SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
Programme & Subject : B.Sc. Information Technology
Semester – VI
US06CINT21 : OOPS Technology - II
(Syllabus Effective from June 2020)

Credits : 4 **External : 70 Marks**
Contact Hrs per Week : 4 **University Examination Duration: 3 Hrs**
All units carry equal weightage

Unit	Description
I	**Introduction** Introduction to OOP,Object Oriented Paradigm,Basic Concepts of OOP: Objects and classes, data abstraction and encapsulation, inheritance, polymorphism, dynamic binding, message communication. Benefits of OOP, Applications of OOP. History of Java, features, the Java environment, the Java Virtual Machine (JVM) Structure of a Java program, a simple Java program, implementing a Java program Tokens, comments, constants, variables and data types Scope of variables, type casting Operators: arithmetic, relational, logical, assignment, increment/decrement, conditional, ternary operator & special operators Decision making: if statement, if…else statement, nesting of if…else, the else if ladder, switch statement Looping: while, do…while, for, for each loop, jumps in loops, labeled loops Arrays: one, two dimensional arrays
II	**Class, Objects, Method Overloading and Overriding** Defining a class, members of a class: variables and methods, creating objects, constructors, accessing class members, Static members v/s instance members Introduction to inheritance, ***super*** keyword Interfaces: introduction, Final variables, methods and classes, abstract methods and classes Introduction to method overloading and overriding
III	**Exception Handling, I/O Management and Packages** Managing errors & exceptions: introduction, types of errors, exceptions, syntax of exception handling construct, multiple catch statements, the finally clause, defining and throwing user-defined exceptions, the throw statement Managing I/O files : introduction, concept of streams, Character stream classes Introduction to the concept of package, Java API packages, using the System package Using java.lang (String, Math)
IV	**Applet Programming and JDBC** Applet architecture and skeleton java.awt package (Button, CheckBox, CheckBoxGroup, Choice, Color, Label, List, TextArea, TextField), HTML applet tag, display techniques (DrawString, Lines, Rectangle, Ellipses, Circles, Arcs, Polygons, Color) Introduction to event handling, Introduction to JDBC, types of drivers, java.sql package Retrieving, inserting, deleting and updating data though Java

Basic Text and Reference Books:

1. Programming with Java- A Primer by E. Balaguruswami, 3rd Edition, TMH Publication
2. The Complete Reference – Java 2 7th Edition Herbert Schildt. TMH Publication
3. Saba Zame , Handbook of Object technology, CRC Press, Washington DC, 1999
4. Sefs Mary Campion and Kathy Walrath, Java tutorial, Second Edition, Addison Wesley Pun. 1998
5. Java 2 Programming Black Book, Steven Holzner

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
Programme & Subject : B.Sc. Information Technology
Semester – VI
US06CINT22: Web Technology using ASP
(Syllabus Effective from June 2020)

Credits : 4 **External: 70 Marks**

Contact Hrs per Week : 4 **University Examination Duration: 3 Hrs**

All units carry equal weightage

Unit	Description
I	**Introduction ASP. NET** – Introduction, Overview of ASP .NET Framework, Understanding ASP .NET Controls, Understanding ASP.NET Pages, Advantages of ASP.NET Web Servers – Introduction and Role, Internet Information Server (IIS), Introduction ASP .NET Application – Introduction Creating ASP .NET Page, Understanding the ASP.NET Page Execution, The Page class
II	**ASP.NET Standard Controls and Validation Controls** Using Standard Controls: Label, TextBox, CheckBox, Button, RadioButton, Linkbutton, ImageButton, Client-Side Validation vs. Server-Side Validation, Overview of Validation Controls: RequiredField Validator, RangeValidator, CompareValidator, RegularExpression Validator, CustomValidator, Validation Summary, Overview of Various Rich Controls
III	**State Management and Advanced Concepts** Introduction View State: Example, Making View State Secure, Retaining Member Variables, Storing Custom Objects, Transferring Information, Custom Cookies, Session State, Session State Configuration, Application State, The Global.asax, Application File, Login Controls, Site Navigation, and Site Maps
IV	**Database Processing and Security:** ADO .NET Architecture, Connected and Disconnected ADO .NET Basics, Data Provider, Connection, Command, DataReader, DataSet, DataAdapter Data Binding, Introduction to Data Controls – GridView, DetailsView, FormView, Repeater, DataList, Microsoft Reports: Designing and coding

Basic Text & Reference Books:

1. Matthew MacDonald: Beginning ASP.NET 2.0 in VB 2005 by Apress, First Indian Reprint 2006
2. Stephen Walther: ASP.NET 2.0 Unleashed by Sams Publication
3. Scott Mitchell: Teach Yourself ASP.NET 2.0 in 24 Hours by Sams Publication
4. Steven Holzner: Vb.Net Black Book By Dreamtech Publication

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
Programme & Subject : B.Sc. Information Technology
Semester – VI
US06CINT23 : Python Programming
(Syllabus Effective from June 2020)

Credits : 4 **External : 70 Marks**

Contact Hrs per Week : 4 **University Examination Duration: 3 Hrs**

All units carry equal weightage

Unit	Description
I	**Introduction to Python** Installing and Working with Python. Features of Python, Python Variables, Data Types, and Operators, Conditional Statements, Iteration Statements, Control structures: Break, Continue, Pass. Build in Functions.
II	**Python Data Structures and Manipulation** Understanding Strings, Lists, Tuples, Sets and Dictionaries, Data Structure Manipulation using loops
III	**Functions, File Management, Exception Handling and Debugging** Functions- Defining Functions, Testing Functions, Name Scopes, Inline Functions, Using global names inside function, Recursive Functions, Modules, File Handling – Introduction , Creating files, Read and Write files, Delete files, Exception handling, Debugging
IV	**Object-Orientated Concepts, Regular Expression, Python MySQL** Class, Object, Instances, Inheritance, Encapsulation, Polymorphism, Method Overriding, Object Overloading, Packages, Regular Expression, Python MYSQL – Create Database, Create Table, Insert, Select, Where, Order By, Delete, Drop Table, Update, and Join.

Basic Text and Reference Books:

1. Paul A. DeBarry: Head First Python, 2010, O'Reilly Media, Inc.
2. Martin C. Brown: The Complete Reference Python, McGraw Hill
3. David M. Beazley: Python Essential Reference, Pearson Addison-Wesley Professional.
4. Allen Downey, Jeffrey Elkner, Chris Meyers : How to think like a computer scientist learning with Python , Freely available online.2012
5. Exploring Python, Timothy A. Budd ,McGraw Hill

Online Reading / Support material:

1. http://docs.python.org/3/tutorial/index.html
2. http://interactivepython.org/courselib/static/pythonds
3. http://www.ibiblio.org/g2swap/byteofpython/read/
4. Python Tutorial/Documentation : www.python.org

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
Programme & Subject : B.Sc. Information Technology
Semester – VI
US06CINT24 : Computer Networks
(Syllabus Effective from June 2020)

Credits : 4 **External : 70 Marks**
Contact Hrs per Week : 4 **University Examination Duration: 3 Hrs**
All units carry equal weightage

Unit	Description
I	**Introduction to Computer Networks** Computer Networks : Definition and Advantages Classification of Computer Networks Introduction and differences among Local Area Networks (LANs), Metropolitan Area Networks (MANs), Wide Area Networks (WANs) Communication Mode, Data encoding: analog and digital Definitions: data rate, baud rate, modulation rate, frequency, spectrum, bandwidth, server, host. Various types of transmission media - guided transmission media: magnetic media, twisted pair, coaxial cables, fiber optics, Introduction to unguided transmission media LAN Topologies Functions of various networking components : modems, amplifiers, repeaters, hubs, switches, bridges, routers, gateway
II	**Data Communication Fundamentals and Layered Protocols** Introduction to the concept of modulation, types of modulation, serial transmission vs. parallel transmission, synchronous transmission v/s asynchronous transmission, circuit switching, packet switching The concept of multiplexing, Frequency Division Multiplexing (FDM) and. Time Division Multiplexing (TDM) Protocol significance and hierarchies Design issues for the layers, Error Detection and correction The OSI Reference model, functions and responsibilities of each layer. TCP/IP Reference model. Comparison of OSI and TCP/IP Examples of protocols for different layers of the OSI model.
III	**Network Layer , Transport Layer and Network Security** CSMA/CD TCP IP Fast Ethernet
IV	**Wireless Networks** Introduction to wireless networks Radio, VHF, microwave ,infrared, light-wave transmission Communication satellites Wireless Network Topologies, Cellular Topology, Cell Fundamentals Concepts of GSM, GPRS, CDMA and SMS. Wireless LANs,Wireless Geolocation systems

Basic Text and Reference Books:

1. Behrouz Forouzan, Introduction to Data Communications and Networking, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1998.
2. Tanenbaum A. S., Computer Networks, Prentice-Hall of India Pvt. Ltd., New Delhi, 1997.
3. Stallings W., Data and Computer Communications, 3rd Edition, Macmillan Pub. Company, New York, 1991.
4. Kaveh Pahlavan and Prashant Krishnamurthy: Principles of Wireless Networks, Pearson Education Asia, 2002.

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
Programme & Subject : B.Sc. Information Technology
Semester – V
US06CINT25 : Practicals
(Syllabus Effective from June 2020)

Credits : 6 **External : 105 Marks**

Contact Hrs per Week : 12

All units carry equal weightage **University Examination Duration: 6 Hrs**

	Description	Weightage
	Practicals	**60%**
	Project	**40%**

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
Programme & Subject : B.Sc. Information Technology
Semester – VI
US06DINT26 : Information Security
(Syllabus Effective from June 2020)

Credits : 2 **External : 50 Marks**
Contact Hrs per Week : 2 **University Examination Duration: 2 Hrs**
All units carry equal weightage

Unit	Description in detail
I	**Introduction of Security** Attacks, services and mechanism Security attacks Security services A model for network security
II	**Cryptography** Introduction Conventional encryption principles Basic terms : plaintext, ciphertext, cryptography, cryptanalysis Substitution ciphers, transposition ciphers Types of attack on encrypted messages Introduction to public key cryptography Applications for public-key cryptosystems
III	**System Security** Intruders Viruses and related threats : trap doors, logic bombs, trojan horses, viruses, worms, bacteria The nature of viruses Types of viruses Antivirus approaches : detection, identification and removal
IV	**Network Security** Digital signatures Firewalls : introduction, design principles, characteristics, types, configuration

Basic Text & Reference Books:

1. William Stallings: Network Security Essentials (Applications and Standards), Pearson Education India, 2001.
2. Tanenbaum A. S., Computer Networks, Prentice-Hall of India Pvt. Ltd., New Delhi, 1997.

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
Programme & Subject : B.Sc. Information Technology
Semester – VI
US06DINT27 : Data Mining
(Syllabus Effective from June 2020)

Credits : 2 **External : 50 Marks**
Contact Hrs per Week : 2 **University Examination Duration: 2 Hrs**
All units carry equal weightage

Unit	Description
I	**Introduction to Data Warehousing** Data warehouse and DBMS Architecture of Data Warehouse Multi dimensional data model concepts of OLAP (Online analytical processing) and Data Cube, OLAP operations Dimensional Data Modeling - Star schemas, snowflake schemas
II	**Introduction to Data Mining(DM), Data Processing** Basic concepts of data mining. Types of Data to be mined. Stages of the Data mining process. Data Mining Techniques knowledge discovery in databases. Data mining Issues Application of Data mining Need Data processing attributes and Data types Statistical descriptions of Data Handling missing data Data sampling, Data Cleaning, Data Integration and transformation, Data Reduction, Discretization and generating concept hierarchies.
III	**Data Mining Techniques : Association Rule mining and Classification** Basic idea : Item sets, Frequent Item sets, Association Rules mining Generating item sets and rules efficiently FP growth algorithm. Definition of classification, Decision tree induction: Information gain, Gain ratio, Gini Index. Issues : Over-fitting tree pruning methods, Missing values, Continuous classes Classification and regression trees(CART) Bayesian Classification : Bayes theorem, Naïve Bayes Classifier, Least squares SVM classifiers, lazy learner.
IV	**Data mining Techniques : Prediction, Clustering, performance measure** Definition of prediction, linear regression, non linear regression, logistic regression. Definition of Clustering, partitioning methods: Hierarchical methods, Distance measures in Algorithmic methods. Precision, Recall, F- measure, confusion matrix, cross validation, bootstrap.

Basic Text and Reference Books:

1. Data warehousing: Fundamentals of IT professionals 3rd edition , Kimball, Wiley Publication
2. Data Mining: Concepts and Techniques, Han, Elsevier ISBN:9789380931913/ 9788131205358
3. Margaret H. Dunham, S. Sridhar, Data Mining – Introductory and Advanced Topics, Pearson Education
4. Ian H.Witten, Eibe Frank Data Mining: Practical Machine Learning Tools and Techniques, Elsevier/(Morgan Kauffman), ISBN:9789380501864
5. J. Han, M. Kamber, "Data Mining Concepts and Techniques", 3rd Edition , Morgan Kaufmann,2011.
6. Paulraj Ponnian, "Data Warehousing Fundamentals", John Willey, 2nd Edition,2010.
7. M. Kantardzic, "Data mining: Concepts, models, methods and algorithms", John Wiley &Sons Inc,2011.
8. M. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education,2006.
9. Pieter Adriaans, Dolf Zantinge , "Data Mining", Pearson Education Asia,2006.