

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI – 625 014.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)

Re-accredited (3rd Cycle) with Grade **A+** & **CGPA 3.51** by NAAC

DEPARTMENT OF INFORMATION TECHNOLOGY



CBCS With OBE

BACHELOR OF SCIENCE

PROGRAMME CODE - I

COURSE STRUCTURE

(w.e.f. 2022 – 2023 Batch onwards)

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI – 14.
(An Autonomous Institution – Affiliated to Madurai Kamaraj University)
Re-accredited (3rd Cycle) with Grade A⁺ & CGPA 3.51 by NAAC

DEPARTMENT OF INFORMATION TECHNOLOGY- UG
CBCS with OBE

COURSE STRUCTURE - SEMESTER WISE
(w.e.f. 2022 – 2023 Batch onwards)

Semester	Part	Course Code	Title of the paper	Teaching Hrs. (per week)	Duration of Exam (hrs.)	Marks Allotted			Credits
						CIA	SE	Total	
1	I	22OUITA1	Part I - Tamil	6	3	25	75	100	3
	II	22OU2EN1	Part II - English	6	3	25	75	100	3
	III	22OUIT11	Core 1 - Object Oriented Programming with C++	4	3	25	75	100	4
	III	22OUIT1P	Core Lab 2 - Object Oriented Programming with C++ Lab	5	3	40	60	100	3
	III	22OUITGEIT1	GEC I: Physics – Digital Principles and Applications	5	3	25	75	100	5
	IV	22OUITSE1P	SEC – HTML and Office Automation Lab	2	2	40	60	100	2
	IV	22OUITID1	IDC - Windows Tools and Applications	2	2	25	75	100	2
2	I	22OU1TA2	Part I - Tamil	6	3	25	75	100	3
	II	22OU2EN2	Part II - English	6	3	25	75	100	3
	III	22OUIT21	Core 3 – Operating System	4	3	25	75	100	4
	III	22OUIT2P	Core Lab 4 - Linux Programming Lab	5	3	40	60	100	3
	III	22OUITGEMA2	GEC II : Mathematics – Resource Management Techniques	5	3	25	75	100	5
	IV	22OUITSE2P	SEC – Desktop Publishing Lab	2	2	40	60	100	2
	IV	22OUITID2	IDC - Introduction to Internet	2	2	25	75	100	2
3	I	22OU1TA3	Part I - Tamil	6	3	25	75	100	3
	II	22OU2EN3	Part II - English	6	3	25	75	100	3
	III	22OUIT31	Core 5 – RDBMS	4	3	25	75	100	3
	III	22OUIT32	Core 6 – Data Structure and Algorithms	4	3	25	75	100	4
	III	22OUIT3P	Core Lab 7 – RDBMS Lab	3	3	40	60	100	3
	III	22OUITGECOM3	GEC III : Commerce - E-Commerce	5	3	25	75	100	5
	IV	22OUITSE3P	SEC – PHP and MySQL Lab	2	2	40	60	100	2

4	I	22OUITA4	Part I - Tamil	6	3	25	75	100	3
	II	22OU2EN4	Part II - English	6	3	25	75	100	3
	III	22OUIT41	Core 8 – Computer Graphics	4	3	25	75	100	4
	III	22OUIT4P	Core Lab 9 – Computer Graphics Lab	3	3	40	60	100	3
	III	22OUIT42	Core 10 – Computer Organization	4	3	25	75	100	3
	III	22OUITGECOM4	GEC IV: Commerce – Financial and Cost Accounting	5	3	25	75	100	5
	IV	22OUITSE4P	SEC – Tally Lab	2	2	40	60	100	2
5	III	22OUIT51	Core 11 - Programming in Java	5	3	25	75	100	4
	III	22OUIT52	Core 12 - Software Engineering	5	3	25	75	100	4
	III	22OUIT53	Core 13 – Computer Networks	5	3	25	75	100	4
	III	22OUIT5P	Core Lab 14 – Programming in Java Lab	6	3	40	60	100	3
	III		DSEC - I	5	3	25	75	100	5
	IV	22OUITSE5P	SEC – Dot Net Technologies Lab	2	2	40	60	100	2
	IV	22OUAECEV5	AECC - Environmental Studies	2	2	25	75	100	2
6	III	22OUIT61	Core 15 – Python Programming	5	3	25	75	100	4
	III	22OUITPR6	Core 16 – Project	5	3	20	80	100	4
	III	22OUIT6P	Core Lab 17 – Python Programming Lab	6	3	40	60	100	3
	III		DSEC - II	5	3	25	75	100	5
	III		DSEC - III	5	3	25	75	100	5
	IV	22OUITSE6	SEC - Quantitative Aptitude	2	2	25	75	100	2
	IV	22OUAECVE6	AECC - Value Education	2	2	25	75	100	2
	V	22O5NS4/ 22O5PE4	Extension Activities N.S.S / Physical Education	-	2	25	75	100	1
			Total	180					140

GEC: Generic Elective Course

SEC : Skill Enhancement Course

DSEC: Discipline Specific Elective Course

AECC: Ability Enhancement Compulsory Course

IDC : Inter Disciplinary Course

DSEC: Discipline Specific Elective Course:**Semester - V (DSEC - I Choose any one)**

1. Android Programming - 22OUITDSE5A
2. Cloud Computing - 22OUITDSE5B

Semester - VI (DSEC - II Choose any one)

1. Mobile Computing - 22OUITDSE6A
2. Block Chain Technologies - 22OUITDSE6B

Semester - VI (DSEC - III Choose any one)

1. Internet of Things - 22OUITDSE6C
2. Cyber Security - 22OUITDSE6D

NOTE:

The students are permitted to obtain additional credits (Optional)

1. MOOCs / SWAYAM / NPTEL Course (Online)
2. Project

Year	Semester	Title	Duration of Study	Credits
III	VI	Mini Project	6 months	1

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
V	Core	22OUIT51	Programming in Java	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To introduce the features of object oriented programming languages using Java.
2. To provide an introduction to Java and enable the student to create simple Web based applications using Java Applets.
3. To identify Java language components and how they work together in applications.
4. To have a basic idea about Graphics programming using Java.
5. To design and program stand-alone Java applications.

Course Content:

Unit-I:

Fundamentals of Object-Oriented Programming: Introduction – Object-oriented Paradigm – Basic concepts of OOP – Benefits of OOP – Applications of OOP.

Java Evolution: Java History – Java Features – Java Differs from C & C++ - Java and Internet – Java Environment. **Overview of Java Language:** Introduction – Simple Java Program – More of Java – Application with two classes – Java Program structure – Java Tokens – Java statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments.

Unit-II : Constants, Variables and Data Types: Introduction – Constants – Variables –Data Types – Declaration of variables – Giving values to variables – Scope of variables – Symbolic constants – Type casting – Getting values of variables – Standard default values.

Operators and Expressions: Introduction – Arithmetic operators – Relational operators – Logical operators – Assignment operators – Increment and Decrement operators – Conditional operators – Bitwise operators – Special operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic operators – Type conversions in Expressions – Mathematical Functions.

Decision Making and Branching: Introduction – Decision making with IF statement – The Switch statement – The ?: operator .

Unit-III:

Decision Making and Looping: The While Statement – The do statement – The for statement – Jumps in loops – Labeled Loops-

Arrays, Strings and Vectors: Introduction-One Dimensional Arrays-Creating an Array- Two Dimensional Arrays-Strings-Vectors-Wrapper Classes-Enumerated Types

Classes, Objects and Methods: Introduction Defining a class- Fields Declaring-methods Declaration –Creating Objects- Accessing Class Members- Constructors- method Overloading-Static Members-Nesting of Methods—Inheritance: Extending a Class-Overriding Methods-Final Variables and Methods-Final Classes-Finalizer Methods-Abstract Method and Classes-Methods with Varargs-Visibility Control

Unit-IV:

Interfaces: Multiple Inheritances: Defining Interfaces – Extending interfaces – Implementing Interfaces – Accessing Interface Variables.

Packages: Java API Packages – Using System Packages – Naming Conventions – Creating packages – Accessing a Package – Using a Package – Adding a class to a Package.

Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the ‘Runnable’ Interface.

Unit-V:

Managing Errors and Exceptions: Introduction – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple catch statements – Using Finally statement – Throwing our own Exception – Using Exception for Debugging.

Applet Programming: Introduction – Applets Vs Applications – Building Applet code – Applet Life Cycle – Designing a Web page – Applet Tag –Adding applet to Html file – Passing parameters to Applets – Displaying Numerical values – Getting Input from the User.

Graphics Programming: introduction – The Graphics Class – lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing polygons – Line Graphs – Using Control oops in applets – Drawing bar Charts.

Text Book:

Balagurusamy.E. (2015). *Programming with Java A Primer*, Tata McGraw Hill Publishing Company Limited. New Delhi. Fifth Edition (First reprint).

Chapters:

Unit I	:	Chapters 1,2,3
Unit II	:	Chapters 4,5,6,
Unit III	:	Chapters 7,8,9
Unit IV	:	Chapters 10,11,12
Unit V	:	Chapters 13, 14 ,15

Reference Books:

- 1) David Holmes., James Gosling & Ken Arnold. (2000). *The Java Programming Language*. Addison Wesley Longman (Singapore) Pvt. Ltd., Indian Branch. New Delhi. Third Edition.
- 2) Dr.Muthu.C.(2010). *Programming with Java*. Vijay Nicole Imprints Private Limited.Chennai. Second Edition.
- 3) Patrick Naughton. (2007). *The Java Handbook*. Tata McGraw-Hill Publishing Company Ltd. New Delhi. Twenty Third Reprint.
- 4) Somasundaram.K.(2008). *Advanced Programming in Java 2*. Jaico Publishing House. Mumbai.First Edition.
- 5) Xavier.C.(2005). *Programming with Java 2*.Scitech Publications (India) Pvt. Ltd. Chennai.Fourth Reprint.

Web Resources / E-Books:

1. <https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf>
2. <https://www.cs.cmu.edu/afs/cs.cmu.edu/user/gchen/www/download/java/LearnJava.pdf>
3. <https://www.sietk.org/downloads/javabook.pdf>
4. <https://yourlogix.files.wordpress.com/2016/10/java-a-beginners-guide.pdf>
5. <https://www.minds.co.za/wp-content/uploads/2019/06/object-oriented-programming-using-java.pdf>

Pedagogy

Chalk and Talk, PPT, Group discussion, OHP presentations, Quiz, On the spot test, YouTube Links, Open book test and Virtual Labs.

Activities to be given

- Group Discussion
- Quiz
- PPT

Course Learning Outcomes (CLOs):

Upon successful completion of the Course, the students will be able to

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K Level)
CLO 1	Understand the basic concepts, benefits and applications of OOP	K1 to K3
CLO 2	Clarify the program-structure, operator expression and decision making	K1 to K3
CLO 3	Develop the Classes, Objects and Methods and interfaces	K1 to K4
CLO 4	Develop programming ability of students to create package and multithread	K1 to K3
CLO 5	Design event driven GUI and web related applications using Applet a	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	3	1	2	3	2
CLO2	3	3	2	3	3	2
CLO3	3	3	1	2	2	1
CLO4	3	2	2	1	1	2
CLO5	3	3	1	2	3	1

1-Basic Level

2- Intermediate Level

3-Advanced Level

LESSON PLAN: (Total Hours: 75)

Unit	Course Content	Hrs.	Mode
I	<p>Fundamentals of Object-Oriented Programming: Introduction – Object-oriented Paradigm – Basic concepts of OOP – Benefits of OOP – Applications of OOP.</p> <p>Java Evolution: Java History – Java Features – Java Differs from C & C++ - Java and Internet – Java Environment.</p> <p>Overview of Java Language: Introduction – Simple Java Program – More of Java – Application with two classes – Java Program structure – Java Tokens – Java statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments.</p> <p>Constants, Variables and Data Types: Introduction – Constants – Variables –Data Types – Declaration of</p>	15	Chalk & Talk,PPT

	variables – Giving values to variables – Scope of variables – Symbolic constants – Type casting – Getting values of variables – Standard default values.		
II	<p>Operators and Expressions: Introduction – Arithmetic operators – Relational operators – Logical operators – Assignment operators – Increment and Decrement operators – Conditional operators – Bitwise operators – Special operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic operators – Type conversions in Expressions – Mathematical Functions.</p> <p>Decision Making and Branching: Introduction – Decision making with IF statement – The Switch statement – The ?: operator - Decision Making and Looping: The While Statement – The do statement – The for statement – Jumps in loops – Labeled Loops- Arrays, Strings and Vectors: Introduction-One Dimensional Arrays-Creating an Array- Two Dimensional Arrays-Strings-Vectors-Wrapper Classes-Enumerated Types.</p>	15	Chalk & Talk,Spot test, Exercise, Assignment, PPT, Video material.
III	<p>Classes, Objects and Methods: Introduction Defining a class- Fields Declaring-methods Declaration –Creating Objects- Accessing Class Members- Constructors- method Overloading-Static Members-Nesting of Methods— Inheritance: Extending a Class- Overriding Methods-Final Variables and Methods-Final Classes-Finalizer Methods- Abstract Method and Classes-Methods with Varargs- Visibility Control</p> <p>Interfaces: Multiple Inheritances: Defining Interfaces – Extending interfaces – Implementing Interfaces – Accessing Interface Variables.</p>	15	Chalk & Talk, Exercise, PPT,Video Material
IV	<p>Packages: Java API Packages – Using System Packages – Naming Conventions – Creating packages – Accessing a Package – Using a Package – Adding a class to a Package.</p> <p>Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods</p>	15	Chalk & Talk, Exercise, Assignment, Video Material,

	– Thread Exceptions – Thread Priority – Synchronization – Implementing the ‘Runnable’ Interface.		Group Discussion
V	<p>Managing Errors and Exceptions: Introduction – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple catch statements – Using Finally statement – Throwing our own Exception – Using Exception for Debugging.</p> <p>Applet Programming: Introduction – Applets Vs Applications – Building Applet code – Applet Life Cycle – Designing a Web page – Applet Tag – Adding applet to Html file – Passing parameters to Applets – Displaying Numerical values – Getting Input from the User.</p> <p>Graphics Programming: introduction – The Graphics Class – lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing polygons – Line Graphs – Using Control oops in applets – Drawing bar Charts.</p>	15	Quiz, Chalk &Talk, Exercise , Spot test, Assignmen t, Seminar

Mrs.R.Lakshmi
Course Designer

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
V	Core	22OUIT52	Software Engineering	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To establish and evolving methodologies for the analysis, design and development of a Software.
2. To Estimate the cost factors for the development of a software product.
3. To identify potential risks and challenges associated with the software requirements early in the project lifecycle.
4. To design the software in a cost-effective manner without compromising quality or performance.
5. To validate that the software meets the needs and expectations of its intended users and stakeholders.

Course Content:

Unit-I: Introduction to Software Engineering: Some Definitions - Some Size factors - Quality and productivity factors - Managerial Issues. **Planning a software project:** Defining the problem - Developing a Solution Strategy - Planning the Development Process - Planning an Organizational structure - Other Planning Activities.

Unit-II: Software Cost Estimation: Software Cost Factors - Software Cost Estimation Techniques - Staffing Level Estimation – Estimating software Maintenance costs.

Unit-III: Software Requirements Definition: The software Requirements Specification - Formal Specification Techniques - Languages and Processors for Requirements Specifications.

Unit-IV: Software Design: Fundamental Design Concepts - Modules and Modularization Criteria - Design Notations - Design techniques - Detailed Design Considerations - Real time and distributed system Design - Test plans - Milestones, Walkthroughs and Inspection - Design Guidelines.

Unit-V: Verification and Validation Techniques: Quality Assurance - Static analysis - Symbolic Execution - Unit testing and Debugging - System Testing - Formal Verification.

Software Maintenance: Enhancing Maintainability during Development - Managerial Aspects of Software Maintenance - Configuration Management - Source Code Metrics.

Text Book:

Richard E. Fairly, *Software Engineering Concepts*, McGraw Hill Book company, New Delhi, 38th Reprint, 2012.

Chapters:

Unit I	-	Chapters 1& 2
Unit II	-	Chapter 3
Unit III	-	Chapter 4
Unit IV	-	Chapter 5
Unit V	-	Chapters 8 & 9

Reference Books:

1. Jones & Bartlett.(2010). *Essentials of Software Engineering*, Jones & Bartlett Publishers. New Delhi. First Edition.
2. Pankajjalote.(2012).*Integrated approach to Software Engineering*, Tata McGraw.Hill, New Delhi. Third Edition.
3. Roger S.Pressman. (2012). *Software Engineering*. Tata McGraw Hill Edition. New Delhi. Fifth reprint.
4. Robert-Facts & Fallacies. (2011). *Software Engineering*. Beverly Publications.USA,. Second Edition,
5. Sommervill.(2010). *Software Engineering*. Pearson Education. Newyork. 7th Edition.

Web Resources / E-Books:

1. https://elearn.daffodilvarsity.edu.bd/pluginfile.php/799120/mod_book/intro/Software_Engineering-Roger_S_Pressman.pdf
2. <https://engineering.futureuniversity.com/BOOKS%20FOR%20IT/Software-Engineering-9th-Edition-by-Ian-Sommerville.pdf>
3. <https://davcollegetitilagarh.org/wp-content/uploads/2020/09/fundamentals-of-software-engineering-fourth-edition-rajib-mall.pdf>
4. https://www.mlsu.ac.in/econtents/16_EBOOK-7th_ed_software_engineering_a_practitioners_approach_by_roger_s._pressman_.pdf
5. https://www.cs.uct.ac.za/mit_notes/software/pdfs/SE_top.pdf
6. https://dahlan.unimal.ac.id/files/ebooks/2010%20SW_Engineering_and_Testing_An_Introduction_CS_Agarwal.pdf

Pedagogy

Chalk and Talk, PPT, Group discussion, OHP presentations, Quiz, On the spot test, YouTube links, Open book test and Virtual Labs.

Activities to be given

- Group Discussion
- Quiz
- PPT

Course Learning Outcomes (CLOs):

Upon successful completion of the Course, the students will be able to

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K Level)
CLO 1	Understanding of the fundamental concepts, principles, and terminologies related to software engineering.	K1 to K3
CLO 2	Understanding a structured approach to software development and understand the importance of each phase in the SDLC.	K1 to K3
CLO 3	Develop problem-solving skills to analyze, design, and implement software solutions to real-world problems.	K1 to K4
CLO 4	designing software systems that are scalable, reusable, and easy to maintain.	K1 to K3
CLO 5	Apply the testing strategies and quality assurance practices to identify and rectify defects and vulnerabilities.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	3	1	2	3	2
CLO2	3	3	2	3	3	2
CLO3	3	3	1	2	2	1
CLO4	3	2	2	1	1	2
CLO5	3	3	1	2	3	1

1-Basic Level 2- Intermediate Level 3- Advanced Level

LESSON PLAN: (Total Hours: 75)

Unit	Course Content	Hrs.	Mode
I	Introduction to Software Engineering: Some Definitions - Some Size factors - Quality and productivity factors - Managerial Issues. Planning a software project: Defining the problem - Developing a Solution Strategy - Planning the Development Process - Planning an Organizational structure - Other Planning Activities.	15	Chalk & Talk,PPT
II	Software Cost Estimation: Software Cost Factors - Software Cost Estimation Techniques - Staffing Level Estimation – Estimating software Maintenance costs.	15	Chalk & Talk,Spot test, Assignment, PPT
III	Software Requirements Definition: The software Requirements Specification - Formal Specification Techniques - Languages and Processors for Requirements Specifications.	15	Chalk & Talk, Exercise, PPT, Video Material
IV	Software Design: Fundamental Design Concepts - Modules and Modularization Criteria - Design Notations - Design techniques - Detailed Design Considerations - Real time and distributed system Design - Test plans - Milestones, Walkthroughs and Inspection - Design Guidelines.	15	Chalk & Talk, Exercise, Assignment, Video Material, Group Discussion
V	Verification and Validation Techniques: Quality Assurance - Static analysis -Symbolic Execution - Unit testing and Debugging - System Testing - Formal Verification. Software Maintenance: Enhancing Maintainability during Development - Managerial Aspects of Software Maintenance - Configuration Management - Source Code Metrics.	15	Quiz, Chalk &Talk, Exercise , Spot test, Assignmen t,Seminar

Mrs R.Boomadevi
Course Designer

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
V	Core	22OUIT53	Computer Networks	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To Learn the layered architecture of computer networks, typically referring to the OSI model or the TCP/IP model.
2. To learn the concepts like bandwidth, throughput, latency, and packet-switching.
3. To understand the principles of wireless communication and mobile networking.
4. To learn about network management tools and techniques for monitoring, troubleshooting, and maintaining a network.
5. To gain the purpose, operation, and differences between the protocols.

Course Content:

Unit-I: Introduction: Uses of Computer Networks - Network Hardware - Network Software - Reference Models: The OSI Reference Model - The TCP/IP Reference Model – A Comparison of the OSI and TCP/IP Reference Models.

Unit-II: The Physical Layer: Guided Transmission Media - Wireless Transmission - Communication Satellites. The Data Link Layer: Data link layer design Issues - Error Detection and Correction.

Unit-III: The Medium Access Control: The Channel Allocation Problem - Multiple Access Protocols - Ethernet - Data Link Layer Switching.

Unit-IV: The Network Layer: Network Layer Design Issues - Routing Algorithms - Congestion Control Algorithms - Internetworking.

Unit-V: The Transport Layer: The Transport Service - Elements of Transport Protocols. The Application Layer: DNS - The Domain Name System - Electronic Mail.

Text Book:

Andrew S.Tanenbaum & David J.Wetherall.(2013). *Computer Networks*. Pearson Education. New Delhi. 5th Edition.

Chapters:

Unit 1 - Chapter 1 (1.1-1.3, 1.4.1, 1.4.2, 1.4.4)

Unit 2 - Chapters 2 & 3 (2.2 - 2.4, 3.1, 3.2)

Unit 3 - Chapter 4 (4.1 - 4.3, 4.8)

Unit 4 - Chapter 5 (5.1 - 5.3, 5.5)

Unit 5 - Chapters 6 & 7 (6.1, 6.2, 7.1, 7.2)

Reference Books:

1. Behrouz A.Forouzan. (2011).*Data Communications and Networking*, Tata McGraw Hill Publications. New Delhi. 22nd Reprint,
2. Brijendra Singh,.(2009). *Data communications and Computer Networks*. PHI Learning Private Limited. New Delhi. 2nd Edition.
3. Barry Dumas.M & Morris Schwartz.(200). *Principles of Computer Networks and Communications*. Pearson Education. New Delhi. IV Edition.
4. Fred Halsall.(2003).*Data Communications, Computer Networks and Open Systems*. Pearson Education. New Delhi. IV Edition.
5. William Stallings.(2004). *Data and Computer Communications*. Pearson Education New Delhi. 7th Edition.

Web Resources / E-Books:

1. https://ebooks.lpude.in/computer_application/bca/term_4/DCAP207_NETWORKS_DCAP406_COMPUTER_NETWORKS.pdf
2. https://www.pcenagpur.edu.in/assets/books/Computer_Nerworks.pdf
3. https://textbookequity.org/Textbooks/Computer-Networking-Principles-Bonaventure_f.pdf
4. [https://womengovtcollegevisakha.ac.in/departments/Computer%20networks%20_%20an%20open%20source%20approach%20\(%20PDFDrive%20\).pdf](https://womengovtcollegevisakha.ac.in/departments/Computer%20networks%20_%20an%20open%20source%20approach%20(%20PDFDrive%20).pdf)
5. https://opac.atmaluhur.ac.id/uploaded_files/temporary/DigitalCollection/Yzg0ZmVhY2FiY2ZlNTVjZGVmZjI2OGRiMGJlYzE4NGNkOTI3ZmRjZQ==.pdf

Pedagogy

Chalk and Talk, PPT, Group discussion, OHP presentations, Quiz, On the spot test,

YouTube links Open book test and Virtual Labs.

Activities to be given

- Group Discussion
- Quiz
- PPT

Course Learning Outcomes (CLOs):

Upon successful completion of the Course, the students will be able to

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K Level)
CLO 1	Identify and differentiate between various network protocols and their respective uses.	K1 to K3
CLO 2	Design and implement basic network topologies considering scalability, performance, and fault tolerance.	K1to K3
CLO 3	Implement basic network security measures, including access control and encryption	K1 to K4
CLO 4	Develop skills in diagnosing and troubleshooting common network problems, including connectivity issues, bandwidth congestion, and security breaches.	K1 to K3
CLO 5	comprehend the principles of wireless communication and mobile networking and be able to design and configure wireless LANs and mobile networks.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	3	1	2	3	2
CLO2	3	3	2	3	3	2
CLO3	3	3	1	2	2	1
CLO4	3	2	2	1	1	2
CLO5	3	3	1	2	3	1

1-Basic Level**2- Intermediate Level****3Advanced Level**

LESSON PLAN: (Total Hours: 75)

Unit	Course Content	Hrs.	Mode
I	Introduction: Uses of Computer Networks - Network Hardware - Network Software - Reference Models: The OSI Reference Model - The TCP/IP Reference Model – A Comparison of the OSI and TCP/IP Reference Models.	15	Chalk & Talk,PPT
II	The Physical Layer: Guided Transmission Media - Wireless Transmission - Communication Satellites. The Data Link Layer: Data link layer design Issues - Error Detection and Correction.	15	Chalk & Talk,Spot test, Assignment, PPT, Video material.
III	The Medium Access Control: The Channel Allocation Problem - Multiple Access Protocols - Ethernet - Data Link Layer Switching.	15	Chalk & Talk, PPT,Video Material
IV	The Network Layer: Network Layer Design Issues - Routing Algorithms - Congestion Control Algorithms - Internetworking.	15	Chalk & Talk, Exercise, Assignment, Group Discussion
V	The Transport Layer: The Transport Service - Elements of Transport Protocols. The Application Layer: DNS - The Domain Name System - Electronic Mail.	15	Quiz, Chalk &Talk, Exercise , Spot test, Assignment, Seminar

Mrs.G.Amudha
Course Designer

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
V	Core Lab	22OUIT5P	Programming in Java Lab	3	6	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To understanding of basic programming constructs such as variables, data types, operators, and control statements.
2. To Provide practical experience in designing and implementing object-oriented programs using Java.
3. To teach students how to handle exceptions and errors in Java programs.
4. To provide practical experience in implementing concurrent programs and handling synchronization.
5. To provide hands-on experience in designing and implementing simple GUI applications.

LIST OF PROGRAMS:

1. Write java program to calculate the grading the students in an academic institution.

The grading is done according to the following rules

Average mark	Grade
80 to 100	Honors
60 to 79	First Division
50 to 59	Second Division
40 to 49	Third division
0 to 39	Fails

2. Write Java program to print the following outputs using for loop
1 22 333 4444 5555
3. Write a Java Program to calculate Area of Rectangle using classes.
4. Write a Java Program to implement Constructors.
5. Write a Java program for implementing Method Overloading.
6. Write a Java program for implementing Method Overriding.
7. Write a Java program(s) on use of inheritance.
8. Write a Java program(s) on ways of implementing interface.
9. Write Java program(s) which uses the exception handling features.

10. Write Java Implement a program to handle custom exceptions like 'InvalidAgeException'.
11. Write a java program for creating multiple catch blocks.
12. Write Java program(s) on creating multiple threads, assigning priority to threads, synchronizing threads, suspend and resume threads.
13. Write Java to create a program to demonstrate thread communication using wait () and notify () methods.
14. Write a java program to create user defined package.
15. Write Java to Implement a simple client-server chat application using Socket programming.
16. Write java to create the marquee of Text using Java Applet.
17. Design Traffic Signal using an Applet.
18. Draw the polygon Shape using an Applet.
19. Calculation the Factorial number using Applet.
20. Display Digital Clock in Applet.
21. Write a java program for handling Mouse events.
22. Write a java program for handling Key events.
23. Write a java program that connects to a database using JDBC.
24. Write a java program to insert and update a database using JDBC.
25. Write a java program to connect to a database using JDBC and delete values from it.

Text Book:

Balagurusamy .E. (2015) . *Programming with Java A Primer*, Tata McGraw Hill Publishing Company Limited. New Delhi. Fifth Edition (First reprint).

Reference Books:

1. David Holmes., James Gosling & Ken Arnold. (2000). *The Java Programming Language*. Addison Wesley Longman (Singapore) Pvt. Ltd., Indian Branch. New Delhi. Third Edition.
2. Dr.Muthu.C.(2010). *Programming with Java*. Vijay Nicole Imprints Private Limited.Chennai. Second Edition.
3. Patrick Naughton. (2007). *The Java Handbook*. Tata McGraw-Hill Publishing Company Ltd. New Delhi. Twenty Third Reprint.
4. Somasundaram.K.(2008). *Advanced Programming in Java 2*. Jaico Publishing House. Mumbai.First Edition.

5. Xavier.C.(2005). *Programming with Java 2*. SciTech Publications (India) Pvt. Ltd. Chennai. Fourth Reprint.

Web Resources / E-Books:

1. <https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf>
2. <https://www.cs.cmu.edu/afs/cs.cmu.edu/user/gchen/www/download/java/LearnJava.pdf>
3. <https://www.sietk.org/downloads/javabook.pdf>
4. <https://yourlogix.files.wordpress.com/2016/10/java-a-beginners-guide.pdf>
5. <https://www.minds.co.za/wp-content/uploads/2019/06/object-oriented-programming-using-java.pdf>

Pedagogy

Chalk and Talk, PPT, Group discussion, OHP presentations, Quiz, On the spot test, YouTube links Open book test and Virtual Labs.

Activities to be given

- Group Discussion
- Quiz
- PPT

Course Learning Outcomes (CLOs):

Upon successful completion of the Course, the students will be able to

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K Level)
CLO 1	Demonstrate an understanding of the principles of OOP and their practical applications	K1 to K3
CLO 2	Implement robust error handling and exception management in Java programs using try-catch blocks and custom exception classes.	K1to K3
CLO 3	Create and manage multithreaded applications in Java, understand thread synchronization, and handle concurrency issues effectively.	K1 to K4
CLO 4	Develop basic client-server applications using Java's networking capabilities and Socket programming.	K1 to K3
CLO 5	Design and implement simple Graphical User Interface (GUI) and JDBC.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	3	1	2	3	2
CLO2	3	3	2	3	3	2
CLO3	3	3	1	2	2	1
CLO4	3	2	2	1	1	2
CLO5	3	3	1	2	3	1

1-Basic Level

2- Intermediate Level

3Advanced Level

LESSON PLAN: (Total Hours: 90)

Unit	Course Content	Hrs.	Mode												
I	<p>1. Write java program to calculate the grading the students in an academic institution. The grading is done according to the following rules</p> <table style="margin-left: 40px;"> <thead> <tr> <th>Average mark</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>80 to 100</td> <td>Honors</td> </tr> <tr> <td>60 to 79</td> <td>First Division</td> </tr> <tr> <td>50 to 59</td> <td>Second Division</td> </tr> <tr> <td>40 to 49</td> <td>Third division</td> </tr> <tr> <td>0 to 39</td> <td>Fails</td> </tr> </tbody> </table> <p>2. Write Java program to print the following outputs using for loop</p> <pre style="margin-left: 40px;">1 22 333 4444 5555</pre> <p>3. Write a Java Program to calculate Area of Rectangle using classes.</p> <p>4. Write a Java Program to implement Constructors.</p> <p>5. Write a Java program for implementing Method Overloading.</p>	Average mark	Grade	80 to 100	Honors	60 to 79	First Division	50 to 59	Second Division	40 to 49	Third division	0 to 39	Fails	18	Demo & Practical Session
Average mark	Grade														
80 to 100	Honors														
60 to 79	First Division														
50 to 59	Second Division														
40 to 49	Third division														
0 to 39	Fails														
II	<p>6. Write a Java program for implementing Method Overriding.</p> <p>7. Write a Java program(s) on use of inheritance.</p> <p>8. Write a Java program(s) on ways of implementing interface.</p> <p>9. Write Java program(s) which uses the exception handling features.</p> <p>10. Write Java Implement a program to handle custom exceptions like 'InvalidAgeException'.</p>	18	Demo & Practical Session												

III	11. Write a java program for creating multiple catch blocks. 12. Write Java program(s) on creating multiple threads, assigning priority to threads, synchronizing threads, suspend and resume threads. 13. Write Java to create a program to demonstrate thread communication using wait () and notify () methods. 14. Write a java program to create user defined package. 15. Write Java to Implement a simple client-server chat application using Socket programming.	18	Demo & Practical Session
IV	16. Write java to create the marquee of Text using Java Applet. 17. Design Traffic Signal using an Applet. 18. Draw the polygon Shape using an Applet. 19. Calculation the Factorial number using Applet. 20. Display Digital Clock in Applet.	18	Demo & Practical Session
V	21. Write a java program for handling Mouse events. 22. Write a java program for handling Key events. 23. Write a java program that connects to a database using JDBC. 24. Write a java program to insert and update a database using JDBC. 25. Write a java program to connect to a database using JDBC and delete values from it.	18	Demo & Practical Session

Mrs.G.Amudha
Course Designer

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/ Week	CIA	SE	Total
V	DSEC	22OUITDSE5A	Android Programming	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To understand the basics of activities and multiple layouts.
2. To understand the usage of menus in designing widgets.
3. To explore the App architecture with fragments.
4. To acquire knowledge in handling database, files and notifications.
5. To impart graphics and animation process.

Course Content:

Unit-I: Activities and Layout: Introduction-Declaring an Activity- Starting a new activity with an intent object-Switching between activities-Passing data to another activity-Returning a result from an activity-Saving an activity's state-Storing persistent activity data-Understanding the activity life cycle. **Layouts:** Introduction –Defining and inflating a layout-Using Relative layout- Using linear layout- Creating tables- Table Layout and Grid Layout-Recycler View replaces List View – Changing layout properties during runtime.

Unit-II: Views, Widgets and Styles: Introduction- Inserting a widget into a Layout-Using Graphics to show button State-Creating a widget at runtime-Creating a custom component-Applying a style to a view-Turning a style into a theme-Selecting a theme based on the Android version. **Menus and Action Mode:** Introduction-Creating an options menu-Modifying menus and menu items during runtime-Enabling Contextual Action Mode for a view-Creating a pop-up menu.

Unit-III: Fragments and System UI: Introduction-Creating and Using a Fragment-Adding and Removing Fragments during runtime-Passing data between Fragments. **Home Screen Widgets, Search and the System UI:** Introduction- Creating a shortcut on the Home Screen-Creating a Home Screen widget- Adding Search to the Action Bar-Showing your App full-screen.

Unit-IV: Data Storage: Introduction-Storing simple data-Read and Write a text file to internal storage-Read and Write a text file to external storage-Including resource files in your project-Creating and Using an SQLite database-Accessing data in the background using a Loader-Accessing external storage with scoped directories in Android N. **Alerts and Notifications:** Displaying a message box with Alert Dialog- Displaying a progress dialog-Making a Flashlight with a Heads-up Notification.

Unit-V: Graphics and Animation: Using the Touchscreen and Sensors: Listening for click and long-press events- Pinch-to-zoom with multi-touch gestures- Reading sensor data-using Android Sensor Framework events- Reading device orientation. **Graphics and Animation:** Introduction-Scaling down large images to avoid Out of Memory exceptions-A transition animation-defining scenes and applying a transition- Creating a Compass using sensor data and Rotate Animation- Creating a slideshow with View Pager-Creating a Card Flip Animation with Fragments-Creating a Zoom Animation with a Custom Transition-Displaying Animated image (GIF/Web P) with the new Image Decoder library- Creating a Circle image with the new Image Decoder.

Book for Study

Rick Boyer Cookbook. (2018). *“Android 9 Development”*. Packet Publishing Ltd. 3rd Edition.

Chapters:

Unit I	: Chapter 1, 2
Unit II	: Chapter 3, 4
Unit III	: Chapter 5, 6
Unit IV	: Chapter 7, 8
Unit V	: Chapter 9, 10

Books for Reference

1. B.M.Harwani. (2013). *“Android Programming Unleashed”*. Pearson Education.
2. Bill Phillips, Chris Stewart. *Android Programming*. O’Reilly Media Publishers. Third Edition.
3. John Horton .(2015).*“Android Programming for Beginners”*. Packt Publishing. 1st Edition.
4. Reto Meier.(2012).*“Android4 Application Development”*. Wiley Publications.
5. Rick Rogers., John Lombardo., Zigurd Mednieeks.&Blake meike.(2009).*“Android Application Development”* O’Reilly Media Publishers.First Edition.

Web Resources / E-Books:

1. <https://www.tutorialspoint.com/android/index.htm>
2. <https://www.w3adda.com/android-tutorial>
3. <https://www.w3points.com/android-tutorial/>
4. <https://sites.google.com/site/cse4707/file-cabinet>

Pedagogy

Chalk and Talk, PPT, Group discussion, OHP presentations, Quiz, On the spot test, YouTube links, Open book test and Virtual Labs.

Activities to be given

- Group Discussion
- Quiz
- PPT

Course Learning Outcomes (CLOs):

Upon successful completion of the Course, the students will be able to

CLO	Course Outcomes Statement	Knowledge According to Bloom's Taxonomy (Up to K Level)
CLO 1	Develop various Android applications related to layouts and pass information between multiple activities.	K1 to K3
CLO 2	Describe how to design simple GUI applications, use built-in widgets and components.	K1 to K3
CLO 3	Discuss the usage of fragments in android platform. Design and develop user interfaces for the Android platform.	K1 to K4
CLO 4	Design Android applications which make use of internal storage.	K1 to K3
CLO 5	Rate the importance of animation techniques and graphics with simple graphical objects on a display screen.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs / POs	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	2	2	1	1	1	2
CLO 2	2	2	1	2	1	2
CLO 3	2	2	1	2	1	2
CLO 4	2	2	2	2	3	2
CLO 5	2	2	3	3	3	2

1-Basic Level **2- Intermediate Level** **3- Advanced Level**

LESSON PLAN: (Total Hours: 75)

Unit	Course Content	Hrs.	Mode
I	<p>Activities and Layout: Introduction-Declaring an Activity- Starting a new activity with an intent Object-Switching between activities-Passing data to another activity-Returning a result from an activity-Saving an activity's state-Storing persistent activity data-Understanding the activity life cycle.</p> <p>Layouts: Introduction –Defining and inflating a layout- Using Relative layout- Using linear layout- Creating tables- Table Layout and Grid Layout-Recycler View replaces List View – Changing layout properties during runtime.</p>	15	Chalk & Talk, PPT
II	<p>Views, Widgets and Styles: Introduction- Inserting a widget into a layout-Using Graphics to show button state-Creating a widget at runtime-Creating a custom component-Appling a style to a view-Turning a style into a theme-Selecting a theme based on the Android version.</p> <p>Menus and Action Mode: Introduction-Creating an options menu-Modifying menus and menu items during runtime-Enabling Contextual Action Mode for a view-Creating a pop-up menu.</p>	15	Chalk & Talk, Spot test, Exercise, Assignment, PPT, Video material.
III	<p>Fragments and System UI: Introduction-Creating and Using a Fragment-Adding and Removing Fragments during runtime-Passing data between Fragments.</p> <p>Home Screen Widgets, Search and the System UI: Introduction- Creating a shortcut on the Home Screen-Creating a Home Screen widget- Adding Search to the Action Bar-Showing your App full-screen</p>	15	Chalk & Talk, Exercise, PPT, Video Material

IV	<p>Data Storage: Introduction-Storing simple data-Read and Write a text file to internal storage-Read and Write a text file to external storage-Including resource files in your project-Creating and Using an SQLite database-Accessing data in the background using a Loader-Accessing external storage with scoped directories in Android N.</p> <p>Alerts and Notifications: Displaying a message box with AlertDialog- Displaying a progress dialog-Making a Flashlight with a Heads-up Notification.</p>	15	Chalk & Talk, Exercise, Assignment, Video Material, Group Discussion
V	<p>Graphics and Animation: Using the Touchscreen and Sensors: Listening for click and long-press events- Pinch-to-zoom with multi-touch gestures- Reading sensor data-using Android Sensor Framework events- Reading device orientation.</p> <p>Graphics and Animation: Introduction-Scaling down large images to avoid Out of Memory exceptions-A transition animation-defining scenes and applying a transition- Creating a Compass using sensor data and RotateAnimation- Creating a slideshow with ViewPager-Creating a Card Flip Animation with Fragments-Creating a ZoomAnimation with a Custom Transition-Displaying Animated image (GIF/WebP) with the new ImageDecoder library- Creating a Circle image with the new ImageDecoder.</p>	15	Quiz, Chalk & Talk, Exercise , Spot test, Assignment, Seminar

Course Designer
Mrs.R.Boomadevi

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
V	DSEC	22OUITDSE5B	Cloud Computing	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To understand the various Cloud concepts and Technologies.
2. To learn the Cloud based Services and Applications.
3. To choose among various cloud technologies for implementing applications.
4. To gain the basic python programming for cloud services.
5. To apply the concept of Data Security for Industry, Healthcare & Education.

Course Content:

Unit-I: Introduction to Cloud Computing: Introduction – Characteristics of Cloud Computing – Cloud Models – Cloud-based Services & Applications. Cloud Concepts & Technologies: Virtualization – Load Balancing – Scalability & Elasticity – Deployment – Replication – Monitoring – Software Defined Networking – Network Function Virtualization – MapReduce.

Unit-II: Cloud Services & Platforms: Compute Services – Storage Services – Database Services – Application Services – Content Delivery Services. Hadoop & MapReduce: Apache Hadoop – Hadoop MapReduce Job Execution – Hadoop Schedulers.

Unit-III: Cloud Application Design: Introduction – Design Considerations for Cloud Applications – Reference Architectures for Cloud Applications – Cloud Application Design Methodologies – Data Storage Approaches.

Unit-IV:Big Data Analytics: Introduction- Clustering Big Data – K-Means Clustering – DBSCAN Clustering – Parallelizing Clustering Algorithms using Map Reduce. Classification of Big Data – Naïve Bayes – Decision Trees – Random Forest – Support Vector Machine.

Multimedia Cloud: Introduction –Case Study: Live Video Streaming App Streaming Protocols- RTMP streaming –HTTP Live Streaming-HTTP Dynamic Streaming.

Case study: Video Transcoding App.

Unit-V: Cloud Security: Introduction – CSA Cloud Security Architecture – Authentication – Authorization – Identity & Access Management – Data Security. Cloud for Industry, Healthcare & Education: Cloud Computing for Healthcare –Cloud Computing for Manufacturing Industry – Cloud Computing for Education.

Book for Study:

Arshdeep Bahga, Vijay Madiseti. (2016). *Cloud Computing: A Hands-on Approach*. University Press(India) Private Limited. Hyderabad. 2th Edition.

Chapters:

Unit I	-	Chapters 1 (1.1-1.3, 1.5) & 2 (2.1 - 2.9)
Unit II	-	Chapters 3 (3.1 - 3.5) & 4 (4.1 - 4.3)
Unit III	-	Chapter 5 (5.1 - 5.5)
Unit IV	-	Chapters 9, 10
Unit V	-	Chapters 12 (12.1 - 12.6) & 13 (13.1, 13.4, 13.5)

Books for Reference

1. John W.Rittinghouse and James F.Ransome. (2010). *Cloud Computing: Implementation, Management, and Security*. CRC Press. United States.
2. Katarina Stanoevska-Slabeva, Thomas Wozniak & SantiRistol. (2010). *Grid and Cloud Computing – A Business Perspective on Technology and Applications*. Springer. Chennai.
3. Kumar Saurabh. (2011). *Cloud Computing – insights into New-Era Infrastructure*. Wiley India. New Delhi.
4. Rajkumar Buyya, Christian Vecchiola & ThamaraiSelvi S. (2013). *Mastering Cloud Computing*. Tata McGraw Hill Education Private Limited. New Delhi.
5. Ronald L. Krutz, Russell Dean Vines. (2010). *Cloud Security – A comprehensive Guide to Secure Cloud Computing*. Wiley – India. New Delhi.

Web Resources

- 1.[https://mrcet.com/downloads/digital_notes/IT/CLOUD%20COMPUTING%20DIGITAL%20NOTES%20\(R18A0523\).pdf](https://mrcet.com/downloads/digital_notes/IT/CLOUD%20COMPUTING%20DIGITAL%20NOTES%20(R18A0523).pdf)
- 2.https://www.iare.ac.in/sites/default/files/lecture_notes/CC%20LECTURE%20NOTES.pdf
- 3.https://mrcet.com/pdf/Lab%20Manuals/IT/R15A0529_CloudComputing_Notes-converted.pdf
- 4.https://annamalaiuniversity.ac.in/studport/download/engg/CSE_Engg/resources/B.E._CSE_4Y_8SEM_CLOUD%20COMPUTING%2006oE8021.pdf
5. https://www.tutorialspoint.com/cloud_computing/cloud_computing_tutorial.pdf

E-Books

1. <https://studytm.files.wordpress.com/2014/03/hand-book-of-cloud-computing.pdf>
2. <https://arpatatel.files.wordpress.com/2014/10/cloud-computing-bible1.pdf>

3. file:///C:/Users/Administrator/Downloads/CC_Prebook.pdf
4. https://www.motc.gov.qa/sites/default/files/cloud_computing_ebook.pdf
5. <https://eniac2017.files.wordpress.com/2017/03/distributed-and-cloud-computing.pdf>

Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

Activities to be given

- Group Discussion
- Quiz
- Seminar

Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

No.	Course Outcome	Knowledge Level(According to Bloom's Taxonomy)
CLO 1	Describe the principles of Parallel and Distributed Computing and evolution of cloud computing from existing technologies	K1 to K3
CLO 2	Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model.	K1 to K3
CLO 3	Identify cloud application design methodologies.	K1 to K4
CLO 4	Implement the Python for Amazon Web Services	K1 to K3
CLO 5	Illustrate data security and cloud for industry, healthcare, education.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

1-Basic Level

2- Intermediate Level

3- Advanced Level

LESSON PLAN: (Total Hours: 75)

Unit	Course Content	Hrs.	Mode of Teaching
I	<p>Introduction to Cloud Computing: Introduction – Characteristics of Cloud Computing – Cloud Models – Cloud-based Services & Applications.</p> <p>Concepts & Technologies: Virtualization – Load Balancing – Scalability & Elasticity – Deployment – Replication – Monitoring – Software Defined Networking – Network Function Virtualization – MapReduce.</p>	15	Chalk & Talk, PPT
II	<p>Cloud Services & Platforms: Compute Services – Storage Services – Database Services – Application Services – Content Delivery Services.</p> <p>Hadoop & MapReduce: Apache Hadoop – Hadoop MapReduce Job Execution – Hadoop Schedulers.</p>	15	Chalk & Talk, Spot test, Exercise, Assignment, PPT, Video material.
III	<p>Cloud Application Design: Introduction – Design Considerations for Cloud Applications</p> <p>Reference Architectures for Cloud Applications – Cloud Application Design Methodologies – Data Storage Approaches.</p>	15	Chalk & Talk, Exercise, PPT, video material
IV	<p>Multimedia Cloud: Introduction –Case Study : Live Video Streaming App Streaming Protocols- RTMP streaming –HTTP Live Streaming-HTTP Dynamic Streaming. Case study : Video Transcoding App.</p> <p>Cloud Application Benchmarking App: Introduction-Trace Collection /Generation – Workload Modeling –Workload Specification-Synthetic Workload Generation-User Emulation vs Aggregate Workloads. Workload Characteristics. Application Performance Metrics. Design Considerations for a Benchmarking Methodology. Benchmarking Tools- Types of Tests.</p>	15	Chalk & Talk, Exercise, Assignment, video material, Group Discussion

V	Cloud Security: Introduction – CSA Cloud Security Architecture – Authentication – Authorization – Identity & Access Management – Data Security. Cloud for Industry, Healthcare & Education: Cloud Computing for Healthcare –Cloud Computing for Manufacturing Industry – Cloud Computing for Education.	15	Quiz, Chalk & Talk, Exercise, Spot test, Assignment, Seminar
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Course Designer
Mrs.R.Lakshmi

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
V	SEC	22OUISE5P	Dot Net Technologies Lab	2	2	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To construct variables, data types, operators, and control statements.
2. To understand and apply concepts of properties, indexers, and events.
3. To create a simple Windows Forms application.
4. To provide practical experience in implementing programs.
5. To implement master pages and user controls using ASP.NET.

LIST OF PROGRAMS:**Java Script:**

1. Odd Number Generation using Java Script
2. Fibonacci Series using Java Script
3. To Check a Number Palindrome or Not
4. Perform All Arithmetic Operation
5. To Search an elements in a dynamic Array

VB .NET:

6. Adding methods to class
7. Program for Class Event
8. Program for Inheritance
9. List to Add or Remove an Item
10. Date Time Picker-To view files on a particular date
11. Program for Track bar Control
12. Program for Common dialog Control
13. Program for Tree View control
14. Program for Menu Editor

ASP .NET:

15. Write a console application that obtains four int values from the user and displays the product

16. Write an application that uses two command-line arguments to place values into a string and an integer variable, respectively. Then display these values.
17. Write programs using conditional statements and loops:
Generate various patterns (triangles, diamond and other patterns) with numbers.
18. Check whether the number in the textbox 'getnum' is palindrome or not.
19. List of employees is available in list box. Write an application to add selected or all records from list box (assume multi-line property of textbox is true)
20. Write a program to access data source through ADO.NET.

Text Book:

RadhaGanesan.P.(2008). *VB.NET*. SCITECH Publications (INDIA) Pvt. Ltd, Chennai, Second Edition.

Reference Books:

1. Jack Purdum. (2004). *Visual Basic .NET primer Plus*. Pearson Education Private Limited. New Delhi.
2. Jeffrey R.Shapiro.(2000). *Visual Basic .NET The Complete Reference*. Tata MCGraw Hill Publishing Company Limited. New Delhi.
3. Muthu.C. (2007). *Visual Basic .Net*. Vijay Nicole Imprints Private Limited. Chennai.
4. Shirishchavan.(2009). *Visual Basic .NET*. Pearson Education Private Limited. New Delhi.
5. Steven Holzner. (2005). *VisualBasic.NETProgramming Black Book*. Dream Tech Press. New Delhi. New Edition.

E-Resources / E-Books:

1. https://docs.google.com/document/d/1_b7tPf6In551-DorHNm3FgnVKVK9w4FNyHgNqAFHMCg/preview?hgd=1
2. https://www.programmingempire.com/asp-net-practice-exercise/#google_vignette
3. <https://www.w3schools.com/asp/default.ASP>
4. <https://www.codingfusion.com/Asp--Net-Practice-Questions>
5. https://www.w3schools.com/asp/webpages_intro.asp

Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

No.	Course Outcome	Knowledge Level(According to Bloom's Taxonomy)
CLO 1	Understand the architecture of Dot Net Technology.	K1 to K3
CLO 2	Develop single form based simple .Net applications using basic and advanced control.	K1 to K3
CLO 3	Develop multiple form and menu based .Net applications.	K1 to K4
CLO 4	Develop small ADO.net based database driven .Net application.	K1 to K3
CLO 5	Implement and trouble shoot simple .Net Applications.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

1-Basic Level

2- Intermediate Level

3- Advanced Level

LESSON PLAN: (Total Hours: 30)

Unit	Course Content	Hrs.	Mode
I	Java Script: 1. Odd Number Generation using Java Script 2. Fibonacci Series using Java Script 3. To Check a Number Palindrome or Not 4. Perform all Arithmetic Operation 5. To Search an elements in a dynamic Array	6	Demo & Practical Session
II	VB .NET: 6. Adding methods to class 7. Program for Class Event 8. Program for Inheritance 9. List to Add or Remove an Item 10. Date Time Picker-To view files on a particular date	6	Demo & Practical Session

III	11. Program for Track bar Control 12. Program for Common dialog Control 13. Program for Tree View control 14. Program for Menu Editor	6	Demo & Practical Session
IV	ASP .NET: 15. Write a console application that obtains four int values from the user and displays the product. 16. Write an application that uses two command-line arguments to place values into a string and an integer variable, respectively. Then display these values. 17. Write programs using conditional statements and loops: Generate various patterns (triangles, diamond and other patterns) with numbers.	6	Demo & Practical Session
V	18. Check whether the number in the textbox 'getnum' is palindrome or not. 19. List of employees is available in list box. Write an application to add selected or all records from list box (assume multi-line property of textbox is true). 20. Write a program to access data source through ADO.NET.	6	Demo & Practical Session

Course Designer
Mrs.R.RajaSangeetha

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/ Week	CIA	SE	Total
VI	Core	22OUIT61	Python Programming	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To acquire skill in core Python Programming and identify Python Objects.
2. To learn the functions and functional programming in Python.
3. To gain the knowledge on Object Oriented Programming and Exception handling.
4. To expertise on GUI Programming using Widgets in Python.
5. To develop Database Applications in Python.

Course Content:

UNIT I : Core Python: Introduction -Python Basics: Comments - Statements and syntax – variable Assignment - Identifiers - **Python objects:** Built-in-types - Internal types - Standard Type operators - Standard Type Built-in-functions. **Numbers :** Introduction to Numbers - Integers –Floating point numbers-Complex numbers-Operators-Built-in and factory functions–Conditionals and Loops-**Sequences:** Strings, Lists and Tuples.

UNIT II: Mapping and set types. **Functions and functional programming:** Introduction Calling functions- Creating functions- passing functions-Formal arguments-Variable Length Arguments-Functional Programming- Variable Scope – Recursion.

UNIT III : Modules: Modules and Files – namespaces - Importing Modules - Features - Built-in functions. **Object Oriented Programming:** Introduction-Object Oriented Programming – Encapsulation Inheritance–Polymorphism - **Errors and Exceptions: Introduction** – Exceptions in Python.

UNIT IV : GUI Programming: Introduction – **Using Widgets:** Core widgets- Generic widget properties –Labels–Buttons–RadioButtons–CheckButtons–Text–Entry–ListBoxes–Menus–Frame– Scroll Bars – Scale.

UNIT V:

Database Programming: Connecting to a data base using Mongo DB-Creating Tables-INSERT-UPDATE-DELETE-READ operations.

Text Books:

1. Wesley J. Chun. (2007). “*Core Python Programming*”. Pearson Education. Second Edition. (Unit I, II, III).
2. CharlesDierbach.(2015).“*IntroductiontoComputerScienceUsingPythonAComputational Problem-Solving Focus*”. Wiley India Edition. (Unit III- Object Oriented Programming)
3. Martin. C Brown. (2018). “*The Complete Reference Python*”. McGraw Hill Education (India) Private Limited. (Unit IV)

Reference Books:

1. MarkLutz. (2013). *Learning Python Powerful Object Oriented Programming*. O’reilly Media. Fifth Edition.
2. Timothy. A. Budd. (2011), *Exploring Python*. Tata MCGraw Hill Education Private Limited. First Edition.
3. AllenDowney. Jeffrey Elkner. Chris Meyers. (2012). *How to think like a computer scientist :learning with Python*.
4. Eric Matthes. (2019). “*Python Crash Course, A Hands – on Project Based Introduction to Programming*”. 2nd Edition. No Starch Press.
5. Martin C. Brown. (2018). “*Python: The Complete Reference*”. 4th Edition. Mc-Graw Hill.

Websites and e-Learning resources

1. <http://interactivepython.org/courselib/static/pythonds>
2. <http://www.ibiblio.org/g2swap/byteofpython/read/>
3. <http://www.diveintopython3.net/>
4. <http://docs.python.org/3/tutorial/index.html>

Rationale for nature of Course:

- **Knowledge and Skill:** To make students developing well-designed, efficient, and testable code. Conducting software analysis, programming, testing, and debugging.
- **Activities to be given:** Student to be designing, building and maintaining Python applications & websites.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Explain the basic concepts in python language	K1 to K4
CO2	Apply the various functions and modules in python for processing the data.	K1 to K4
CO3	Analyze and solve problems using basic constructs and techniques of python.	K1 to K4
CO4	Assess the approaches used in the development of interactive application.	K1 to K5
CO5	To build real time programs using python.	K1 to K5

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	2
CO2	3	2	2	3	3	2
CO3	3	2	3	3	3	3
CO4	3	2	3	3	3	3
CO5	3	2	2	3	3	3

LESSON PLAN: (Total Hours: 75)

UNIT	Course Content	No. of Hours	Mode of Teaching
I	Core Python: Introduction -Python Basics: Comments - Statements and syntax – variable Assignment - Identifiers - Python objects: Built-in-types - Internal types - Standard Type operators - Standard Type Built-in-functions. Numbers: Introduction to Numbers - Integers –Floating point numbers-Complex numbers-Operators-Built-in and factory functions–Conditionals and Loops- Sequences: Strings, Lists and Tuples.	15	Chalk and Talk, PPT
II	Mapping and set types. Functions and functional programming: Introduction Calling functions- Creating functions- passing functions-Formal arguments-Variable Length Arguments-Functional Programming- Variable Scope – Recursion.	15	Chalk and Talk, PPT

III	Modules: Modules and Files – namespaces - Importing Modules - Features - Built-in functions. Object Oriented Programming: Introduction-Object Oriented Programming – Encapsulation Inheritance– Polymorphism - Errors and Exceptions: Introduction – Exceptions in Python.	15	Chalk and Talk, PPT
IV	GUI Programming: Introduction – Using Widgets: Core widgets- Generic widget properties –Labels– Buttons–RadioButtons–CheckButtons–Text–Entry– ListBoxes–Menus–Frame– Scroll Bars – Scale.	15	Chalk and Talk, PPT
V	Database Programming: Connecting to a data base using Mongo DB-Creating Tables-INSERT-UPDATE-DELETE-READ operations.	15	Seminar, PPT presentation
	Total	75	

Course Designer
Mrs.S.Sumathi

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/ Week	CIA	SE	Total
VI	Core	22OUITPR6	Project	4	5	20	80	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

Course Objectives:

1. The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
2. Each student should carry out individually one Project Work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea.

Exam will be conducted as follows

- Viva-voce will be conducted at the end of IV semester.
- Both the Internal (Respective Guides) and External Examiners (20+80) should conduct the Viva-Voce Examination.
- For awarding a pass, a candidate should have obtained 50% of the Total 100 marks.

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/ Week	CIA	SE	Total
VI	Core Lab	22OUIT6P	Python Programming Lab	3	6	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To interpret the use of procedural, conditional statements, loops and functional calls.
2. To develop programs using string operations, regular expression and handling files.
3. To build programs by using Lists, Tuples, Dictionaries, Classes and Objects.
4. To apply the concepts of inheritance, overloading and exception handling.
5. To demonstrate the use of Networking, Database and Graphics in programming.

List of Programs:

1. Write a Python program to print all Prime numbers in an Interval.
2. Write a Python program to print Nth Fibonacci number using recursion.
3. Write a program to calculate the total amount of money in the piggybank, given the coins of Rs.10, Rs.5, Rs.2 and Rs1.
4. Write a Python program to sort the given n numbers.
5. Write a Python program to implement any 5 string operations.
6. Write a Python program to extract date from the given string and validate the mobile number.
7. Write a Python program to read data from a file and calculate the percentage of vowels and consonants in the file.
8. Write a Python program to create a file and display its contents.
9. Write a Python Program to perform append, insert, pop, reverse, sort methods in list.
10. Write a Python program to add two matrices (using nested lists).
11. Write a Python program to perform repetition, membership, maximum and minimum operations in Tuple.
12. Write a Python program to perform union, intersection, difference, symmetric difference and enumerate operation in Sets.

13. Create a menu driven Python program with a dictionary for words and their meanings. Write functions to add a new entry (word: meaning), search for a particular word and retrieve meaning, for given meaning find words with the same meaning, remove an entry, display all words sorted alphabetically.
14. Write a python program that has a class person storing name, DOB. The program should subtract DOB from current date to find whether the person is eligible to vote or not.
15. Write a Python program that has classes such as student, course and department. Enroll a student in a course of a particular department. (Use inheritance)
16. Write a Python program that overloads the + operator to add two objects of class Matrix.
17. Write a Python program that opens a file and writes data to it. Handle exceptions that can be generated during I/O operations.
18. Write a python program to create a socket to establish connection to client and server.
19. Write a Python program to create student database in MySQL, insert, update and display the records.
20. Write a Python program to draw line, circle, triangle, square and rectangle with different colors.

Books for Study

1. Reema Thareja. (2017). *Python Programming: Using Problem Solving Approach*. Oxford University Press.
2. Mark Summerfield. (2018). *Programming in Python 3: A Complete Introduction to the Python Language*. Second Edition. Pearson Education.

Books for Reference

1. Paul Deitel and Harvey Deitel. (2021). “*Python for Programmers*”. Pearson Education. 1st Edition.
2. G Venkatesh & Madhavan Mukund. (2021). “*Computational Thinking: A Primer for Programmers and Data Scientists*”. 1st Edition. Notion Press.
3. John V Guttag, & quot. (2021). ‘*Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data*’. Third Edition. MIT Press.
4. Eric Matthes. (2019). “*Python Crash Course, A Hands – on Project Based Introduction to Programming*”. 2nd Edition. No Starch Press.
5. Martin C. Brown. (2018). “*Python: The Complete Reference*”. 4th Edition. Mc-Graw Hill.

Web Resources

1. <https://docs.python.org/3/>
2. <https://learnpython.org>
3. <https://www.python.org/>

E-Books

1. <https://www.jnec.org/labmanuals/cse/se/sem1/Python%20SY%20BTech%20Lab%20Manual.pdf>
2. [https://mrcet.com/pdf/Lab%20Manuals/CSE/\(R18A0588\)%20Python%20Programming%20%20Lab%20Manual.pdf](https://mrcet.com/pdf/Lab%20Manuals/CSE/(R18A0588)%20Python%20Programming%20%20Lab%20Manual.pdf).
3. <https://realpython.com/python-csv>.

Activities to be given

- Implement Programming
- Mini Projects

Activities on Employability Oriented

- Software Development
- Data Analysis

Pedagogy

Record Book writing, Program development, Projector Demonstration and Practical sessions.

Course Learning Outcomes (CLOs)

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

CLOs	COURSE LEARNING OUTCOMES	K - Level
CLO 1	Apply the basics, control statements and modules in Python.	K1 to K3
CLO 2	Demonstrate various string operations and execute simple Python programs.	K1 to K3
CLO 3	Use different Data Structures and implement classes and objects	K1 to K4
CLO 4	Implement the concepts of Object-Oriented Programming.	K1 to K3
CLO 5	Utilize Standard libraries to perform Multithreading, Networking, Databases and Graphics.	K1 to K4

Mapping of CLOs with POs

CLOs / POs	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	2	2	1	2	2	1
CLO 2	2	3	2	2	2	2
CLO 3	2	3	3	2	1	1
CLO 4	2	3	3	2	2	2
CLO 5	2	2	2	2	2	1

1-Basic Level

2- Intermediate Level

3- Advanced Level

LESSON PLAN: (Total Hours: 90)

Unit	Course Content	Hrs.	Mode of Teaching
I	1. Write a Python program to print all Prime numbers in an Interval. 2. Write a Python program to print N th Fibonacci number using recursion. 3. Write a program to calculate the total amount of money in the piggybank, given the coins of Rs.10, Rs.5, Rs.2 and Rs1. 4. Write a Python program to sort the given n numbers.	18	Demo & Practical Session
II	5. Write a Python program to implement any 5 string operations. 6. Write a Python program to extract date from the given string and validate the mobile number. 7. Write a Python program to read data from a file and calculate the percentage of vowels and consonants in the file. 8. Write a Python program to create a file and display its contents.	18	Demo & Practical Session
III	9. Write a Python Program to perform append, insert, pop, reverse, sort methods in list. 10. Write a Python program to add two matrices (using nested lists). 11. Write a Python program to perform repetition, membership, maximum and minimum operations in Tuple. 12. Write a Python program to perform union, intersection, difference, symmetric difference and enumerate operation in Sets. 13. Create a menu driven Python program with a dictionary for words and their meanings. Write functions to add a new entry (word: meaning), search for a particular word and retrieve meaning, for given meaning find words with the same meaning, remove an entry, display all words sorted alphabetically.	18	Demo & Practical Session

IV	<p>14. Write a python program that has a class person storing name, DOB. The program should subtract DOB from current date to find whether the person is eligible to vote or not.</p> <p>15. Write a Python program that has classes such as student, course and department. Enroll a student in a course of a particular department. (Use inheritance)</p> <p>16. Write a Python program that overloads the + operator to add two objects of class Matrix.</p> <p>17. Write a Python program that opens a file and writes data to it. Handle exceptions that can be generated during I/O operations.</p>	18	Demo & Practical Session
V	<p>18. Write a python program to create a socket to establish connection to client and server.</p> <p>19. Write a Python program to create student database in MySQL, insert, update and display the records.</p> <p>20. Write a Python program to draw line, circle, triangle, square and rectangle with different colors.</p>	18	Demo & Practical Session

Course Designer
Mrs.S.Sumathi

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	CourseCode	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
VI	DSEC	22OUITDSE6A	Mobile Computing	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To impart fundamental concepts in the area of Mobile Computing.
2. To learn the basics of mobile telecommunication system.
3. To understand Global System for mobile Communication and transport layers
4. To analyze next generation Mobile Communication System.
5. To elaborate the idea about the Intelligent Networks and Interworking.

Course Content:

Unit- I: Mobility of Bits and Bytes-Wireless The beginning –Mobile computing –Dialogue Control-Networks-Middleware and Gateways-Applications and Services-Developing Mobile Computing Applications –Security in Mobile Computing-Standards –Standard Bodies-Players in the wireless space. **Mobile Computing Architecture:** History of computers-History of Internet-Internet-The Ubiquitous Networks –Architecture for Mobile Computing –Three tier Architecture-Design consideration for mobile computing-Mobile computing through Internet-Making existing applications mobile enabled.

Unit- II: Mobile computing through Telephony-Evolution of Telephony-Multiple Access Procedures- Satellite Communication System-Mobile computing through telephone-Developing an IVR Application-Voice XML-Telephony Application Programming Interface.

Emerging Technologies: Introduction–Bluetooth-Radio Frequency Identification(RFID)-Wireless broadband(WIMAX)-Mobile IP-Internet Protocol Version6(IPV6)-Java Card.

Unit- III: Global System for mobile Communication-Global System for Mobile Communications- GSM Architecture-GSM Entities –Call routing in GSM-PLMN interfaces-GSM address and Identifiers-Network aspects in GSM –GSM Frequency Allocation-Personal Communication Service-Authentication and Security

Unit- IV: Wireless Application Protocol –Introduction- WAP- MMS - GPRS applications –**CDMA and 3G:** Introduction-Spread Spectrum technology –Is 95-CDMA versus GSM- Wireless Data- Third Generation Networks-Applications on 3G.

Unit-V: Wireless LAN: Introduction-Wireless LAN advantages-IEEE 802.11 standards – wireless LAN architecture –mobility in wireless LAN-deploying wireless LAN-Mobile adhoc Networks and sensor Networks-wireless LAN security-Wireless Access in Vehicular Environment-Wireless Local Loop- HiperLAN- WiFi versus 3G. **Intelligent Networks and Interworking:** Introduction- Fundamentals of call processing – Intelligence in the networks – SS#7 signaling –IN Conceptual Model-Soft switch -Programmable networks-Technologies and Interfaces for IN-SS7 Security-MAPSec-Virtual Private Network(VPN).

Book for Study

Asoke K Talukder, Roopa R Yavagal. (2012). *Mobile Computing Technology applications and Service creation*. TMH publishing company. New Delhi. Second Edition.

Chapters:

Unit I	–	Chapters 1, 2
Unit II	–	Chapters 3, 4
Unit III	–	Chapter 5
Unit IV	–	Chapters 8, 9
Unit V	–	Chapters 10,11

Reference books:

1. Amjad Umar. (2004). *Mobile Computing and Wireless Communications*. NGS solutions. Chennai. First Edition.
2. Behera G.K, Pamudra Das.L.O. (2009). *Mobile Communication*. Scitech Publication of India. Chennai. First Edition.
3. Frank Adelestein, Sandeep K.S.Gupta, Golden G.Richard & Loren Schwiebert. (2005). *Fundamentals of Mobile and Pervasive Computing*. Tata MCGraw Hill Publishing Limited. New York. Fourth Edition.
4. Jochen Schiller. (2003). *Mobile Communication*. Dorling Kindersley of India Pearson Education. South Asia. Second Edition.
5. Tomasz Imielinski, Henry F. Korth. (1996). *Mobile Computing*, Kluwer Academic Publishers, New Delhi, First Edition.

Web Resources and E-Books

1. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.457.2732&rep=rep1&type=pdf>
2. <http://www0.cs.ucl.ac.uk/staff/W.Emmerich/lectures/3C05-01-02/aswe18.pdf>
3. <http://notesmagic.blogspot.com/2015/09/mobile-and-wireless-computing.html>

4. https://nanopdf.com/download/mobile-and-pervasive-computing_pdf
5. <http://www.gpsrinagar.org/lms/CSE-IT/Lect%202.pdf>

Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

Rationale for Nature of the course

- Emphasizes the data flow, timing analysis, memory hierarchy, tradeoff between execution cycles, hardware requirements/cost and software that must be made in order to produce good system design.

Activities to be given

- Group Discussion
- Quiz
- Seminar

Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

S.No.	Course Outcome	Knowledge Level(According to Bloom's Taxonomy)
CLO 1	Understand the Infer knowledge about mobile communications and its services.	K1 to K3
CLO 2	Analyze Identifying several communication access techniques and functionality of Mobile IP and Transport Layer	K1to K3
CLO 3	Classify different types of mobile telecommunication systems	K1 to K4
CLO 4	Determine the functionality of MAC, Network layer and Identifying a routing protocol for given Adhoc Networks	K1 to K3
CLO 5	Identify and solve database issues using hoarding techniques	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

1-Basic Level

2- Intermediate Level

3- Advanced Level

LESSON PLAN: (Total Hours: 75)

Unit	Course Content	Hrs.	Mode
I	<p>Mobility of Bits and Bytes-Wireless The beginning –Mobile computing –Dialogue Control-Networks-Middleware and Gateways-Applications and Services-Developing Mobile Computing Applications – Security in Mobile Computing-Standards –Standard Bodies-Players in the wireless space.</p> <p>Mobile Computing Architecture: History of computers-History of Internet-Internet-The Ubiquitous Networks –Architecture for Mobile Computing –Three tier Architecture-Design consideration for mobile computing-Mobile computing through Internet-Making existing applications mobile enabled.</p>	15	Chalk & Talk, PPT
II	<p>Mobile computing through Telephony-Evolution of Telephony-Multiple Access Procedures- Satellite Communication System-Mobile computing through telephone-Developing an IVR Application-Voice XML-Telephony Application Programming Interface.</p> <p>Emerging Technologies: Introduction–Bluetooth-Radio Frequency Identification(RFID)-Wireless broadband(WIMAX)-Mobile IP-Internet Protocol Version6(IPV6)-Java Card.</p>	15	Chalk & Talk, Spot test, Exercise, Assignment, PPT, Video material.
III	<p>Global System for mobile Communication-Global System for Mobile Communications-GSM Architecture-GSM Entities –Call routing in GSM-PLMN interfaces-GSM address and Identifiers-Network aspects in GSM –GSM Frequency Allocation-Personal Communication Service-Authentication and Security</p>	15	Chalk & Talk, Exercise, PPT, video material
IV	<p>Wireless Application Protocol –Introduction-WAP- MMS - GPRS applications –CDMA and 3G: Introduction-Spread Spectrum technology –Is 95-</p>	15	Chalk & Talk, Exercise,

	CDMA versus GSM- Wireless Data- Third Generation Networks-Applications on 3G.		Assignment, video material, Group Discussion
V	<p>Wireless LAN: Introduction-Wireless LAN advantages-IEEE 802.11 standards –wireless LAN architecture –mobility in wireless LAN-deploying wireless LAN-Mobile adhoc Networks and sensor Networks-wireless LAN security-Wireless Access in Vehicular Environment-Wireless Local Loop-HiperLAN- WiFi versus 3G.Intelligent Networks and Interworking: Introduction- Fundamentals of call processing – Intelligence in the networks –SS#7 signaling –IN Conceptual Model-Soft switch - Programmable networks-Technologies and Interfaces for IN-SS7 Security-MAPSec-Virtual Private Network(VPN).</p>	15	Quiz, Chalk & Talk, Exercise , Spot test, Assignment, Seminar

Course Designer
Mrs.G.Amudha

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	CourseCode	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
VI	DSEC	22OUITDSE6B	Block Chain Technologies	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To be able to state core Block chain concepts, the benefits, and the limitations of block chain technologies.
2. To impart knowledge in block chain and full ecosystem decentralization.
3. To get familiarity with mining algorithm and Bitcoin improvement proposals.
4. Analyze of block chain systems with difficulty adjustment and retargeting algorithms.
5. Apply various block chain concepts like Tendermint Socket Protocol and Block Apps to analyze block chain system design.

Course Content:

Unit- I: Block chain Distributed systems -The history of block chain –Electronic cash -The concept of electronic cash -Introduction to block chain -Various technical definitions of block chains -Generic elements of a block chain –Addresses Transaction Block -Peer-to-peer network -Scripting or programming language -Virtual machine -State machine –Nodes -Smart contracts -Features of a block chain - Distributed consensus -Transaction verification -Applications of blockchain technology - Tiers of blockchain technology Types of blockchain - Benefits and limitations of blockchain.

Unit- II: Decentralization -Decentralization using blockchain -Methods of decentralization Disintermediation-Through competition-Routes to decentralization-How to decentralize Examples - Blockchain and full ecosystem decentralization-Storage-Communication Computation-Smart contract-Decentralized organizations-Decentralized autonomous organizations -Decentralized autonomous corporations-Decentralized autonomous societies.

Unit- III: Bitcoin-Bitcoin-Bitcoin Definition-Keys and addresses-Public keys in bitcoin-Private keys in bitcoin-Bitcoin currency units-Base58Check encoding-Vanity addresses Transactions-The transaction life cycle-The transaction structure-The script language Commonly used Opcodes-Types of transaction-Coinbase transactions-Transaction pools-Transaction Verification.

The mining algorithm-The hashing rate-Mining systems-CPU-GPU-FPGA-ASICs-Mining pools .The bitcoin network-Wallets-Wallet types-Non-deterministic wallets-Deterministic wallets-Hierarchical deterministic wallets-Brain wallets-Paper wallets-Hardware wallets-Online wallets-Mobile wallets-Bitcoin payments-Bitcoin investment and buying and selling bitcoins- Bitcoin programming and the command-line interface-Bitcoin improvement proposals (BIPs)

Unit- IV: Alternative Coins -Theoretical foundations-Alternatives to Proof of Work Proof of Storage-Proof of Stake-Proof of coinage-Proof of deposit-Proof of burn Proof of activity-Non-outsourcable puzzles-Difficulty adjustment and retargeting algorithms-Kimoto Gravity Well-Dark Gravity Wave-Digi Shield -MIDAS- Bitcoin limitations Privacy and anonymity-Mixing protocols-Third-party mixing protocols-Inherent –onymity-Extended protocols on top of bitcoin-Colored coins-Counterparty-Development of altcoins-Consensus algorithms-Hashing algorithms.

Unit-V: Alternative Blockchains -Blockchains-Kadena-Ripple-Transactions-Payments related-Order related-Account and security related-Application layer-Transport layer-Interledger layer-Ledger layer-Stellar-Rootstock-Drivechain-Quorum-Transaction manager-Crypto Enclave-QuorumChain-Network manager-Tezos-Storj-Maidsafe-BigChainDB-Multichain-Tendermint-Tendermint Core-Tendermint Socket Protocol (TMSP)-Platforms-Block Apps-Installation-Application development and deployment using Block Apps-Eris Blockchain-Outside of Currencies-Internet of Things-Physical object layer-Device Layer-Network layer-Management layer-Application layer.

Book for Study

Imran Bashir. (2017). *Mastering Block chain*. Packt Royal Holloway. University of London. First Edition.

Chapters:

- Unit I : Chapters 1
- Unit II : Chapter 2
- Unit III : Chapters 4
- Unit IV : Chapter 5
- Unit V : Chapter 10, 11

Reference books:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller & Steven Goldfeder. (2016). *“Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction”*. Princeton University Press.

2. Bellaj Badr, Richard Horrocks & Xun (Brian) Wu. (2018). “*Blockchain By Example: A developer's guide to creating decentralized applications using Bitcoin, Ethereum, and Hyperledger*”. Packt Publishing Limited.
3. Josh Thompson. (2017). ‘*Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming*’. Create Space Independent Publishing Platform.
4. Nakul Shah. (2019). “*Blockchain for Business with Hyperledger Fabric: A complete guide to enterprise blockchain implementation using Hyperledger Fabric*”.BPB Publications.
5. Singha. B. & G. Dhameja G. (2018). ”*Beginning Blockchain: A Beginner's Guide to Building Blockchain Solutions*”. First Edition.

Web Resources and E-Books

1. <https://www.tutorialspoint.com/blockchain/index.htm>
2. <https://www.javatpoint.com/blockchain-tutorial>
3. <https://nptel.ac.in/courses/106/105/106105184/>
4. https://onlinecourses.nptel.ac.in/noc20_cs01/preview
5. <https://builtin.com/blockchain/blockchain-books>

Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

Rationale for Nature of the course

- Blockchain uses crypto currencies, so an understanding of its concepts will enable you to invest and trade smartly. This is one of the main reasons to learn block chain. You can make use of this technology to invest and trade.
- Blockchain has the potential to ensure the identity, privacy, and security of students' data. As shown earlier in this paper, block chain offers security and validity by ensuring immutability through its hash chain.

Activities to be given

- Group Discussion, Quiz, Seminar

Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

S.No.	Course Outcome	Knowledge Level(According to Bloom's Taxonomy)
CLO 1	Describe the basic concepts and technology used for block chain.	K1 to K3
CLO 2	Describe the primitives of the distributed computing and cryptography related to blockchain.	K1to K3
CLO 3	Illustrate the concepts of Bitcoin and their usage.	K1 to K4
CLO 4	Realize difficulty adjustment and retargeting algorithms.	K1 to K3
CLO 5	Apply security features in blockchain technologies.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

1-Basic Level

2- Intermediate Level

3- Advanced Level

LESSON PLAN: (Total Hours: 75)

Unit	Course Content	Hrs.	Mode
I	Block chain Distributed systems -The history of block chain – Electronic cash -The concept of electronic cash -Introduction to block chain -Various technical definitions of block chains - Generic elements of a block chain –Addresses Transaction Block -Peer-to-peer network -Scripting or programming language -Virtual machine -State machine –Nodes -Smart contracts -Features of a block chain - Distributed consensus - Transaction verification -Applications of blockchain technology - Tiers of blockchain technology Types of blockchain - Benefits and limitations of blockchain.	15	Chalk & Talk, PPT
II	Decentralization -Decentralization using blockchain -Methods of decentralization Disintermediation-Through competition-Routes to decentralization-How to decentralize Examples - Blockchain and full ecosystem decentralization-Storage-Communication Computation-Smart contract-Decentralized	15	Chalk & Talk, Spot test, Exercise, Assignment,

	organizations-Decentralized autonomous organizations - Decentralized autonomous corporations-Decentralized autonomous societies.		PPT, Video material.
III	Bitcoin-Bitcoin-Bitcoin Definition-Keys and addresses-Public keys in bitcoin-Private keys in bitcoin-Bitcoin currency units-Base58Check encoding-Vanity addresses Transactions-The transaction life cycle-The transaction structure-The script language Commonly used Opcodes-Types of transaction-Coinbase transactions-Transaction pools-Transaction Verification.	15	Chalk & Talk, Exercise, PPT, video material
IV	Alternative Coins -Theoretical foundations-Alternatives to Proof of Work Proof of Storage-Proof of Stake-Proof of coinage-Proof of deposit-Proof of burn Proof of activity-Non-outsourceable puzzles-Difficulty adjustment and retargeting algorithms-Kimoto Gravity Well-Dark Gravity Wave-Digi Shield -MIDAS- Bitcoin limitations Privacy and anonymity-Mixing protocols-Third-party mixing protocols-Inherent – anonymity-Extended protocols on top of bitcoin-Colored coins-Counterparty-Development of altcoins-Consensus algorithms-Hashing algorithms.	15	Chalk & Talk, Exercise, Assignment, video material, Group Discussion
V	Alternative Blockchains -Blockchains-Kadena-Ripple-Transactions-Payments related-Order related-Account and security related-Application layer-Transport layer-Interledger layer-Ledger layer-Stellar-Rootstock-Drivechain-Quorum-Transaction manager-Crypto Enclave-QuorumChain-Network manager-Tezos-Storj-Maidsafe-BigChainDB-Multichain-Tendermint-Tendermint Core-Tendermint Socket Protocol (TMSP)-Platforms-Block Apps-Installation-Application development and deployment using Block Apps-Eris Blockchain-Outside of Currencies-Internet of Things-Physical object layer-Device Layer-Network layer-Management layer-Application layer.	15	Quiz, Chalk & Talk, Exercise, Spot test, Assignment, Seminar

Course Designer
Mrs.R.Rajasangeetha

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
VI	DSEC	22OUITDSE6C	Internet of Things	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives

1. To understand general concepts of Internet of Things (IoT).
2. To recognize various devices, sensors and applications in IoT and M2M.
3. To apply design concept to IoT solutions of logical design using Python.
4. To evaluate design issues in IoT Physical Servers & Cloud Offerings.
5. To create IoT solutions using case Studies and Data Analytics.

Course Content:

Unit- I: Introduction to Internet of Things: Introduction – Physical Design of IoT – Logical Design of IoT – IoT Enabling Technologies – IoT & Deployment Templates. **Domain Specific IoTs:** Introduction – Home Automation – Cities – Environment – Energy – Retail – Logistics – Agriculture – Industry – Health & Lifestyle.

Unit- II: IoT and M2M : Introduction : M2M – Difference between IoT and M2M – SDN and NFV for IoT. **IoT System Management with NETCONF-YANG :** Need for IoT Systems Management – Simple Network Management Protocol (SNMP) – Network Operator Requirements – NETCONF- YANG – IoT Systems Management with NETCONF_YANG.

Unit- III: IoT Platforms Design Methodology: Introduction – IoT Design Methodology – Case Study on IoT System for Weather Monitoring – Motivation for using Python.

IoT Systems – Logical Design using Python: Introduction – Installing Python – Python Data types & Data Structures – Control Flow – Functions – Modules – Packages – File Handling – Date/Time Operations – Classes – Python packages of Interest for IoT.

Unit- IV: IoT Physical Devices & Endpoints: What is an IoT Device – Exemplary Device: Raspberry Pi– About the Board – Linux on Raspberry Pi – Raspberry Pi Interfaces – Programming Raspberry Pi with Python –Other IoT devices.

IoT Physical Servers & Cloud Offerings : Introduction to Cloud Storage Models & Communication APIs – WAMP-Auto Bahn for IoT – Xively Cloud for IoT – Python Web application Framework-Django – Designing a RESTful Web API – Amazon Web Services for

IoT – SkynetIoT messaging platform

Unit-V: Case Studies Illustrating IoT Design: Introduction – Home Automation – Cities – Environment – Agriculture – Productivity applications.

Data Analytics for IoT : Introduction – Apache Hadoop – Using HadoopMapReduce for Batch Data Analysis – Apache Oozier – Apache Spark – Apache Storm – Using Apache Storm for Real-time Data Analysis.

Book for Study

ArshdeepBahga, Vijay Madisett. (2015). *Internet of Things*. Universities Press(INDIA) Private Ltd. New Delhi. First Edition.

Chapters:

Unit I	:	Chapter 1 & 2
Unit II	:	Chapter 3 & 4
Unit III	:	Chapter 5 & 6
Unit IV	:	Chapter 7 & 8
Unit V	:	Chapter 9 &10

Books for Reference

1. Adrian McEwen, Hakim Cassimally. (November 2013). “*Designing the Internet of Things*”. John Wiley and Sons.
2. AdrianMcewen, HakinCassimally. (2015). *Designing the Internet of Things*, Willey.
3. CunoPfister, O’Relly. (2011). *Getting Started with the Internet of Things*. Universities Press (India) Pvt. Ltd. Hyderabad. Second Edition.
4. Dieter Uckelmann; Mark Harrison; Florian Michahelles. (2009). *Architecting the Internet of Things* (Eds.) Springer Pvt. Ltd. New Delhi. Fifth Edition.
5. Francis daCosta. “*Rethinking the Internet of Things: A Scalable Approach to Connecting Everything*”. 1st Edition. Apress Publications.
6. Zach Shelby, Carsten Bormann. “*6LoWPAN: The Wireless Embedded Internet*”. John Wiley and Sons.

Web Resources / E-Books

1. <https://www.udemy.com/internet-of-things-iot-for-beginners-getting-started/>
2. <http://playground.arduino.cc/Projects/Ideas>
3. <http://runtimeprojects.com>
4. <http://www.megunolink.com/articles/arduino-garage-door-opener>
5. <http://www.willward1.com/arduino-wifi-tutorial>

Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

Activities to be given

- Group Discussion
- Quiz
- Seminar

Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	Understand the basics of IoT.	K1 to K3
CO 2	Implement the state of the Architecture of an IoT & M2M.	K1to K3
CO 3	Understand design methodology and hardware platforms involved in IoT.	K1 to K4
CO 4	Understand how to analyze and organize the data.	K1 to K3
CO 5	Compare IOT Applications in Industrial & real world.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

1-Basic Level**2- Intermediate Level****3- Advanced Level****LESSON PLAN: (Total Hours: 75)**

Unit	Course Content	Hrs.	Mode of Teaching
I	Introduction to Internet of Things: Introduction – Physical Design of IoT – Logical Design of IoT – IoT Enabling Technologies – IoT& Deployment Templates. Domain Specific IoTs: Introduction – Home Automation – Cities – Environment – Energy – Retail – Logistics – Agriculture – Industry – Health & Lifestyle.	15	Chalk & Talk, PPT
II	IoT and M2M : Introduction : M2M – Difference between IoT and M2M – SDN and NFV for IoT. IoT System Management with NETCONF-YANG : Need for IoT Systems Management – Simple Network Management Protocol (SNMP) – Network Operator Requirements –	15	Chalk & Talk, Spot test, Exercise, Assignment, PPT, Video material.

	NETCONF- YANG – IoT Systems Management with NETCONF_YANG.		
III	<p>IoT Platforms Design Methodology: Introduction – IoT Design Methodology – Case Study on IoT System for Weather Monitoring – Motivation for using Python.</p> <p>IoT Systems – Logical Design using Python: Introduction – Installing Python – Python Data types & Data Structures – Control Flow – Functions – Modules – Packages – File Handling – Date/Time Operations – Classes – Python packages of Interest for IoT.</p>	15	Chalk & Talk, Exercise, PPT, video material
IV	<p>IoT Physical Devices & Endpoints: What is an IoT Device – Exemplary Device: Raspberry Pi– About the Board – Linux on Raspberry Pi – Raspberry Pi Interfaces – Programming Raspberry Pi with Python – Other IoT devices. IoT Physical Servers & Cloud Offerings : Introduction to Cloud Storage Models & Communication APIs – WAMP-Auto Bahn for IoT – Xively Cloud for IoT – Python Web application Framework-Django – Designing a RESTful Web API – Amazon Web Services for IoT – SkynetIoT messaging platform</p>	15	Chalk & Talk, Exercise, Assignment, video material, Group Discussion
V	<p>Case Studies Illustrating IoT Design: Introduction – Home Automation – Cities – Environment – Agriculture – Productivity applications.</p> <p>Data Analytics for IoT : Introduction – Apache Hadoop – Using HadoopMapReduce for Batch Data Analysis – Apache Oozier – Apache Spark – Apache Storm – Using Apache Storm for Real-time Data Analysis.</p>	15	Quiz, Chalk & Talk, Exercise , Spot test, Assignment, Seminar

Course Designer
Mrs.R.Rajasangeetha

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
VI	DSEC	22OUITDSE6D	Cyber Security	5	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To have knowledge on the use of cryptography and network security.
2. To explore the basic issues to be addressed by a program security capability.
3. To Improve the Database and Data Mining Security.
4. To familiar with Firewalls and Security in Networks.
5. To develop an organizational security policies such as authentication, Reliability and Integrity.

Course Content:

Unit- I: Cryptography: Terminology and Background – Substitution Ciphers – Transpositions – Making Good Encryption Algorithms- Data Encryption Standard- AES Encryption Algorithm – Public Key Encryption – The Uses of Encryption.

Unit- II: Program Security: Secure programs – Non-malicious Program Errors – Viruses and other Malicious Code – Targeted Malicious code – Controls Against Program Threat.

Protection in General-Purpose Operating System: Protected Objects and Methods of Address Protection – Control of Access to General Objects – File Protection Mechanisms - User Authentication.

Unit- III: Database and Data Mining Security: Introduction to Databases – Security Requirements – Reliability and Integrity – Sensitive Data – Inference – Multilevel Databases – Proposals for Multilevel Security – Data Mining.

Unit- IV: Security in Networks : Threats in networks – Network Security Controls – Firewalls – Intrusion Detection Systems – Secure e-mail

Unit-V: Administering Security: Security Planning – Risk Analysis – Organizational Security Policies – Physical Security.

Book for Study:

Charles P. Pfleeger, Shari Lawrence Pfleeger. (2011). *Security in Computing*. Pearson Education. New Delhi. Third Edition.

Chapters:

- Unit I : Chapter 2
- Unit II : Chapters 3, 4
- Unit III : Chapter 6
- Unit IV : Chapter 7
- Unit V : Chapter 8

Books for Reference

1. Mao.W. (2007). *Modern Cryptography – Theory and Practice*. Pearson Education. New Delhi. Second Edition.
2. Michael Whitman, Herbert J. Mattord. (2010). *Management of Information Security*. Course Technology. Boston US. Third Edition.
3. MY Rhee. (2002). *Network Security*. John Wiley and Sons. New York. Second Edition.
4. Wade Trappe, Lawrence C Washington. (2007). *Introduction to Cryptography with coding*, Pearson Publication. New Delhi. Second Edition.
5. William Stallings. (2010). *Cryptography and Network security: Principles and Practices*. PHI Publication. New Delhi. Fifth Edition.

Web Resources /E-Book

1. <https://www.uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf>
2. https://www.vssut.ac.in/lecture_notes/lecture1423183198.pdf
3. <http://www.uptti.ac.in/classroom-content/data/cyber%20security%20unit-3.pdf>

Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

Activities to be given

- Group Discussion
- Quiz
- Seminar

Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

No.	Course Outcome	Knowledge Level(According to Bloom's Taxonomy)
CLO 1	Understand the conceptual foundation of information security awareness.	K1 to K3
CLO 2	Understand the interface of the components, roles and their difference in Program Security.	K1to K3
CLO 3	Study the back end of the system in database security issues	K1 to K4
CLO 4	Grasp the knowledge in networking components with its architecture and protocols.	K1 to K3
CLO 5	Analysis the fraud risk assessment.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

1-Basic Level

2- Intermediate Level

3- Advanced Level

LESSON PLAN: (Total Hours: 75)

Unit	Course Content	Hrs.	Mode of Teaching
I	Cryptography: Terminology and Background – Substitution Ciphers – Transpositions – Making Good Encryption Algorithms- Data Encryption Standard- AES Encryption Algorithm – Public Key Encryption – The Uses of Encryption.	15	Chalk & Talk, PPT
II	Program Security: Secure programs – Non-malicious Program Errors – Viruses and other Malicious Code – Targeted Malicious code – Controls Against Program Threat. Protection in General-Purpose Operating System: Protected Objects and Methods of Address Protection – Control of Access to General Objects – File Protection Mechanisms - User Authentication.	15	Chalk & Talk, Spot test, Exercise, Assignment, PPT, Video material.

III	Database and Data Mining Security: Introduction to Databases – Security Requirements – Reliability and Integrity Sensitive Data – Inference – Multilevel Databases – Proposals for Multilevel Security – Data Mining.	15	Chalk & Talk, Exercise, PPT, video material
IV	Security in Networks : Threats in networks – Network Security Controls – Firewalls – Intrusion Detection - Systems – Secure e mail	15	Chalk & Talk, Exercise, Assignment, video material, Group Discussion
V	Administering Security: Security Planning – Risk Analysis – Organizational Security Policies – Physical Security.	15	Quiz, Chalk & Talk, Exercise , Spot test, Assignment, Seminar

**Course Designer
Mrs.R.Lakshmi**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: III B.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
VI	SEC	22OUISE6	Quantitative Aptitude	2	2	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives:

1. To understand various number systems.
2. To get an idea of age, profit and loss related problem solving.
3. To understand time series simple and compound interests.
4. To impart knowledge on the problem related to probability, and series.
5. To understand graphs, charts.

Course Content:

Unit – I: Numbers- HCF and LCM of numbers - Decimal fractions – Simplification – Average - Problems on Numbers.

Unit – II: Problems on Ages - percentage - profits and loss - ratio and proportion-partnership.

Unit – III: Time and work - Time and Distance - problems on trains - simple interest - compound interest - Area - Volume and surface area.

Unit – IV: Permutation and combination – Probability – True Discount - Odd man out and Series.

Unit – V: Calendar - Clocks - Data representation - Bar Graphs - Pie charts.

Book for Study:

Quantitative Aptitude for Competitive Examinations- R.S. Aggarwal - S. Chand & Company Ltd - Revised and Enlarged edition - 2017.

Chapters:

Unit I – 1, 2, 3, 4, 6, 7

Unit II – 8, 11, 12, 13, 14

Unit III – 17, 18, 20, 22, 23, 24, 25

Unit IV – 30, 31, 32, 35

Unit V – 27, 28, 37, 38

Books for References:

1. AbhijitGuha, *Quantitative Aptitude*, Tata McGraw Hill, New Delhi, Second Edition, 2003.
2. Career Launcher, *Quantitative Ability*, Vikas Publishing House Pvt Ltd, New Delhi, first Edition, 2009.
3. DineshKhattar, *The Pearson Guide to Quantitative Aptitude*, Saurabh Printers Pvt.Ltd, India, Third Edition, 2009.
4. Praveen R.V., *Quantitative Aptitude and Reasoning*, PHI, Second Edition, 2013.
5. Rita Mishra, *Quantitative Aptitude*, Khurmi Publication, New Delhi, Second Edition, 2008.

Web Resources:

1. <https://www.math-shortcut-tricks.com/>
2. <https://www.sanfoundry.com/quantitative-aptitude-questions-answers/>
3. <https://www.indiabix.com/aptitude/questions-and-answers/>

Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

Activities to be given

- Group Discussion
- Quiz
- Seminar

Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CLO 1	Understand various number systems.	K1 to K3
CLO 2	Acquire an idea of age, profit and loss related problem solving.	K1 to K3
CLO 3	Understand time series simple and compound interests.	K1 to K4
CLO 4	Grasp knowledge on the problem related to probability and series.	K1 to K3
CLO 5	Analyze on graphs and charts.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

1-Basic Level **2- Intermediate Level** **3- Advanced Level**

LESSON PLAN: (Total Hours: 30)

Unit	Course Content	Hrs.	Mode of Teaching
I	Numbers- HCF and LCM of numbers - Decimal fractions – Simplification – Average - Problems on Numbers.	6	Chalk and Talk, PPT
II	Problems on Ages - percentage - profits and loss - ratio and proportion-partnership.	6	Chalk and Talk, PPT
III	Time and work - Time and Distance - problems on trains - simple interest - compound interest - Area - Volume and surface area.	6	Chalk and Talk, PPT, quiz
IV	Permutation and combination – Probability – True Discount - Odd man out and Series.	6	Chalk and Talk, PPT, quiz, on the spot test
V	Calendar - Clocks - Data representation - Bar Graphs - Pie charts.	6	PPT presentation.

Course Designer
Mrs.S.Sumathi