

Gondwana University, Gadchiroli



Choice Based Credit System (CBCS)

Syllabus of M.Sc. (Computer Science) - I (Two Years Degree Course)

Computer Science Board

2016-2017

M.Sc. (Computer Science) – I (Semester - I)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	% of Assessment			
					IA	UE	Total	Min. Passing (40%)
Core	PSCSCT01	Advanced Java	4	4	20	80	100	40
	PSCSCT02	Discrete Mathematics	4	4	20	80	100	40
	PSCSCT03	Data Warehouse & SQL	4	4	20	80	100	40
	PSCSCT04	Scripting Language & Information Retrieval	4	4	20	80	100	40
Core Lab	PSCSCP01	Practical based on PSCST01	8	4	20	80	100	40
	PSCSCP02	Practical based on PSCST03 & PSCST04	8	4	20	80	100	40
Ability Enhancement	PSCSCS01	Seminar	2	1	25	-	25	10
Total			34	25	145	480	625	250

- **Core:** Major theory papers in the concerned subject.
- **Discipline Specific Elective:** These papers will be specialization in the concerned subject.
- **Skill Enhancement course:** Student can choose this paper from any subject.
- From Elective Courses (Either Skill based and Discipline Specific), students need to select one paper form each.
- **IA**(Internal Assessment) :It will be evaluated by Internal Examiner appointed by College in consultation with the University. (Refer Appendix 1)
- **UE**(University Examination): It will be evaluated by External Examiner appointed by University. (Refer Appendix 1 & 3)
- **Period:** Each period is of 48 minutes or as per Government direction from time to time.
- In Paper Code
 - 1st Letter (U) : Represent it a Under Graduate Course.
 - 2nd Letter (S) : Represent it is Science Faculty
 - Next 3 Letter (CSC) : Represent the subject Computer Science
 - Next Letter (T/P) : T : Represent Theory Paper (Refer Appendix 1)
 - P : Represent Practical/Project (Refer Appendix 1 & 2)

S : Represent Seminar (Refer Appendix 1)

- Last two letter : Represent Paper No. for Ex. 01 Represent Paper no. 1

- **Lab* :**

- 1) Not more than two students should be allowed to do practical on one machine.
- 2) Wherever possible Practical's should be perform using Open Source Software.

Note: Student must appear for University Practical Examination.

Note : Direction and Scheme of course is available in the website of Gondwana University, Gadchiroli (www.gondwana.digitaluniversity.ac)

M.Sc. (Computer Science) – I (Semester - II)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	% of Assessment			
					IA	UE	Total	Min. Passing (40%)
Core	PSCSCT05	Theory of Computation & System Programming	4	4	20	80	100	40
	PSCSCT06	VB.NET	4	4	20	80	100	40
	PSCSCT07	Web Technologies	4	4	20	80	100	40
	PSCSCT08	Software Engineering	4	4	20	80	100	40
Core Lab	PSCSCP03	Practical based on PSCSCT06	6	4	20	80	100	40
	PSCSCP04	Practical based on PSCSCT07	6	4	20	80	100	40
Ability Enhancement	PSCSCS02	Seminar	2	1	25	-	25	10
Total			32	25	145	480	625	250

M.Sc. - I (Computer Science)

SEMESTER – I

M.Sc. (Computer Science) - I (SEMESTER – I)

Paper Code : PSCSCT01

PAPER – I : ADVANCED JAVA

Credit : 4]

[Max. Marks: 80

UNIT – I : Introduction of Java with OOPs Concepts

Introduction of Java: Features of Java, Data Types, Operators, Variables, Conditional and looping Statements, Arrays

Classes: Oops Concepts of Java, Declaring Objects, Methods, Constructor, Overloading Constructor, Garbage Collection, Finalize() Method, Uses of Static and Final Variable, Uses of Packages.

Exception Handling: Uncaught Exception, Try -Catch Block, Multiple Catch, Nested Try, Throw, Throws, Finally, Built-in and User- Defined Exception.

Multithreading: Life Cycle, Thread Class and Runnable Interface, Type Priorities, Synchronization and Interthread Communication.

UNIT – II : Applet, AWT and Swings

Applet: Applet Class, Architecture, Life Cycle, Display Methods, HTML Applet Tag, And Passing Parameter to Applet.

AWT: Working with Windows (Frames and Panel), Controls (Label, TextField, Button, Checkbox, ScrollBar, List, Choice) **Layout Managers :** Border Layout, Flow Layout, Grid Layout. Menus.

Swings: Introduction and Event Handling.

UNIT – III : JDBC ODBC

Database Programming: Design of JDBC, JDBC Configuration, Types of Drivers, Executing SQL Statements, Query Execution, Scrollable and Updatable Result Sets, Rowset, Metadata, Transactions, Sample example of JDBC connectivity with MS-Access and ORACLE.

Collections: Introduction to the Collection Framework (Interfaces, Implementation)

UNIT – IV : Servlet and JSP

Servlet: Introduction to Servlet(Http Servlet),Life Cycle of Servlet, Handling Get and Post Request(Http),Data Handling Using Servlet, Creating and Cookies, Session Tracking Using Http Servlet,

JSP: Getting Familiar with JSP Server, First JSP, Adding Dynamic Contents via Expressions Scriptlet, Mixing Scriptlet and HTML, Directives, Declaration, Tags and Session.

Books:

- 1) Dietal, “Java How to Program”, Pearson Education Inc, 6th Ed., 2007, ISBN 81-317-0954-X
- 2) Herbert Schield, “Java2 Complete References”, TMH, 7th Ed., 2007, ISBN 0-07-063677-X
- 3) Steven Horlzner , “Java 2 Programming Black Books”, ISBN-13: 978-1588800978

References:

- 1) Jason Hunter, William Crawford, “Java Servlet Programming”, O'reilly Media Inc., 2th Edition, ISBN- 0596000405

M.Sc. (Computer Science) - I (SEMESTER – I)

Paper Code : PSCSCT02

PAPER-II : DISCRETE MATHEMATICS

Credit : 4]

[Max. Marks: 80

UNIT – I : Fundamental of Sets and Mathematical Logic

Fundamental: Sets and Subsets, Operations on Sets, Sequence, Matrices.

Logic-Proposition and Logical Operation Conditional Statements, Methods of Proof, Mathematical Induction

Mathematical Logic- Statements and Notation, Equivalence of Formulas, Duality, Connectives, Normal Forms, Principle Disjunctive Normal Form, Principle Conjunctive Normal Form, Theory of Inference for the Statement Calculus, Inference Theory of the Predicate Calculus.

UNIT – II : Counting, Relation and Diagraph

Counting: Permutation, Combination, Pigeonhole Principle, and Recurrence Relations.

Relational and Digraphs- Product Sets and Partitions, Relations and Digraphs, The Matrix of a Relation, Paths in Relations and Digraphs, Properties of Relations, Equivalence Relations, Computer Representation of Relations and Digraph, Manipulation of Relations, Transitive Closure and Warshall's Algorithm.

UNIT – III : Graph Theory, Lattices and Boolean-Algebra

Graph Theory: Basic Concept of Graph Theory, Euler Paths and Circuits, Hamiltonian Paths and Circuits.**Additional Relations and Structure-**Partially Ordered Sets, Lattices, Hasse Diagram, Principle of Duality, Distributive Lattice, Sub Lattice, Complemented Lattice, **Boolean-Algebra:** Introduction, Functions of Boolean algebra's, Boolean Function as Boolean Polynomials

UNIT – IV : Groups, Languages and Finite State Machines

Groups : Binary Operations, Products and Quotients of Groups, Subgroup, Abelian Group, Normal Subgroup, Semi Groups, Products and Quotients of Semi Groups.

Languages: Definition, Languages of Machine, Grammar, Derivation Trees

Finite-State Machines: Introduction to Finite State Machine, Moore Machines

Books:

- 1) Dr. S.B. Kishor, "Discrete Mathematics", Das Ganu Prakashan, 2014, ISBN-978-93-81660-21-8
- 2) Bernard Kolman, Robert C. Busby, Sharon C. Ross, "Discrete Mathematical Structures", Prentice Hall Publication, "6th Edition", Year-2008, ISBN No.-0132297515.
- 3) Discrete Mathematical Structures with Application to computer science, Publication Tata McGraw –Hill, Year-2003, ISBN-0-07-065142-6,

References:

- 1) Goodaire, "Discrete Mathematics with Graph Theory", PHI Publication, Year-1997, ISBN No-0136020798.
- 2) J.K. Sharma, "Discrete Mathematics", McMillan Publication, Copyright Year-2011, ISBN No-9780230322301.
- 3) Rajendra Akerkar, "Discrete Mathematics", Publication Pearson

M.Sc. (Computer Science) - I (SEMESTER – I)

Paper Code : PSCSCT03

Paper-III : DATA WAREHOUSE AND SQL

Credit : 4]

[Max. Marks: 80

UNIT – I : (Data Warehousing and OLAP)

Introduction to Data Warehousing: Characteristics of a Data Warehouse, Data Warehouse Architectural Strategies, Design Considerations, Data Content, Building a Data Warehouse, Metadata, Tools for Data Warehousing, Performance Considerations, Crucial Decisions in Designing a Data Warehouse, Different Case Studies. Various Technological Considerations: OLTP and OLAP Systems, Data Modeling, Managed Query Environment (MQE).

UNIT – II : (Data Mart and Data Mining Tools)

Data Mart: Data Mart, Type of Data Mart, Loading a Data Mart, Metadata for a Data Mart, Data Model for a Data Mart, Software Component for a Data Mart, Tables in Data Mart, Security in Data Mart.

Data Mining and Tools: Introduction, From Data Warehouse to Data Mining, Steps of Data Mining, Data Mining Algorithm, Database Segmentation, Predictive Modeling, Link Analysis, Tools for Data Mining.

UNIT – III : (SQL Server, Components and Queries)

SQL Server Architecture: SQL Server Data Storage Architecture, The Data Engine, System Databases.

SQL Components: SQL's Basic Object, Data Types, Transact-SQL Functions, Scalar Operators, Null Values. Data Definition Language, Data Manipulation Language, Queries, Modification of Table Contents, Stored Procedures and User-Defined Functions, Views.

UNIT – IV : (Data Integrity, User Security and Concurrency Control)

Managing Data Integrity: Data Integrity Controls, Working with Constraints, DML Triggers.

Managing User Security: Security Architecture, Implementing SQL Server Principles and Authentication, Implementing Permission in SQL Server.

Backup and Concurrency Control: Transaction Architecture, Locking, Backup Types, Performing Database Restore, Replication, Using Transaction Logs, Using Triggers, Replication Methods.

Books:

1. C.S.R. Prabhu, "Data Warehousing", PHI, 3rd Ed., 2010, ISBN-978-81-203-3421-2.
2. Dusan Petkovic, "Microsoft SQL Server 2008, Beginner S Guide", TMH Pub., 1st Edition, 2008, ISBN-0071540383.
3. Michel Lee, Gentry Bieker, "Mastering SQL Server 2008", Sybex Pub., 1st Ed., 2009, ISBN-047028904x.

References:

1. Jiawei Han, Micheline Kamber, Jian Pei, "Data Mining Concepts and Techniques", Elsevier Pub. 3RD Ed, 2011, ISBN-9780123814791.
2. Alex Berson, "Data Warehousing, Data Mining & OLAP", TMH, ISBN 0-07-058741-8
3. Robert Vieira, "Beginning Microsoft SQL Server 2008 Programming", Wrox Publication, 2009, ISBN-9780470257012.

M.Sc. (Computer Science) - I (SEMESTER – I)

Paper Code : PSCSCT04

Paper-IV : Scripting Language & Information Retrieval

Credit : 4]

[Max. Marks: 80

UNIT – I : HTML and Linking

HTML - Introduction to HTML, Creating HTML Documents, Creating Web Pages with HTML **Tags:** HTML, Head, Title, Body ,Heading , Paragraph Tags, Alignment, formatting, Font Size, Attributes, List, Character formatting : Logical Verses Physical Style, Logical and Physical Style, Changing The Colors of The Fonts, Multiple Tags.

Linking: Relative Pathnames Verses Absolute Pathnames, URL, Links to Specific, Sections within the Current Document, Mailto. **Inline Images:** Images Size Attributes, Inline Images, Alternate Text Images, Images Hyperlink

Tables: Table Row and Columns, Creating Simple Tables, Spanning Row and Columns with HTML Tables, Spanning Rows and Columns, Table Alignment Properties.

UNIT – II : Java Script

Java Script: The Nature of Java Script, Script, Script Writing Basic, Auditioning of Interactivity to a Web Page. Creating Dynamic Web Pages, Java Scripting Your forms. Creating Scrolling Messages Animating a Graphics, Creating a Floating Toolbar, Setting Up Tool Bar, Window, Designing Image Map Navigation

UNIT – III : VB Script

Introduction VB Script: Evolution of Scripting Language, Introduction to VB Script, Features of VB Script, Data Types in VB Script, Elements of VB Script: Identifiers, Operators, Control Statements, Control Structure

Functions: Variant Function, Math Function, formatting Function, String Manipulation Function, Type Conversion Methods Supported by VB Script, Arrays in VB Script, Regular Expression

UNIT – IV : Information Retrieval

Information Retrieval- Boolean Retrieval ,The Term Vocabulary and Postings Lists, Dictionaries and Tolerant Retrieval, Index Construction, Index Compression, Scoring, Term Weighting and The Vector Space Model, Computing Scores in a Complete Search System, Evaluation in Information Retrieval, Relevance Feedback and Query Expansion, XML Retrieval, Probabilistic Information Retrieval

Books:

1. C.Xavier ,“Web Technology and Design”, ISBN-812214508/9788122414509.
2. O’relly “Dynamic HTML” SPD, ISBN-978-56592-494-9.
3. Dr. S. B. Kishor, Rajani Singh, “Web Designing”, Das Ganu Prakashan
4. Prabhakar Raghavan and Hinrich Schütze ,“Introduction to Information Retrieval Christopher D. Manning”, ISBN-0521865719

References:

1. “Web Application”, NIIT Prentice Hall of India, ISBN- 81-203-2714-4
2. “Dynamic HTML in Action”, PHI, ISBN-978-81-203-3872-2.

M.Sc. (Computer Science) - I (SEMESTER – I)

Paper Code : PSCSCP01

Practical

(Practical based on PSCST01)

[Max. Marks: 80]

Practical List of Advanced Java

1. Write a java program to create a class “ Student” with rollno,sub1,sub2,sub3 as data members and getData() and printData() as member functions.
2. Write a java program to create a class “ Box” with width, height and length as data members and getBox() and printBox() as member functions.
3. Write a java program to design a Box Class with overloaded constructor
4. Default constructor
5. Constructor with one argument.
6. Constructor with three arguments.
7. Design a package “MyPackage” and write two class MyClass1 and MyClass2 with appropriate members and add these classes to MyPackage Package.
8. Design a Interface “MyInter” and add two methods sum() and mult() for two integers in it.
9. Write a java program to demonstrate the try...catch mechanism.
10. Write a java program to show use of throw, throws and finally keyword.
11. Write a java program to demonstrate Threads using Thread class and also with Runnable interface.
12. Write a java program which shows the use of synchronization.
13. Design a user interface using applet to accept two values and calculate sum of these numbers.
14. Design a user interface using applet which accepts a number and program will calculate square and cube of given number and also display in respective textbox.
15. Write a java program to which read a data from a file and print contents of a file on VDU.
16. Write a java program to read the contents of a one file and copied to another.
17. Write a java program to read the contents from given URL.
18. Write a java program to create Client and Server program to communicate each other.

Practical List of Discrete Mathematics (Practical Should Perform on C++)

1. A PROGRAM FOR UNION OF SETS (A U B)
2. A PROGRAM FOR INTERSECTION OF SETS (A B)
3. A PROGRAM FOR DIFFERENCE OF SETS (A-B)
4. A Program to find addition of two matrix
5. A Program to find multiplication of two matrix
6. A Program to find transpose matrix

M.Sc. (Computer Science) - I (SEMESTER – I)

Paper Code : PSCSCP02

Practical

(Practical based on PSCST03 & PSCST04)

[Max. Marks: 80

Practical List of SQL and PL/SQL

- A. Create table DONAR with following fields (Dno, Dname, City, Age, Sex, BG, Quantity, date).
B. Insert the following records into the table DONAR.

Dno	Dname	City	Age	Sex	BG	Quantity	Date
101	RAJESH RAO	CHANDRAPUR	28	M	O+ve	100	25-AUG-11
102	ANAND SHARMA	NAGPUR	20	M	O+ve	200	26-AUG-11
103	VISHAL DESHPANDE	HYDERABAD	23	M	O-ve	250	26-AUG-11
104	SHRUTI RAKHUNDE	CHANDRAPUR	22	F	A+ve	100	27-AUG-11
105	ANUSHREE DHAKATE	-	22	F	A-ve	200	26-AUG-11
106	VIJETA DHAKATE	BALLARPUR	22	F	O+ve	100	25-AUG-11
107	AAMIR TAJA	CHANDRAPUR	21	M	O+ve	250	27-AUG-11
108	AMIR KHAN	DURGAPUR	25	M	O+ve	100	25-AUG-11

C] Perform following queries on above table.

1. Find all donars whose name starts between alphabets 'A' to 'S'.
2. Find all donars who belongs to city CHANDRAPUR.
3. Find all donars who does not belongs to CHANDRAPUR city.
4. Find all donars who belongs to either CHANDRAPUR or NAGPUR city.
5. Find all donars whose city value contains NULL.
6. Arrange all donars in the sorted order whose age is between 18 and 22.
7. Find all male donars.
8. Find all male donars having O+Ve blood group.
9. Find all donars who donated the blood between 25-AUG-10 and 26-AUG-11.

10. Find all donars who donated more than 100 ml of blood.
11. Find all female donars who belong to city CHANDRAPUR having blood group 'O+Ve' in the sorted order of city?
12. Display all donars according their age.
13. Display the donar list in recent order of donation date.
14. Display all distinct blood group type.
15. Update the age of all donars by 1.
16. Mr. RAJESH RAO changed his name as RAMESH RAO and he is shifted to DURGAPUR. Note the above changes in the table.
17. Due to certain reason all the donars who donated the blood on date '26-AUG-11' are rejected. Hence delete their information.
18. Find the donars names whose first name starts with letter 'A' and ends with 'D' irrespective of case letter.
19. Find the donar names whose last name starts between alphabets 'D' to 'S' (Ex. DESPANDE, SHARMA)
20. Find total number of donars having O+Ve group.
21. Find total quantity of blood of group A+Ve.
22. Average age of female donar of O+Ve group by rounding the age to next digit.
23. Display all donars who name pronounces like 'AAMIR';
24. Find the donars who donated the blood in the month of AUG.
25. Find the donars who donated the blood on 15th Aug. of year.

Practical List of Scripting Language

1. Demonstrate of Logical Format Tag.
2. Demonstrate of Physical (Formatting) style tag
3. Demonstration of Level of Headings
4. Demonstration of Block Alignment
5. Demonstrate the Font Face, Color and Size.
6. Demonstrate the Alignment
7. Demonstrate the Scrolling tab using Mercury.
8. Demonstrate of Order List

9. Write a program to embed VBScript in HTML Document.
10. Write a program to illustrate Option Explicit Statement in VBScript.
11. Write a program to add an ActiveX Control in HTML Document.
12. Write a program to set properties to ActiveX Control.
13. Write a program to illustrate Client-Server Program using VBScript.
14. Write a JavaScript program to associate the Method with the Object.
15. Write a JavaScript program to illustrate the different properties of Document Object.
16. Write a JavaScript Program to Create a Dynamic Web Page.
17. Write a JavaScript Program to Generate User ID at Runtime.

M.Sc. (Computer Science) - I (SEMESTER – I)

**Paper Code: PSCSCS01
SEMINAR**

[Max. Marks: 25

Refer Appendix -I

M.Sc. - I (Computer Science)

SEMESTER – II

M.Sc. (Computer Science) - I (SEMESTER – II)

Paper Code : PSCSCT05

PAPER - I : THEORY OF COMPUTATION & SYSTEM PROGRAMMING

Credit : 4]

[Max. Marks: 80

UNIT - I : Finite Automation and Regular Expression

Finite Automation and Regular Expression : Finite State Systems, Basic Definitions, Non - Deterministic Finite Automata, Finite Automata with Moves, Regular Expressions, Two Way Finite Automata, Finite Automata with Output, Application on Finite Automata.

Properties of Regular Sets: The Pumping Lemma for Regular Sets, Close Properties of Regular Sets, Decision Algorithms for Regular Sets.

Context Free Grammars : Motivation and Introduction, Context Free Grammar, Derivation Tree, Simplification of Context Free Grammars, Chomsky Normal form, Greibach Normal form, The Existence of Inherently Ambiguous Context Free Languages.

UNIT - II : Push Down Automata and Turing Machine

Push Down Automata: Informal Description, Definitions, Push Down Automata and Context Free Languages.

Turing Machine : Introduction, The Turing Machine Model, Computable Languages and Functions , Techniques Turing Machine Construction, Modification of Turing Machines, Church's Hypothesis, Turing Machine As Enumerators, Restricted Turing Machine Equivalent to The Basic Model. **Chomsky:** Regular Grammars, Unrestricted Grammars, Context Sensitive Languages, Relation between Classes of Languages.

UNIT – III : Introduction to Device Drivers

Introduction to Device Drivers: Role of Device Drivers, Splitting The Kernel, Classes of Devices and Modules, Security Issues, Version Numbering, Building and Running Modules Kernel Modules Vs. Applications, Compiling and Loading, Kernel Symbol Table, Preliminaries, Interaction and Shutdown, Module Parameters, Doing It in User Space.

UNIT - IV: (Assembly and Machine Languages)

Assembly and Machine Languages: CPU Architecture of 8086 Family, Function, Procedure and General Purpose Registers, Memory Segmentation and Address Computation, Addressing Modes, Instructions Set and formats. Different Types of Instruction, Processing of Binary, ASCII and BCD Data, Stacks, Calls, Returns, Near and Far Procedures. Interrupts and Their Routines, Definitions and Recursive Macros, Assemblers, Overview of Compilation Process.

Loaders and Linkers: Loading Schemes, Linking, Relocation and Program Relocation.

Books:

1. Donovan J.J, "Systems Programming", New York, TMH, ISBN-0-07-460482-1
2. Dhamdhere D.M., "System Programming", TMH, ISBN-0-7-133311-8
3. John E. Hopcroft and Jeffery D.Ullman, "Introduction to Automata Theory, Languages and Computation".
4. E. V. Krishnamoorthy, "Theory of Computer Science", ISBN-088791255x.

References:

1. Adam Hoover, "System Programming with C and UNIX", Pearson, ISBN-0136076602.
2. D. I. A. Cohen, "Introduction to Computer Theory", ISBN-0-471-13772-3.
3. H.R. Lewis and C.H. Papadimitriou, "Elements of Theory of Computation", PHI, ISBN-0132624788

M.Sc. (Computer Science) - I (SEMESTER – II)

Paper Code : PSCSCT06

PAPER – II : VB.NET

Credit : 4]

[Max. Marks: 80

UNIT – I : Introduction to .NET

Introduction to .Net Framework, Basic Functionality of CLR, MSIL, About Platform Independency, Language Interoperability, CTS and CLS, .Net Languages, Assemblies, Garbage Collection, Architecture of GC and Application Domain.

UNIT – II : Visual Studio.NET

WPF Designer and Windows form Integration, Multi-Framework Targeting, Better Intelligent Support, Refactoring and Enhancements, Visual Studio Split View, Debugging The .Net Source Code

VB.Net Language: Features of VB.Net, Writing Programs in VB.Net, Compiling and Execution from Command Prompt

Data Types, Expressions and Operators: Option Statements, Basic Element of Programming (Data types, Variable, Constant, Control Flow Statement), Type Casting, Boxing and Unboxing, Built-in Functions in VB.Net, Sub Programs and Working with Arrays

UNIT – III : Object oriented Programming with VB.NET

Principles of OOP, Data Encapsulation, Data Abstraction, Properties, Method Overloading, Constructors, Inheritance, Overloading and Overriding, Shadowing, Abstract Classes and Sealed Class, Polymorphism,

Delegate- Unicast and Multicast, Events, Collections, Directories, Strings, String Builders, Attributes, Namespaces and Generics

Windows Applications: Introduction to System.Windows.forms.Dll, Basic Controls and Event Driven Programming, Programming with Advanced Controls.

Windows Control Library Error Handling: Structured Error Handling, Error Categories, Debug and Trace Classes, Code Optimization, Testing Phases and Strategies.

UNIT – IV : Data Access with ADO.NET

Introduction to Access Libraries DAO, RDO, ADO, Limitation of ADO, ADO.Net Objects and Usage, ADO.Net Managed Providers, Data Reader, Data Adapter and Dataset, Data Relation and Dataset, Data Binding, Connected and Disconnected Environments, Connection Pooling, ADO.Net Exceptions, Using Stored Procedures, N-Tier Database Application, ADO.Net and XML. File Stream, Windows Services, Crystal Reports

Books:

- 1) David I. Schneider, “an Introduction to Programming Using Visual Basic .Net”, PHI, ISBN-81-203-2159-6
- 2) Shirish Chavan, “Visual Basic .Net”, Pearson, ISBN-81-317-1391-1
- 3) Mastering Crystal Report, BPB.

References:

- 1) Jeffrey R. Shapiro, “The Complete References -Visual Basic .Net”, TMH, ISBN-0-07-049511-4
- 2) Anne Prince and Doug Lowe, “March’s VB.Net Database Programming with ADO.Net”.
- 3) Crystal Report – The Complete References, TMH

M.Sc. (Computer Science) - I (SEMESTER – II)

Paper Code : PSCSCT07

PAPER – III : WEB TECHNOLOGIES

Credit : 4]

[Max. Marks: 80

UNIT – I : Introduction to Core PHP

Introduction to PHP, Why PHP, Hardware & Software Requirements, Advantages of PHP Why PHP is better alternative, PHP Syntax, Data Types, Variables, Operators, Conditional Statements, Loops; Super Globals, String Manipulation, Working with Array, PHP functions, Working with Forms, MySQL Database MySQL Database - What is Database, Database Models, Tables, Records and Files, SQL Language, MySQL Command-Line, Working with PHP MyAdmin,

UNIT – II : Advanced PHP Programming Cookies

What is Cookie? Cookie Syntax, How to Create, Store, Retrieve and Delete Cookie. PHP File Upload – Create an Upload-File Form, Upload Script and Save Uploaded file, putting restrictions on uploads.

PHP File Handling – Opening and Closing of a File, Check End-of-file, Reading a File – Line by Line and Character by Character.

Session – What is Session? Creating, Storing and Destroying Sessions.

Classes & Object – OO Concepts, Define Class, Class Attributes, An Object, Creating an Object, Object Properties & Methods, Object constructors and destructors, Static Method, Class Inheritance, Abstract Class, Implement Inheritance.

UNIT – III : Introduction To Python

Basic Concept, Python Identifiers And Reserved Words, Lines And Indentation, Multi-Line Statements, Comments, Print And Raw_Input()/Input, Command Line Arguments And Processing, Command Line Arguments, Standard Data Types - Basic, None, Boolean (True & False), Numbers, Python Strings, Data Type Conversion, Python Basic Operators (Arithmetic, Comparison, Assignment, Bitwise Logical), Python Membership Operators (In & Not In), Python Identity Operators (Is & Is Not), Operator Precedence, Control Statements, Python Loops, Mathematical Functions And Constants (Import Math), Random Number Functions

UNIT – IV : Python strings, Concept, Slicing, escape characters, String special operations, String formatting operator, Triple quotes, Raw String, Unicode strings, Built-in String methods. Python Lists - concept, creating and accessing elements, updating & deleting lists, basic list operations **Python tuples and sets - Concept (immutable), creating & deleting tuples, accessing values in a tuple, updating tuples, delete tuple elements, basic tuple operations, Indexing, slicing and Matrices, builtin tuple functions. Sets - Concept, operations.**

Python Dictionary - Concept (mutable), creating and accessing values in a dictionary , updating dictionary, delete dictionary elements, properties of dictionary keys, built-in dictionary functions and methods, Object Oriented Programming in Python, Classes and Objects, Create new objects, Overload Operators, and utilize Python Special Methods.

Books:

1. Larry Ullman, “PHP 6 and MYSQL 5 for Dynamic Web Sites: Visual Quick Pro Guide”, Peachpit Press, ISBN- 978-0321525994
2. Bill Lubanovic, “Introducing Python”, Shroff Publication

References

1. Joseph Joyner, “Python Programming for Begnners”, ISBN 13-9781633830394

M.Sc. (Computer Science) - I (SEMESTER – II)

Paper Code : PSCSCT08

PAPER- IV : SOFTWARE ENGINEERING

[Credit : 4]

[Max. Marks: 80

UNIT – I : Introduction to Software Engineering

The Role of Software Engineering, History of Software Engineering, The role of Software Engineering, The Software Life cycle, The Relationship of Software Engineering to Other Areas of Computer Science. The Relationship of Software Engineering to other Disciplines.

Software: Its Nature and Qualities- Classification of software Qualities, Representative Qualities, Quality Requirements in different application Areas, Measurement of Quality.

UNIT – II : Software Engineering Principles

Rigor and Formality, Separation of Concern, Modularity, Abstraction, Anticipation of Change, Generality, Instrumentality.

Software Design- Software Design Activity and its Objectives, Modularization Techniques, Object- Oriented Design.

UNIT – III : Software Specification/ Verification

Software Specification – The Uses of Specification, Specification Qualities, Classification of Specification Styles, Verification of specifications, Operational Specification, Descriptive Specification.

Software Verification- Goals and Requirement of Verification, Approaches to Verification, Testing, Analysis, Symbolic Execution, Debugging, Verifying Other Software Properties.

UNIT - IV : Software Production Process & Management of Software Engineering

The Software Production Process – Software Production Process Models: Waterfall Model, Evolutionary Model, Transformation Model, and Spiral Model. Organizing the process.

Management of Software Engineering – Management Functions, Project Planning, Project Control, Organization, Risk Management.

Books:

1. Ghezzi, Jazayeri, Mandrioli, “Fundamentals of Software Engineering”, PHI.
2. Pressman, “Software Engineering”, Tata McGraw Hill

References:

1. Mall, “Fundamentals of Software Engineering”, PHI.
2. Richard Fairley, “Software Engineering Concepts”, Tata McGraw Hill.

M.Sc. (Computer Science) - I (SEMESTER – II)

Paper Code : PSCSCP03

Practical

(Practical based on PSCST06)

[Max. Marks: 80

Practical List of VB.NET

1. A console application to print star in triangular format.
2. A console application to convert a number into string.
3. Write a program for Binary Search.
4. Write a program to merge two different arrays.
5. Write a program add the graphics in given form.
6. Write a program to count character A to Z from given text.
7. Write a program to handle interaction of two forms.
8. Write a program to store two lists of names and merge them into third list.
9. Write a program to create histogram, a file should hold years and values.
10. Write a program to find the currency of selected country using database connectivity.
11. Write a program to save and load the table using database connectivity.
12. Write a program to handle three files at a time by differentiating using password.
13. Write a program to change the dimension of one array into another using Re Dim statement.
14. Write a program to insert Menu strip.
15. Write a program to access the data from the given database to the current working window using data grid.
16. Write a program to handle text file info in the given window.

M.Sc. (Computer Science) - I (SEMESTER – II)

Paper Code : PSCSCP04

Practical

(Practical based on PSCST07)

[Max. Marks: 80

Practical List of PHP

1. Write a PHP program to display the today's date and current time.
2. Write a PHP program to calculate sum of given number.
3. Write a PHP program to display the Fibonacci series.
4. Write PHP program to display current day using switch case.
5. Write a PHP program to prepare student Mark sheet using Switch statement.
6. Write a PHP program to demonstrate the use of array.
7. Write a PHP program to display the use of associative array.
8. Write a PHP program to display the use of multidimensional array.
9. Write a PHP program to generate the multiplication of matrix.
10. Write a PHP program for reading the content of file.
11. Write PHP program to copy the content of a file.
12. Write PHP program to append a file
13. Write a PHP Program for Create, Delete, and Copying file from PHP Script.
14. Write a PHP Program to Recursive Traversals of Directory.
15. Write PHP program to test for function's existence.
16. Write a program to build a simple HTML form.
17. Write a program to build an HTML form including multiple checkboxes.
18. Write a program to Add an Array Variable to a Session Variable.
19. Write a PHP program to send Mail from PHP Script.
20. Write a PHP program to read the employee detail using form component.
21. Write a PHP program to create a table in mysql database .
22. Write a PHP program to insert a record into a table in mysql
23. Write a PHP program to select a record from a table in mysql database .

Practical List of Python

1. Write a Python Program to Print Hello World !
2. Write a Python Program to add two Numbers.
3. Write a Python Program to find the Square root.
4. Write a Python Program to generate a Random Numbers.
5. Write a Python Program to check if a number is positive, negative or zero.
6. Write a Python Program to check number is odd or even
7. Write a Python Program to find sum of natural numbers
8. Programs on Python List, Dictionary, and Object Oriented Concepts

M.Sc. (Computer Science) - I (SEMESTER – II)

**Paper Code: PSCSCS02
SEMINAR**

[Max. Marks: 25

Refer Appendix -I

Appendix 1

Evaluation Rules

A) Internal Assessment:

1. The internal assessment marks shall be awarded by the concerned teacher.
2. The internal assessment marks shall be sent to the University after the Assessment in the prescribed format and direction by University.
3. General guidelines for Internal Assessment are:
 - a) The internal assessment marks assigned to each theory paper on the basics of the performance in any two assignments (each of 10 marks) as described below selected by concerned teacher.
 1. Class Test / Sessional examination
 2. On-line Test
 3. Theory Assignments
 4. Programming Assignments
 5. Study tour
 6. Industrial visits
 7. Visit to educational institutions and research organizations, field work, Conference etc
 8. Group discussions
 9. Seminar Presentation
 10. Publishing Research Paper
 11. Review of Research Papers
 12. Participation in Departmental Activities
 - b) There shall be no separate / extra allotment of work load to the concerned teacher related to above assignments. He/ She shall conduct the Internal assessment activity during the regular teaching days / periods as a part of regular teaching activity.
 - c) The concerned teacher / department / college shall have to keep the record of all the above activities until six months after the declaration of the results of that semester.
 - d) At the beginning of each semester, every teacher / department / college shall inform his / her students unambiguously the method he / she propose to adopt and the scheme of marking for internal assessment.
 - e) Teacher shall announce the schedule of activity for internal assessment in advance in consultation with HOD.

B) Seminar

In seminar, the student will have to deliver a seminar on any topic relevant to the syllabus / subject encompassing the recent trends and development in that field / subject. The topic of the seminar will be decided at the beginning of each semester in consultation with the supervising teachers. The student has to deliver the seminar which will be followed by discussion.

The students should submit the seminar report typed and properly bound in one copy to the head of the department along with soft copy in CD. The said shall be evaluated by the concerned supervisor / head of the department. The concerned teacher / department / college shall have to keep the record of Seminar Reports until six months after the declaration of the

results of that semester.

C) Practical Assessment:

Time: Minimum 2 Hours 30 Min. for conducting the practical examination subject to the condition the availability of computers and printers at the center.

Marks Distribution: A practical mark will be allocated by Internal & External Examiner as per the following format

Sr. No.	Particulars	Max. Marks
a.	Writing, Execution and Printout of Program	32
b.	Writing Program	16
c.	Practical Record	16
d.	Viva Voce	16
Total		80

- Note :** 1) The Written work should be completed within max. 45 minutes.
2) For execution and taking printout max. 45 minutes is reserved.

E) Theory Paper Assessment : Theory papers will be held as per the scheduled given by the university and examinee needs to score minimum 40% of marks to clear the paper including internal assessment marks.

F) Revaluation: There is also a provision for the Revaluation only for theory papers examination conducted by University (i.e. it is not applicable for Internal Assessment) as per the rules and fee structure prescribed by University.

Appendix 2
Practical Examination

1. Each practical carries 100 marks. The scheme of marking shall be as per given in the syllabi of respective subjects.
2. Practical performance shall be jointly evaluated by the External and Internal Examiner. In case of discrepancy, the External Examiner's decision shall be final.
3. Duration of practical examination will be Minimum 2 Hours 30 Min.
4. The Practical Record of every student shall carry a certificate as shown below, duly signed by the teacher-in-charge and the Head of the Department. If the student fails to submit his / her certified Practical Record duly signed by the Teacher-In-Charge and the Head of the Department, he / she shall not be allowed to appear for the Practical Examination and no Marks shall be allotted to the student.
5. The certificate template shall be as follows:

C E R T I F I C A T E
Name of the College / Institution : _____ Name of the Department: _____
This is to certify that this Practical Record contains the bonafide record of the practical work of Mr. / Mrs. / Ku. _____ of M.Sc.(Computer Science) _____ Semester _____ during the academic year _____.
The candidate has satisfactorily completed the practical's prescribed for the course by Gondwana University, Gadchiroli for the subject _____
Dated : __ / __ / _____
Signature of the teacher who taught the examinee
1. _____ 2. _____
Head of the Department

Appendix-3

Pattern of Question Paper

General Rules and Regulations regarding pattern of question paper for the semester end examination is as given below:

1. There will be four units in each paper.
2. Maximum marks of each theory paper will be 80.
3. Question paper will consist of five questions, each of 16 marks.
4. Four questions will be based on four units with internal choice.
5. Fifth question will be compulsory with questions from each of the four units having equal weightage and there will be no internal choice.

Master of Science	
M.Sc. (Computer Science) – [I / II]	Semester – [I / II/ III / IV]
Paper Code:	Paper: Name of Paper
Time: 3 Hours]	[Max. Marks: 80
Note: 1) All questions are compulsory and carry equal marks. 2) Draw Neat and Labeled diagram and use supporting data wherever necessary. 3) Avoid vague answers and write specific points/answer related to questions.	
<hr style="border-top: 1px dashed black;"/>	
Q1 Either (From Unit 1)	
a)	8
b)	8
Or	
c)	8
d)	8
Q2 Either (From Unit 2)	
a)	8
b)	8
Or	
c)	8
d)	8
Q3 Either (From Unit 3)	
a)	8
b)	8
Or	
c)	8
d)	8
Q4 Either (From Unit 4)	
a)	8
b)	8
Or	
c)	8
d)	8
Q5 Solve all questions	
a) (From Unit 1)	4
b) (From Unit 2)	4
c) (From Unit 3)	4
d) (From Unit 4)	4

Gondwana University, Gadchiroli



Choice Based Credit System (CBCS)

Syllabus of

**M.Sc. (Computer Science) - II
(Two Years Degree Course)**

Prepared by

Dr. S. B. Kishor

Chairman, BOS Computer Science

2017-2018

M.Sc. (Computer Science) – II (Semester - III)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	% of Assessment			
					IA	UE	Total	Min. Passing (40%)
Core	PSCST09	Software Testing Tools and Methodology	4	4	20	80	100	40
	PSCST10	Soft Computing Techniques	4	4	20	80	100	40
	PSCST11	Research Methodology And Operational Technique	4	4	20	80	100	40
	PSCST12	C#.NET	4	4	20	80	100	40
Core Lab	PSCSP05	Practical based on PSCST09 & PSCST10	8	4	20	80	100	40
	PSCSP06	Practical based on PSCST11 & PSCST12	8	4	20	80	100	40
Ability Enhancement	PSCSS03	Seminar	2	1	25	-	25	10
Total			34	25	145	480	625	250

- **Core:** Major theory papers in the concerned subject.
- **Discipline Specific Elective:** These papers will be specialization in the concerned subject.
- **Skill Enhancement course:** Student can choose this paper from any subject.
- From Elective Courses (Either Skill based and Discipline Specific), students need to select one paper form each.
- **IA(Internal Assessment) :**It will be evaluated by Internal Examiner appointed by College in consultation with the University. (Refer Appendix 1)
- **UE(University Examination):** It will be evaluated by External Examiner appointed by University. (Refer Appendix 1 & 3)
- **Period:** Each period is of 48 minutes or as per Government direction from time to time.
- In Paper Code
 - 1st Letter (U) : Represent it a Under Graduate Course.
 - 2nd Letter (S) : Represent it is Science Faculty
 - Next 2 Letter (CS) : Represent the subject Computer Science
 - Next Letter (T/P) : T : Represent Theory Paper (Refer Appendix 1)
P : Represent Practical (Refer Appendix 1 & 2)
S : Represent Seminar (Refer Appendix 1)
 - Last two letter : Represent Paper No. for Ex. 01 Represent Paper no. 1

- **Lab* :**

- 1) Not more than two students should be allowed to do practical on one machine.
- 2) Wherever possible Practical's should be perform using Open Source Software.

Batch: Each batch can be of Maximum 12 students

Note : Direction and scheme of course is available in the website of Gondwana University, Gadchiroli (www.gondwana.digitaluniversity.ac)

M.Sc. (Computer Science) – II (Semester - IV)								
Subject	Paper Code	Paper Name	Total Period /Week	Credit	% of Assessment			
					IA	UE	Total	Min. Passing (40%)
Core	PSCST13	Android Application Development	4	4	20	80	100	40
	PSCST14	Digital And Cyber Forensics	4	4	20	80	100	40
	PSCST15	Web Designing Using Asp .Net	4	4	20	80	100	40
	PSCST16	Project	4	4	20	80	100	40
Core Lab	PSCSP07	Practical based on PSCST13 & PSCST14	6	4	20	80	100	40
	PSCSP08	Practical based PSCST15	6	4	20	80	100	40
Ability Enhancement	PSCSS04	Seminar	2	1	25	-	25	10
Total			32	25	145	480	625	250

M.Sc. - II (Computer Science)

SEMESTER – III

Unit –I: (Introduction to Testing)

Introduction: Fundamentals of Test Process, Purpose of Testing, Testing and Debugging, Software Quality, Requirement Behavior and Correctness, General Principles of Testing, Test Metrics, Model for Testing

Role of Testing in SDLC: Review of Software Development Models (Waterfall Models, Spiral Model, W Model, V Model) Agile Methodology and Its Impact on Testing, Test Levels (Unit, Component, Module, Integration, System, Acceptance, Generic)

Unit – II: (Flow Graphs, Transaction, Dataflow and Path Testing)

Flow Graphs and Path Testing: Basics Concepts of Path Testing, Predicates, Path Predicates and Achievable Paths, Path Sensitizing, Path Instrumentation, Application of Path Testing.

Transaction Flow Testing: Transaction Flows, Transaction Flow Testing Techniques.

Dataflow Testing: Basics of Dataflow Testing, Strategies in Dataflow Testing, Application of Dataflow Testing

Domain Testing: Domains and Paths, Nice and Ugly Domains, Domain Testing, Domain and Interface Testing, Domains and Testability

Unit – III: (Static, Dynamic, White Box Testing)

Static Testing: Structured Group Examinations, Static Analysis, Control Flow and Data Flow, Determining Metrics

Dynamic Testing: Black Box Testing, Equivalence Class Partitioning, Boundary Value Analysis, State Transition Test, Cause Effect Graphing and Decision Table Technique and Used Case Testing and Advanced Black Box Techniques

White Box Testing: Statement Coverage, Branch Coverage, Test of Conditions, Path Coverage, Advanced White Box Techniques, Instrumentation and Tool Support, Gray Box Testing, Intuitive and Experience Based Testing

Unit - IV: (Testing Tools and Object oriented Software)

Testing Tools: Automation of Test Execution, Requirement Tracker, High Level Review Types of Test Tools, Tools for Test Management and Control, Test Specification, Static Testing, Dynamic Testing, Non Functional Testing, Selection and Introduction of Test Tools Tool Selection and Introduction, Cost Effectiveness of Tool Introduction **Testing Object oriented Software:** Introduction to OO Testing Concepts, Differences in OO Testing

Books:

- 1) Baris Beizer, “Software Testing Techniques”, Dreamtech, Second Edition.
- 2) Dr.K.V.K.K.Prasad, “Software Testing Tools”, Dreamtech

References:

- 1) Andreas Spillner, Tilo Linz, Hans Schaefer ,“Software Testing Foundations”, Shoff Publishers and Distributors
- 2) Srinivasan D and Gopalswamy R ,”Software Testing: Principles and Practices”, Pearsoned, 2006
- 3) Robert V Binder, Addison Wesley ,”Testing Object oriented Systems Models, Patterns and Tools” , 1996

M.Sc. (Computer Science) - II
(SEMESTER – III)
Paper Code : PSCST10
PAPER-II : SOFT COMPUTING TECHNIQUES

[Max. Marks: 80]

Unit I (Soft Computing)

Soft Computing: Introduction of Soft Computing, Soft Computing Verses Hard Computing, Various Types of Soft Computing Techniques, Application of Soft Computing
Artificial Intelligence: Introduction, Various types of Production System, Characteristics of production system, breadth first search, depth first search techniques, other search techniques like Hill Climbing, Best first search, A* Algorithm, AO* Algorithms and various types of control strategies, knowledge represent issues, propositional and predicted logic

Unit II (Neural Network)

Neural Network: Structure and functions of a single neural, biological neural, artificial neural, definition of ANN, taxonomy of neural net, difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithms, linear separability, Widrow and Hebb's learning rule/Delta rule, ADALINE, MADALINE, AI V/S ANN.
Introduction of MLP, different activation functions, error back propagation algorithms, derivations of BBPA, Momentum, Limitation, Characteristic and Application of EBPA.

Unit III (Fuzzy logic)

Fuzzy logic: fuzzy set theory, fuzzy set verses crisp set, Crisp Relation and Fuzzy Relation, Fuzzy Systems: Crisp logic, Fuzzy logic, introduction and features of membership functions, fuzzy rule base system: fuzzy propositions, formations, decomposition and aggregation of fuzzy rule, fuzzy reasoning, fuzzy interface system, fuzzy decision making & applications of fuzzy logic.

Unit IV (Genetic Algorithms)

Genetic Algorithms: fundamentals, basic concepts, working principle, encoding , fitness function, reproduction, genetic modeling: inheritance operators, cross over, inversion and deletion, mutation operator, bitwise operator, generational cycle, Convergence of GA, application and advance in GA, difference and similarity between GA, and other traditional methods.

Books:

- 1) L. Fortuna, G. Rozzotto, M. Lavorgna, "Soft Computing: New Trends and Applications", Springer. 2001
- 2) James Anderson , " An Introduction To Neural Networks", The MIT Press, 1995
- 3) Burkhardt, Henn, Hepper, Rintdorff, Schaeck. "Pervasive Computing", Pearson, 2002. Isbn 978-81-7758-280-2
- 4) Melanie Mitchell, "An Introduction To Genetic Algorithms" , Mit Press , 1998, Isbn 0-262-13316-4

References:

- 1) F. Adelstein, S.K.S. Gupta, "Fundamentals of Mobile and Pervasive Computing", TMH.
- 2) Mohamad H. Hassoum, " Fundamentals of Artificial Neural Network" The MIT Press 1995

M.Sc. (Computer Science) - II

(SEMESTER – III)

Paper Code : PSCST11

Paper-III : RESEARCH METHODOLOGY AND OPERATIONAL TECHNIQUE

[Max. Marks: 80

Unit – I (Introduction to Research Methodology)

Introduction to Research Methodology : Meaning, Objectives, Motivation in Research, Types, Approaches ,Importance, Research Methodology, Scientific Research, Process, Criteria for Good Research, Problems Encountered , Defining Research Problem, Developing Research Proposal, **Research Design:** Meaning, Need, Features, Important, Six P of Research

Data Collection Method- Primary Data- Observation Method, Personal Interview, Telephonic Interview, Mail Survey, Questionnaire Design.

Unit – II (Sampling Design)

Sampling Design: Implications, Steps Criteria for Sampling Procedure, Characteristics of Good Sample Design, Different Types of Sample Design, Different Types of Sample Design- (a) Probability Sampling Like Simple Random, System Random, Systematic Random, Stratified, Cluster.(B) Non Probability Sampling Like Quota, Judgmental, Convenience

Report Writing and Interpretation- Pre-Writing Considerations. Meaning and Technique of Interpretation, Different Types of Report Writing, formats of Report Writing, Thesis Writing, formats of Publication in Research Journals.

Unit –III (Large Sample Test)

Large Sample Test: Definition of Hypothesis, Basic Concepts- Null Hypothesis and Alternative, The Level of Significance, Type I and Type II Errors, Two Tailed and One Tailed, Power of Test, Testing of Mean, Testing of Differences Between Two Means, Testing of Proportion of Difference Between Two Proportion Limitations of Hypothesis Testing.

Small Sample Test: Idea of Degree of Freedom, Test Significance Based Upon T and F Statistic-Testing of Mean, Testing of Difference Between Two Means, Testing of Equality of Variances, Chi-Square Test.

Unit –IV (CHI-Square Test for Large Samples)

CHI-Square Test for Large Samples: Definition of Chi-Square, Limitations of Chi-Square Test, and Chi - Square Test As a Test of Goodness of Fit and As a Test of Independence, Yates's Correction and Its Application, **Analysis of Variance (ANOVA):** Concept, One Way ANOVA, and ANOVA in Test in Latin Square Design.

Books:

- 1) Kothari .C.R, “Research Methodology-Methods and Techniques”, New Age Publications.
- 2) S.P.Gupta, “Introduction to Mathematical Statics”.
- 3) Sancheti and Kapoor, “Business Statics”, Sultan Chand and Sons, New Delhi.

References:

- 1) D.K.Bhattacharyya, “Research Methodology”, 1st Edition (2003), EBP, New Delhi

M.Sc. (Computer Science) - II
(SEMESTER – III)
Paper Code : PSCST12
Paper - IV : C#.NET

[Max. Marks: 80]

Unit- I: (Understanding .Net)

Basic of .Net Framework, Evolution of C#, The C# Environment, Characteristics of C#, Comparison Among C++, and Benefits of C #.

Unit-II: (C# .Net Programming)

Overview of C# ,Basics in C#, Object oriented Aspects of C#, Delegates and Their Usefulness, Events, Errors and Exceptions Properties and Indexers, , Attributes, I/O in C#, Exception and Error Handling in C#, C# and Windows Applications

Unit-III- (Advanced Features Using C#)

Web Services, Window Services, Asp.Net Web form Controls and ADO.Net. Distributed Application in C#, Unsafe Mode, Graphical Device Interface with C#.

Unit-IV: (Net Assemblies and Attribute)

.Net Assemblies Features and Structure, Private and Share Assemblies, Built-in Attribute and Custom Attribute. Introduction about Generic. Versioning, Attributes, Reflection, Viewing Metadata, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using Single call, Threads.

Books:

- 1) E.Balagurusamy, "Programming in C#", Tata Mcgraw-Hill, 2004.
- 2) J. Liberty, "Programming C#", 2nd Ed., O'reilly, 2002.
- 3) Herbert Schildt, "The Complete References: C#", Tata Mcgraw-Hill, 2004.
- 4) Robinson Et Al, "Professional C#", 2nd Ed., Wrox Press, 2002.

References:

- 1) Andrew Troelsen, "C# and the .Net Platform", Press, 2003.
- 2) S. Thamarai Selvi, R. Murugesan, "A Textbook on C# ", Pearson, 2003

M.Sc. (Computer Science) - II (SEMESTER – III)

Paper Code : PSCSP05
Practical -I
(Practical based on PSCST09 & PSCST10)

[Max. Marks: 80]

Section – A: Based Soft Computing Technique using Mat Lab

Fuzzy Logic

- Different operations on Fuzzy sets.
- Linguistic variables
- Fuzzy intersections
- Fuzzy unions

Neural Network

- Properties of single neuron
- Theoretical model of neuron
- Binary model of neuron
- Essential vector operations

Genetic Algorithm

- Genetic algorithm in problem solving
- Biological terminology of genetic algorithm

Section B - Based on Software Testing

(Note :Minimum 10 practicals based on available projects)

M.Sc. (Computer Science) - II

(SEMESTER – III)
Paper Code : PSCSP06
Practical-II
(Practical based on PSCST11 & PSCST12)

[Max. Marks: 80

Section – A Practical based C#.NET

1. Simple Programs with C#:
 - a) Write a console application that obtains four int values from the user and displays the product. Hint: you may recall that the Convert.ToDouble () command was used to convert the input from the console to a double; the equivalent command to convert from a string to an int is Convert.ToInt32 ().
 - b) If you have two integers stored in variables var1 and var2, what Boolean test can you perform to see if one or the other (but not both) is greater than 10?
 - c) Write an application that includes the logic from Exercise 1, obtains two numbers from the user, and displays them, but rejects any input where both numbers are greater than 10 and asks for two new numbers.
 - d) Write an application that receives the following information from a set of students: Student Id:
Student
Name:
Course
Name: Date
of Birth:
The application should also display the information of all the students once the data is entered. Implement this using an Array of Structs.
 - e) Write programs using conditional statements and loops:
 - i. Generate Fibonacci series.
 - ii. Generate various patterns (triangles, diamond and other patterns) with numbers.
 - iii. Test for prime numbers.
 - iv. Generate prime numbers.
 - v. Reverse a number and find sum of digits of a number.
 - vi. Test for vowels.
 - vii. Use of for each loop with arrays.
2. Object oriented programs with C#
 - a) Program using classes.
 - b) Program with different features of C#
 - i. Function Overloading
 - ii. Operator Overloading
 - iii. Inheritance (all types)
 - iv. Constructor overloading
 - v. Interfaces
 - vi. Using Delegates and events
 - vii. Exception handling
3. Programs using different controls.
4. Programs using CSS.
5. Programs using ASP.NET Server controls.
6. Database programs with ASP.NET and ADO.NET

7. Programs using Language Integrated query.
8. Programs securing web pages.
9. Programs using AJAX.
10. Programs using JQuery.

**M.Sc. (Computer Science) - II
(SEMESTER – III)
Paper Code: PSCSS03
SEMINAR**

[Max. Marks: 25

Refer Appendix -I

**M.Sc. - II (Computer
Science)
SEMESTER – IV**

Unit-I: (Introduction to Android)

The Android Platform, Understanding Android Market, Layers of Android, Intent of Android Development, Types of Android Components, Mapping Applications to Processes, Creating an Android Application.

Android's Development Environment: Introduction to Android SDK, Exploring Android Development Environment and Building Android Application in Eclipse, Android Emulator and User Interfaces, Working with Views, Using Resources, and Understanding and Exploring Android Manifest File.

Unit-II: (Intents and Services)

Serving up Restaurant finder with Intent, Checking Weather with a Custom URI and Broadcast Receivers, Building a Background Weather Services, Communicating Weather alert service From Other Apps.

Storing and Retrieving Data: Using Preferences, Using the File System, Persisting Data to a Database, Working with Content provider Classes.

Networking and Web Services: An Overview of Networking and Web Services, Checking The Network Status, Communicating with a Server Socket, Working with HTTP and Web Services, Introducing Toast, Introducing Notifications, Introducing Alarms.

Unit-III: (Graphics, Animation and Multimedia)

Drawing Graphics in Android, Creating Animations with Android's Graphics API, Introducing Openly for Embedded Systems, Introduction to Multimedia and Open core, Playing Audio, Playing Video, Capturing Media, Recording Video, Simulating Your Location within The Emulator, Using Location manager and Location provider, Working with Maps, Converting Places and Addresses with Decoder.

Unit-IV: (Platform Maturity with Android Applications)

Using Android to Work in a Field Service Application, Building Android Applications in C, Bluetooth and Sensors, Integration, Android Web Development, Appwidgets, Localization, Android Native Development Kit

Books:

- 1) W. Frank Ableson, Robi Sen, Chris King, "Android in Action", 2nd Edition, Manning Publications Co., 2011, ISBN 978-1-935182-72-6
- 2) Damon Oehlman, Sebastien Blanc, "Pro Android Web Apps - Develop for Android Using HTML5, CSS3 and Javascript", Apress Publications, 2011, ISBN-13: 978-1-4302-3276-6
- 3) Chris Haseman, "Android Essentials", Apress Publications, 2008, ISBN-13: 978-1-4302-1064-1

References:

- 1) Lucas Jordan, Pieter Greyling, "Practical Android Projects", Apress Publications, 2011, ISBN-13: 978-1-4302-3243-8

M.Sc. (Computer Science) - II
(SEMESTER – IV)
Paper Code : PSCST14
PAPER – II : DIGITAL AND CYBER FORENSICS

[Max. Marks: 80

Unit I: (Introduction to Networking)

Introduction to Networking: Networking Hardware, Networking Software, Internet, Web Phishing.

History and Future of Cybercrime: Old and New Crimes, The Internet Spawns Crime, Worms Verses Viruses, Broadband, Wireless.

Introduction to Computer forensics: Computer forensics Definitions , Computers' Roles in Crimes, Computer forensics Tasks, Prepare for an Investigation, Collect Evidence, Preserve Evidence, Recover Evidence, Document Evidence, Challenges Associated with Making "Cybercrime" Laws, Jurisdictional Issues, Introduction to Computer Hardware

Unit II: (Computer Crimes and Criminals)

Computer Crimes and Criminals: Crimes, Violent Crimes: Computers Included in Terrorism, Assault Threat, Stalking, Child Pornography, Nonviolent Crimes, Trespass, Theft, Fraud, Vandalism, Address Books, Chat Logs, E-Mail, Images, Movies, Internet Browser History, Etc. Crime Timeline, Modify Access Create (Mac) Dates Associated with Files, Criminals and Crime Fighter, Understanding "Cyber , Criminals" and Their Victims, "Cyber Investigators" , Protecting Yourself on The Internet, Anti-Virus and Firewall Software.

Unit III: (Collecting and Preserving Digital Evidence)

Collecting and Preserving Digital Evidence: Admissibility of Evidence, Must Be Legally Obtained, (Obeying The 4th Amendment and Other Federal and State Laws), Must Be Competent, Relevant, and Material, Types of Evidence, Physical, Direct, Circumstantial, Demonstrative, Documentary, Documenting Evidence with Tags and Logs, Maintaining The Chain of Custody, Processes for Collecting Computer Evidence.

Building a Cybercrime Case: Bodies of Law, Constitutional Law, Criminal Law, Civil Law, Administrative Regulations, Levels of Law, Local Laws, State Laws, Federal Laws, International Laws , Levels of Culpability, Intent, Knowledge, Recklessness, Negligence, Level and Burden of Proof, Criminal Versus Civil Cases , Vicarious Liability, Laws Related to Computers, CFAA, DMCA, Can Spam.

Unit IV: (Computer Hardware, Software)

Computer Hardware: Computer Architectures, Components, Power Supply, Motherboard, Ethernet, Com, Parallel Port, Modem Etc.

Computer Software: Operating : Systems, Types of Operating Systems, Working **Preserving and Recovering Digital Evidence:** Disk Imaging, Creating a Message Digest or Hash Code for a Disk, Where Data Hides; Deleted and Erased Data, File Systems, Files, Modify Access Create (Mac) Dates to Establish Time Line, File Headers - Info About File Type.

Books:

- 1) Debra Littlejohn Shiner, "Scene of the Cybercrime".
- 2) Vakul Sharma, "Handbook of Cyber Laws", McMillan

References:

- 1) Micheal Cross, "Scene of the Cybercrime" Second Edition.

M.Sc. (Computer Science) - II
(SEMESTER – IV)
Paper Code: PSCST15
PAPER – III: WEB DESIGNING USING ASP .NET

[Max. Marks: 80]

Unit-I: (Web Development and Asp .Net)

Comparison of Asp and Asp .Net, Features of Asp .Net, Benefits of Asp .Net, Web forms and Their Components, Overview of Web Services. **Web Application Basics:** Web forms Model, Web forms Internals, Asp.Net Core Server Controls, Working with Page.

Unit-II: (Creating Web forms Application)

Upgrading HTML Pages to Asp.Net, Asp Pages to Asp.Net, **Adding Data in an Asp.Net Site:** ADO.Net, Paging Through Data Sources, **Creating Web forms Application:** Creating an Asp.Net Web Application Project, Responding to Events, Namespace Fundamentals Maintaining State Information.

Unit-III: (Creating a User Interface)

Using Web Controls, Using Visual Studio.Net, Validation and Rich Control, Validating Data, Navigating Between forms, Navigation between Pages, **Data Binding:** Bind Data to The UI, Transform and Filter Data Storing and Retrieving Data with ADO.Net, Accessing Data with ADO.Net, Using Data Sets on Web forms, Processing Transactions, Catching and Correcting Errors: Using Exception Handling, Using Error Pages, Logging Exceptions.

Unit-IV: (Web Services)

Creating Web Services, Discovering Web Services, Instantiating and Invoking Web Services, Testing Web Applications: Creating Tests, Running Tests. Debugging, Building and Deploying Web Applications, Creating an Installation Program, Maintaining Security: Authenticating and Authorizing Users, Using Windows Authentication, Using forms Authentication.

Books:

- 1) Russel, “Mastering Asp.Net”, BPB Publication,
- 2) MatThew Macdonald, “Asp.Net the Complete References”, TMH.

References:

- 1) Mitchell and Atkinson, “Active Server Pages 3.0 (in 21 Days)” Tecmedia”
- 2) David Buser, John Kauffman, Juan T. Llibre, Brian Francis, Dave Sussman, Chris Ullman, Jon Duckett, “Beginning Active Server Pages 3.0”, Wrox Press.

Instruction:

Towards the end of the second semester of study, a student will be examined in the Course “Project Work”.

- a. Project Work may be done individually or in groups (Maximum 2 students) in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to monitor the progress of individual student.
- b. The Project Work should be done using the tools covered in M.Sc. (Computer Science)
- c. The Project Work should be of such a nature that it could prove useful or be relevant from the System-oriented/Application/commercial / management angle.
- d. The project work will carry 100 marks.
- e. The external viva-voce examination for Project Work would be held as per the Examination Time Table of the second year of study, by a panel of one external and one Internal examiner.
- f. Head/Co-ordinator of Computer Dept. must reject any project title which was already carried out in any computer course in the college. He must maintain a Record that lists the projects along with other detail (like Guide, Session, and Number of students working on project etc) that was carried out so far and must be shown to external examiner at the time of examination.

Types of Project

As majority of the students are expected to work out a project in some industry/research and development laboratories/educational institutions/software export companies, it is suggested that the project is to be chosen which should have some direct relevance in day-today activities of the candidates in his/her institution. The Applications Areas of project - Financial/Marketing/Database Management System/ Relational Database Management System/E-Commerce /Internet/ Manufacturing/ web Designing/Hardware and Software interaction based etc.

Project Proposal (Synopsis)

The project proposal should be prepared in consultation with the guide. The Project Guide May alter the sequence as given below depending upon the nature of project. The project guide must be a person having minimum Qualification M.Sc. (Computer)/ MCA/ M.Sc.(Maths/Electronics/Statistics/Physics + Post B.Sc. Dip. In Comp. Sc. & Appl.) The project proposal should clearly state the objectives and environment of the proposed project to be undertaken. It should have full details in the following form:

Title of the project

Objectives and Hypothesis of the Project

Project Category (DBMS/RDBMS/OOPS/Web Designing/Internet etc.)

Tools/Platform, Languages to be used

A complete Structure of the program:

i. Analysis.

ii. Numbers of Modules.

- iii. Data Structures or Tables
- iv. Process Logic.
- v. Types of Report Generation.
- Scope of future Application.

Project Report Formulation.

- 1. Title Page.
 - 2. Certificate Page.
 - 3. Declaration Page.
 - 4. Acknowledgment Page.
 - 5. Index or Content Page.
 - 6. Documentation.
 - i. Introduction/Objectives.
 - ii. Preliminary System Analysis.
 - Identification of Need.
 - Preliminary Investigation.
 - Feasibility Study.
 - Need of New System.
 - Flaws in Present System.
 - iii. Project Category.
 - iv. Software Requirement Specification.
 - v. Detailed System Analysis.
 - Data Flow Diagram.
 - Numbers of Modules and Process Logic.
 - Data Structures and Tables.
 - Entity-Relationship Diagram.
 - vi. System Design.
 - Source Code.
 - Input screen & Output Screen.
 - Vii Validation Checks.
 - Viii Implementation, Evaluation and Maintenance.
 - Ix Security Measures taken.
 - X Future Scope of the project.
 - Xi Bibliography
- Appendix
- Survey Questionnaire

M.Sc. (Computer Science) - II
(SEMESTER – IV)

Practical I Based on Android Application.

1. Testing your android development environment perform following operations.
 - a. Add the sample application to a project in your eclipse workspace.
 - b. Create an Android Virtual Device (AVD) for your sample project.
 - c. Create a launch configuration for your sample project.
 - d. Run your sample application in Android Emulator.
2. Write a program to build your first Android Application “Hello World” with common activity.
3. Write a program which will implement Sub menu in android application.
4. Write a program which will implement Context menu (Floating List of Menu Items) in android application.
5. Write a program to displays the use of Relative Layout Views with different attributes.
6. Write a program to displays the use of Linear Layout Views with different attributes.
7. Write a program to implement a menu which uses check-able items in Menu.
8. Write a program to implement a Custom Button and handle the displayed message on button press.
9. Write a program to implement the Table layout in View Group that displays child View elements in rows and columns.
10. Write a program to implement the List View in your android application.
11. Write a program to implement tween animation and rotate the text in your android application.
12. Write a sample program to create a progress bar for your android applications.
13. Write a program to show how to use Date picker control of ADK in your android applications.
14. Write a program which enables you to draw an image using bitmap class object.
15. Write a program which shows you how to handle any type of interruption in your android application.
16. Write a program which allows you to set an image as wallpaper.
17. Write a program which allows you to get image from web and displayed them using the Image View.
18. Write a program which shows you how to create a scrollview when text is not visible on one page.
19. Write a program which will shows you how to run any video file.

Practical -II
(Practical based on PSCST07 & PSCST08)

[Max. Marks: 80

Practical II: Based on Web designing using ASP.NET

List of Practical

1. Design simple web application using ASP.NET.
2. Design web application with different validations.
3. Design on line database application.
4. Design data report application.
5. Design web application for uploading files on web.
6. Design AJAX application.
7. Design localized web application.
8. Design WPF browser application.
9. Authentication and authorization in asp..
10. Deployment and publishing web sites.

M.Sc. (Computer Science) - II

(SEMESTER – IV)

Paper Code: PSCSS04

SEMINAR

[Max. Marks: 25

Refer Appendix -I

Appendix 1

Evaluation Rules

A) Internal Assessment:

1. The internal assessment marks shall be awarded by the concerned teacher.
2. The internal assessment marks shall be sent to the University after the Assessment in the prescribed format and direction by University.
3. General guidelines for Internal Assessment are:
 - a) The internal assessment marks assigned to each theory paper on the basics of the performance in any two assignments (each of 10 marks) as described below selected by concerned teacher.
 1. Class Test / Sessional examination
 2. On-line Test
 3. Theory Assignments
 4. Programming Assignments
 5. Study tour
 6. Industrial visits
 7. Visit to educational institutions and research organizations, field work, Conference etc
 8. Group discussions
 9. Seminar Presentation
 10. Publishing Research Paper
 11. Review of Research Papers
 12. Participation in Departmental Activities
 - b) There shall be no separate / extra allotment of work load to the concerned teacher related to above assignments. He/ She shall conduct the Internal assessment activity during the regular teaching days / periods as a part of regular teaching activity.
 - c) The concerned teacher / department / college shall have to keep the record of all the above activities until six months after the declaration of the results of that semester.
 - d) At the beginning of each semester, every teacher / department / college shall inform his / her students unambiguously the method he / she propose to adopt and the scheme of marking for internal assessment.
 - e) Teacher shall announce the schedule of activity for internal assessment in advance in consultation with HOD.

B) Seminar

In seminar, the student will have to deliver a seminar on any topic relevant to the syllabus / subject encompassing the recent trends and development in that field / subject. The topic of the seminar will be decided at the beginning of each semester in consultation with the supervising teachers. The student has to deliver the seminar which will be followed by discussion.

The students should submit the seminar report typed and properly bound in one copy to the head of the department along with soft copy in CD. The said shall be evaluated by the concerned supervisor / head of the department. The concerned teacher / department / college shall have to keep the record of Seminar Reports until six months after the declaration of the results of that semester.

C) Practical Assessment:

Time: Minimum 2 Hours 30 Min. for conducting the practical examination subject to the condition the availability of computers and printers at the center.

Marks Distribution: A practical mark will be allocated by Internal & External Examiner as per the following format

Sr. No.	Particulars	Max. Marks
a.	Writing, Execution and Printout of Program	32
b.	Writing Program	16
c.	Practical Record	16
d.	Viva Voce	16
Total		80

- Note :** 1) The Written work should be completed within max. 45 minutes.
2) For execution and taking printout max. 45 minutes is reserved.

E) Theory Paper Assessment : Theory papers will be held as per the scheduled given by the university and examinee needs to score minimum 40% of marks to clear the paper including internal assessment marks.

F) Revaluation: There is also a provision for the Revaluation only for theory papers examination conducted by University (i.e. it is not applicable for Internal Assessment) as per the rules and fee structure prescribed by University.

Appendix 2
Practical Examination

1. Each practical carries 100 marks. The scheme of marking shall be as per given in the syllabi of respective subjects.
2. Practical performance shall be jointly evaluated by the External and Internal Examiner. In case of discrepancy, the External Examiner's decision shall be final.
3. Duration of practical examination will be Minimum 2 Hours 30 Min.
4. The Practical Record of every student shall carry a certificate as shown below, duly signed by the teacher-in-charge and the Head of the Department. If the student fails to submit his / her certified Practical Record duly signed by the Teacher-In-Charge and the Head of the Department, he / she shall not be allowed to appear for the Practical Examination and no Marks shall be allotted to the student.
5. The certificate template shall be as follows:

C E R T I F I C A T E
Name of the College / Institution : _____ Name of the Department: _____
This is to certify that this Practical Record contains the bonafide record of the practical work of Mr. / Mrs. / Ku. _____ of M.Sc.(Computer Science) _____ Semester _____ during the academic year _____.
The candidate has satisfactorily completed the practical's prescribed for the course by Gondwana University, Gadchiroli for the subject _____
Dated : __ / __ / _____
Signature of the teacher who taught the examinee
1. _____ 2. _____
Head of the Department

Appendix-3**Pattern of Question Paper**

General Rules and Regulations regarding pattern of question paper for the semester end examination is as given below:

1. There will be four units in each paper.
2. Maximum marks of each theory paper will be 80.
3. Question paper will consist of five questions, each of 16 marks.
4. Four questions will be based on four units with internal choice.
5. Fifth question will be compulsory with questions from each of the four units having equal weightage and there will be no internal choice.

Master of Science	
M.Sc. (Computer Science) – [I / II]	Semester – [I / II/ III / IV]
Paper Code:	Paper: Name of Paper
Time: 3 Hours]	[Max. Marks: 80
Note: 1) All questions are compulsory and carry equal marks.	
2) Draw Neat and Labeled diagram and use supporting data wherever necessary.	
3) Avoid vague answers and write specific points/answer related to questions.	
Q1 Either (From Unit 1)	
a)	8
b)	8
Or	
c)	8
d)	8
Q2 Either (From Unit 2)	
a)	8
b)	8
Or	
c)	8
d)	8
Q3 Either (From Unit 3)	
a)	8
b)	8
Or	
c)	8
d)	8
Q4 Either (From Unit 4)	
a)	8
b)	8
Or	
c)	8
d)	8
Q5 Solve all questions	
a) (From Unit 1)	4
b) (From Unit 2)	4
c) (From Unit 3)	4
d) (From Unit 4)	4