

M.Sc. (Computer Science)-II

Semester-III

Syllabus

Wef. A.Y. 2023-24

(2022 Pattern)

M.Sc. Computer Science (Sem. I)

Subject	Paper Code (2019 Patt.)	Paper Code (2022 Patt.)	Paper Title
Principles of Programming Languages	COMP4101	PSCS111	Principles of Programming Language (C)
Cryptography & Network Security	COMP4102	PSCS112	Cryptography and Cyber Forensics(C)
Database Technologies	COMP4103	PSCS113	Database Technologies (C)
Design and Analysis of Algorithms	COMP4104	PSCS114	Design and Analysis of Algorithms (C)
Programming with DOT NET	COMP4105	PSCS115	Dot Net (Basic)(C)
Lab Course on DOT NET, PPL and Database Technologies	COMP4106	PSCS116	Lab Course on Dot Net, PPL,DBT & DAA (C)
Human Rights – I	HR-101	HR1	Human Rights – I
Introduction to Cyber Security – I	CYS-101	CYS1	Introduction to Cyber Security – I

M.Sc. Computer Science (Sem. II)

Subject	Paper Code (2019 Patt.)	Paper Code (2022 Patt.)	Paper Title
Digital Image Processing	COMP4201	PSCS121	Digital Image Processing (C)
Data Mining and Data Warehousing	COMP4202	PSCS122	Data Mining and Data Warehousing (C)
Python Programming	COMP4203	PSCS123	Emerging Technologies - Python Programming –I(Basic) (C)
Advanced Operating System	COMP4204	PSCS124	Dot Net (Advanced) (C)
Lab Course on Python Programming & AdvanceOperating System	COMP4205	PSCS125	Lab Course on Dot Net, DIP and DM&DW(C)
Project	COMP4206	PSCS126	Project(C)
Artificial Intelligence	COMP4207	PSCS127(A)	Artificial Intelligence (Elective I)
		PSCS127(B)	Advanced Operating System (Elective II)
Introduction to Cyber Security – II	CYS-102	CYS2	Introduction to Cyber Security – II

M.Sc. (Computer Science) – II (Sem. III)

Subject	Paper Code (2019 Patt.)	Paper Code (2022 Patt.)	Paper Title
Mobile Technologies (C)	COMP5301	PSCS231	Software Architecture & Design Pattern
Soft Computing (C)	COMP5302	PSCS232	Soft Computing
Web Services (C)	COMP5303	PSCS233	Data Science and Analytics
Software Architecture & Design Pattern (Elective I)	COMP5304	PSCS234	Web Services Architecture Using Dot Net Framework
Lab Course-on Mobile Technology and Web Services (C)	COMP5305	PSCS235 (A) OR PSCS235 (B)	Emerging Technologies -Python Programming – II (Advanced) (Elective) Emerging Technologies - R Programming –I (C) (Elective)
Project (Elective II)	COMP5306	PSCS236	Lab Course on PSCS133, 134 & PSCS135(A)
Recent Trends in IT (Internet of Things) (Elective III)	COMP5307	PSCS237	Project
Certificate Course – II	CC-23	CON	Introduction to Constitution
Skill Development – I	Certificate Course – II	SD – 23	Skill Development - I

M.Sc. (Computer Science) – II (Sem. IV)

Subject	Paper Code (2019 Patt.)	Paper Code (2022 Patt.)	Paper Title
Industrial Training/ Institutional Project (IT)	COMP5401	PSCS241	Industrial Training/ Institutional Project (IT)
Skill Development - II	-----	SD-24	Skill Development - II

Anekant Education Society's
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Autonomous

M.Sc.(Computer Science) Academic Year 2022-2023

M.Sc. (Computer Science) I - Credit Structure

Subject	Semester I	Semester II	Total
Paper – I	4	4	8
Paper – II	4	4	8
Paper – III	4	4	8
Paper – IV	4	4	8
Paper – V	4	4	8
Practical	4	4	8
Practical (Project)	---	4	4
Intro. to Cyber Security – I & II	2	2	4
Human Rights	2	--	2
Certificate Course- I	--	2	2
Total =====	28	32	60

M.Sc. (Computer Science) II - Credit Structure

Subject	Semester III	Semester IV	Total
Paper – I	4	Industrial Training Project / Internship (IT) 16	4
Paper – II	4		4
Paper – III	4		4
Paper – IV	4		8
Paper – V	4		8
Practical / Paper VI (Sem IV)	4		8
Practical (Project)	4		8
Certificate Course- II	2	-----	2
Skill Development I & II	2	2	4
			2
Total =====	32	18	50

Extra Credits:

1	Human Rights	2 Credits
2	Cyber Security Module I & II	4 Credits
3	Certificate Courses I & II	4 Credits
4	Skill Development I & II	4 Credits
Total Extra Credits =		14 Credits

Total Credits: Academic Credits (24+28+28+16 = 96) + Extra Credits (14) = 110

Paper wise Course Structure for M.Sc. (Computer Science)-I (2022 Pattern)

No	Class	Sem	Code	Paper	Paper Title	Credit	Exam	Marks
1	M.Sc. - I	I	PSCS111	Theory	Principles of Programming Language (C)	4	I / E	60 + 40
2			PSCS112	Theory	Cryptography and Cyber Forensics(C)	4	I / E	60 + 40
3			PSCS113	Theory	Database Technologies (C)	4	I / E	60 + 40
4			PSCS114	Theory	Design and Analysis of Algorithms (C)	4	I / E	60 + 40
5			PSCS115	Theory	Dot Net (Basic)(C)	4	I / E	60 + 40
6			PSCS116	Pract.	Lab Course on Dot Net, PPL,DBT & DAA (C)	4	I / E	60 + 40
7			HR1	----	Human Rights – I	2	----	----
8			CYS1	----	Introduction to Cyber Security – I	2	----	----

Note: Credit: 24. Core subjects are compulsory and Extra credits (2+2=4) is also compulsory.

9	M.Sc. - I	II	PSCS121	Theory	Digital Image Processing (C)	4	I / E	60 + 40
10			PSCS122	Theory	Data Mining and Data Warehousing (C)	4	I / E	60 + 40
11			PSCS123	Theory	Emerging Technologies - Python Programming –I(Basic) (C)	4	I / E	60 + 40
12			PSCS124	Theory	Dot Net (Advanced) (C)	4	I / E	60 + 40
13			PSCS125	Pract.	Lab Course on Dot Net, DIP and DM&DW(C)	4	I / E	60 + 40
14			PSCS126	Pract.	Project(C)	4	I / E	60 + 40
15			PSCS127 (A)	Theory	Artificial Intelligence (Elective I)	4	I / E	60 + 40
16			PSCS127 (B)	Theory	Advanced Operating System (Elective II)	4	I/E	60 + 40
17			CC-12	----	Certificate Course – I	2	----	----
18			CYS2	----	Introduction to Cyber Security – II	2	----	----

Note: : Credit: 28. Core subjects is compulsory and Extra credits (4) is also compulsory.

Paper wise Course Structure for M.Sc. (Computer Science)-II Sem- III (2022 Pattern)

19	M.Sc. - II	III	PSCS231	Theory	Software Architecture & Design Pattern	4	I / E	60 + 40
20			PSCS232	Theory	Soft Computing	4	I / E	60 + 40
21			PSCS233	Theory	Data Science and Analytics	4	I / E	60 + 40
22			PSCS234	Theory	Web Services Architecture Using Dot Net Framework	4	I / E	60 + 40
23			PSCS235 (A)	Theory	Emerging Technologies -Python Programming – II(Advanced) (Elective)	4	I / E	60 + 40
			OR					
24			PSCS235 (B)		Emerging Technologies - R Programming –I (C) (Elective)	4	I / E	60 + 40
25			PSCS236	Pract	Lab Course on PSCS233, PSCS234, PSCS235(A)	4	I / E	60 + 40
26			PSCS237	Prajct.	Project	4	I/E	60 + 40
27			CON	----	Introduction to Constitution	2	----	----
28	SD-23	----	Skill Development – I	2	----	----		
Note: Credit: 28. Core subjects are compulsory and Extra credits (2+2) is also compulsory.								
29	M.Sc. - II	IV	PSCS241	Project	Industrial Training/ Institutional Project (IT) (C)	16	I / E	60 + 40
32			SD-24	----	Skill Development – II	2	----	----
Note: Credit: 16. Core subject is compulsory,								
Total Credits: Academic Credits (24+28+28+16 = 96) + Extra Credits (14) = 110								

Class: M. Sc. (Computer Science)-II (Sem-III)
Title of Paper: Software Architecture & Design Pattern
Credit: 4 (4 Lectures/Week)

Paper Code : PSCS231
Paper : I
No. of lectures: 60

Objectives:

To Understand and learn the software architecture, its styles, views and pattern for design software with minimum complexity and maintain flexibility

Prerequisites:

System Analysis and Design, Software Engineering, OOSE, Software project Management, UML

Outcomes: Able to assist learner to utilize styles and views to state Architecture, define documentation, analyze the architectural structures and it's Influence on business and development process.

Unit	Contents	No. of Lect.
1	Introduction to Software Architecture 1.1. Introduction to concept of Software Architecture 1.2 Definition, Architectural structures 1.3 Need and Influence of software architecture in organization as business and technical aspects 1.4 Architecture Business Cycle 1.5 Introduction – Functional requirements, technical constraints, Quality Attributes	4
2	Quality Attribute 2.1 Introduction Quality Attribute 2.2 Documenting Quality Attributes 2.3 Six Part Scenarios 2.4 Case Studies	4
3	Architectural Views 3.1 Introduction, Definitions for views 3.2 Structures and views, Representing views, available notations 3.4 Standard views, 4+1 view of RUP, Siemens 4 views SEI's perspectives and views 3.4 Case Studies	6
4	ARCHITECTURAL STYLES 4.1 Introduction 4.2 Data flow styles with Case study 4.3 Call-return styles with Case study 4.4 Shared Information styles with Case study 4.5 Event styles with Case study	6
5	Common Software Architectural Patterns 5.1 Layered pattern 5.2 Client-server pattern 5.3 Master-slave pattern 5.4 Pipe-filter pattern 5.5 Broker pattern 5.6 Peer-to-peer pattern 5.7 Event-bus pattern 5.8 Model-view-controller pattern	12

	5.9 Blackboard pattern 5.10 Interpreter pattern	
6	Design Pattern 6.1 Important Design Patterns 6.2 Design Pattern Catalogue, Creational, Structural and behavioral Patterns 6.3 Structural Decomposition 6.4 Organization of Work, Access Control.	10
7	DOCUMENTING THE ARCHITECTURE 7.1 Good practices, Documenting the Views using UML 7.2 Merits and Demerits of using visual languages 7.3 Need for formal languages 7.4 Architectural Description Languages ACME 7.5 Case studies. Special topics: SOA and Web services, Cloud Computing, Adaptive structures	6

Reference Books:

- Beyond Software architecture, Luke Hohmann, Addison wesley, 2003.
- Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001
- Software Design, David Budgen, second edition, Pearson education, 2003
- Head First Design patterns, Eric Freeman & Elisabeth Freeman, O'REILLY, 2007.
- Design Patterns in Java, Steven John Metsker& William C. Wake, Pearson education, 2006
- J2EE Patterns, Deepak Alur, John Crupi& Dan Malks, Pearson education, 2003.
- Design Patterns in C#, Steven John metsker, Pearson education, 2004.
- Pattern Oriented Software Architecture, F. Buschmann& others, John Wiley & Sons
- Anti-Patterns: Refactoring Software, Architectures and Projects in Crisis, William J Brown et al., John Wiley, 1998
- Object-oriented analysis, design and implementation, brahma dathan, sarnathrammath, universities press,2013
- Design patterns, erich gamma, Richard helan, Ralph johman , john vlissides ,PEARSON Publication,2013.

Class: M. Sc. (Computer Science) II (Sem-III)

Title of Paper: Soft Computing

Credit: 4 (4 Lectures/Week)

Paper Code: PSCS232

Paper: II

No. of lectures: 60

Prerequisites: Probability, First Order Mathematical Logic, Classical Logic, Linear algebra and Calculus.

Objective:

- To understand the concepts of how an intelligent system work and its brief development process.
- Be familiar with design of various neural networks & fuzzy logic & Learn genetic programming.

Learning Outcome:

- Describe human intelligence and AI
- Know intelligent system works.
- Apply basics of Fuzzy logic and neural networks.
- Know and Apply ideas of fuzzy sets, fuzzy logic and use of human experience relate with neural networks, generalize appropriate rules for inference systems
- Deploy the genetic algorithms and other random search procedures.
- Develop some familiarity with current research problems and research methods in Soft Computing Techniques.

Units & Contents	No. Of Lectures
<p style="text-align: center;">1.Introduction to Soft Computing</p> <ul style="list-style-type: none">• Concept of computing system• “Soft” Vs. “Hard” computing• Characteristics of soft computing• Some application of soft computing techniques	06
<p style="text-align: center;">2. Fuzzy Logic</p> <ul style="list-style-type: none">• The Illusion: Ignoring Uncertainty and accuracy• Uncertainty and information• Fuzzy set and membership• Chance versus Fuzziness• Classical Sets, Fuzzy Sets• Cartesian Product• Crisp Relations• Fuzzy relations• Tolerance and equivalence Relations, Fuzzy Tolerance and equivalence Relations• Value assignments, Other Forms of the Composition Operations• Features of the membership Function• various forms, Fuzzification, Defuzzification to Crisp sets• λ-Cuts for fuzzy Relations, Defuzzification to Scalars	14

3. Fuzzy System	06
<ul style="list-style-type: none"> • Fuzzy Logic • Approximate Reasoning, Others forms of implication operations • Natural Language, Linguistic Hedges • Fuzzy (Ruled-Based) system • Graphical technique of inference • Membership value assignment-Intuition, Inference. 	
4. Neural Network	10
<ul style="list-style-type: none"> • Biological neurons and its working. • Simulation of biological neurons to problem solving. • Different ANNs architectures. • Training techniques for ANNs. • Applications of ANNs to solve some real-life problems. 	
5. Genetic Algorithms	12
<ul style="list-style-type: none"> • A Gentle Introduction to Genetic Algorithms: <ul style="list-style-type: none"> ○ What is Genetic Algorithm? ○ Robustance of Traditional Optimization and Search Methods ○ The Goals of Optimization • How are Genetic Algorithms Different from Traditional Methods? • A simple Genetic Algorithm • Genetic Algorithms at Work—a Simulation by hand • Grist for the Search Mill—Important Similarities • Similarity Templates (Schemata) Learning the Lingo. 	

Reference Books

1. Fuzzy Logic With Engineering Applications, 3rd Edition By Timothy Ross , Wiley Publication
2. Neural Networks By Satish Kumar, Tata McGraw Hill
3. Introduction to Soft Computing by Deepa & Shivanandan, Wiley Publication
4. Genetic Algorithms in Search, Optimization and Machine Learning By David E. Goldberg, Pearson Education.

Class: M. Sc.(Computer Science) II (Semester- III)

Title of Paper: Data Science and Analytics

Credit: 04

Paper Code: PSCS233

Paper : III

No. of lectures: 60

Objective:

- Understand the concepts of Data Procedures.
- Learn the tools to analyze the data.

Course outcome: Students successfully completing this course will be able to:

- Analyze the nature of data with the help of statistical methods and different visualization techniques.
- Evaluate the model performance by applying various algorithms and communicate the observations.
- Apply and analyze data analytical methods for real life problems.

Unit	Title and Contents	No. of Lectures
Unit 1	Introduction to Data Science 1.1 What is Data Science 1.2 Importance of Data Science 1.3 Big data and data science 1.4 Types of data: structured vs unstructured data 1.5 Quantitative vs Categorical data 1.6 Data Science process	06
Unit 2	Statistics for Data Science 2.1 Population and samples 2.2 The fundamentals of descriptive statistics: Frequency distribution, Measures of central tendency and variability: range, standard deviation, variance 2.3 Correlation, Simpson's paradox 2.4 Probability: Dependence and Independence, conditional probability, Bayes's theorem, Random variables, continuous distributions, normal distribution 2.5 Estimators and estimates 2.6 Confidence intervals 2.7 Hypothesis testing	14
Unit 3	Data visualization and multidimensional data 3.1 Basic of data visualization: Line plot, Scatter plot, Boxplot, Histogram, Bar chart, Pie chat etc. 3.2 Need of data modeling 3.3 Multidimensional data models 3.4 Principal component analysis 3.5 Clustering of high dimensional data	10
Unit 4	Data Analytics 4.1 Introduction to Data Analytics	

	4.2 Data Analytics vs Data Reporting 4.3 Use of Data Analytics 4.4 Applications of Data Analytics 4.5 Characteristics of Data Analytics 4.6 Types of Data Analytics 4.7 Data Analytics Process Steps 4.8 Technical & Business Skills for Data Analytics	10
Unit 5	Data Analytics using Python 5.1 Why Data Analytics Using Python 5.2 Python Libraries for Data Analytics 5.3 Data Analytics Using the Python Library- NumPy 5.4 Data Analytics Using Python Libraries- Pandas and Matplotlib 5.5 Case Studies and Real-Life examples	08

Note: 48 hours for theory lectures and 12 hours for internal assessment and learning.

References:

1. Data Science and Big Data Analytics Publisher, Wiley, ISBN:9781118876053, 1118876059
2. Data Analytics Publisher, McGraw Hill Education (India) Private Limited, ISBN:9789352604180, 9352604180
3. Data Analytics for Beginners Publisher, CreateSpace Independent Publishing Platform, ISBN:9781539896739, 1539896730

Class: M. Sc. (Computer Science) (Sem-III)

Paper Code: PSCS234

Title of Paper: Web Services Architecture Using Dot Net Framework

Paper: IV

Credit: 4 (4 Lectures/Week)

No. of lectures: 48

Pre-requisites:

- Strong Knowledge of Dot.Net Framework and ASP.NET Core ASP.NET MVC.
- Familiarity with programming language C #.
- Must be familiar with XML.

Objectives:

- To Understand Web Services and implementation using Dot Net Framework.
- To Understand the SOA architecture, its Principles and benefits.
- To understand cloud computing as a web service.
- To understand XML concepts.

Learning Outcomes: Student will able to :

- Understand the principles of SOA.
- Efficiently use Dot Net framework for creating web services and web applications.
- Ability to write the Web application using ASP.Net Core MVC -API.

Unit	Contents	No. of Lectures
1	Overview of Dot Net Framework Dot Net Class Framework, CLR, elements of Dot Net application, Window programming, ASP DOT NET MVC, ASP DOT NET MVC-Web API, ASP DOT NET Core	5
2	Web Service and SOA fundamental 2.1 Introduction: what are Web Services? Concept of Saas, 2.2 Web services Vs Web based Implementation. 2.3 Characteristics of Web Services: Types of Web services, Functional and nonfunctional properties, State processing, loose Coupling, Service Granularity, Service Synchronization. 2.4 Service Interface and Implementation 2.5 The Services oriented Architecture (SOA): Roles of Interaction in SOA, Layer of SOA6. Quality Of Service (QoS) 2.6 Web Service Interoperability (WS-I) 2.7 Web Services Vs Components 2.8 Restful Services 2.9 Impact and Shortcomings of Web services: Impact of web services	8
3	Web Services Architecture 3.1 Introduction 3.2 Web Services Architecture and It's Characteristics: Web service characteristics, WebService Architecture 3.4 Core building blocks of web services 3.5 Web Services Communication Models: RPC-based Communication Model, Messaging-based communication Model 3.6 Basic steps of implementing web services 3.7 Developing web services-Enabled applications: Web Services Implementation Using Dot Net Environment, Developing Web Services Using Dot Net: AN Example	8

	3.8 Packaging and Deploying the Service: Creating web Service Clients.	
4	SOAP: Simple Object Access Protocol 4.1 Introduction 4.2 Inter-application communication and wire protocols: SOAP as a wire representation, SOAP as a messaging protocol 4.3 Structure of a SOAP message: SOAP Envelope, SOAP Header, SOAP Body. 4.4 SOAP communication model: RPC-Style, Document – (Message)Style Web Services 5 Building SOAP Web Services 4.5 Building SOAP Web Services 4.6 Error handling in SOAP and Advantages and disadvantages of SOAP.	8
5	Describing and Discovering Web Services: 5.1 WSDL in the world of Web Services 5.2 Web Services life cycle: Anatomy of WSDL definition document, Patterns Of Operations 5.3 WSDL bindings, WSDL Tools, limitations of WSDL 5.4 Service discovery: Role of service discovery in a SOA, service discovery mechanisms. 5.5 UDDI – UDDI Registries, uses of UDDI Registry, Searching information in a UDDI Registry, Deleting information in a UDDI Registry, limitations of UDDI.	9
6	Cloud Computing: 6.1 Introduction: What is Cloud Computing? Essential characteristic of cloud, Cloud Deployment Model, History, Benefits, Risk 6.2 SOA Meets the Cloud: Comparing SOA with Cloud Computing, SOA Deployment: Cloud Computing Vs The ESB 6.3 Cloud Computing Technologies: Virtualization, SOA, Grid Computing, Utility Computing. 6.4 Cloud Computing Architecture: Front End, Back End 6.5 . Cloud Model: Public Cloud, Private Cloud, Hybrid Cloud, Benefits, Disadvantages 6.6 Security and Privacy: Insecure or incomplete data and deletion, Security Planning, understanding security of cloud, Security Boundaries, Understanding Data Security, Isolated Access To data. 6.7 Cloud Computing Application: Business, Social, Entertainment	

Reference Book:

1. Restful Web Services Cookbook, Subbu Allamaraju
2. Service Architecture, Thomas Eri
3. XML, Web Services, and the Data Revolution ,F.P. Coyle, Pearson Education
Professional visual C#, wrox publication.

Text Books

- Web Services & SOA Principles and Technology.
- Beginning visual C#, Wrox publication.

Class: M.Sc. (Computer Science) II (Semester – III)

Paper Code: PSCS235(A)

Title of Paper: Emerging Technologies - Python Programming-II **Paper:** V

Credit: 4

No. of Lectures: 60

Prerequisites:

- To introduce various concepts of programming to the students using Python.
- Students should be able to apply the problem-solving skills using Python

Learning Objectives: Student successfully computing this course will be able to understand and gain the knowledge of the subject

Learning Outcomes:

- Students will understand all the important and beneficial concepts of Python Programming.
- Students will learn Practical implementation of Python Programming concepts.

Units	Title and Contents	No. of Lectures
Unit -I	Writing GUIs in Python (Tkinter) <ul style="list-style-type: none">• Introduction• Components and Events• An Example GUI• The root Component• Adding a Button• Entry Widgets• Text Widgets• Check buttons	10
Unit -II	Python SQL Database Access <ul style="list-style-type: none">• Introduction• Installation• DB Connection• Creating DB Table• INSERT, READ, UPDATE, DELETE operations.• COMMIT & ROLLBACK operation.• handling Errors	08
Unit –III	Network Programming <ul style="list-style-type: none">• Introduction• A Daytime Server• Clients and Servers• The Client Program• The Server Program	08

Unit - IV	Python MongoDB <ul style="list-style-type: none"> • Introduction • Installation • DB Connection • Creating DB Table • INSERT, READ, UPDATE, DELETE operations. 	08
Unit – V	Python Libraries NumPy <ul style="list-style-type: none"> • Array in NumPy • Data Types in NumPy • Methods in NumPy • String Operations • Sorting, Searching and Counting Pandas <ul style="list-style-type: none"> • Data Frame • Working with Text Data • Pandas Merging, Joining, and Concatenating 	14

NOTE: 48 LECTURES FOR CURRICULUM (TEACHING) &12 LECTURES FOR LEARNING

Reference Books:

1. Python GUI Programming with Tkinter – By Alan D Moore
2. Databases and Python Programming: MySQL, MongoDB, OOP and Tkinter- By R PANNEERSELVAM
3. Foundations of Python Network Programming: The comprehensive guide to building network applications with Python – By Brandon Rhodes and John Goerzen
4. Guide to NumPy – Travis E. OLIPHANT PHD

Class: M. Sc. (Computer Science) -II (Semester- III)

Title of Paper: Lab I : Based on PSCS233,PSCS234,PSCS235(A)

Credit : 4 (3 Hour Practical/Week/batch)

Paper Code : PSCS236

Paper : VI

No. of Practical : 12

Learning Outcome:

- Students will learn practical implementation of Data Science and Analytics concepts.
- Develop and deploy webservice using Dot Net Framework
- Students will learn Advanced Python Programming.

Assignments	
	Assignment based on PSCS133: Data Science & Analytics
1	Practical implementation of Descriptive statistics such as Frequency distribution, Measures of central tendency and variability: range, standard deviation, variance
2	Practical implementation of Basics of data visualization such as Line plot, Scatter plot, Boxplot, Histogram, Bar chart, Pie chat etc.
3	Practical implementation of Data Analytics Using the Python Library- NumPy
4	Practical implementation of Data Analytics Using Python Libraries- Pandas and Matplotlib
	Assignment based on PSCS134: Web Services Architecture using Dot Net Framework
1	Introduction of Web Services
2	Assignment on SOAP
3	Assignment on WSDL
4	Assignment on UDDI
5	Assignment on XML
	Assignment based on PSCS135 (A): Emerging Technologies: Python Programming – II (Advanced)
1	Assignment on GUI
2	Assignment on SQL & Mango DB Database
3	Assignment on NumPy
4	Assignment on Pandas

Class: M. Sc. (Computer Science)-II (Semester- III)

Title of Paper: Lab Course: Projects

Credit : 4 (3 Hour Practical/Week/batch)

Paper Code : PSCS237

Paper : VII

No. of Practical : 12

Learning Outcome:

- Students will learn and implementation of different systems.

Instructions for Project:

- The Project can be platform, language and technology independent.
- Project will be evaluated by the project guide.
- Assessment will be done weekly in the respective batch.
- Evaluation will be on the basis of weekly progress of project work, progress report, oral, results and documentation and demonstration.
- You should fill your status of project work on the progress report and get the signature of project guide regularly.
- Progress report should sharply focus how much time you have spent on specific task? You should keep all sign progress report.

Project will not be accepted, if progress report is not submitted and all the responsibilities remain with student.

The format of Progress Report is:

Roll No. & Name of Student:	
Title of the Project:	
Project Guide Name:	

Sr. No.	Date	Details of Project Work	Project Guide Sign (With Date)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Head
Department of Computer Science