DEPARTMENT OF COMPUTER SCIENCE

M.Sc. (INFORMATION TECHNOLOGY)

(Students admitted during 2019-2020 Onwards)

(Under CBCS with Outcome Based Education (OBE) Pattern)

SYLLABUS

I & II SEMESTER

GOBI ARTS & SCIENCE COLLEGE

(Govt. Aided Autonomous Co-educational Institution, Affiliated to Bharathiar University, Coimbatore, Re-accredited with 'A' Grade by NAAC (3rd cycle) and Nationally Ranked by NIRF, MHRD, Government of India)

KARATTADIPALAYAM POST,

GOBICHETTIPALAYAM - 638453

ERODE DISTRICT.

GOBI ARTS & SCIENCE COLLEGE (Autonomous)

Vision

Social and Economic upliftment of the people of this area through value based quality Education.

Mission

Committed to serve the society with humility and trust, devoid of exploitation; to impart value based higher education, particularly to the socially and economically deprived sections of this area; to make students of this institution worthy citizens of our glorious motherland.

DEPARTMENT OF COMPUTER SCIENCE

Vision

To inculcate better programming skills among rural area students.

Mission

To impart value based technical education and educate students towards the design and development of software products for the benefit of computer industry and society.

GOBI ARTS & SCIENCE COLLEGE (AUTONOMOUS): GOBICHETTIPALAYAM

SCHEME OF EXAMINATIONS - M.Sc. (INFORMATION TECHNOLOGY) (19 BATCH)

No.	Course Code	Course	Total Hours	Hrs/ Exam	Maximum Marks		Total Marks	Credits
					CIA	EOS		
		SEMESTER - I						
1	19P3IT01	DATA ANALYTICS	75	3	40	60	100	4.0
2	19P3IT02	VISUAL COMPUTING	75	3	40	60	100	4.0
3	19P3IT03	OBJECT ORIENTED ANALYSIS & DESIGN	75	3	40	60	100	4.0
4	19P3IT04	ELECTIVE – I :	75	3	40	60	100	5.0
5	19P3ITPA	PROGRAMMING LAB - I : (DATA ANALYTICS)	60	3	40	60	100	4.0
6	19P3ITPB	PROGRAMMING LAB - II : (VISUAL COMPUTING)	60	3	40	60	100	4.0
		SEMESTER – II						
7	19P3IT05	OPEN SOURCE SCRIPTING TOOLS (PERL & PYTHON)	75	3	40	60	100	4.0
8	19P3IT06	ANDROID	75	3	40	60	100	4.0
9	19P3IT07	MACHINE LEARNING	75	3	40	60	100	4.0
10	19P3IT08	ELECTIVE - II :	75	3	40	60	100	5.0
11	19P3ITPC	PROGRAMMING LAB - III : (PERL & PYTHON)	60	3	40	60	100	4.0
12	19P3ITPD	PROGRAMMING LAB - IV : (ANDROID)	60	3	40	60	100	4.0
		SEMESTER - III						
13	19P3IT09	JAVA AND JSP	75	3	40	60	100	4.0
14	19P3IT10	LINUX, SHELL & NETWORK PROGRAMMING	75	3	40	60	100	4.0
15	19P3IT11	ELECTIVE - III :	75	3	40	60	100	5.0
16	19P3ITPE	PROGRAMMING LAB - V : (JAVA AND JSP)	60	3	40	60	100	4.0
17	19P3ITPF	PROGRAMMING LAB - VI : (LINUX, SHELL & NETWORK PROGRAMMING)	60	3	40	60	100	4.0
18		SUPPORTIVE PAPER :	90	3	40	60	100	4.0
		SEMESTER - IV						
19	19P3CSV1	PROJECT REPORT & VIVA - VOCE			40	60	100	15.0

TOTAL CREDITS: 90

List of Elective Papers:

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1. DIGITAL IMAGE PROCESSING
2. CLIENT SERVER COMPUTING
3. CLOUD COMPUTING
4. INTERNET OF THINGS
5. GRID COMPUTING
6. ARTIFICIAL NEURAL NETWORKS
7. NETWORK SECURITY & CRYPTOGRAPHY
8. SOFTWARE QUALITY MANAGEMENT
9. ADVANCED NETWORKING (TCP/IP)
10. GENETIC ALGORITHMS
11. DISTRIBUTED COMPUTING
12. DATA COMPRESSION
13. EMBEDDED SYSTEM
14. ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; **K2**- Understanding; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate

I. END OF SEMESTER (EOS) EXAMINATIONS:

1. Theory: 60 Marks

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	10 × 1 = 10	MCQ	60
K2	B (Either or Pattern)	5 × 4 = 20	Short answers	
K3 & K4	C (Answer 3 out of 5)	3 × 10 = 30	Descriptive/Detailed	

2. Practical Examinations: 60 Marks

Knowledge Level	Section		Total
	Practical	Record work	
K3	50	10	60
K4			
K5			

II. CONTINUOUS INTERNAL ASSESSMENT (CIA):

1. Test – I & II: 30 Marks (Theory)

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	10 × 1 = 10	MCQ	30
K2	B (Answer 2 out of 3)	2 × 5 = 10	Short answers	
K3 & K4	C (Answer 1 out of 2)	1 × 10 = 10	Descriptive/Detailed	

2. Test –III: (Model Exam)

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	10 × 1 = 10	MCQ	60 Marks converted to 40 Marks
K2	B (Either or Pattern)	5 × 4 = 20	Short answers	
K3 & K4	C (Answer 3 out of 5)	3 × 10 = 30	Descriptive/Detailed	

3. Practical Internal Assessment: 40 Marks

Knowledge Level	Components		Calculation	Lab Performance	Total
K3, K4, K5	Test 1	30	$\frac{\text{Test 1 + Test 2}}{2}$	10	40
	Test 2	30			

Components of Continuous Internal Assessment (CIA)

Components		Calculation	CIA Total
Test 1 & Test 2	30	$30 + 40 + 30 = \frac{100 \times 40}{100} = 40$	40
Test 3	40		
Assignment+ Seminar+ Quiz / GD / Poster Presentation / Book Review / Field Visit Report	10+10+10 = 30		

PROGRAMME SPECIFIC OBJECTIVES:

The students, after successful completion of programme, will be able to

1. Drive scientific and societal advancement through technological innovation and entrepreneurship.
2. Become a leader and a responsible citizen whose strengths will come from the ability to draw on and contribute to diverse teams, expertise and experiences.
3. Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
4. Obtain employment in industry/academia and possess skills to identify, critically access, analyze and solve problems related to information technology.
5. Acquire morale value, kinship and the spirit of compassion and committed to ethical society and the environment.

PROGRAMME SPECIFIC OUTCOMES (PSO):

PSO1: Understand the knowledge in information technology of theory, programming, algorithm, database and web development.

PSO2: Acquire and analyze the knowledge to develop solutions using information technology.

PSO3: Apply the design and implement solution of common computing applications in par with industry standards using concepts and programming techniques.

PSO4: Possess professional skills in software design process and practical competence in broad range of open source programming languages to withstand technological change and provide solutions to new ideas and innovations.

PSO5: Analyze and interpret data so as to reach to a valid conclusion by using of theoretical and practical knowledge to design experiments.

Programme Code:	M.Sc.	Programme Title:	Information Technology	
Course Code:	19P3IT01	Course Title:	Batch:	2019
Total Hours:	75	Data Analytics (Common for CS & IT)	Semester:	I
			Credits:	4.0

Course Objective

The course aims

- To explore the concepts of huge data complexities and the need of data analytics.
- To understand the R basic data types and structures and visualize the results of statistical functions.
- To know about the basis of Hadoop, MapReduce and also how to use on Big Data.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2	**CO1**	Know the benefits that Big Data can offer to businesses and organizations.
K1,K2	**CO2**	Conceptually know how to build a Big Data Team and all the Big Data sources available.
K3,K4,K5	**CO3**	Understand about the Big Data evaluation, In-Memory processing and how to visualizing the Big Data.
K2,K3,K4,K5	**CO4**	Deploy basic statistical methods and demonstrates ways to make and rearrange the data for easier analysis.
K2,K3,K4,K5	**CO5**	Design and develop Hadoop MapReduce program.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** - Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**What is Big Data?** - The Arrival of Analytics, Where is the Value? More to Big Data Than Meets the Eye, Dealing with the Nuances of Big Data, An Open Source Brings Forth Tools, Caution: Obstacles Ahead - **Why Big Data Matters** – Big Data Reaches Deep, Obstacles Remain, Data Continue to Evolve, Data and Data Analysis Are Getting More Complex, The Future is Now – **Big Data and the Business Case** – Realizing Value, The Case for Big Data, The Rise of Big Data Options, Beyond Hadoop, With Choice Come Decisions.	**15**
II	**Building The Big Data Team** – The Data Scientist, The Team Challenge, Different Teams, Different Goals, Don't Forget the Data, Challenges Remain, Teams Versus Culture, Gauging Success – **Big Data Sources** – Hunting For Data, Setting the Goal, Big Data Sources Growing, Diving Deeper into Big Data Sources, A wealth of Public Information, Getting Started with Big Data Acquisition, Ongoing Growth, No End in Sight – **The Nuts and Bolts of Big Data** – The Storage Dilemma, Building a Platform, Bringing Structure to Unstructured Data, Processing Power, Choosing among In-House, Outsourced or, Hybrid Approaches.	**15**
III	**The Evaluation of Big Data –** Big Data: The Modern Era, Today, Tomorrow, and the Next Day, Changing Algorithms, **Best Practices For Big Data Analytics** – Start Small with Big Data, Thinking Big, Avoiding Worst Practices, Baby	**15**

	Steps, The Value Of Anomalies, Expediency versus Accuracy, In-Memory Processing – **Bringing it All Together –** The Path to Big Data, The Realities of Thinking Big Data, Hands-On Big Data, The Big Data Pipeline in Depth, Big Data Visualization, Big Data Privacy- *Big Data Analytics*	
IV	**BECOMING FAMILIER WITH R: Some Simple Math** – Use R like a Calculator, Storing the Results of Calculations – **Reading and Getting Data Into R –** Using the Combine Command for Making Data, Using the Scan Command for Making Data, Reading Bigger Data Files – **Viewing Named Objects –** Viewing Previously Loaded Named-Objects, Removing Objects From R - **Types of Data Items – The Structure Of Data Items – Examining Data Structure: Working With History Commands –** Using History Files, Editing History Files – **Saving your Work in R –** Saving The Workspace on Exit, Saving Data Files to Disk, Reading Data files from Disk, Saving Data to Disk as Text Files.	**15**
V	**INTRODUCING HADOOP –** Why "Hadoop in Action"?, What is Hadoop?, Understanding distributed systems and Hadoop, Comparing SQL databases and Hadoop, Understanding MapReduce, Counting words With Hadoop-running your first program, History of Hadoop – **Starting Hadoop -** The Building Blocks of Hadoop, Setting up SSH for a Hadoop cluster, Running Hadoop, Web-based cluster UI – **Components of Hadoop -** Working with Files in HDFS, Anatomy of a MapReduce program, Reading and writing-*The Building Blocks of Hadoop.*	**15**

Text Books:

1. Frank J. Ohlhorst, "*Big Data Analytics – Turning Big Data Into Big Money"*, SAS Institute Inc., Cary, North Carolina, USA, 2012 (Unit - I, II & III).
2. Dr. Mark Gardener, "*Beginning R The Statistical Programming Language"*, Wiley India Pvt. Ltd., First Edition, 2013 (Unit – IV).
3. Chuck Lam, *"Hadoop in Action"*, Dreamtech Press, First Edition, 2011 (Unit – V).

Reference Books:

1. Seema Acharya, Subhashini Chellappan, *"Big Data and Analytics"*, Wiley India Pvt. Ltd., 2015.
2. V. Bhuvaneswari, *"Data Analytics with R - Step by Step"*, Department of Computer Applications, Bharathiar University, Coimbatore, 2016.
3. Jared P. Lander, *"R for Everyone - Advanced Analytics and Graphics",* Addison Wesley Data & Analytics Series, Pearson Education, Inc, 2015.
4. Tom White, *"Hadoop - The Definitive Guide"*, O'Reilly, 2009.
5. Vignesh Prajapati, *"Big Data Analytics with R and Hadoop*", Packt Publishing Ltd, First Edition, 2013.

E-references:

1. https://www.tutorialspoint.com/big_data_analytics/
2. https://www.datamentor.io/r-programming/examples/
3. https://www.tutorialspoint.com/r/index.htm
4. https://www.geeksforgeeks.org/hadoop-an-introduction/
5. https://www.tutorialspoint.com/map_reduce/map_reduce_quick_guide.htm

Mapping with Programme Specific Outcomes

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	M	M
CO2	S	S	H	M	H
CO3	S	M	M	H	H
CO4	M	H	S	H	S
CO5	H	H	S	H	S

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	Programme Title:	Information Technology	
Course Code:	19P3IT02	Course Title:	Batch:	2019
Total Hours:	75	Visual Computing (Common for CS & IT)	Semester:	I
			Credits:	4.0

Course Objective

The course aims

- To learn the fundamentals of web page design using ASP and C#.
- To design web pages with back end connectivity and custom controls.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K3	**CO1**	Understand .NET programming and C# programming.
K2,K3	**CO2**	Use ASP.NET controls in web applications.
K2,K3	**CO3**	Program with state management.
K2,K3,K4,K5	**CO4**	Create database driven ASP.NET web applications and web services
K2,K3	**CO5**	Use data source controls and deploy ASP.NET web applications.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** –Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**THE .NET FRAME WORK:** Languages, CLR, Namespace, Assemblies, **ASP.NET:** File Types, Stages in ASP.NET request, Code behind, global.asx files, Web.config files, **C#.NET Programming**: Variables, Data Types, Scope, Conditional Structure, Loop Structure, Functions and Subroutines.	**15**
II	**ASP.NET FUNDAMENTALS:** Page Directives, Page Events, Cross Page Posting, **ASP.NET SERVER CONTROLS:** Types of Server controls, Building, Working and Applying styles to server controls, **WEB SERVER CONTROLS:** TextBox, Button, HyperLink, ListBox, Radio Button, Calendar, Adrotator - Events and methods.	**15**
III	**VALIDATION SERVER CONTROLS:** Client side Validation, Validation controls, Regular Expressions, Programming with Validation, **STATE MANAGEMENT:** Session states, Understanding session object in ASP.NET, Query strings, Cookies, Hidden Field, ViewState, Programming with state Management.	**15**
IV	**DATA MANAGEMENT WITH ADO.NET:** Common ADO.NET operations, ADO.NET Namespace and Classes, Objects - Connection, Command, Data Reader, DataSet, Data Tables using parameters, Programming with ADO.NET- *Programming with ADO.NET.*	**15**
V	**DATA BINDING: Data Source controls** – Sql Data source control, **DATA SOURCE CONTROL CATCHING:** Storing Connection, **USING BOUND LIST CONTROLS WITH DATA SOURCE CONTROL: Grid View-**	**15**

	Templates, Paging, Using Template field columns, Editing, Deleting, **List view binding, Form view binding**, Programs for binding- *List and Form View.*	

Text Books:

1. Mathew Mac Donald, *"The Complete Reference ASP.NET"*, Tata McGraw Hill Publishing Edition, 2002. (UNIT-I).
2. Bill Evjen, Scott Hanselman & Devin Rader, *"Professional ASP.NET 4 in C# and VB"*, Wiley Publishing, Reprint- 2011 (UNIT II-V).

Reference Books:

1. Jon Galloway, Brad Wilson, K. Scott Allen, David Matson, *"Professional ASP.NET MVC 5"*, John Wiley & Sons, 2014.
2. Imar Spaanjaars, *"Beginning ASP.NET 3.5: In C# and VB"*, John Wiley & Sons, 2008.
3. Michael Amundsen, Paul Litwin *"ASP.NET for Developers"*, SAMS Publishing, 2002.
4. Stephen Walther, *"ASP.NET Unleashed"*, SAMS Publishing, Second Edition, 2004.

E-references:

1. https://www.tutorialspoint.com/asp.net/asp.net_useful_resources.htm
2. https://www.guru99.com/asp-net-tutorial.html
3. https://dotnet.microsoft.com/learn/web/aspnet-hello-world-tutorial/intro

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	S
CO2	S	H	S	H	S
CO3	S	H	H	S	S
CO4	S	S	S	S	S
CO5	S	H	H	M	S

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	Programme Title:	Information Technology	
Course Code:	19P3IT03	Course Title:	Batch:	2019
Total Hours:	75	Object Oriented Analysis & Design	Semester:	I
			Credits:	4.0

Course Objective

The course aims

- To provide students with specific knowledge and skills about OOAD concepts in application.
- To develop and learn of modeling language UML for architectural designing of applications.
- To design system architecture using UML diagrams.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2,K3	**CO1**	Remember the basic knowledge on design technique.
K1,K2,K3	**CO2**	Understanding the concept of modeling with example of ATM.
K1,K2,K3	**CO3**	Apply on object designing.
K1,K2,K4	**CO4**	Analyze about UML.
K1,K2,K4	**CO5**	Analyze on different diagrams used for UML.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** -Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	INTRODUCTION - Meaning of Object-Oriented, Object-Oriented Development, Object-Oriented Themes, MODELLING AS A DESIGN TECHNIQUE: Modeling, The Object Modeling Technique, Objects and Classes, Links and Associations, Advanced Link and Association Concepts, Generalization and Inheritance, Grouping Constructs.	**15**
II	ANALYSIS: Overview of Analysis, Problem Statement, Automated Teller Machine Example, Object Modeling, Dynamic Modeling, Functional Modeling, Adding Operations, Iterating the Analysis.	**15**
III	OBJECT DESIGN: Overview of Object Design, Combining the Three Models, Designing Algorithms, Design Optimization, Implementation of Control, Adjustment of Inheritance, Design of Associations, Object Representation, Physical Packaging, Documenting Design Decisions.	**15**
IV	INTRODUCTION TO MODELING: The importance and principles of modeling, Object Oriented Modeling, INTRODUCTION TO UML: Brief History of UML, An Overview and a Conceptual Model of the UML, *Common Mechanisms in the UML*. BUILDING BLOCKS OF THE UML: Things, Relationships, Diagrams, Rules , Systems Architecture, Class Diagrams, Use Case Diagrams,	**15**
V	Object Diagrams, Collaboration Diagrams, Sequence Diagrams, State Chart Diagrams, Activity Diagrams, Component Diagrams and Deployment Diagrams-M*odeling of a building access control application.*	**15**

Text Books:

1. James Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy, William Lorensen, "*Object Oriented Modeling and Design*", First Edition, Prentice-Hall of India Pvt. Ltd, 2001. (UNITS I - III)
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "*The Unified Modeling Language User Guide*", Second Edition, Addison Wesley Publication, 2000. (UNIT IV)
3. Pieere Alian Muller, "*Instant UML*", First Edition, Shroff Publishers & Distributors, 2000. (UNITS IV - V)

Reference Books:

1. Michael R. Blaha, James R. Rumbaugh, "*Object-Oriented Modeling and Design with UML*", Second Edition, Pearson, 2005.
2. H. Srimathi, H. Sriram, A. Krishnamoorthy, "*Object-Oriented Analysis & Design using UML*", Second Edition, Scitech Publications, 2006.
3. James Rumbaugh, Ivar Jacabson, Grady Booch, "*The Unified Modeling Language Reference Manual*", Second Edition, Pearson, 2004.
4. Mike O' Docherty, "*Object-Oriented Analysis & Design - Understanding System Development with UML 2.0*", First Edition, Wiley India Pvt. Ltd, 2012.

E-references:

1. https://en.wikipedia.org/wiki/Object-oriented_analysis_and_design
2. http://kmvportal.co.in/Course/OOAD/object-oriented-analysis-and-design-with-applications-2nd-edition.pdf
3. https://www.oreilly.com/library/view/object-oriented-analysis-and/9780201895513/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	S	M
CO2	S	H	H	H	L
CO3	S	S	H	H	S
CO4	H	S	M	S	H
CO5	H	S	S	H	H

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	**Programme Title:**	Information Technology	
Course Code:	19P3IT05	**Course Title:**	**Batch:**	2019
Total Hours:	75	Open Source Scripting Tools (Perl & Python) (Common for CS & IT)	**Semester:**	II
			Credits:	4.0

Course Objective

The course aims

- To understand the fundamentals of Python programming and Search text using regular expressions.
- To know the basic Perl programming to write simple scripts.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2	**CO1**	Realize and comprehend the basis of regular expressions, string matching, list, dictionary and its operations in Python Programming.
K1,K2,K3	**CO2**	Define and demonstrate the use of various Python thread and threading module.
K2,K3,K4,K5	**CO3**	Make database connectivity in python programming language.
K1,K2,K3	**CO4**	Utilize and develop Perl Script with modules, arrays and hash functions.
K1,K2,K3,K4, K5	**CO5**	Deploy the operators, control structures, regular expressions and files in Perl.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** –Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**INTRODUCTION:** Regular Expression, Symbols and Characters, Matching, Patterns and characters, Denoting Ranges, Closure operators, Special Characters and grouping, **REGEXES AND PYTHON:** Core functions and Methods, Compiling Regexes, Matching strings and characters, sub(), subn(), split() functions.	**15**
II	**MULTITHREADED PROGRAMMING:** Introduction to Threads and Processes, **THREADS AND PYTHON:** Locking and exiting Threads, Accessing Threads, Thread module, **THREADING MODULE:** Thread Class, Thread instance, Passing in Function and Callable class Instance, Subclass Thread and Instance, **COMPARING SINGLE vs MULTITHREADED EXECUTION:** Multithreading examples, Porting to Python, **SEMAPHORE EXAMPLES.**	**15**
III	**DATABASE PROGRAMMING:** Introduction, Basic Database operations, **PYTHON DB-API:** Module Attributes, connection objects, cursor objects, Type objects, **DATABASE AND PYTHON:** Adaptors, Insertion, Deletion, and Updation using Adaptor objects.	**15**
IV	**PERL:** Introduction, Perl Scripts - The Script, Getting a Handle on Printing- The Print, Printf Function, **NAME:** Perl variables, Scalars, Arrays, Hashes, **ARRAY Functions, HASH Functions**-*Perl Variables*	**15**
V	**OPERATORS:** Types, **CONTROL STRUCTURES:** Decision making, Repetition with loops, **REGULAR EXPRESSIONS:** Modifiers, operators, **GETTING A HANDLE ON FILES:** User defined handles, Passing Arguments, **SUBROUTINES:** Calling function, Passing Arguments, Call by reference-*Operators in Perl.*	**15**

Text Books:

1. Wesley J. Chun, "*Core Python Applications Programming*", Dorling Kindersley Publishers, Pearson Education, Third Edition, 2013. (UNIT - I to III).
2. Ellie Quigley, *"Perl"*, Dorling Kindersley Publishers, Pearson Education, Fourth Edition, 2009. (UNIT – IV to V).

Reference Books:

1. Dr. R. Nageswara Rao, *"Core Python Programming"*, Dreamtech Press, Second Edition, 2018.
2. Mike McGrath, *"Python – in easy steps"*, McGraw Hill Education (India) Private Limited, 2013.
3. Wesley J. Chun, *"Core Python Programming"*, Second Edition, Pearson Education, Inc., 2010.
4. Martin C. Brown, *"The Complete Reference – Perl"*, Tata McGraw Hill Edition, Second Edition, 2006.
5. Clinton Pierce, *"Perl – in 24 Hours"*, SAMS Techmedia, 2006.

E-references:

1. https://www.tutorialspoint.com/python/python_basic_operators.htm
2. https://www.w3schools.com/python/
3. https://www.tutorialspoint.com/perl/
4. http://sandbox.mc.edu/~bennet/perl/leccode/index.html

Mapping with Programme Specific Outcomes

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	S
CO2	H	H	S	H	H
CO3	H	S	S	H	S
CO4	M	H	S	H	H
CO5	S	S	S	H	H

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	Programme Title:	Information Technology	
Course Code:	19P3IT06	Course Title:	Batch:	2019
Total Hours:	75	Android (Common for CS & IT)	Semester:	II
			Credits:	4.0

Course Objective

The course aims

- To introduce mobile application development for android platform.
- To learn skills for creating and deploying android applications.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2	**CO1**	Describe Android platform, Architecture and features.
K1,K2,K3	**CO2**	Design User Interface and develop activity for Android Application.
K1,K2,K3	**CO3**	Use Intent, Broadcast receivers and Internet services in Android Application.
K1,K2,K3, K4,K5	**CO4**	Design and implement Database Application and Content Providers.
K1,K2,K3, K4,K5	**CO5**	Use multimedia, camera and Location based services in Android App & Discuss various security issues in Android platform.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** -Evaluate

SYLLABUS

Unit	Content	No. of Hours
I	OVERVIEW OF ANDROID: Android APIs – Android Architecture – Application Framework – Features – Application Components – Manifest File – Developing and Executing the First Android Application. ACTIVITIES: Working with Activities.	**15**
II	Intent Objects – Intent Resolution – Intent Filters – Resolving Intent Filter Collision – Linking the Activities Using Intent – Obtaining Results – Passing Data Using an Intent Object – Fragments – Working With View Groups.	**15**
III	Working with Views – Binding Data With the AdapterView Class – Designing the AutoTextCompleteView – Handling UI Events – Specialized Fragments – Creating Menus.	**15**
IV	Working with Image Views – Context Menu for Image View – Analogclock and Digitalclock Views – Embedding Web Browser in an Activity – Notifying the User - Working With Graphics – Drawable Object – ShapeDrawable Object – NinePatchDrawable Graphics – Working With Animations-*Drawable Object.*	**15**
V	STORING THE DATA PERSISTENTLY: Data Storage Options – Internal Storage – External Storage – SQLite Database – Working with Content Providers - Creating and Consuming User-Defined Content Provider-*SQLite Database.*	**15**

Text Book:

1. Pradeep Kothari, *"Android Application Development"*, Dreamtech Press, 2016. (UNIT I to V).

Reference Books:

1. Reto Meier, *"Professional Android 2 Application Development"*, Wiley India Pvt Ltd, 2010.
2. James C.Sheusi, *"Android Application Development for Java Programmers"*, Course Technology, Cengage Learning India Pvt Ltd., 2013.
3. Prasanna Kumar Dixit, "*Android*", Vikas publishing house Pvt., Ltd., First Edition, 2014.
4. J.F. DiMarzio, "*Android A Programmer's Guide*", Tata McGraw Hill Education Private Limited, 2010.
5. Zigurd R. Mednieks, Laird Dornin, G. Blake Meike, "*Programming Android*", O'Reilly, Second Edition, 2012.

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2. https://developer.android.com/guide
3. https://www.javatpoint.com/android-tutorial

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	S	M	S
CO2	M	H	S	S	M
CO3	H	S	M	H	S
CO4	S	M	S	S	H
CO5	S	H	S	M	S

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	Programme Title:	Information Technology	
Course Code:	19P3IT07	Course Title:	Batch:	2019
Total Hours:	75	Machine Learning	Semester:	II
			Credits:	4.0

Course Objective

The course aims

- To learn the state of the art methods and modern tools for machine learning.
- To understand modern computing tools.
- To understand scaling up approaches.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2,K3	CO1	Understand complexity of Machine Learning algorithms and their limitations.
K1,K2,K3	CO2	Understand modern notions in data analysis oriented computing.
K1,K2,K4	CO3	Capable of confidently applying common Machine Learning algorithms in practice and implementing on their own.
K1,K2,K3	CO4	Capable of performing distributed computations.
K1,K2,K4	CO5	apable of performing experiments in Machine Learning using real-world data.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** -Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	What is Machine Learning?: Understanding How Machines Learn- Using Data to Make Decisions- Following ML Workflow: from data to deployment- Boosting model performance with advanced techniques. Real World Data: Getting started: data collection- Preprocessing the data for modeling- Using data Visualization.	**15**
II	Modeling and Prediction: Basic Machine Learning Modeling – Classification: predicting into buckets - Regression: predicting Numerical values. Model Evaluation and Optimization: Model Generalization: assessing predictive accuracy for new data - Evaluation of classification models.	**15**
III	Model Evaluation and Optimization: Evaluation Regression models- Model optimization through parameter tuning. Basic Feature Engineering: Motivation: why is feature engineering useful?- Basic feature-engineering processes- Feature Selection -*Modeling.*	**15**
IV	Advanced Feature Engineering: Advanced text features - Image features – Time series features. Exploring the data and use case - Extracting basic NLP features and Building the initial model.	**15**
V	Scaling Machine- Learning Workflows: Before Scaling up - Scaling ML Modeling Pipelines - Scaling Predictions. Digital Advertising Data - Feature engineering and modeling strategy - Size and shape of the data - Singular value decomposition - Resource estimation and optimization - Modeling - K-Nearest Neighbors- Random forests - Other real- world considerations-*Display Advertising.*	**15**

Text Book:

1. Hen rik

Brink, Joseph W.Richards, Mark Fetherolf,"*Real-World Machine Learning"*, Edition 2017, Dreamtech Publication, ISBN: 978-93-5119-949-6.

Reference Books:

1. Andreas C.Muller, Sarah Guido, *"Introduction to Machine Learning with Python"*, First Edition, Shroff Publishers, 2017.
2. M.Gopal, *"Applied Machine Learning", First Edition*, McGraw Hill Education, 2018.
3. Michael Bowles, "*Machine Learning in Python"*, Second Edition, Wiley Publication, 2016.
4. K.P.Soman, R.Loganathan, V.Ajay, "*Machine Learning with SVM and Other Kernel Methods"*, First Edition, PHI Learning Publication, 2009, ISBN: 978-81-203-3435-9.

E-references:

1. https://searchenterpriseai.techtarget.com/definition/machine-learning-ML
2. https://in.mathworks.com/campaigns/offers/machine-learning-with-matlab.html\
3. https://en.wikipedia.org/wiki/Machine-Learning

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	L
CO2	S	M	M	H	M
CO3	M	M	H	H	S
CO4	M	H	H	S	H
CO5	M	H	H	H	S

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	**Programme Title:**	Information Technology	
Course Code:		**Course Title:**	**Batch:**	2019
Total Hours:	75	Elective - Digital Image Processing (Common for CS & IT)	**Semester:**	
			Credits:	5.0

Course Objective

The course aims

- To get exposed to simple image enhancement techniques in Spatial and Frequency domain.
- To know the categories of image processing applications.
- To learn concepts of degradation function and restoration techniques.
- To study the image segmentation and representation techniques.
- To become familiar with image compression and recognition methods.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2,K3	**CO1**	Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.
K1,K2	**CO2**	Understand the mathematical foundations for digital image representation, image acquisition, image transformation, and image enhancement.
K2,K3,K4	**CO3**	Operate on images using the techniques of smoothing, sharpening and enhancement. Understand the restoration concepts and filtering techniques.
K2,K3,K4	**CO4**	Understand the restoration concepts and filtering techniques.
K2,K3,K4, K5	**CO5**	Learn the basics of segmentation, features extraction, compression and recognition methods for color models.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** -Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	Introduction: Digital Image Fundamentals -Elements of visual perception-Light and the Electromagnetic Spectrum-Image Sensing and Acquisition-Basic Concept in Sampling and Quantization-Representing Digital Images-Spatial and Gray-Level Resolution-Zooming and Shrinking Digital Images-Some Basic Relationships Between Pixels.	**15**
II	Image Enhancement in the Spatial Domain-Background-Some Basic Gray Level Transformations-Histogram Processing-Smoothing Spatial Filters.	**15**
III	Image Enhancement in the Frequency Domain-Background-Introduction to the Fourier Transform and the Frequency Domain-Smoothing Frequency-Domain Filters-Sharpening Frequency Domain Filters.	**15**
IV	Morphological Image Processing-Preliminaries-Dilation and Erosion-Opening and Closing - *The Hit-or-Miss Transformation.*	**15**
V	Image Segmentation-Detection of Discontinuities-Foundation-The Role of Illumination-Basic Global Thresholding- Optimal Global and Adaptive Thresholding- Region-Based *Segmentation.*	**15**

Text Book:

1. Rafael C.Gonzalez & Richard E.Woods, *"Digital Image Processing"*, Pearson Education, Second Edition, 2002.

Reference Books:

1. Kenneth R. Castleman, *"Digital Image Processing"*, Pearson, 2006.
2. D.E. Dudgeon and RM. Mersereau, *"Multidimensional Digital Signal Processing"*, Prentice Hall Professional Technical Reference. 1990.
3. William K. Pratt, *"Digital Image Processing*", John Wiley, New York, 2002.
4. Milan Sonka et al, *"Image processing*", 2nd edition, analysis and machine vision Brookes/Cole, Vikas Publishing House, 1999.
5. Anil Jain K, "*Fundamentals of Digital Image Processing*", PHI Learning Pvt. Ltd, 2011.

E-references:

1. http://eeweb.poly.edu/~onur/lectures/lectures.html.
2. http://www.caen.uiowa.edu/~dip/LECTURE/lecture.html

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	M	S	H	M	S
CO3	S	H	S	H	H
CO4	S	M	H	S	S
CO5	H	S	S	H	H

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	**Programme Title:**	Information Technology	
Course Code:		**Course Title:**	**Batch:**	2019
Total Hours:	75	Elective - Client Server Computing (Common for CS & IT)	**Semester:**	
			Credits:	5.0

Course Objective

The course aims

- To provide students with specific knowledge and skills about client/server concept.
- To know about the SQL database concepts and mechanisms.
- To learn about benefits and components of distributed objects.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2,K3	**CO1**	Remember the basic knowledge on server types and building blocks.
K1,K2,K3	**CO2**	Understanding the concept of SQL database servers and data warehouse.
K1,K2,K3	**CO3**	Apply on transaction processing models and TP monitors.
K1,K2,K4	**CO4**	Analyze knowledge about groupware.
K1,K2,K4	**CO5**	Analyze on distributed objects and components.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** -Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	INTRODUCTION TO CLIENT/SERVER COMPUTING: What is client/server?, File Servers, Database Servers, Transaction Servers, Groupware Servers, Object/Servers, Web Servers, Middleware, Fat Servers, Fat Clients, 2-tier versus 3-tier. CLIENT/SERVER BUILDING BLOCKS: Operating Systems, Base Services, Extended Services, Server Scalability - Remote Procedure Call (RPC), Messaging and Queuing.	**15**
II	SQL DATABASE SERVERS – SQL and Relational Databases, SQL Database Server Architecture, Stored Procedures, Triggers and Rules – DATA WAREHOUSE – OLTP, Information Hounds, DSS, EIS, Elements Of Data Warehousing, Warehouse Hierarchies, Replication Versus Direct Access, The Mechanics Of Data Replication.	**15**
III	CLIENT/SERVER TRANSACTION PROCESSING: The ACID Properties, Transaction Models, TP MONITORS: TP Monitors, Transactions Management Standards.	**15**
IV	CLIENT/SERVER GROUPWARE: Importance of Groupware, What is Groupware?, -*The Components of Groupware.*	**15**
V	DISTRIBUTED OBJECTS AND COMPONENTS: Benefits of distributed objects, From Distributed Objects to components, 3- tier Client/Server, Object Style – CORBA – Distributed Objects, CORBA style, OMG's Object Management Architecture, Object Request Broker (ORB), Anatomy of a CORBA 2.0 ORB, CORBA Object Services-*CORBA Common Facilities.*	**15**

Text Book:

1. Robert Orfali, Dan Harkey and Jeri Edwards, "*The Essential Client/Server Survival Guide*", Galgotia Publications Pvt. Ltd., Third Edition, 2001. (Unit I-V)

Reference Books:

1. Steve Bobrowski, "*Oracle 7.0 and Client/Server Computing*", BPB Publications, Second Edition, 1996.
2. Patrick Smith, Steve Guengerich, "*Client/Server Computing*", PHI Learning, Second Edition, 2012.
3. Dawna Travis Dewire, "*Client/Server Computing*", Tata McGraw Hill, First Edition, 2003.

4. Dr.A.Murugan, Dr.K.Shyamala, T.Sunitha Rani, "*Client/Server Computing*", Margham Publications, First Edition, 2016.

E-references:

1. https://en.wikipedia.org/wiki/Client%E2%80%93server_model
2. https://www.webopedia.com/Computer_Science/Client_Server_Computing
3. https://simple.wikipedia.org/wiki/Client-server

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	H
CO2	S	M	S	H	H
CO3	S	S	M	S	S
CO4	S	S	M	M	S
CO5	S	S	S	H	S

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	**Programme Title:**	Information Technology	
Course Code:		**Course Title:**	**Batch:**	2019
Total Hours:	75	Elective - Cloud Computing (Common for CS & IT)	**Semester:**	
			Credits:	5.0

Course Objective

The course aims

- To know about the types and models of cloud services.
- To provide students with specific knowledge and skills about cloud deployment techniques.
- To know about the challenges in cloud services security.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2,K3	**CO1**	Remember the basic knowledge on virtualization.
K1,K2,K3	**CO2**	Understanding the concept of cloud computing services and its business value.
K1,K2,K3	**CO3**	Apply on cloud deployment techniques.
K1,K2,K4	**CO4**	Analyze about the security in cloud.
K1,K2,K4	**CO5**	Analyze on mobile cloud computing.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** -Evaluate

	SYLLABUS	
Unit	**Content**	**No. of Hours**
I	ERA OF CLOUD COMPUTING: How We Got to the Cloud-Server Virtualization Versus Cloud Computing - Components of Cloud Computing-Cloud Types - Private, Public and Hybrid - Impact of Cloud Computing on Businesses. INTRODUCING VIRTUALIZATION	**15**
II	CLOUD COMPUTING SERVICES, CLOUD COMPUTING AND BUSINESS VALUE: Key Drivers for Cloud Computing-Cloud Computing and Outsourcing-Types of Scalability-Use of Load Balancers to Enhance Scalability-Variable Operating Costs Using Cloud Computing-Time-to-market Benefits of Cloud Computing-Distribution Over the Internet-Levels of Business Value from Cloud Computing.	**15**
III	CLOUD TYPES AND MODELS: Private Cloud-Community Cloud-Public Cloud-Hybrid Cloud, CLOUD DEPLOYMENT TECHNIQUES: Potential Network Problems and their Mitigation-Cloud Network Topologies-Automation for Cloud Deployment-Self-Service Features in a Cloud Deployment-Federated Cloud Deployments-Cloud Performance- Cloud Performance Monitoring and Tuning-Impact of Memory on Cloud Performance-Improving Cloud Database Performance-Cloud Services Brokerage(CSB)-Approaches to Implement Interoperability between Clouds-Recent Changes in Professional Certification-Cloud Ratings-Cloud Computing Trends that are Accelerating Adoption-*Recent Trends in Cloud Computing and Standards.*	**15**
IV	HOST SECURITY IN THE CLOUD: Security for the Virtualization Product-Host Security for SaaS-Host Security for PaaS-Host Security for IaaS. DATA SECURITY IN THE CLOUD: Challenges with Cloud Data*-Challenges with Data Security-Data Confidentiality and Encryption-Data Availability-Data Integrity-Cloud Data Management Interface-Cloud Storage Gateways (CSGs)-Cloud Firewall-Virtual Firewall.	**15**
V	APPLICATION SECURITY IN THE CLOUD: Cloud Application Software Development Lifecycle (SDLC)-Cloud Service Reports by Providers-	**15**

	Application Security in an IaaS Environment- Application Security in a PaaS Environment- Application Security in a SaaS Environment, MOBILE CLOUD COMPUTING: Definitions of Mobile Cloud Computing-Architecture of Mobile Cloud Computing-Benefits of Mobile Cloud Computing-Mobile Cloud Computing Challenges.	

Text Book:

1. Kailash Jayaswal, Jagannath Kallakurchi, Donald J.Houde, Dr. Deven Shah, "*Cloud Computing-Black Book*", Dreamtech press, First Edition, 2014. (Unit I-V)

Reference Books:

1. Barrie Sosinsky, "*Cloud Computing Bible"*, Wiley, First Edition, 2011.
2. Rajkumar Buyya, Christian Vecchida, S.Thamarai Selvi, "*Mastering Cloud Computing"*, McGraw Hill Education, First Edition, 2013.
3. Antony T.Velte, Toby J. Velte, Robert Elsenpeter, "*Cloud Computing – A Practical Approach*", McGraw Hill Education, First Edition, 2010.
4. A.Srinivasan, J-Suresh, "*Cloud Computing - A Practical Approach for Learning and Implementation"*, Pearson, First Edition, 2014.

E-references:

1. https://en.wikipedia.org/wiki/Cloud_computing
2. https://www.investopedia.com/terms/c/cloud-computing.asp
3. https://cloudcomputing.ieee.org/images/files/education/studygroup/ Cloud_Computing_Definition_Reference_ Architecture_and_General_Use_Cases.pdf

Mapping with Programme Specific Outcomes

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	H	M	H
CO2	S	M	M	M	H
CO3	S	H	S	S	S
CO4	S	S	S	H	S
CO5	S	M	H	S	S

S-Strong; H-High; M- Medium; L-Low

Programme Code:	M.Sc.	**Programme Title:**	Information Technology	
Course Code:		**Course Title:**	**Batch:**	2019
Total Hours:	75	Elective - Internet Of Things (Common for CS & IT)	**Semester:**	
			Credits:	5.0

Course Objective

The course aims

- To learn the fundamentals of IoT.
- To realize the concepts of Wireless sensor networks and RFID applications.
- To understand the standards and settings of IoT.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2.K3	**CO1**	Remember the building block of Internet Of Things and characteristics.
K1,K2,K3	**CO2**	Understand the various network protocols used in IoT.
K1,K2,K3	**CO3**	Apply the internet of things in different contexts.
K1,K2,K4	**CO4**	Analyze protocols used in IOT.
K1,K2,K4	**CO5**	Analyze IOT to different applications.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** -Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**INTRODUCTION TO THE INTERNET OF THINGS:** Introduction – History of IoT – About object/things in the IoT – The identifier in the IoT – Enabling technologies of IoT – About the Internet in IoT **RADIO FREQUENCY IDENTIFICATION TECHNOLOGY:** Introduction – Principle of RFID – Components of an RFID system – Issues.	**15**
II	**WIRELESS SENSOR NETWORKS: TECHNOLOGY:** History and context – The node – Connecting nodes – Networking nodes – Securing communication – Standards .	**15**
III	**RFID APPLICATIONS:** Introduction – Concepts and terminology-*RFID applications.*	**15**
IV	**RFID DEPLOYMENT FOR LOCATION AND MOBILITY MANAGEMENT ON THE INTERNET:** Introduction – Background and related work – Localization and handover management relying on RFID – Technology considerations.	**15**
V	**THE INTERNET OF THINGS – SETTING THE STANDARDS:** Introduction – Standardizing the IoT – Exploiting the potential of RFID – Identification in the IoT – Promoting ubiquitous networking- *Safeguarding data and consumer privacy.*	**15**

Text Book:

1. Hakima Chaouchi, **"***The Internet of Things connecting objects to the web"***,** WILEY Publication, 2017. (Unit I-V).

Reference Books:

1. Arshdeep Bahga, Vijay Madisetti, "*Internet of Things A hands on Approach"*, Universities Press, First Edition, 2016.
2. David Hanes, Gonzalo Salgueiro, PATRICK Grossetete, Robert Barto, Jerome Henry, "*IoT Fundamentals*", Cisco Press, First Edition, 2017.
3. Michael Miller, "*The Internet of Things*", Pearson's Education Services, First Edition, 2015.
4. Rajkamal, "*Internet of Things Architecture and Design Principles"*, McGraw Hill Education, 2017.

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1. https://www.tutorialspoint.com/internet_of_things/
2. http://www.ibm.com/blogs/internet-of-things/what-is-the-lot/
3. https://www.udemy.com/internet-of-things-from-beginner-to-making-you-first-device/
4. https://www.edureka.co/blog/iot-tutorial/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	L
CO2	S	H	H	M	M
CO3	S	S	S	H	H
CO4	S	S	S	M	M
CO5	S	H	S	S	S

S-Strong; H-High; M- Medium; L-Low

Question Paper Pattern - P.G. Courses

(Common for Major and Supportive Papers)

For EOS Examinations: 60 Marks

The Question Paper is to be divided into THREE Sections.

Section-A Carries 10 Marks, Section-B Carries 20 Marks and Section-C Carries 30 Marks.

Section-A Contains 10 Multiple Choice Questions. (10 x 1 = 10)

Two Questions from each unit. (Q. No: 1 to 10)

Section-B Contains 5 Either or Choice Questions. (5 x 4 = 20)

Each Question carries 4 Marks. Both (a) and (b) from the same unit.

Q. No.: 11 (a) or (b) to 15(a) or (b)

Section-C Contains 5 Questions, out of which 3 Questions are to be answered. (3 x 10 = 30)

Each Question carries 10 Marks. One Question from each unit. Q. No.: 16 to 20

For CIA Examinations: 40 Marks

CIA Test I and II Question Paper Pattern: (30 Marks)

Section-A: 10 Multiple Choice Questions. (10 x 1 = 10)

Section-B: Two Questions out of Three. (2 x 5 = 10)

Section-C: One Question out of Two. (1 x 10 = 10)

Components of Continuous Internal Assessment (CIA)

<table>
<tr><th colspan="2">Components</th><th>Calculation</th><th>CIA Total</th></tr>
<tr><td>Test 1 & Test 2</td><td>30</td><td rowspan="3">$30 + 40 + 30 = \frac{100 \times 40}{100} = 40$</td><td rowspan="3">40</td></tr>
<tr><td>Test 3 (Model Exam)</td><td>40</td></tr>
<tr><td>Assignment + Seminar + Quiz / GD / Poster Presentation / Book Review / Field Visit Report</td><td>10+10+10 = 30</td></tr>
</table>