOMS)- Cognitive Complexity Theory(CCT)-Adaptive Control of Thought-Relational(ACT-R)- State, Operator and Result (SOAR)- Belief-Desire-Intention(BDI)-ICARUS-Connectionist Learning with Adaptive Rule Induction On-line(CLARION)-Subsumption Architecture.

UNIT III

Spoken Dialogue System: Introduction –Factors Defining Dialogue System-General Architecture of a Spoken Dialogue system-Dialogue Management (DM) Strategies-Computational Models for Dialogue Management-Statistical Approaches to Dialogue Management-Learning Automata as Reinforcement Learners

Recommender Systems: Introduction –HCI Study based on Personalization-Personalization in

Recommender Systems-Relational between Information Filtering and Recommender Systems-Application Areas of Recommender Systems- Recommender Systems Field as an Interdisciplinary Area of Research- Phases of Recommender Systems-User Profiling Approaches-Classification of Recommendation Techniques-Advantages and Disadvantages of Recommender System Approaches- Need of Software Agent-Based Approach in Recommender Systems-Evaluating Recommender Systems-Integrated Framework for Recommender Systems

UNIT IV

Advanced Visualization Methods: Ontology Definition-Ontology Visualization Methods-Space Dimensions of Ontology Visualization- Ontology Languages- Ontology Visualization Tools- Ontology Reasoning-Reasoner - Case Study 1: Teaching Ontology with C Programming Language- Case Study 2: Activity for Ontology Creation with a Case of a Software Company Scenario- Case Study 3: Activity for History Ontology Creation.

UNIT V

Ambient Intelligence: The New Dimension of Human-Computer Interaction: Introduction-Ambient Intelligence Definition –Context-aware Systems and Human-Computer Interaction-Middleware- Modelling Data for AmI Environment-Development of Context-awareness Future in Smart Class Room-A Case Study-Context-aware agents for developing AmI Applications- A Case Study.

TEXT BOOK:
1. "Human-Computer Interaction", K.Meena and R.Sivakumar, PHI Learning Private Limited, Delhi, 2015.

REFERENES:
1. Human - Computer Interaction, Third Edition, "Alan Dix, Janet Finlay, Gregory D. Abowd and Russell Beale", Pearson Education, 2004.
2. Human – Computer Interaction in the New Millennium, "John C. Carroll", Pearson Education" 2002.

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – IV SEMESTER – ELECTIVE COURSE - V
(For the candidates admitted from the year 2016 -17 onwards)

SOFT COMPUTING

- To learn about the how to make the computers think by itself.
- To know about various training algorithms
- Impart the knowledge of Fuzzy concept to the real world application
- Provide the mathematical background for optimization associated with soft computing
- Analyze the genetic algorithm and their applications.

UNIT-I
INTRODUCTION: Neural Networks : Application Scope of Neural Networks – Fuzzy Logic
– Genetic Algorithm – Hybrid Systems – Soft Computing. Artificial Neural
Network: An Introduction- Fundamental concept-Evolution of Neural Networks-
Basic Models of Artificial Neural Network – Important Terminologies of ANNs-
McCulloch-Pitts Neuron- Linear Separability - Hebb Network.

UNIT-II
Supervised Learning Network :Introduction – Perceptron Networks – Adaptive Linear
Neuron (Adaline) – Multiple Adaptive Linear Neurons – Back-Propagation Network-
Radial Basis Function Network.

UNIT-III
Associative Memory Networks: Introduction- Training Algorithms for Pattern Association-
Auto associative Memory Network – Hetero associative Memory Network –
Bidirectional Associative Memory (BAM) – Hopfield Networks – Iterative Auto
associative Memory Networks – Temporal Associative Memory Network –
Unsupervised Learning Networks :
Introduction - Kohonen Self-Organizing Feature Maps – Learning Vector Quantization –
Counter propagation Networks- Adaptive Resonance Theory Networks.

UNIT-IV
Introduction to Classical Sets and Fuzzy Sets: Introduction – Classical Sets (Crisp
Sets) – Fuzzy Sets – Classical Relations and Fuzzy Relations: Introduction –
Cartesian Product of Relation – Classical Relation – Fuzzy Relations – Tolerance and
Equivalence Relations –Non interactive Fuzzy sets. Defuzzification: Introduction –
Lambda – Cuts for Fuzzy Sets(Alpha- Cuts) – Lambda-Cuts for Fuzzy Relations –
Defuzzification Methods.

UNIT-V
Genetic Algorithm: Introduction – Basic Operators and Terminologies in GAs –
Traditional Algorithm vs. Genetic Algorithm – Simple GA – General Genetic
Algorithm – The Schema Theorem – Classification of Genetic Algorithm – Holland
Classifier Systems – Genetic Programming – Applications of Soft Computing.

TEXT BOOK:
1. "Principles of Soft Computing ", S.N.Sivanandam, S.N. Deepa, Wiley-India I
   Edition 2007

REFERENCE:
1. "Soft Computing Fundamentals and Applications ", Dilip K. Pratihar , Narosa
   Publishing House Edition

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GOVERNMENT ARTS COLLEGE (AUTONOMOUS) KARUR-05

M.Sc., COMPUTER SCIENCE – IV SEMESTER

(For the candidates admitted from the year 2016 -17 onwards)

PROJECT WORK

- To offer students a glimpse into real world problems and challenges that need IT based solutions.
- Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.
- Students are provided to work on multidisciplinary Problems.
- An ability to develop a project and manage the situations of the problem and improve the documentation capability

SL.	Area of Work	Maximum Marks
1.	PROJECT WORK: (i) Plan of the Project (ii) Execution of the plan / Collection of data / Organization of materials/ Fabrication Experimental study / Hypothesis, Testing etc., and Presentation of the report. (iii)Individual Initiative	20 45 15
2.	VIVA VOCE EXAMINATION	20
	TOTAL	100

PASSING MINIMUM – 50 MARKS

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