



Panchajanya Vidya Peetha Welfare Trust (Regd)

Dr. Ambedkar Institute of Technology

An Autonomous Institution, Affiliated to Visvesvaraya Technological University, Belagavi,
Aided by Govt. of Karnataka, Approved by All India Council for Technical Education (AICTE), New Delhi
Accredited by NBA and NAAC with 'A' Grade

BDA Outer Ring Road, Mallathalli, Bengaluru - 560 056

Ref. No. AI/ISE/605/2023

Date : 05-01-2023

This is to certify the list of courses having focus on employability/ entrepreneurship/ skill development year-wise during the last five years.

Course name	Course Code	Mapping
2021-2022		
Soft skills	18HS33	Skill Development
Employability skills	18HS43	Skill Development, Employability
Object Oriented Concepts	18IS43	Skill Development
Object Oriented Concepts Lab	18ISL46	Skill Development
Python Programming	18IS44	Skill Development
Web Technologies	18IS52	Skill Development
Artificial Intelligence	18IS53	Skill Development
Internet of things	18IS551	Skill Development
Management and Entrepreneurship	18HS61	Entrepreneurship
Machine Learning	18IS62	Skill Development, Employability
Cloud Computing	18IS63	Skill Development, Employability
Machine Learning Lab	18ISL66	Skill Development, Employability
Cloud Computing Lab	18ISL67	Skill Development, Employability
Advanced Java and J2EE	18IS641	Skill Development, Employability
Mobile Application Development	18IS644	Skill Development, Employability
Big Data Analytics	18IS71	Skill Development, Employability
Software Testing	18IS72	Skill Development, Employability
C# Programming and .Net	18IS732	Skill Development, Employability
Block Chain Technology	18IS734	Skill Development, Employability
Soft and Evolutionary Computing	18IS743	Skill Development
Big Data Analytics Lab	18ISL76	Skill Development, Employability
Software Testing Lab	18ISL77	Skill Development, Employability

BOS Chairman

HEAD

Dept of Information Science & Engg.
Dr. Ambedkar Institute of Technology
Bangalore-560 056

Principal



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Date : 05-01-2023

The list of courses having focus on employability/ entrepreneurship/ skill development

Course name	Course Code	Mapping
2020 - 2021		
Object Oriented Concepts	18IS43	Skill Development
Python Programming	18IS44	Skill Development
Object Oriented Concepts Lab	18ISL46	Skill Development
Employability skills	18HS43	Employability
Web Technologies	18IS52	Skill Development
Artificial Intelligence	18IS53	Skill Development
Internet of things	18IS551	Skill Development
Management and Entrepreneurship	18HS61	Entrepreneurship
Machine Learning	18IS62	Skill Development, Employability
Cloud Computing	18IS63	Skill Development, Employability
Machine Learning Lab	18ISL65	Skill Development, Employability
Cloud Computing Lab	18ISL66	Skill Development, Employability
Advanced Java and J2EE	18IS641	Skill Development, Employability
Digital Image Processing	18IS642	Skill Development
Big Data Analytics	IS73	Skill Development, Employability
Mobile Application Development lab	ISL75	Skill Development, Employability
Big Data And Analytics Lab	ISL76	Skill Development, Employability
C# Programming and .Net	IS744	Skill Development, Employability
Software Testing	IS81	Skill Development
Machine Learning	IS823	Skill Development, Employability


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Date : 05-01-2023

The list of courses having focus on employability/ entrepreneurship/ skill development

Course name	Course Code	Mapping
2019 - 2020		
Soft skills (MC)	18HS33	Skill Development
Object Oriented Concepts	18IS43	Skill Development
Python Programming	18IS44	Skill Development
Object Oriented Concepts Lab	18ISL46	Skill Development
Employability skills	18HS43	Employability
Java Programming	IS52	Skill Development, Employability
Web Technologies	IS53	Skill Development
Web Technologies Lab	ISL58	Skill Development
Java Programming Lab	ISL59	Skill Development
Management and Entrepreneurship	HS03	Entrepreneurship
Mobile Application Development	IS61	Skill Development, Employability
Cloud Computing	IS63	Skill Development, Employability
Cloud Computing Lab	ISL67	Skill Development, Employability
Python programming	IS653	Skill Development, Employability
Machine Learning	IS654	Skill Development, Employability
Big Data Analytics	IS73	Skill Development, Employability
C# Programming and .Net	IS744	Skill Development, Employability
Big Data And Analytics Lab	ISL76	Skill Development, Employability
Software Testing	IS81	Skill Development, Employability
Machine Learning and Applications	IS823	Skill Development, Employability


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Date : 05-01-2023

The list of courses having focus on employability/ entrepreneurship/ skill development

Course name	Course Code	Mapping
2018 - 2019		
Object Oriented Programming with C++	IS43	Skill Development
Object Oriented Programming with C++ Lab	ISL46	Skill Development
Java Programming	IS52	Skill Development
Web Technologies	IS53	Skill Development
Web Technologies Lab	ISL58	Skill Development
Java Programming Lab	ISL59	Skill Development
Management and Entrepreneurship	HS03	Entrepreneurship
Mobile Application Development	IS61	Skill Development, Employability
Cloud Computing	IS63	Skill Development, Employability
Python programming	IS653	Skill Development, Employability
Artificial Intelligence	IS651	Skill Development, Employability
Internet of Things	IS72	Skill Development, Employability
Big Data Analytics	IS73	Skill Development, Employability
Mobile Application Development lab	ISL75	Skill Development, Employability
Big Data Lab	ISL76	Skill Development, Employability
C# Programming and .Net	IS744	Skill Development, Employability
Software Testing	IS81	Skill Development


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Date : 05-01-2023

The list of courses having focus on employability/ entrepreneurship/ skill development

Course name	Course Code	
2017 - 2018		
Object Oriented Programming With C++	IS43	Skill Development
Object Oriented Programming with C++ Lab	ISL46	Skill Development
Java Programming	IS52	Skill Development
Web Technologies	IS53	Skill Development
Web Technologies Lab	ISL58	Skill Development
Java Programming Lab	ISL59	Skill Development
Management and Entrepreneurship	HS03	Entrepreneurship
Mobile Application Development	IS61	Skill Development, Employability
Cloud Computing	IS63	Skill Development, Employability
Cloud Computing Lab	ISL67	Skill Development, Employability
Cryptography and Network Security	IS656	Skill Development
Python Programming	IS72	Skill Development, Employability
Big Data Analytics	IS73	Skill Development
C# Programming and .Net	IS744	Skill Development, Employability
Python Programming Lab	ISL75	Skill Development, Employability
Cloud Computing and Big Data Lab	ISL76	Skill Development, Employability
Software Testing	IS81	Skill Development, Employability


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Dr.AMBEDKAR INSTITUTE OF TECHNOLOGY
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING


The Enclosed documents are verified and approved



HOD,ISE
HEAD

Dept. of Information Science & Engg.
Dr. Ambedkar Institute of Technology
Bangalore-560 099.

2021-2022

	SOFT SKILLS		
	Subject Code: 18HS33	Mandatory Course	No of lecture hours per week: 2 Hrs
	Exam Duration:	Exam marks: NIL	Total No. of lecture hours: 26 hrs per semester

COURSE OBJECTIVES:

1. The lessons under unit 1 is to help students to recognize oneself as an individual being aware of one's knowledge, personality, environment and lifestyle, through different base and measures like SWOC analysis, personal developments.
2. The lessons under this unit make students to understand the importance of soft skills and hard skills and how to think critically and also learn the importance of creative thinking.
3. The lessons under this unit make students to understand the importance of attitude, time, and also learn to manage them.
4. The objective of this unit is to help a student to learn the art of goal setting and being motivated in achieving his goal in spite of all the hardships with different problems along with teamwork, and leadership qualities.
5. The unit 5 aims at teaching the students about importance of handwriting, punctuation marks, spellings, which helps them, improve in writing skills.

UNIT NO	SYLLABUS CONTENT	HRS /COS
1	a. SWOC ANALYSIS b. SELF – AWARENESS AND PERSONAL DEVELOPMENT c. ETTIQUTTE AND MANNERS	5 CO1
2	d. INTRODUCTION TO SOFT SKILLS AND HARD SKILLS e. CREATIVITY f. CRITICAL THINKING	5 CO2
3	g. ATTITUDE h. ADAPTABILITY i. TIME MANAGEMENT/ PRIORITY j. STRESS MANAGEMENT	5 CO3
4	k. GOAL SETTING l. MOTIVATION m. TEAM WORK n. PROBLEM SOLVING o. LEADERSHIP	5 CO4


5	<p>p. GUIDELINES FOR HANDWRITING</p> <p>q. PUNCTUATION MARKS</p> <p>r. SPELLING</p> <p>s. VISUAL NARRATIVES(Ramayana, Mahabharata, Short Stories, films and advertisements)</p>	6 CO5
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COURSE OUTCOME:

1. After the completion of this unit students will know about their self assessments and personality that how to handle various situations in a positive way.
2. At the end of this unit student will be able to see how important it is to consider things carefully and from different angles, something one sees, hears, experiences or reads in order to understand it fully. The student will also have understood the importance of soft skills and thinking creatively.
3. After the completion of this unit students will have learnt about attitude and adaptability and also how to deal with problems and stress in the present world.
4. At the end of this unit students will have learnt some simple ways of planning to achieve his dream and also feel enthusiastic about doing something individually and as well in team.
5. After the completion of this unit students writing skills will have improved.

REFERENCE:

- English for Job Seekers (Language and Soft Skills for the Aspiring) by Geetha Rajeevan, C.L.N. Prakash at al) Cambridge University Press pvt,Ltd.
- New International Business English by Leo Jones and Richard Alexander. Cambridge University Press pvt,Ltd
- Business Benchmark by Norman Whitby. Cambridge University Press pvt,Ltd
- Grammar practice Activities (practical guide for teachers) Cambridge University Press pvt,Ltd

EMPLOYABILITY SKILLS		
	Subject Code: 18HS43	Mandatory Course
	Exam Duration:	Exam marks: NIL
		No of lecture hours per week: 2 Hrs
		Total No. of lecture hours: 26 hrs per semester

COURSE OBJECTIVE:

1. According to the present day requirement, this unit is designed on job seeking topics, adopting a task based approach with activities and worksheets.
2. In this unit students will be taught to prepare project report effectively which is integral part of their academics by making use of referencing skills. And also they will be taught how to write an abstract and will be familiarized with research paper guidelines.
3. The unit 3 aims at preparing the student to face interviews confidently.
4. Under the topics like synonyms, antonyms and homophones students' vocabulary will be enhanced.
5. The lessons under this unit help students' to use idioms and phrases, decoding the analogies and the correct usage of collective nouns

UNIT NO	SYLLABUS CONTENT	HRS/COS
1	a. Employability Skills b. PRESENTATION SKILLS c. RESUME WRITING d. COVERING LETTER e. E-MAIL WRITING	8 CO1
2	a. PROJECT REPORT b. REFERENCING SKILLS c. ABSTRACT WRITING d. RESERCH PAPER GUIDELINE AND FORMAT	2 CO2
3	e. INTERVIEW SKILLS	8 CO3
4	f. SYNONYMS g. ANTONYMS h. HOMOPHONES	4 CO4
5	i. IDIOMS & PHRASES j. ANALOGY k. COLLECTIVE NOUNS	4 CO5

COURSE OUTCOME:

1. After the completion of this unit students will have learnt to make presentations both in formal and informal situations. And also will have learnt the art of resume writing.
2. After the completion of this unit student will have learnt how to do a project report using referencing skills. And also they will have learnt how to write abstract and will have been familiarized with research paper guidelines.
3. This unit will have helped student to communicate with various skills required for job interviews.
4. After the completion of this unit the students will have learnt the strategies of vocabulary.
5. After the completion of this unit student will have learnt to use idioms and phrases in everyday conversation.

REFERENCE:

- English Skills for Technical Students by British Council, Orient Black Swan.
- A course in Grammar and Composition by Geetha Nagaraj, Cambridge University Press India Pvt. Ltd.
- Communication Skills for Professionals by Nira Konar, PHI learning Pvt. Ltd.
- Enhancing English and Employability Skills by State Board of Technical Education.

Sub Title : OBJECT ORIENTED CONCEPTS		
Sub Code: 18IS43	No. of Credits:4=4: 0 : 0 (L-T-P)	No.of Lecture Hours/Week: 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 52

UNIT No	Syllabus Content	No of Hours
1	Introduction to Java: Java and Java applications; Java Development Kit (JDK); Java is interpreted, Byte Code, JVM; Object-oriented programming; Simple Java programs. Data types and other tokens: Boolean variables, int, long, char, operators, arrays, white spaces, literals, assigning values; Creating and destroying objects; Access specifiers.Operators and Expressions: Arithmetic Operators, Bitwise operators, Relational operators, The Assignment Operator, The ? Operator; Operator Precedence; Logical expression; Type casting; Strings Control Statements: Selection statements, iteration statements, Jump Statements. T1:Ch1,2,3,4,5	11
2	Classes, Inheritance, Exceptions: Classes: Classes fundamentals; Declaring objects; Constructors, this keyword, garbage collection. Inheritance: inheritance basics, using super, creating multi-level hierarchy, method overriding. Exception handling: Exception handling in Java. Text book 2: T1 :Ch 6 , Ch 7, Ch 8 , Ch10	10
3	Packages and Interfaces, Multi-Threaded Programming: Packages, Access Protection, Importing Packages, Interfaces. Multi Threaded Programming: What are threads? How to make the classes threadable ; Extending threads; Implementing runnable; Synchronization; Changing state of the thread;read-write problem, producer consumer problems. T1 : Ch 9 , Ch 11	10

4	<p>Event Handling: Two event handling mechanisms; The delegation event model; Event classes; Sources of events; Event listener interfaces; Using the delegation event model; Adapter classes; Inner classes.</p> <p>Introducing the AWT: Working with Windows, Graphics, and Text: Introduction the AWT: Working with Windows, Graphics and Text AWT Classes, Window Fundamentals, Working with Frame Windows, Introducing Graphics, Working with Color</p> <p>T1:Ch 22 , Ch 23</p>	10
5	<p>Swings: Swings: The origins of Swing; Two key Swing features; Components and Containers; The Swing Packages; A simple Swing Application; Create a Swing Applet; JLabel and ImageIcon; JTextField;The Swing Buttons; JTabbedPane; JScrollPane; JList; JComboBox; JTable.</p> <p>T1: Ch 29, Ch 30</p>	11

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of the course students will be able to

CO1:Develop JAVA programs using OOPs principles.

CO2: Develop computer programs to solve real world problems in Java.

CO3: Develop simple GUI interfaces for a computer program to interact with users, and to comprehend the event-based GUI handling principles using Applets and swings.

CO4: Develop the procedure to store and retrieve data using AWT

CO5:Build the simple swings module using Jlist, Jcombobox as GUI

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO4,PO5
CO2	PO1, PO5,PO6, PO9,PO10,
CO3	PO1, PO2,PO2,PO5,PO11
CO4	PO1,PO2,PO3, PO4,PO5
CO5	PO3,PO4,,PO5, PO9,PO11

TEXT BOOK:

1. Herbert Schildt: Java - The Complete Reference, 7th Edition, Tata McGraw Hill, 2007. (Chapters 1, 2, 3, 4, 5, 6, 8, 10, 11, 21, 22, 29, 30, 31)

REFERENCE BOOKS:

1. Mahesh Bhawe and Sunil Patekar, "Programming with Java", First Edition, Pearson Education,2008, ISBN:9788131720806
2. Herbert Schildt, The Complete Reference C++, 4th Edition, Tata McGraw Hill, 2003.
3. Stanley B.Lippmann, JoseeLajore, C++ Primer, 4th Edition, Pearson Education, 2005.
4. RajkumarBuyya,SThamarasiselvi, xingchenchu, Object oriented Programming with java, Tata McGraw Hill education private limited.
5. Richard A Johnson, Introduction to Java Programming and OOAD, CENGAGE Learning.E Balagurusamy, Programming with Java A primer, Tata McGraw Hill companies

Sub.Title: PYTHON PROGRAMMING		
Sub Code: 18IS44	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. Understanding the syntax and semantics of the Python language.
2. To create Functions in Python.
3. To handle Files & Regular expressions in Python.
4. To apply Object Oriented Programming concepts in Python.
- 5 To create Threaded and Networking applications in Python .

UNIT No	Syllabus Content	No of Hours
1	Introduction to Python, Writing Our First Python Program, Datatypes in Python, Operators in Python, Input and Output, Control Statements T1: Ch 1, Ch 2, Ch 3, Ch 4,Ch 5 , Ch 6	7
2	Arrays in Python, Strings and Characters, Functions, Lists and Tuples, Dictionaries T1: Ch 7,Ch 8,Ch 9, Ch 10, Ch 11	7
3	Introduction to OOPS, Classes and Objects, Inheritance and Polymorphism T1: Ch12,Ch13,Ch14,Ch16	7
4	Files in Python, Regular Expressions in Python, Data Structures in Python, Date and Time T1: Ch 17, Ch 18 ,Ch 19, Ch 20	9
5	Threads, Graphical User Interface, Networking in Python, Python's Database Connectivity T1: Ch 20 ,Ch 21, Ch 22, Ch 23	9

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of the above course students will be able to

CO1: Demonstrate the understanding and usage of core python scripting elements python constructs, data types.

CO2 : Demonstrate the understanding and usage of functions ,lists, tuples and dictionaries.

CO3: Demonstrate the understanding and usage of modules, packages and regular expressions.

CO4: Demonstrate usage of object oriented features such as Inheritance, Polymorphism, operator

overloading.

CO5:Apply the knowledge of python and

TEXT BOOK:

1. Core Python Programming: Dr.R.Nageshwara Rao,Dreadm Tech Press 2018

REFERENCE BOOKS:

1. Think Python, Allen Downey, Green Tea Press.
2. Learning Python, Mark Lutz, Orielly.

COs	Mapping with POs
CO1	PO1,PO2,PO4
CO2	PO1,PO2,PO4
CO3	PO1,PO2,PO4,PO5,PO8
CO4	PO1,PO2,PO4,PO5,PO8
CO5	PO1,PO2,PO4,PO5,PO8

Sub Title : OBJECT ORIENTED CONCEPTS LAB		
Sub Code:: 18ISL46	No. of Credits:1= 0:0:1 (L-T-P)	No. of Lecture Hours/Week: 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 = 100	

Course Objectives:

1. Design programs using classes and objects for java
2. Build programs for automatic initialization of objects and destroy objects that are no longer required through constructors and destructors.
3. Construct applications to provide flexible options for the creation of new definitions for some of the operators.
4. Specifying mechanism of deriving a new class from older classes through inheritance.
5. Implement methods to select appropriate member function during run time.

I. LIST OF PROGRAMS

- 1 Create a class called Student with the following details as variables within it.
 - (i) USN
 - (ii) Name
 - (iii) Branch
 - (iv) Phone
 Write a Java/c++ program to create nStudent objects and print the USN, Name, Branch, and Phone of these objects with suitable headings.
- 2 Design
 - a. Java/c++ Program to demonstrate Constructor Overloading and method overloading
 - b. Develop a Java/c++ Program to implement Inner class and demonstrate its Access Protections.
- 3 Write a Java/c++ program to implement the Stack using arrays. Write Push(), Pop(), and Display() methods to demonstrate its working.
- 4 Design a superclass called Staff with details as StaffId, Name, Phone, Salary. Extend this class by writing three subclasses namely Teaching (domain, publications), Technical (skills), and Contract (period). Write a Java program to read and display at least 3 staff objects of all three categories.
- 5 Write a Java class called Customer to store their name and date_of_birth. The date_of_birth format should be dd/mm/yyyy. Write methods to read customer data as and display as using StringTokenizer class considering the delimiter character as "/".
- 6 Write a Java/c++ program to read two integers a and b. Compute a/b and print, when b is not zero. Raise an exception when b is equal to zero.
- 7 Write a Java program that implements a multi-thread application that has three threads. First thread generates a random integer for every 1 second; second thread computes the square of the number and prints; third thread will print the value of cube of the number.
- 8 Design a JAVA program using Synchronized Threads, which demonstrates Producer Consumer concept.

- 9 Develop JAVA programs which demonstrates utilities of Linked List Class
- 10 Develop JAVA Applet programs which handles Key Board Event

Identify the different objects in the following environments and implement different suitable operations

- 1. Banking System
- 2. Library
- 3. Automobile Industry
- 4. Home Appliances
- 5. User Interface design etc

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY APPROVED BY THE STAFF IN CHARGE.

2. IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 10 QUESTIONS

Course Outcomes:

After completing the course the students are able to:

- CO1:Design programs using classes and objects using JAVA/C++
- CO2:Develop programs for automatic initialization of objects and destroy objects that are no longer required.
- CO3:Develop applications to provide flexible options for the creation of new definitions for some of the operators.
- CO4:Specify mechanism of deriving a new class from older classes through inheritance .
- CO5:Design a program using Templates & Exception Handling.

COs	Mapping with POs
CO1	PO2,PO3,PO5
CO2	PO2,PO3,PO6,PO9
CO3	PO2,PO3,PO5,PO6
CO4	PO2,PO3,PO5,PO9
CO5	PO2,PO3,PO5,PO6

Sub Title : WEB TECHNOLOGIES		
Sub Code: 18IS52	No. of Credits:4=3 : 1 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 52
Course Objectives: <ol style="list-style-type: none"> 1. To create a web pages using XHTML using Cascading Style Sheets 2. To do data validation and user interaction using JavaScript 3. To create XML documents and provide styling to documents. 4. To design web applications using the concepts of PHP 5. To design real world Web applications 		

Unit No	Syllabus Content	No of Hours
1	XHTML : Origins and evolution of HTML and XHTML; Basic syntax; Standard XHTML document structure; Basic text markup. Images; Hypertext Links; Lists; Tables; Forms; Frames; Syntactic differences between HTML and XHTML. Introduction to XML: XML Syntax; Document structure; Document Type definitions; Namespaces; XML schemas; Displaying XML documents with CSS; XSLT style sheets; XML processors; Web services CSS: Introduction; Levels of style sheets; Style specification formats; Selector forms; Property value forms; Font properties; List properties; Color; Alignment of text; The Box model; Background images. T1:Ch 2, Ch 3, Ch 7	12
2	JavaScript: Overview of JavaScript; Object orientation and JavaScript; General syntactic characteristics; Primitives, operations, and expressions; Screen output and keyboard input; Control statements; Object creation and modification; Arrays; Functions; Constructor; Pattern matching using regular expressions. T1: Ch 4	10
3	JavaScript and HTML documents: The JavaScript execution environment; The Document Object Model; Element access in JavaScript; Events and event handling; Handling events from the Body elements, Button elements, Text box and Password elements; The DOM 2 event model T1: Ch 5	10
4	PHP: Origins and uses of PHP, Overview of PHP, General syntactic characteristics, Primitives, Operations, and Expression, Output, Control Statements, Arrays, Form handling, Files, Cookies, Session Tracking. T1: Ch 11	10

5	Web Application Design: Real World Web Software Design, Principles of Layering, Software design patterns in the web context, Data and Domain patterns, Presentation patterns, T2: Ch 14	10
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

Students will demonstrate the knowledge and the skills acquired with respect to:

CO1: Design simple web pages using different tags of XHTML and Classify and use different levels of style sheets

CO2 : Validate and provide user functionality using JavaScript

CO3 : Design and develop XML document and use the style sheet to display.

CO4: Design and develop PHP programs to perform database access & session tracking.

CO5: Develop web application projects

Sub Title :ARTIFICIAL INTELLIGENCE		
Sub Code:18IS53	No. of Credits:3=3: 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours :39
Course Objectives:		
<ol style="list-style-type: none"> 1. Understand about agent, behavior and structure 2. Learn different AI models and search strategies 3. Representation of knowledge and reasoning 4. Gain knowledge about learning strategies 		

Unit No	Syllabus Content	No of Hours
1	What is AI? Intelligent Agents: Agents and environment; Rationality; the nature of environment; the structure of agents. Problem-solving: Problem- solving agents; Example problems	8
2	Knowledge representation issues: Representations and mappings approaches to knowledge representation, Issues in knowledge representation	8
3	Logical Agents: Knowledge based agents, The Wumpus world, Logic- Propositional logic Propositional theorem proving, Effective propositional model checking, Agents based on propositional logic. Using predicate logic: Representing simple facts in logic	8
4	Resolution, Natural Deduction, Learning: Forms of Learning; Inductive learning; Learning decision trees; Ensemble learning; Computational learning theory	8

5	Statistical learning, Maximum likelihood parameter learning, Bayesian parameter learning, passive reinforcement learning, active reinforcement learning	7
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

CO1: Describe the modern view of AI as the study of agents that receive percepts and perform actions.	
CO2: Apply AI search Models and Generic search strategies.	
CO3: Write Logic for representing Knowledge and Reasoning of AI systems.	
CO4: Design different learning algorithms for improving the performance of AI systems.	
CO5: Implement projects using different AI learning techniques	
COs	Mapping with POs
CO1	PO1,PO2
CO2	PO1,PO2,PO12
CO3	PO1,PO2,PO4,PO6,PO12
CO4	PO1,PO2,PO3,PO4,PO12
CO5	PO1,PO2,PO3,PO4,PO6,PO12

TEXT BOOKS:

1. “Artificial Intelligence: A Modern Approach ” by Stuart Russel, Peter Norvig, 2nd Edition, Pearson Education, 2003.

2. “Artificial Intelligence” by Elaine Rich, Kevin Knight, Shivashankar B Nair: Tata MCGraw Hill 3rd edition. 2013

REFERENCE BOOKS/WEBLINKS:

1. Luger, G. F., & Stubblefield, W. A., Artificial Intelligence - Structures and Strategies for Complex Problem Solving. New York, NY: Addison Wesley, 5th edition (2005).

2. Nilsson, N. J. Artificial Intelligence - A Modern Synthesis. Palo Alto: Morgan Kaufmann. (1998).

3. Nilsson, N. J., Principles of Artificial Intelligence. Palo Alto, CA: Tioga (1981).

4. Rich, E., & Knight, K., Artificial Intelligence. New York: McGraw-Hill (1991).

E Books:

1. Practical Artificial Intelligence Programming With Java, Third Edition ,Mark Watson

2. Artificial Intelligence Lecture Notes MIT.

MOOCs:

1. Artificial Intelligence - <http://www.nptelvideos.in/2012/11/artificial-intelligence.html>

Sub Title : INTERNET OF THINGS		
Sub Code:18IS551	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours :39
Course Objectives <ol style="list-style-type: none"> To Learn the characteristics, designs,and challenges in the IoT To Understand the key Technologies and protocols in IoT To Analyze various Layers connectivity and motivation of IPV6 To Illustrate the role of IoT in various domains of Industry Infer the role of Data Analytics in IOT 		

UNIT No	Syllabus Content	No of Hours
1	Introduction to IoT Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs.Enabling IOT Technologies,IOT and M2M-Introduction, difference between IOT and M2M. T1:Chapter1-1.1,1.2,1.3,1.4 , Chapter3-3.1,3.2,3.3	8
2	Fundamentals IoT Mechanism and Key Technologies-Identification of IoT Object and Services, Structural Aspects of the IoT, Key IoT Technologies. Evolving IoT Standards-Overview and Approaches,IETF IPV6 Routing Protocol for RPL Roll, Constrained Application Protocol, Representational State Transfer, ETSI M2M,Third Generation Partnership Project Service Requirements for Machine-Type Communications, CENELEC, IETF IPv6 Over Lowpower,Zigbee. T2:Chapter4-4.1,4.2,4.3 T2:Chapter5-5.1,5.2,5.3,5.4,5.5,5.6,5.7,5.8,5.9	8
3	Layer ½ Connectivity: Wireless Technologies for the IoT-WPAN Technologies for IoT/M2M, Cellular and Mobile Network Technologies for IoT/M2M,Layer 3 Connectivity :IPv6 Technologies for the IoT: Overview and Motivations. Address Capabilities,IPv6 Protocol Overview, IPv6 Tunneling. TEXT BOOK 2: Chapter6-6.1,6.2, Chapter7-7.1,7.2,7.3,7.4,7.5	8
4	Case Studies Illustrating IoT Design-Introduction, Home Automation, Cities,Environment, Agriculture, Productivity Applications. T1:Chapter 9-9.1,9.2,9.3,9.4,9.5,9.6	8

5	Data Analytics for IoT – Introduction, Apache Hadoop, U Spark, Apache Storm, Using Apache Storm for Real-time Data Analysis, Structural Health Monitoring . T1:Chapter 10-10.1,10.2,10.3,10.4,10.5,10.6,10.7,10.8	7
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course outcomes:

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

CO1: Interpret the impact and challenges posed by IoT networks

CO2: Appraise the role of IoT protocols for efficient network communication

CO3: Deployment of different sensor technologies and Layers to connect the network.

CO4: To Deploy the role of IoT design in various domains of Industry

CO5:Elaborate the need for Data Analytics

Sub Title: Management and Entrepreneurship		
Sub Code: 18HS61	No. of Credits : 3	No. of Lecture hours/week : 3
Exam Duration :3 hours	CIE + Assignment + SEE =100 = 45 + 5 + 50 = 100	Total No. of Contact Hours: 39

Course Objectives :

1. To help students understand the Management concepts & its evolution.
2. To impart the knowledge about various Managerial functions.
3. To make the student learn the Entrepreneurial process.
4. To understand the role of SSI in economic development and gain an insight of funding agencies.
5. To have a clear understanding of preparation of project & its screening.

UNIT NO	Syllabus Content	No. of Hours
1	<p>MANAGEMENT: Introduction- Meaning, characteristics of management, functions of Management- POSDCORB, Levels and Skills of Management, Roles of Managers Management as science or an art or profession, Management and Administration, Development of management thought - Early management approaches: Psychological Development, Bureaucratic, Scientific and Administrative, Human Relations Approach, Modern management approaches: Behavioral, Systems, Quantitative and Contingency Approach.</p>	07 Hours
2	<p>PLANNING: Meaning, Types of Plans (Single use & Standing plans), Steps in Planning process. ORGANIZING: – Meaning, Types of organization (Line, Staff, Line & Staff, Matrix and Committee form) Departmentation (Functional, Product, Process, Territorial and Customer), Span of Control, MBO and MBE. STAFFING: Meaning and importance of staffing, Sources of recruitment, process of selection. DIRECTING: Meaning, Leadership: Definition, Leadership styles (Autocratic, Democratic, Charismatic, Laissez faire and Participative.) Introduction to motivation: Meaning & Definition – Maslow, Herzberg & McGregor’s Theory X & Y. Communication– Meaning, types, communication process and barriers of communication, Co-ordination: Meaning and importance. CONTROLLING: Meaning, steps in controlling, types of controlling. <i>Case study discussion with respect to Indian context.</i></p>	08 Hours
3	<p>ENTREPRENEUR: Definition & Meaning, Characteristics, types of entrepreneurs(Imitative, Innovative, Fabian and drone), Intrapreneur- meaning, Difference between Entrepreneurs, Intrapreneur & Manager, Stages in Entrepreneurial process, barriers to entrepreneurs, Role of Entrepreneurs in economic development. Rural entrepreneurship– Definition, challenges & opportunities. Women Entrepreneurs – Definition, challenges, and Institutional support to Women Entrepreneurs in India Family Business: Meaning and Definition, succession planning in family business and reasons for failure of family business. Corporate Social Responsibility- Meaning, definition and benefits. <i>Case study discussion with respect to Indian context.</i> <i>Activity: Profile of successful entrepreneur.</i></p>	08 Hours

4	<p>MSME: Definition of MSME (latest). SMALL SCALE INDUSTRY: Meaning, and definition, Characteristics, forms of ownership, sources of financing, Steps to start SSI, Problems faced by SSI. Introduction to GATT, WTO & LPG.</p> <p>Institutional Support: <i>Central level Institutions</i> – KVIC, NSIC, SIDBI, EDI and NABARD. <i>State level Institutions-</i> DIC, KSFC, KIADB, TECSOK.</p> <p>STARTUP COMPANIES-Meaning and Challenges. Make in India concept and MUDRA Bank Initiative.</p> <p><i>Activity for students: Schemes for startup companies.</i></p>	09 Hours
5	<p>PREPARATION OF PROJECT:</p> <p>Project- Meaning, Project identification, Project selection, Project Appraisal, Project implementation. Project Report –Outline, Feasibility Study- –PESTLE and errors in preparation of project report.</p> <p><i>Activity for students: Writing of a business plan.</i></p>	7 Hours

Note: Every unit will have an internal choice question for SEE.

Course Outcomes :

- CO1 : The students will gain knowledge on management concepts & its evolution.
- CO2 : The students will learn the application of managerial skills & attributes.
- CO3 : The students will get an in depth knowledge of entrepreneurial process & contribute to the betterment of the society.
- CO4 : Students will be able to compile information about setting up an MSME & explore the sources of funding agencies.
- CO5 : Students will be able to identify business opportunities & design a project report.

Sub Title : MACHINE LEARNING		
Sub Code: 18IS62	No. of Credits: 4 =4:0:0:0	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 52
<p>Course objectives: This course will enable students to:</p> <ol style="list-style-type: none"> 1. Define machine learning and understand about various machine learning applications 2. Differentiate supervised, unsupervised and reinforcement learning methods 3. Apply decision trees, neural networks, Bayes classifier, Kmeans clustering and k-nearest neighbour methods for problems in machine learning 		

Unit No.	Syllabus Content	No. of Hours
1	<p>INTRODUCTION TO MACHINE LEARNING: Introduction; Human learning and types of human learning; What is machine learning?; Types of machine learning; Well-posed learning problems; Designing a learning system; Applications of machine learning; Tools in machine learning; Machine learning activities; Issues in machine learning.</p> <p>CONCEPT LEARNING AND THE GENERAL-TO-SPECIFIC ORDERING: Concept learning task; Concept learning as search; Find-S algorithm; Version spaces and the Candidate-elimination algorithm.</p> <p>T2: Ch 1: 1.1- 1.8 ,T1: 1.1-1.3 ; T1:Ch 2:2.1-2.5 ,T2: 2.2 .</p>	11
2	<p>DECISION TREE LEARNING: Decision tree representation; Appropriate problems for decision tree learning; Basic decision tree learning algorithm; Hypothesis space search in decision tree learning; Inductive bias in decision tree learning; Issues in decision tree learning;</p> <p>T1:Ch 3: 3.2-3.7.</p>	11
3	<p>ARTIFICIAL NEURAL NETWORKS: Introduction; Neural Network representations; Appropriate problems for neural network learning; Perceptrons; Backpropagation algorithm.</p> <p>BAYESIAN LEARNING-I: Introduction; Bayes theorem; Bayes theorem and concept learning;</p> <p>T1:Ch 4: 4.1-4.4 (Only 4.4.1), 4.5 ;T1:Ch 6: 6.1-6.3(Only 6.3.1)</p>	10
4	<p>BAYESIAN LEARNING-II: Bayes optimal classifier; Naive Bayes classifier; Bayesian belief networks.</p> <p>CLUSTERING: Introduction; Kmeans clustering</p> <p>T1:Ch 6: 6.7, 6.9, 6.11</p>	10
5	<p>INSTANCE BASED LEARNING: Introduction; k-nearest neighbor learning</p>	10

REINFORCEMENT LEARNING: Introduction; Learning task. T1:Ch 8: 8.1-8.3; T1:Ch 13: 13.1-13.3 Use Cases: Applications of Reinforcement Learning in Finance, Banking	
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks: Assignment – I from Units 1 and 2. Assignment – II from Units 3 and 4 . Assignment -III from Unit 5

Course Outcomes:

After completion of course students will be able to:

CO1: Identify problems of machine learning and it's methods

CO2: Apply apt machine learning strategy for any given problem

CO3: Design systems that uses appropriate models of machine learning

CO4: Solve problems related to various learning techniques

COs	Mapping with POs
CO1	PO1, PO2
CO2	PO3, PO4
CO3	PO2,PO3, PO5,PO12
CO4	PO4, PO9, PO12

TEXT BOOKS:

1. Tom M. Mitchell, "Machine Learning", McGraw Hill Education. India Edition 2013.
2. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, "Machine Learning" , Pearson India Education Services Pvt. Ltd., 2019.

REFERENCE BOOKS/WEB LINKS:

1. Ethem Alpaydin, "Introduction to Machine Learning", 2nd Ed., PHI Learning Pvt. Ltd., 2013.
2. T. Hastie, R. Tibshirani, J. H. Friedman, "The Elements of Statistical Learning", Springer; 1st edition, 2001.
3. Peter Harrington , "Machine Learning in Action", MANNING Shelter Island Publication, ISBN 9781617290183, 2012.

Weblinks:

1. [NPTEL course by Balaram Ravindran](#)
2. [FAST.ai course on ML](#)

Sub Title : CLOUD COMPUTING		
SubCode:18IS63	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To study the history and the fundamental concepts of Cloud Computing, Parallel, Distributed Computing and Virtualization.
2. To understand the concept of cloud computing architecture and different Cloud models.
3. To impart Cloud offerings which enhances the usage of Cloud.
4. To analyze the Cloud Storage and Security maintenances.
5. To become familiar with the different applications of Cloud Computing.

UNIT No	Syllabus Content	No of Hours
1	Introduction to Cloud Computing: Cloud Computing at a Glance, Historical Developments, Building Cloud Computing Environments Computing Platforms and Technologies. T1: Ch1: 1.1-1.3	7
2	Principles of Parallel and Distributed Computing: Eras of Computing , Parallel vs. Distributed Computing, Elements of Parallel Computing, Elements of Distributed Computing, Technologies for Distributed Computing Virtualization: Introduction, Characteristics of Virtualized Environments, Virtualization and Cloud Computing, Pros & Cons of Virtualization. Technology examples: Xen: paravirtualization, VMware: full virtualization, Microsoft Hyper-V. T1: Ch 2: 2.1-2.5, Ch 3: 3.1-3.6	9
3	Cloud Computing Architecture: Introduction, Cloud Reference Model, types of Clouds, Economics of the cloud, Open challenges. T1: Ch 4: 4.1-4.5	7
4	Cloud offerings: Cloud Analytics, Testing under cloud, Information Security, Virtual Desktop Infrastructure, Storage Cloud. Cloud management: Introduction, Resiliency, Provisioning, Asset management. Cloud governance, High availability and disaster recovery, Charging models, Usage reporting, Billing and metering. T2: Ch 3: 3.1-3.4	7
5	Cloud Platforms in Industry: Amazon Web Services, Google AppEngine. Cloud Applications: Scientific Applications, Business and Consumer Applications. T1: Ch 9: 9.1-9.2, Ch: 10: 10.1-10.2	9

Note 1: All chapters will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks: Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 . Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the student will be able to:

CO1: Analyze core concepts and fundamentals of the Cloud Computing.

CO2: Identify systems, protocols and mechanisms to support Cloud Infrastructure.

CO3: Analyze the Software and Hardware necessities for Cloud Computing.

CO4: Develop applications and host on Cloud Environment.

CO5: To manage the Cloud Environment.

COs	Mapping with Pos
CO1	PO4,PO5,PO10,PO11,PO12
CO2	PO1,PO2,PO4,PO7,PO8,PO9
CO3	PO2,PO3, PO4,PO5,PO9,PO10
CO4	PO3,PO4,PO5,PO7,PO8, PO9,PO10,PO11,PO12
CO5	PO4,PO5,PO6,PO7,PO8,PO10,PO11,PO12

TEXT BOOKS:

1. Rajkumar Buyya, Christian Vecchiola, S Thamarai Selvi ,Mastering Cloud Computing , Tata McGraw Hill Education Private Limited, 2013.
2. Dr. Kumar Saurabh , Cloud Computing , Wiley India, 2011.

REFERENCE BOOKS:

1. Dinkar Sitaram, Geetha Manjunath ,Moving to the Cloud. Elsevier Publications, 2011.
- Barrie Sosinsky, Cloud Computing Bible , Wiley Publishing, Inc, 2011.

Sub Title : ADVANCED JAVA AND J2EE		
Sub Code:18IS641	No. of Credits: 3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 39
Course Objectives: <ol style="list-style-type: none"> 1. Identify the need for advanced Java concepts like Enumerations and Collections 2. Construct client-server applications using Java socket API. 3. Make use of JDBC to access database through Java Programs. 4. Adapt servlets to build server side programs. 5. Demonstrate the use of JavaBeans to develop component-based Java software 		

Unit No.	Syllabus Content	Noof Hours
1	<p>Enumerations, Autoboxing and Annotations(metadata): Enumerations, Enumeration fundamentals, the values() and valueOf() Methods, java enumerations are class types, enumerations Inherits Enum, example, type wrappers, Autoboxing, Autoboxing and Methods, Autoboxing/Unboxing occurs in Expressions, Autoboxing/Unboxing, Boolean and character values, Autoboxing/Unboxing helps prevent errors, A word of Warning. Annotations, Annotation basics, specifying retention policy, Obtaining Annotations at run time by use of reflection, Annotated element Interface, Using Default values, Marker Annotations, Single Member annotations, Built-In annotations. T1:Ch 12</p>	7
2	<p>The collections and Framework: Collections Overview, Recent Changes to Collections, The Collection Interfaces, The Collection Classes, Accessing a collection Via an Iterator, Storing User Defined Classes in Collections, The Random Access Interface, Working With Maps, Comparators, The Collection Algorithms, Why Generic Collections?, The legacy Classes and Interfaces, Parting Thoughts on Collections. T1: Ch.17</p>	8
3	<p>String Handling :The String Constructors, String Length, Special String Operations, String Literals, String Concatenation, String Concatenation with Other Data Types, String Conversion and toString() Character Extraction, charAt(), getChars(), getBytes() toCharArray(), String Comparison, equals() and equalsIgnoreCase(), regionMatches() startsWith() and endsWith(), equals() Versus == , compareTo() Searching Strings, Modifying a String, substring(), concat(), replace(), trim(), Data Conversion Using valueOf(), Changing the Case of Characters Within a String, Additional String Methods, StringBuffer , StringBuffer Constructors, length() and capacity(), ensureCapacity(), setLength(), charAt() and setCharAt(), getChars(),append(), insert(), reverse(), delete() and deleteCharAt(), replace(), substring(), Additional StringBuffer Methods, StringBuilder T 1: Ch 15</p>	08

4	Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet; The Servlet API; The Javax.servlet Package; Reading Servlet Parameter; The 08 Javax.servlet.http package; Handling HTTP Requests and Responses; Using Cookies; Session Tracking. Java Server Pages (JSP): JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects T1: Ch 31, T2: Ch 11	08
5	The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process; Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data types; Exceptions. T2: Ch 06	08

Note 1: All Units will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks: Assignment – I from Units 1 and 2; Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

TEXT BOOK:

1. Herbert Schildt: JAVA the Complete Reference, 7th/9th Edition, Tata McGraw Hill, 2007.
2. Jim Keogh: J2EE-TheCompleteReference, McGraw Hill, 2007.

REFERENCE BOOKS:

1. Y. Daniel Liang: Introduction to JAVA Programming, 7thEdition, Pearson Education, 2007.
2. Stephanie Bodoff et al: The J2EE Tutorial, 2nd Edition, Pearson Education,2004.
3. Uttam K Roy, Advanced JAVA programming, Oxford University press, 2015.

Course Outcomes:

After the completion of the course students will be able to

CO1: Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs

CO2:Build client-server applications and TCP/IP socket programs

CO3: Illustrate database access and details for managing information using the JDBC API

CO4: Describe how servlets fit into Java-based web application architecture

CO5:Develop reusable software components using Java Beans

COs	Mapping with POs
CO1	PO1,PO2
CO2	PO1,PO2,PO3
CO3	PO1,PO3,PO4
CO4	PO1,PO4
CO5	PO1,PO2,PO3

Sub Title: MACHINE LEARNING LAB		
SubCode: 18ISL65	No. of Credits:1=0: 0 : 1 (L-T-P)	No. of lecture hours/week : 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 =100	
Course Objectives : This course will enable students to: <ol style="list-style-type: none"> 1. Define machine learning and understand about various machine learning applications 2. Differentiate supervised, unsupervised and reinforcement learning methods 3. Apply decision trees, neural networks, Bayes classifier, K-means clustering and k-nearest neighbor methods for problems in machine learning 		

LIST OF PROGRAMS PART-A:

Execute the following programs using Google Colab/Anaconda/Jupyter Notebook:

1. Demonstrate the following:
 - a. Creation of .CSV files
 - b. insert synthetic data manually into .CSV files
 - c. uploading of .CSV files from local drive to python environment.
 - d. uploading of .CSV files from Google drive to python environment.
2. Demonstrate how to generate synthetic datasets(not manual entry) and generate at least 4 features.
3. Demonstrate the working of Find-S algorithm for finding the most specific hypothesis using appropriate training samples.
4. Implement Candidate Elimination algorithm and display all the consistent hypotheses using appropriate training samples.
5. Create a .CSV file for the datasets containing the following fields(age, income, student, credit_rating, Buys_computer) where Buys_computer is the target attribute and implement ID3 algorithm for the same.
6. Demonstrate the working of XOR gate using Artificial Neural network with Backpropagation method using Tanh activation function.
7. Implement KNN algorithm to classify “iris dataset” using Kaggle or Machine learning repositories.
8. Implement K-means algorithm using suitable dataset from Kaggle repository or any other Machine Learning repositories

PART-B: Virtual Lab

1.Implementation of AND/OR/NOT Gate using Single Layer Perceptron.

2.Understanding the concepts of Perceptron Learning Rule.

3.Understanding the concepts of Correlation Learning Rule.

Web link for 1,2 and 3:

http://vlabs.iitb.ac.in/vlabs-dev/labs/machine_learning/labs/index.php 4.Neural networks simulation

Web link for 4: <https://playground.tensorflow.org/>

Course Outcomes:

After completion of course students will be able to:

- CO1: Identify problems of machine learning and its methods
 CO2: Apply apt machine learning strategy for any given problem
 CO3: Design systems that uses appropriate models of machine learning
 CO4: Solve problems related to various learning techniques

COs	Mapping with POs
CO1	PO1, PO2
CO2	PO3, PO4
CO3	PO3, PO5, PO6
CO4	PO4, PO9, PO12

Sub Title : CLOUD COMPUTING LAB		
Sub Code:18ISL66	No of Credits : 0:0:1(L:T:P)	No. of Lecture Hours/Week : 02
Exam Duration : 3 hours	Exam Marks : CIE + SEE = 50 + 50 = 100	

Course Objectives:

1. To understand the working and usage of different cloud service models.
2. To study the basic understanding of Installation and Configuration of Cloud environment.
3. To understand the concept of Service Model and its usage in Cloud Computing.
4. To learn development of applications using IaaS, PaaS and SaaS.
5. Understand how Cloud environment works, for various deployment models.

I. LIST OF PROGRAMS

PART A

1. Demonstrate the working of Google Drive to make spreadsheet and notes.
2. Installation, Configuration and working on Dropbox.
3. Demonstrate the working in Cloudanywhere to demonstrate different development stacks.
4. Demonstrate the working of Google Form to develop event feedback system.
5. Create an application in Salesforce.com to maintain product information.
6. Create an application in Salesforce.com to demonstrate master-child relationship on invoice bill.
7. Develop a Visual Force Page to demonstrate the working of dependent field.
8. Develop a Visual Force Page to demonstrate the working of basic visual components.
9. Demonstrate the working in Codenvy to illustrate Provisioning and Scaling of a Website.
10. Demonstrate Virtualization using VMware/Hypervisor.

II. OPEN ENDED QUESTIONS

1. Installation and Configuration of Cloudsim cloud software.
2. Installation and Configuration of OpenStack or any equivalent cloud software.

3. Design and implement Cloud based application(mini-project)

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.

2. STUDENT IS REQUIRED TO EXECUTE ONE PROGRAM FROM PART A and ONE PROGRAM FROM PART B .

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Analyze the requirements to setup: Cloud Environment using IaaS Environment

CO2: Develop the ability to solve real-world problems through software development on Cloud Environment.

CO3: Implement, compile, test and run Java/Php/Python programs comprising on PaaS to address a particular software problem.

CO4: Design and develop useful Cloud applications with elegant user interfaces using SaaS.

COs	Mapping with POs
CO1	PO1,PO2,PO5,PO7,PO11
CO2	PO1,PO2, PO5, PO7,PO12
CO3	PO1,PO7,PO9,PO10,PO12
CO4	PO1,PO2,PO6,PO9,PO12

Sub Title : MOBILE APPLICATION DEVELOPMENT		
Sub Code: 18IS644	No. of Credits: 3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment +Group Activity + SEE = 45 + 5+5+50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To understand fundamentals of Android OS, and use appropriate tools for Android Application development.
2. To be familiar with managing of application resources to build elegant user interfaces with views, layouts & fragments
3. To design styling, and common design patterns found among applications
4. To understand storing of application data using preferences, files and directories, SQLite, and content providers.
5. Develop, test, debug and publish mobile applications using android Platform.

UNIT No	Syllabus Content	No of Hours
1	<p>Platform Overview: Introducing Android – History of Mobile Software Development, The Open Handset Alliance, Android Platform Uniqueness, The Android Platform, Setting Up Your Android Development Environment - Configuring Your Development environment, Exploring the Android SDK. Creating first android application - Testing Your Development Environment, Building Your First Android Application.</p> <p>Application Basics : Understanding Application Components - Mastering Important Android Terminology, The Application Context, Performing Application Tasks with Activities, Organizing Activity Components with Fragments, Managing Activity Transitions with Intents TB1: Ch1, Ch2, Ch3,ch4</p>	7
2	<p>Application Basics Continued – Defining the Manifest , Managing Application Resources- What Are Resources?, Adding Simple Resource Values in Android Studio, Working with Different Types of Resources, Working with Layouts, Exploring Building Blocks, Positioning with Layouts, Partitioning with Fragments TB1: Ch5,ch6,ch7,ch8,ch9</p>	9

3	<p>Application Design Essentials: Architecting with Patterns-Architecting Your Application's Navigation, Encouraging Action,, Appealing with Style-Styling with Support, Themes and Styles, Colors, Layout, Embracing Material Design-Understanding Material, The Default Material Theme, Designing Compatible Applications -Maximizing Application Compatibility, Designing User Interfaces for Compatibility, Providing Alternative Application Resources, Targeting Tablets and TVs, Extending Application to Watches and Cars.</p> <p>TB1: Ch10, ch11,ch12,ch13</p>	7
4	<p>Application Development Essentials: Using Android Preferences-Working with Application Preferences, Finding Preferences Data on the File System, Creating Manageable User Preferences, Auto Backup for Android Applications.</p> <p>Accessing Files and Directories: Working with Application Data on a Device, Practicing Good File Management, Understanding Android File Permissions, Working with Files and Directories,</p> <p>Saving with SQLite : Working with Databases</p> <p>Leveraging Content Providers - Exploring Android's Content Providers, Modifying Content Providers Data, Using Third-Party Content Providers</p> <p>TB1: Ch14,Ch15,Ch16, Ch17</p>	9
5	<p>Application Delivery Essentials:</p> <p>Testing Your Applications - Best Practices in Testing Mobile Applications, Android Application Testing Essentials, More Android Automated Testing Programs and APIs, Distributing Your Applications - Choosing the Right Distribution Model, Packaging Your Application for Publication, Publishing to Google Play, Google Play Staged Rollouts, Publishing to the Google Play Private Channel, Translating Your Application, Publishing Using Other Alternatives, Self-Publishing Your Application.</p> <p>TB1: Ch21 and Ch22</p>	7

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Analyze the fundamentals to build Mobile apps by assessing the basic framework by usage of Android SDK.

CO2: Design Android applications using various resources and built-in classes.

CO3:Apply creative skills in designing and deploying the sophisticated mobile applications.

CO4: Design and deploy Android applications with compelling User Interfaces and databases.

CO5: Develop and publish the Android Application in the global marketplace for download.

COs	Mapping with POs
CO1	PO1, PO2, PO3, PO4
CO2	PO2, PO3, PO4, PO5, PO7
CO3	PO4, PO5, PO6, PO8, PO9
CO4	PO4, PO5, PO9, PO10
CO5	PO6, PO7, PO8, PO11, PO12

TEXT BOOK:

1. Joseph Annuzzi, Jr., Lauren Darcey, and Shane Conder - Introduction to Android Application Development - Android Essentials, Fifth Edition, Pearson education, 2016.

REFERENCE BOOKS:

- 1 Reto Meier: Professional Android 4 Application Development , Wrox Publication,2015

Sub Title: BIG DATA ANALYTICS		
Sub Title:18IS71	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks:CIE +Assignment +Group Activity+ SEE = 40 + 5+5 + 50 =100	Total No. of Contact Hours:52

Course Objectives:

- Understand Big data for industry applications.
- Analyze business case studies for Big data analytics
- Define managing of Big data without SQL
- Develop Mapreduce analytics using Hadoop and related tools.

UNIT No.	Syllabus Content	No. of Hours
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1	<p>Introduction to Big Data: Types of Digital Data: classification of Data(Structured, semi structured and unstructured), Characteristics of Data, Evolution of Big Data, Definition of Big Data, challenges of Big Data, Characteristics of Big Data (Volume, Velocity, Variety), Other characteristics of Big Data which are not Definitional Traits of Big Data, Why Big Data?, Are we Information consumer of producer? , Traditional BI vs Big Data, Typical Data warehouse environment, Typical Hadoop Environment, What is changing in realms of Big Data? Text1:Chapter1,Chapter2</p>	10
2	<p>Introduction to NoSQL and Hadoop : NoSQL: Introduction(What is it?, Where It is Used, Types of NoSQL databases, Why NoSQL?, Advantages of NoSQL, Use of NoSQL in Industry, SQL vs NoSQL,NewSQL) Hadoop: Introduction (features, key advantages of Hadoop, Versions of Hadoop, Overview of Hadoop ecosystems, Hadoop distributions, Hadoop vs SQL, Integrated Hadoop Systems offered by leading market vendors, cloud based Hadoop solutions) Text1:Chapter4,Chapter5</p>	10
3	<p>Introduction to MongoDB and MapReduce :MongoDB: Introduction (What is MongoDB, Why MongoDb, using JSON to MongoDB key features, Core Server tools, MongoDB through the JavaScript's Shell, Creating and Querying through Indexes, Document- Oriented, principles of schema design, Constructing queries on Databases, collections and Documents , MongoDB Query Language. MapReduce: Introduction, Mapper, Reducer, Combiner, Partitioner, Searching, Sorting, Compression. Text1:Chapter6,Chapter8</p>	11
4	<p>Introduction to HIVE AND Pig: HIVE Introduction (What is HIVE?, HIVE Architecture, HIVE data Types, HIVE File Formats, HIVE query Language, RCFile implementation, Sharding, user-Defined Functions . Pig: Introduction(What is Pig? The anatomy of Pig, Pig on Hadoop, Pig philosophy,Use Case for Pig- ETL Processing, Pig Latin overview, Datatypes in Pig, running Pig, Execution modes of Pig, HDFS commands, Relational operators, Eval function, complex Data Types, Piggy Bank, User-Define Functions, Parameter substitution, Diagnostic Operator, Word Count Example using Pig, When to use and not use Pig, Pig at Yahoo, Pig vs HIVE. Text1:Chapter9,Chapter10</p>	11

5	<p>Overview of SPARK, Tensor Flow, Theone: Introduction to Data Analysis with Spark, Downloading Spark and Getting Started, Programming with RDDs, Spark about anatomy of job runs, Anatomy of a Spark Job, Run–Task Execution cluster managers and, Executors and Cluster Managers Python Example ,Hive and, Execution engines installing, Installing Spark MapReduce and, Transformations and Actions RDDs and, Resilient Distributed Datasets–Functions resource requests, Resource Requests shared variables, Shared Variables–Accumulators sorting data, Total Sort YARN and, Spark on YARN–YARN cluster mode. Machine Learning with MLlib.Text2:Chapter1,Chapter2</p>	10
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Describe Big data and use cases from selected industry domains.

CO2: Discuss about NoSQL Big data management.

CO3: Install, configure, and run Hadoop.

CO4: Perform Mapreduce analytics using Hadoop.

CO5: Use Hadoop related tools such as HBase, MongoDB, Pig ,Spark, Hive for Big Data Analytics.

COs	Mapping with PO's
CO1	PO2, PO8
CO2	PO4,PO5, PO8
CO3	PO3, PO4, PO5
CO4	PO4, PO5
CO5	PO3, PO4, PO5, PO11.

Text Book(s):

1. Seema Acharya, Subhashini Chellappan, “ Big Data and Analytics”, Wiley India Pvt. Ltd.,2015

2. Matei Zaharia, Patrick Wendell, Andy Konwinski, Holden Karau ,“Learning Spark”,O'Reilly Media,2015

Reference Books:

1. Shashank Tiwari, “ Professional NoSQL”, Wiley India Pvt. Ltd.,2011

2. [Kyle Banker](#),[Peter Bakkum](#),[Shaun Verch](#),[Douglas Garrett](#),[Tim Hawkins](#), “MongoDB in Action”, DreamTech Press, 2nd Edition ,2016

3. [Chris Eaton](#),[Paul Zikopoulos](#),[Tom Deutsch](#),[George Lapis](#),[Dirk Deroos](#),“Understanding Big Data : Analytics for Enterprise Class

- Hadoop and Streaming Data”, Mcgraw Hill Education (India)Pvt.Ltd.,2012
4. [Tom White](#), “Hadoop: The Definitive Guide”, O'Reilly Media, 4th Edition, 2015
 5. [Vignesh Prajapati](#), “Big Data Analytics With R and Hadoop”, Packt Pub Ltd ,2013
 6. [Dt Editorial Services](#), “Big Data - Black Book”, Dreamtech Press, 2016

Web Resources:

- a) <http://www.bigdatauniversity.com>
- b) <http://www.mongodb.com>
- c) <http://hadoop.apache.org/>

Sub Title : SOFTWARE TESTING		
Sub Code:18IS72	No. of Credits:4=4: 0 : 0 (L-T-P)	No.of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks:CIE +Assignment +Group Activity+ SEE = 40 + 5+5 + 50 =100	Total No. of Contact Hours :52

Course Objectives:

1. Discuss about terminologies of software testing .
2. Differentiate the various testing techniques.
3. Analyze the problem and derive suitable test cases.
4. Apply suitable technique for designing of flow graph.
5. Explain the need for planning and monitoring a process.

Unit No	Syllabus Content	No of Hours
1	Basics of Software Testing: Basic definitions, Software Quality , Requirements, Behaviour and Correctness, Correctness versus Reliability, Testing and Debugging, Test cases, Insights from a Venn diagram, Identifying test cases, Test-generation Strategies, Test Metrics, Error and fault taxonomies , Levels of testing, Testing and Verification, Static Testing. Problem Statements: Generalized pseudocode, the triangle problem, the NextDate function, the commission problem, the SATM (Simple Automatic Teller Machine) problem, the currency converter, Saturn windshield wiper T1:Chapter1, Chapter2. T3:Chapter1.	10

2	<p>Functional Testing: Boundary value analysis, Robustness testing, Worst-case testing, Robust Worst testing for triangle problem, Nextdate problem and commission problem, Equivalence classes, Equivalence test cases for the triangle problem, NextDate function, and the commission problem, Guidelines and observations, Decision tables, Test cases for the triangle problem, NextDate function, and the commission problem, Guidelines and observations. Fault Based Testing: Overview, Assumptions in fault based testing, Mutation analysis, Fault-based adequacy criteria, Variations on mutation analysis.</p> <p>T1: Chapter 5, Chapter 6, Chapter 7, T2: Chapter 16</p>	10
3	<p>Structural Testing: Overview, Statement testing, Programme testing, Condition testing, Path testing: DD paths, Test coverage metrics, Basis path testing, guidelines and observations, Data –Flow testing: Definition-Use testing, Slice-based testing, Guidelines and observations. Test Execution: Overview of test execution, from test case specification to test cases, Scaffolding, Generic versus specific scaffolding, Test oracles, Self-checks as oracles, Capture and replay</p> <p>T1: Chapter 9, Chapter 10, T2: Chapter 17, T3: Section 6.2.1, T3: Section 6.2.4</p>	10
4	<p>Process Framework :Basic principles: Sensitivity, redundancy, restriction, partition, visibility, Feedback, the quality process, Planning and monitoring, Quality goals, Dependability properties, Analysis Testing, Improving the process, Organizational factors. Planning and Monitoring the Process: Quality and process, Test and analysis strategies and plans, Risk planning, monitoring the process, Improving the process, the quality team Documenting Analysis and Test: Organizing documents, Test strategy document, Analysis and test plan, Test design specifications documents, Test and analysis reports.</p> <p>T2: Chapter 3, Chapter 4, Chapter 20, Chapter 24.</p>	11
5	<p>Integration and Component-Based Software Testing: Overview, Integration testing strategies, Testing components and assemblies. System, Acceptance and Regression Testing: Overview, System testing, Acceptance testing, Usability, Regression testing, Regression test selection techniques, Test case prioritization and selective execution. Levels of Testing, Integration Testing: Traditional view of testing levels, Alternative life-cycle models, The SATM system, Separating integration and system testing, A closer look at the SATM system, Decomposition-based, call graph-based, Path-based integrations.</p> <p>T1 : Chapter 12, Chapter 13 T2: Chapter 21, Chapter 22</p>	11

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Derive test cases for any given problem

CO2: Compare the different testing techniques

CO3: Classify the problem into suitable testing model

CO4: Apply the appropriate technique for the design of flow graph.

CO5: Create appropriate document for the software artefact.

COs	Mapping with Pos
CO1	PO1,PO2,PO7,PO8,PO12
CO2	PO1,PO2,PO3,PO5,PO7
CO3	PO1,PO2,PO3,PO5
CO4	PO1,PO2,PO3,PO4,PO5
CO5	PO5,PO7,PO9,P10,PO11

TEXT BOOKS:

1. Paul C. Jorgensen: Software Testing, A Craftsman's Approach, 3rd Edition, Auerbach Publications, 2008. (Listed topics only from Chapters 1, 2, 5, 6, 7, 9, 10, 12, 13)
2. Mauro Pezze, Michal Young: Software Testing and Analysis – Process, Principles and Techniques, Wiley India, 2009. (Listed topics only from Chapters 3, 4, 16, 17, 20,21, 22,24)
3. Aditya P Mathur: Foundations of Software Testing, Pearson Education, 2008.(Listed topics only from Section 1.2 , 1.3, 1.4 ,1.5, 1.8,1.12,6. 2.1,6. 2.4)

REFERENCE BOOKS/WEBLINKS:

1. Software testing Principles and Practices – Gopalaswamy Ramesh, Srinivasan Desikan, 2nd Edition, Pearson, 2007.
2. Software Testing – Ron Patton, 2nd edition, Pearson Education, 2004.
3. The Craft of Software Testing – Brian Marrick, Pearson Education, 1995.
4. Anirban Basu, Software Quality Assurance, Testing and Metrics, PHI, 2015.
5. <https://www.softwaretestingmaterial.com/software-testing/>
6. <https://www.guru99.com/software-testing-introduction-importance.html>

Sub Title :C# PROGRAMMING AND .NET		
Sub Code:18IS732	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 3
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + Group Activity+ SEE = 45 + 5 +5 + 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. Understand the nature of .Net application development and build C# applications.
2. Familiarize with Object-oriented Programming concepts as associated with C#, Inheritance, Interfaces, Exception Handling, Reflection, Standard I/O programming, File Handling, Generics,
3. Understand Windows Application using Winforms, File I/O, XML in .NET.Web Services and Deployment.
4. Overview of .NET framework 3.0 features like WPF, WCF and WF.

Unit No.	Syllabus Content	No of Hours
1	<p>The Philosophy Of .Net: Understanding the Previous State of Affairs, The .NET Solution, The Building Block of the .NET Platform (CLR,CTS, and CLS), The Role of the .NET Base Class Libraries, What C# Brings to the Table, An Overview of .NET Binaries (aka Assemblies), the Role of the Common Intermediate Language , The Role of .NET Type Metadata, The Role of the Assembly Manifest, Compiling CIL to Platform –Specific Instructions, Understanding the Common Type System, Intrinsic CTS Data Types, Understanding the Common Languages Specification, Understanding the Common Language Runtime A tour of the .NET Namespaces, Increasing Your Namespace Nomenclature, Deploying the .NET Runtime.</p> <p>Building C# Applications: The Role of the Command Line Compiler (csc.exe), Building C # Application using csc.exe Working with csc.exe Response Files, Generating Bug Reports , Remaining C# Compiler Options, The Command Line Debugger (cordbg.exe) Using the, Visual Studio .NET IDE, Other Key Aspects of the VS.NET IDE, C# “Preprocessor:” Directives, An Interesting Aside: The System. Environment Class.T1:Ch1,Ch2</p>	8

2	<p>C# Language Fundamentals: The Anatomy of a Basic C# Class, Creating objects: Constructor Basics, The Composition of a C# Application, Default Assignment and Variable Scope, The C# Member Initialization Syntax, Basic Input and Output with the Console Class, Understanding Value Types and Reference Types, The Master Node: System, Object, The System Data Types (and C# Aliases), Converting Between Value Types and Reference Types: Boxing and Unboxing, Defining Program Constants, C# Iteration Constructs, C# Controls Flow Constructs, The Complete Set of C# Operators, Defining Custom Class Methods, Understating Static Methods, Methods Parameter Modifies, Array Manipulation in C #, String Manipulation in C#, C# Enumerations, Defining Structures in C#, Defining Custom Namespaces. T1:Ch3</p>	8
3	<p>Object- Oriented Programming With C#: Forms Defining of the C# Class, Definition the “Default Public Interface” of a Type, Recapping the Pillars of OOP, The First Pillars: C#'s Encapsulation Services, Pseudo-Encapsulation: Creating Read-Only Fields, The Second Pillar: C#'s Inheritance Supports, keeping Family Secrets: The “Protected” Keyword, Nested Type Definitions, The Third Pillar: C #'s Polymorphic Support, Casting Between.</p> <p>Exceptions And Object Lifetime: Ode to Errors, Bugs, and Exceptions, The Role of .NET Exception Handling, the System. Exception Base Class, Throwing a Generic Exception, Catching Exception, CLR System – Level Exception (System. System Exception), Custom Application-Level Exception (System. System Exception), Handling Multiple Exception, The Family Block, the Last Chance Exception Dynamically Identifying Application – and System Level Exception Debugging System Exception Using VS. NET, Understanding Object Lifetime, the CIT of “new”, The Basics of Garbage Collection,, Finalization a Type, The Finalization Process, Building an Ad Hoc Destruction Method, Garbage Collection Optimizations, The System. GC Type. T1:Ch4,Ch5,Ch6</p>	8
4	<p>Interfaces And Collections: Defining Interfaces Using C# Invoking Interface Members at the object Level, Exercising the Shapes Hierarchy, Understanding Explicit Interface Implementation, Interfaces As Polymorphic Agents, Building Interface Hierarchies, Implementing, Implementation, Interfaces Using VS .NET, understanding the IConvertible Interface, Building a Custom Enumerator (IEnumerable and Enumerator), Building Cloneable objects (ICloneable), Building Comparable Objects (I Comparable), Exploring the system. Collections Namespace, Building a Custom Container (Retrofitting the Cars Type).</p> <p>Understanding Callback Interfaces, Understanding the .NET DelegateType,Members of System. Multicast Delegate, The Simplest Possible DelegateExample, , Building More a Elaborate Delegate Example, UnderstandingAsynchronous T1:Ch7,Ch8</p>	8

5	Delegates, Understanding (and Using)Events.The Advances Keywords of C#, A Catalog of C# Keywords Building aCustom Indexer, A Variation of the Cars Indexer Internal Representation ofType Indexer . Using C# Indexer from VB .NET. Overloading operators, TheInternal Representation of Overloading Operators, interacting with OverloadOperator from Overloaded- Operator- Challenged Languages, CreatingCustom Conversion Routines, Defining Implicit Conversion Routines, TheInternal Representations of Customs Conversion Routines Understanding .Net Assemblies: Problems with Classic COM Binaries, An Overview of .NET Assembly, Building a Simple File Test Assembly, A C#. Client Application, A Visual Basic .NET Client Application, Cross Language Inheritance, Exploring the CarLibrary’s, Manifest, Exploring the CarLibrary’s Types, Building the Multifile Assembly, Using Assembly, Understanding Private Assemblies, Probing for Private Assemblies (The Basics), Private A Assemblies XML Configurations Files, Probing for Private Assemblies (The Details), Understanding Shared Assembly, Understanding Shared Names, Building a Shared Assembly, Understanding Delay Signing, Installing/Removing Shared Assembly, Using a Shared Assembly. T1:Ch9,Ch10,Ch11	7
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1:Analyze the nature of .Net application development .

CO2:Apply OOAD concepts to build C# applications

CO3:Design and develop console based applications using C#

CO4:Develop Windows Application using Winforms, File I/O, XML in .NET.Web Services and deployment.

CO5:Analyze .NET framework 3.0 features like WPF, WCF and WF.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO4,PO5,PO8
CO2	PO1,PO2,PO3,PO4,PO5,PO7
CO3	PO1,PO2,PO3,PO4,PO5,PO7
CO4	PO1,PO2,PO3,PO4,PO5,PO7
CO5	PO1,PO2,PO3,PO4,PO5,PO7

TEXT BOOKS:

1. Pro C# with .NET 3.0 - Andrew Troelsen, Special Edition, Dream Tech Press, India, 2013.

2. Programming in C# - E. Balagurusamy, 5th Reprint, Tata McGraw Hill, 2011.

REFERENCE BOOKS/WEB LINKS:

Inside C# - Tom Archer, WP Publishers, 2011.

Sub Title : BLOCK CHAIN TECHNOLOGY		
Sub Code: 18IS734	No. of Credits:3=3: 0 : 0 (L-T-P)	No.of Lecture Hours/Week: 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. Understand the fundamentals of BlockChain.
2. Understand the concept of decentralization, its impact, and its relationship with blockchain technology
3. Gain knowledge of the inner workings of blockchain and the mechanisms behind bitcoin and alternative cryptocurrencies.
4. Understand the theoretical foundations of smart contracts
5. Identify and examine applications of the blockchain technology - beyond currencies

UNIT No	Syllabus Content	No of Hours
1	Blockchain 101: Distributed systems, History of blockchain, Introduction to blockchain, Types of blockchain, CAP theorem and blockchain, Benefits and limitations of blockchain. Text Book 1: Chapter 1	8
2	Decentralization and Cryptography: Decentralization using blockchain, Methods of decentralization, Routes to decentralization, Decentralized organizations. Cryptography and Technical Foundations: Cryptographic primitives, Asymmetric cryptography, Public and private keys Text Book 1: Chapter 2,Chapter 4	8
3	Bitcoin and Alternative Coins A: Bitcoin, Transactions, Blockchain, Bitcoin payments B: Alternative Coins Theoretical foundations, Bitcoin limitations, Namecoin, Litecoin, Primecoin, Zcash Text Book 1: Chapter 3, Chapter 6, Chapter 8.	8
4	Smart Contracts and Ethereum 101: Smart Contracts: Definition, Ricardian contracts. Ethereum 101: Introduction, Ethereum blockchain, Elements of the Ethereum blockchain, Precompiled contracts. Text Book 1: Chapter 10	8
5	Alternative Blockchains: Blockchains Blockchain-Outside of Currencies: Internet of Things, Government, Health, Finance, 08 Media Text Book 1: Chapter 17	7

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of the course students will be able to

CO1: Comprehend the fundamentals of Blockchain Technology.

CO2: Apply the methods of Decentralization.

CO3: Analyse Bitcoin and alternative coins.

CO4: Analyze the importance of Smart Contracts and Ethereum

CO5: Apply blockchain technology in various fields like Government, Health finance etc.,

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO12
CO2	PO2,PO3,PO4,PO12
CO3	PO5,PO9,PO12
CO4	PO2,PO3,PO12
CO5	PO2,PO3,PO12

TEXT BOOKS:

1. Mastering Blockchain - Distributed ledgers, decentralization and smart contracts explained, Imran Bashir, Packt Publishing Ltd, Second Edition, ISBN 978-1-78712-544-5, 2017

REFERENCE BOOKS / WEBLINKS:

1. Blockchain Technology (Concepts and applications), Kumar saurabh, Ashutosh saxena, Wiley, 2020.

2. Bitcoin and Cryptocurrency Technologies, Arvind Narayanan, Joseph Bonneau, Edward Felten,2016.

3. Blockchain Basics: A Non-Technical Introduction in 25 Steps, Daniel Drescher, Apress, First Edition, 2017.

4. Mastering Bitcoin: Unlocking Digital Cryptocurrencies, Andreas M. Antonopoulos, O'Reilly Media, First Edition, 2014.

5. <https://www.packtpub.com/in/big-data-and-business-intelligence/mastering-blockchain-second-edition>

Sub Title: SOFT AND EVOLUTIONARY COMPUTING		
Sub Code: 18IS743	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks:CIE +Assignment +Group Activity+ SEE = 40 + 5+5 + 50 =100	Total No. of Contact Hours : 39

Course objectives: This course will enable students to:

- Define and understand important concepts in soft computing
- To gain insight onto Fuzzy logic
- To gain knowledge in machine learning through GA
- Analyze the various soft computing techniques

Unit No.	Syllabus Content	No. of Hours
1	INTRODUCTION TO SOFT COMPUTING: ANN, FS,GA, SI, ES, Comparing among intelligent systems ANN: introduction, biological inspiration, BNN & ANN, classification, first Generation NN, perceptron, illustrative problems Chapter1: 1.1-1.8(T1), Chapter 2: 2.1-2.6(T1)	8
2	ADALINE, MADALINE, ANN: (2 generation), Introduction, BPN, KNN,HNN,BAM, RBF,SVM and illustrative problems Chapter 2: 3.1,3.2,3.3,3.6,3.7,3.10,3.11(T1)	8
3	FUZZY LOGIC: Introduction, human learning ability, undecidability, probability theory, classical set and fuzzy set, fuzzy set operations, fuzzy relations, fuzzy compositions, natural language and fuzzy interpretations, structure of fuzzy inference system, illustrative problems Chapter 5(T1)	8
4	GENETIC ALGORITHMS: Introduction to GAGA, procedures, working of GA, GA applications, applicability, evolutionary programming, working of EP, GA based Machine learning classifier system, illustrative problems Chapter 7(T1)	8

5	<p>Swarm Intelligent system: Introduction, Background of SI, Ant colony system Working of ACO, Particle swarm Intelligence (PSO).</p> <p>Chapter 8: 8.1-8.4, 8.7(T1)</p>	7
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Note 1: All Units will have internal choice.

Note 2: Three assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After completion of course students will be able to:

CO1: Apprehend soft computing techniques

CO2: Apply the learned techniques to solve realistic problems

CO3: Differentiate soft computing with hard computing techniques

CO4: Design a Fuzzy expert system and apply GA for various applications

COs	Mapping with POs
CO1	PO1, PO2, PO3
CO2	PO1, PO2, PO3, PO4
CO3	PO3, PO4, PO5, PO6
CO4	PO3, PO4, PO5, P12

TEXT BOOKS:

1. Soft computing : N. P Padhy and S P Simon , Oxford University Press 2015

REFERENCE BOOKS/WEB LINKS:

1. Principles of Soft Computing, Sivanandam, Deepa S. N Wiley India, ISBN 13: 2011

2. Vojislav Kecman, “Learning & Soft Computing Support Vector Machines, Neural Networks, and Fuzzy Logic Models”, Pearson Education, New Delhi, 2007.

Sub Title :BIG DATA AND ANALYTICS LAB		
Sub Code:18ISL76	No of Credits : 0:0:1(L:T:P)	No. of Lecture Hours/Week : 02
Exam Duration : 3hours	Exam Marks :CIE + SEE = 50 + 50 =100	

Course Objectives:
1. To understand the concept of Big data with hands on.
2. Understand installation of various Big data tools under Hadoop.
3. To apply Hadoop concepts to various applications and NoSQL implementation.

I. LIST OF PROGRAMS

1.Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.

- a. Review the commands available for the Hadoop Distributed File System:
- b. Copy file `foo.txt` from local disk to the user's directory in HDFS
- c. Get a directory listing of the user's home directory in HDFS
- d. Get a directory listing of the HDFS root directory
- e. Display the contents of the HDFS file `user/fred/bar.txt`

2. Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.

- a. Move that file to the local disk, named as `baz.txt`
- b. Create a directory called `input` under the user's home directory
- c. Delete the directory `input old` and all its contents
- d. Verify the copy by listing the directory contents in HDFS.

3. Demonstrate word count on an input file using MapReduce program.

4. Using movie ratings data, Develop the queries in Hive for the following-

- a. List all the Users who have rated the movies (Users who have rated at least one movie)
- b. List of all the User with the max, min, average ratings they have given against any movie
- c. List all the Movies with the max, min, average ratings given by any user

5. In this program you will use HiveQL to filter and aggregate click data to build facts about user's movie preferences. The query results will be saved in a staging table used to populate the Oracle Database.

The `moveapp_log_json` table contains an activity column. Activity states are as follows:

- RATE_MOVIE
- COMPLETED_MOVIE

- PAUSE_MOVIE
- START_MOVIE
- BROWSE_MOVIE
- LIST_MOVIE
- SEARCH_MOVIE
- LOGIN
- LOGOUT
- INCOMPLETE_MOVIE.
- PURCHASE_MOVIE

- a. Write a query to select only those clicks which correspond to starting, browsing, completing, or purchasing movies. Use a CASE statement to transform the RECOMMENDED column into integers where 'Y' is 1 and 'N' is 0. Also, ensure GENREID is not null. Only include the first 25 rows.
- b. Write a query to select the customer ID, movie ID, recommended state and most recent rating for each movie.

6. The moveapp_log_json table contains an activity column. Activity states are as follows:

- RATE_MOVIE
- COMPLETED_MOVIE
- PAUSE_MOVIE
- START_MOVIE
- BROWSE_MOVIE
- LIST_MOVIE
- SEARCH_MOVIE
- LOGIN
- LOGOUT
- INCOMPLETE_MOVIE.

- a. Load the results of the previous two queries into a staging table. First, create the staging table:
- b. Next, load the results of the queries into the staging table.

7. Write R program to:

- a. Create two matrices and perform multiplication & division on those matrices.
- b. Create a data frame and print the: data frame, structure of data frame and summary of data frame.
- c. Create a Bar chart and sketch the Bar chart by taking months as input & plot it against revenue. Also, add legend to the chart that includes regions.

II. OPEN ENDED QUESTIONS

1. Installation and Configuration of Hadoop software on stand alone system.
2. Installation and Configuration of Hadoop software on Ubuntu cluster system.
3. Highest temperature year wise using MapReduce.

NOTE:

1. **STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.**

2. **STUDENT IS REQUIRED TO EXECUTE ONE PROGRAM FROM PART A and ONE PROGRAM FROM PART B .**

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Elucidate installation of various Big data tools under Hadoop.

CO2: Implement HiveQL statements.

CO3: Differentiate between SQL and NoSQL commands.

COs	Mapping with POs
CO1	PO2,PO5,PO7,PO11
CO2	PO5, PO7,PO12
CO3	PO7,PO9,PO10,PO12

Subject :SOFTWARE TESTING LAB.

Sub Code:18ISL77	No. of Credits :0:0:1	No. of lecture hours/week : 02
Exam Duration : 3 hours	CIE + SEE = 50 + 50 =100	

Course objectives:

1. Analyse the requirements for the given problem statement
2. Design and implement various solutions for the given problem
3. Employ various design strategies for problem solving.
4. Construct control flow graphs for the solution that is implemented
5. Create appropriate document for the software artifact

I. LIST OF PROGRAMS

1. Design and develop a program in a language of your choice to solve the triangle problem

1. Design and develop a program in a language of your choice to solve the triangle problem defined as follows: Accept three integers which are supposed to be the three sides of a triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Assume that the upper limit for the size of any side is 10. Derive test cases for your program based on boundary-value analysis, execute the test cases and discuss the results.

2. Design, develop, code and run the program in any suitable language to solve the commission problem. Analyze it from the perspective of boundary value testing, derive different test cases, execute these test cases and discuss the test results.

3. Design, develop, code and run the program in any suitable language to implement theNextDate function. Analyze it from the perspective of boundary value testing, derivedifferent test cases, execute these test cases and discuss the test results.

4. Design and develop a program in a language of your choice to solve the triangleproblem defined as follows: Accept three integers which are supposed to be the threesides of a triangle and determine if the three values represent an equilateral triangle,isosceles triangle, scalene triangle, or they do not form a triangle at all. Assume that theupper limit for the size of any side is 10. Derive test cases for your program based onequivalence class partitioning, execute the test cases and discuss the results.

5. Design, develop, code and run the program in any suitable language to solve thecommission problem. Analyze it from the perspective of equivalence class testing,derive different test cases, execute these test cases and discuss the test results.

6. Design, develop, code and run the program in any suitable language to implement theNextDate function. Analyze it from the perspective of equivalence class value testing,derive different test cases, execute these test cases and discuss the test results.

7. Design and develop a program in a language of your choice to solve the triangleproblem defined as follows: Accept three integers which are supposed to be the threesides of a triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Derive test cases for your program based on decision-table approach, execute the test cases and discuss the results.

8. Design, develop, code and run the program in any suitable language to solve the commission problem. Analyze it from the perspective of decision table-based testing, derive different test cases, execute these test cases and discuss the test results.

9. Design, develop, code and run the program in any suitable language to solve the commission problem. Analyze it from the perspective of dataflow testing, derive different test cases, execute these test cases and discuss the test results.

10. Design, develop, code and run the program in any suitable language to implement the binary search algorithm. Determine the basis paths and using them derive different test cases, execute these test cases and discuss the test results.

11. Design, develop, code and run the program in any suitable language to implement the quicksort algorithm. Determine the basis paths and using them derive different test cases, execute these test cases and discuss the test results.

12. Design, develop, code and run the program in any suitable language to implement an absolute letter grading procedure, making suitable assumptions. Determine the basis paths and using them derive different test cases, execute these test cases and discuss the test results

II.OPEN ENDED QUESTIONS

1. Study of testing tool (e.g. winrunner)
2. Study of web testing tool (e.g. selenium)
3. Study of bug tracking tool (e.g. bugzilla)

4. Study of any test management tool (e.g. test director)
5. Study of any open source testing tool (e.g. test link)

NOTE :

- 1. Student is permitted to submit open ended solution to any other open ended question apart from the list above . but it has to be approved by the staff in charge.**
- 2. In the examination each student picks one question from a lot of all 12 questions.**

2020-2021

Sub Title : OBJECT ORIENTED CONCEPTS		
Sub Code: 18IS43	No. of Credits:4=4: 0 : 0 (L-T-P)	No.of Lecture Hours/Week: 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 52

UNIT No	Syllabus Content	No of Hours
1	<p>Introduction to Java: Java and Java applications; Java Development Kit (JDK); Java is interpreted, Byte Code, JVM; Object-oriented programming; Simple Java programs.</p> <p>Data types and other tokens: Boolean variables, int, long, char, operators, arrays, white spaces, literals, assigning values; Creating and destroying objects; Access specifiers.Operators and Expressions: Arithmetic Operators, Bitwise operators, Relational operators, The Assignment Operator, The.? Operator; Operator Precedence; Logical expression; Type casting; Strings Control Statements: Selection statements, iteration statements, Jump Statements.T1:Ch1,2,3,4,5</p>	11
2	<p>Classes, Inheritance, Exceptions: Classes: Classes fundamentals; Declaring objects; Constructors, this keyword, garbage collection. Inheritance: inheritance basics, using super, creating multi-level hierarchy, method overriding. Exception handling: Exception handling in Java. Text book 2: T1 :Ch 6 , Ch 7, Ch 8 , Ch10</p>	10
3	<p>Packages and Interfaces, Multi-Threaded Programming: Packages, Access Protection, Importing Packages, Interfaces. Multi Threaded Programming: What are threads? How to make the classes threadable ; Extending threads; Implementing runnable; Synchronization; Changing state of the thread;read-write problem, producer consumer problems.T1 : Ch 9 , Ch 11</p>	10

4	<p>Event Handling: Two event handling mechanisms; The delegation event model; Event classes; Sources of events; Event listener interfaces; Using the delegation event model; Adapter classes; Inner classes.</p> <p>Introducing the AWT: Working with Windows, Graphics, and Text: Introduction the AWT: Working with Windows, Graphics and Text AWT Classes, Window Fundamentals, Working with Frame Windows, Introducing Graphics, Working with Color</p> <p>T1:Ch 22 , Ch 23</p>	10
5	<p>Swings: Swings: The origins of Swing; Two key Swing features; Components and Containers; The Swing Packages; A simple Swing Application; Create a Swing Applet; JLabel and ImageIcon; JTextField;The Swing Buttons; JTabbedPane; JScrollPane; JList; JComboBox; JTable.</p> <p>T1: Ch 29, Ch 30</p>	11

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of the course students will be able to

CO1:Develop JAVA programs using OOPs principles.

CO2: Develop computer programs to solve real world problems in Java.

CO3: Develop simple GUI interfaces for a computer program to interact with users, and to comprehend the event-based GUI handling principles using Applets and swings.

CO4: Develop the procedure to store and retrieve data using AWT

CO5:Build the simple swings module using Jlist, Jcombobox as GUI

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO4,PO5
CO2	PO1, PO5,PO6, PO9,PO10,
CO3	PO1, PO2,PO2,PO5,PO11
CO4	PO1,PO2,PO3, PO4,PO5
CO5	PO3,PO4,,PO5, PO9,PO11

TEXT BOOK:

1. Herbert Schildt: Java - The Complete Reference, 7th Edition, Tata McGraw Hill, 2007. (Chapters 1, 2, 3, 4, 5, 6, 8, 10, 11, 21, 22, 29, 30, 31)

REFERENCE BOOKS:

1. Mahesh Bhawe and Sunil Patekar, "Programming with Java", First Edition, Pearson Education, 2008, ISBN:9788131720806
2. Herbert Schildt, The Complete Reference C++, 4th Edition, Tata McGraw Hill, 2003.
3. Stanley B.Lippmann, JoseeLajore, C++ Primer, 4th Edition, Pearson Education, 2005.
4. RajkumarBuyya,SThamarasiselvi, xingchenchu, Object oriented Programming with java, Tata McGraw Hill education private limited.
5. Richard A Johnson, Introduction to Java Programming and OOAD, CENGAGE Learning.E Balagurusamy, Programming with Java A primer, Tata McGraw Hill companies

Sub.Title: PYTHON PROGRAMMING		
Sub Code: 18IS44	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. Understanding the syntax and semantics of the Python language.
2. To create Functions in Python.
3. To handle Files & Regular expressions in Python.
4. To apply Object Oriented Programming concepts in Python.
- 5 To create Threaded and Networking applications in Python .

UNIT No	Syllabus Content	No of Hours
1	Introduction to Python, Writing Our First Python Program, Datatypes in Python, Operators in Python, Input and Output, Control Statements T1: Ch 1, Ch 2, Ch 3, Ch 4,Ch 5 , Ch 6	7
2	Arrays in Python, Strings and Characters, Functions, Lists and Tuples, Dictionaries T1: Ch 7,Ch 8,Ch 9, Ch 10, Ch 11	7
3	Introduction to OOPS, Classes and Objects, Inheritance and Polymorphism T1: Ch12,Ch13,Ch14,Ch16	7
4	Files in Python, Regular Expressions in Python, Data Structures in Python, Date and Time T1: Ch 17, Ch 18 ,Ch 19, Ch 20	9
5	Threads, Graphical User Interface, Networking in Python, Python's Database Connectivity T1: Ch 20 ,Ch 21, Ch 22, Ch 23	9

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of the above course students will be able to

CO1: Demonstrate the understanding and usage of core python scripting elements python constructs, data types.

CO2 : Demonstrate the understanding and usage of functions ,lists, tuples and dictionaries.

CO3: Demonstrate the understanding and usage of modules, packages and regular expressions.

CO4: Demonstrate usage of object oriented features such as Inheritance, Polymorphism, operator

overloading.

CO5: Apply the knowledge of python and

TEXT BOOK:

1. Core Python Programming: Dr.R.Nageshwara Rao, Dream Tech Press 2018

REFERENCE BOOKS:

1. Think Python, Allen Downey, Green Tea Press.
2. Learning Python, Mark Lutz, Orieilly.

COs	Mapping with POs
CO1	PO1,PO2,PO4
CO2	PO1,PO2,PO4
CO3	PO1,PO2,PO4,PO5,PO8
CO4	PO1,PO2,PO4,PO5,PO8
CO5	PO1,PO2,PO4,PO5,PO8

Sub Title : OBJECT ORIENTED CONCEPTS LAB		
Sub Code:: 18ISL46	No. of Credits:1= 0:0:1 (L-T-P)	No. of Lecture Hours/Week: 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 = 100	

Course Objectives:

1. Design programs using classes and objects for java
2. Build programs for automatic initialization of objects and destroy objects that are no longer required through constructors and destructors.
3. Construct applications to provide flexible options for the creation of new definitions for some of the operators.
4. Specifying mechanism of deriving a new class from older classes through inheritance.
5. Implement methods to select appropriate member function during run time.

I. LIST OF PROGRAMS

- 1 Create a class called Student with the following details as variables within it.
 - (i) USN
 - (ii) Name
 - (iii) Branch
 - (iv) Phone

Write a Java/c++ program to create nStudent objects and print the USN, Name, Branch, and Phone of these objects with suitable headings.
- 2 Design
 - a. Java/c++ Program to demonstrate Constructor Overloading and method overloading
 - b. Develop a Java/c++ Program to implement Inner class and demonstrate its Access Protections.
- 3 Write a Java/c++ program to implement the Stack using arrays. Write Push(), Pop(), and Display() methods to demonstrate its working.
- 4 Design a superclass called Staff with details as StaffId, Name, Phone, Salary. Extend this class by writing three subclasses namely Teaching (domain, publications), Technical (skills), and Contract (period). Write a Java program to read and display at least 3 staff objects of all three categories.
- 5 Write a Java class called Customer to store their name and date_of_birth. The date_of_birth format should be dd/mm/yyyy. Write methods to read customer data as and display as using StringTokenizer class considering the delimiter character as “/”.
- 6 Write a Java/c++ program to read two integers a and b. Compute a/b and print, when b is not zero. Raise an exception when b is equal to zero.
- 7 Write a Java program that implements a multi-thread application that has three threads. First thread generates a random integer for every 1 second; second thread computes the square of the number and prints; third thread will print the value of cube of the number.
- 8 Design a JAVA program using Synchronized Threads, which demonstrates Producer Consumer concept.

9 Develop JAVA programs which demonstrates utilities of Linked List Class

10 Develop JAVA Applet programs which handles Key Board Event

Identify the different objects in the following environments and implement different suitable operations

1. Banking System
2. Library
3. Automobile Industry
4. Home Appliances
5. User Interface design etc

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY APPROVED BY THE STAFF IN CHARGE.

2. IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 10 QUESTIONS

Course Outcomes:

After completing the course the students are able to:

CO1:Design programs using classes and objects using JAVA/C++


CO2:Develop programs for automatic initialization of objects and destroy objects that are no longer required.

CO3:Develop applications to provide flexible options for the creation of new definitions for some of the operators.

CO4:Specify mechanism of deriving a new class from older classes through inheritance .

CO5:Design a program using Templates & Exception Handling.

COs	Mapping with POs
CO1	PO2,PO3,PO5
CO2	PO2,PO3,PO6,PO9
CO3	PO2,PO3,PO5,PO6
CO4	PO2,PO3,PO5,PO9
CO5	PO2,PO3,PO5,PO6

	SOFT SKILLS		
	Subject Code: 18HS33	Mandatory Course	No of lecture hours per week: 2 Hrs
	Exam Duration:	Exam marks: NIL	Total No. of lecture hours: 26 hrs per semester

COURSE OBJECTIVES:

1. The lessons under unit 1 is to help students to recognize oneself as an individual being aware of one's knowledge, personality, environment and lifestyle, through different base and measures like SWOC analysis, personal developments.
2. The lessons under this unit make students to understand the importance of soft skills and hard skills and how to think critically and also learn the importance of creative thinking.
3. The lessons under this unit make students to understand the importance of attitude, time, and also learn to manage them.
4. The objective of this unit is to help a student to learn the art of goal setting and being motivated in achieving his goal in spite of all the hardships with different problems along with teamwork, and leadership qualities.
5. The unit 5 aims at teaching the students about importance of handwriting, punctuation marks, spellings, which helps them, improve in writing skills.


UNIT NO	SYLLABUS CONTENT	HRS /COS
1	a. SWOC ANALYSIS b. SELF – AWARENESS AND PERSONAL DEVELOPMENT c. ETTIQUTTE AND MANNERS	5 CO1
2	d. INTRODUCTION TO SOFT SKILLS AND HARD SKILLS e. CREATIVITY f. CRITICAL THINKING	5 CO2
3	g. ATTITUDE h. ADAPTABILITY i. TIME MANAGEMENT/ PRIORITY j. STRESS MANAGEMENT	5 CO3
4	k. GOAL SETTING l. MOTIVATION m. TEAM WORK n. PROBLEM SOLVING o. LEADERSHIP	5 CO4
5	p. GUIDELINES FOR HANDWRITING q. PUNCTUATION MARKS r. SPELLING s. VISUAL NARRATIVES(Ramayana, Mahabharata, Short Stories, films and advertisements)	6 CO5

COURSE OUTCOME:

1. After the completion of this unit students will know about their self assessments and personality that how to handle various situations in a positive way.
2. At the end of this unit student will be able to see how important it is to consider things carefully and from different angles, something one sees, hears, experiences or reads in order to understand it fully. The student will also have understood the importance of soft skills and thinking creatively.
3. After the completion of this unit students will have learnt about attitude and adaptability and also how to deal with problems and stress in the present world.
4. At the end of this unit students will have learnt some simple ways of planning to achieve his dream and also feel enthusiastic about doing something individually and as well in team.
5. After the completion of this unit students writing skills will have improved.

REFERENCE:

- English for Job Seekers (Language and Soft Skills for the Aspiring) by Geetha Rajeevan, C.L.N. Prakash at al) Cambridge University Press pvt,Ltd.
- New International Business English by Leo Jones and Richard Alexander. Cambridge University Press pvt,Ltd
- Business Benchmark by Norman Whitby. Cambridge University Press pvt,Ltd
- Grammar practice Activities (practical guide for teachers) Cambridge University Press pvt,Ltd

EMPLOYABILITY SKILLS		
 Subject Code: 18HS43	Mandatory Course	No of lecture hours per week: 2 Hrs
Exam Duration:	Exam marks: NIL	Total No. of lecture hours: 26 hrs per semester

COURSE OBJECTIVE:

1. According to the present day requirement, this unit is designed on job seeking topics, adopting a task based approach with activities and worksheets.
2. In this unit students will be taught to prepare project report effectively which is integral part of their academics by making use of referencing skills. And also they will be taught how to write an abstract and will be familiarized with research paper guidelines.
3. The unit 3 aims at preparing the student to face interviews confidently.
4. Under the topics like synonyms, antonyms and homophones students' vocabulary will be enhanced.
5. The lessons under this unit help students' to use idioms and phrases, decoding the analogies and the correct usage of collective nouns

UNIT NO	SYLLABUS CONTENT	HRS/COS
1	a. Employability Skills b. PRESENTATION SKILLS c. RESUME WRITING d. COVERING LETTER e. E-MAIL WRITING	8 CO1
2	a. PROJECT REPORT b. REFERENCING SKILLS c. ABSTRACT WRITING d. RESERCH PAPER GUIDELINE AND FORMAT	2 CO2
3	e. INTERVIEW SKILLS	8 CO3

4	f. SYNONYMS g. ANTONYMS h. HOMOPHONES	4 CO4
5	i. IDIOMS & PHRASES j. ANALOGY k. COLLECTIVE NOUNS	4 CO5

COURSE OUTCOME:

1. After the completion of this unit students will have learnt to make presentations both in formal and informal situations. And also will have learnt the art of resume writing.
2. After the completion of this unit student will have learnt how to do a project report using referencing skills. And also they will have learnt how to write abstract and will have been familiarized with research paper guidelines.
3. This unit will have helped student to communicate with various skills required for job interviews.
4. After the completion of this unit the students will have learnt the strategies of vocabulary.
5. After the completion of this unit student will have learnt to use idioms and phrases in everyday conversation.

REFERENCE:

- English Skills for Technical Students by British Council, Orient Black Swan.
- A course in Grammar and Composition by Geetha Nagaraj, Cambridge University Press India Pvt. Ltd.
- Communication Skills for Professionals by Nira Konar, PHI learning Pvt. Ltd.
- Enhancing English and Employability Skills by State Board of Technical Education.

Sub Title : WEB TECHNOLOGIES		
Sub Code: 18IS52	No. of Credits:4=3 : 1 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 52
Course Objectives:		
<ol style="list-style-type: none"> 1. To create a web pages using XHTML using Cascading Style Sheets 2. To do data validation and user interaction using JavaScript 3. To create XML documents and provide styling to documents. 4. To design web applications using the concepts of PHP 5. To design real world Web applications 		

Unit No	Syllabus Content	No of Hours
1	<p>XHTML : Origins and evolution of HTML and XHTML; Basic syntax; Standard XHTML document structure; Basic text markup. Images; Hypertext Links; Lists; Tables; Forms; Frames; Syntactic differences between HTML and XHTML.</p> <p>Introduction to XML: XML Syntax; Document structure; Document Type definitions; Namespaces; XML schemas; Displaying XML documents with CSS; XSLT style sheets; XML processors; Web services</p> <p>CSS: Introduction; Levels of style sheets; Style specification formats; Selector forms; Property value forms; Font properties; List properties; Color; Alignment of text; The Box model; Background images.</p> <p>T1:Ch 2, Ch 3, Ch 7</p>	12
2	<p>JavaScript: Overview of JavaScript; Object orientation and JavaScript; General syntactic characteristics; Primitives, operations, and expressions; Screen output and keyboard input; Control statements; Object creation and modification; Arrays; Functions; Constructor; Pattern matching using regular expressions.</p> <p>T1: Ch 4</p>	10
3	<p>JavaScript and HTML documents:</p> <p>The JavaScript execution environment; The Document Object Model; Element access in JavaScript; Events and event handling; Handling events from the Body elements, Button elements, Text box and Password elements; The DOM 2 event model</p> <p>T1: Ch 5</p>	10
4	<p>PHP: Origins and uses of PHP, Overview of PHP, General syntactic characteristics, Primitives, Operations, and Expression, Output, Control Statements, Arrays, Form handling, Files, Cookies, Session Tracking. T1: Ch 11</p>	10

5	Web Application Design: Real World Web Software Design, Principles of Layering, Software design patterns in the web context, Data and Domain patterns, Presentation patterns, T2: Ch 14	10
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

Students will demonstrate the knowledge and the skills acquired with respect to:

CO1: Design simple web pages using different tags of XHTML and Classify and use different levels of style sheets

CO2 : Validate and provide user functionality using JavaScript

CO3 : Design and develop XML document and use the style sheet to display.

CO4: Design and develop PHP programs to perform database access & session tracking.

CO5: Develop web application projects

Sub Title :ARTIFICIAL INTELLIGENCE		
Sub Code:18IS53	No. of Credits:3=3: 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours :39
Course Objectives:		
<ol style="list-style-type: none"> 1. Understand about agent, behavior and structure 2. Learn different AI models and search strategies 3. Representation of knowledge and reasoning 4. Gain knowledge about learning strategies 		

Unit No	Syllabus Content	No of Hours
1	What is AI? Intelligent Agents: Agents and environment; Rationality; the nature of environment; the structure of agents. Problem-solving: Problem- solving agents; Example problems	8
2	Knowledge representation issues: Representations and mappings approaches to knowledge representation, Issues in knowledge representation	8
3	Logical Agents: Knowledge based agents, The Wumpus world, Logic- Propositional logic Propositional theorem proving, Effective propositional model checking, Agents based on propositional logic. Using predicate logic: Representing simple facts in logic	8
4	Resolution, Natural Deduction, Learning: Forms of Learning; Inductive learning; Learning decision trees; Ensemble learning; Computational learning theory	8

5	Statistical learning, Maximum likelihood parameter learning, Bayesian parameter learning, passive reinforcement learning, active reinforcement learning	7
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

CO1: Describe the modern view of AI as the study of agents that receive percepts and perform actions.	
CO2: Apply AI search Models and Generic search strategies.	
CO3: Write Logic for representing Knowledge and Reasoning of AI systems.	
CO4: Design different learning algorithms for improving the performance of AI systems.	
CO5: Implement projects using different AI learning techniques	
COs	Mapping with POs
CO1	PO1,PO2
CO2	PO1,PO2,PO12
CO3	PO1,PO2,PO4,PO6,PO12
CO4	PO1,PO2,PO3,PO4,PO12
CO5	PO1,PO2,PO3,PO4,PO6,PO12

TEXT BOOKS:

1. “Artificial Intelligence: A Modern Approach ” by Stuart Russel, Peter Norvig, 2nd Edition, Pearson Education, 2003.

2. “Artificial Intelligence” by Elaine Rich, Kevin Knight, Shivashankar B Nair: Tata MCGraw Hill 3rd edition. 2013

REFERENCE BOOKS/WEBLINKS:

1. Luger, G. F., & Stubblefield, W. A., Artificial Intelligence - Structures and Strategies for Complex Problem Solving. New York, NY: Addison Wesley, 5th edition (2005).

2. Nilsson, N. J. Artificial Intelligence - A Modern Synthesis. Palo Alto: Morgan Kaufmann. (1998).

3. Nilsson, N. J., Principles of Artificial Intelligence. Palo Alto, CA: Tioga (1981).

4. Rich, E., & Knight, K., Artificial Intelligence. New York: McGraw-Hill (1991).

E Books:

1. Practical Artificial Intelligence Programming With Java, Third Edition ,Mark Watson

2. Artificial Intelligence Lecture Notes MIT.

MOOCs:

1. Artificial Intelligence - <http://www.nptelvideos.in/2012/11/artificial-intelligence.html>

Sub Title : INTERNET OF THINGS		
Sub Code:18IS551	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours :39
Course Objectives <ol style="list-style-type: none"> 1. To Learn the characteristics, designs,and challenges in the IoT 2. To Understand the key Technologies and protocols in IoT 3. To Analyze various Layers connectivity and motivation of IPV6 4. To Illustrate the role of IoT in various domains of Industry 5. Infer the role of Data Analytics in IOT 		

UNIT No	Syllabus Content	No of Hours
1	Introduction to IoT Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs.Enabling IOT Technologies,IOT and M2M-Introduction, difference between IOT and M2M. T1:Chapter1-1.1,1.2,1.3,1.4 , Chapter3-3.1,3.2,3.3	8
2	Fundamentals IoT Mechanism and Key Technologies-Identification of IoT Object and Services, Structural Aspects of the IoT, Key IoT Technologies. Evolving IoT Standards-Overview and Approaches,IETF IPV6 Routing Protocol for RPL Roll, Constrained Application Protocol, Representational State Transfer, ETSI M2M,Third Generation Partnership Project Service Requirements for Machine-Type Communications, CENELEC, IETF IPv6 Over Lowpower,Zigbee. T2:Chapter4-4.1,4.2,4.3 T2:Chapter5-5.1,5.2,5.3,5.4,5.5,5.6,5.7,5.8,5.9	8
3	Layer ½ Connectivity: Wireless Technologies for the IoT-WPAN Technologies for IoT/M2M, Cellular and Mobile Network Technologies for IoT/M2M,Layer 3 Connectivity :IPv6 Technologies for the IoT: Overview and Motivations. Address Capabilities,IPv6 Protocol Overview, IPv6 Tunneling. TEXT BOOK 2: Chapter6-6.1,6.2, Chapter7-7.1,7.2,7.3,7.4,7.5	8
4	Case Studies Illustrating IoT Design-Introduction, Home Automation, Cities,Environment, Agriculture, Productivity Applications. T1:Chapter 9-9.1,9.2,9.3,9.4,9.5,9.6	8

5	Data Analytics for IoT – Introduction, Apache Hadoop, U Spark, Apache Storm, Using Apache Storm for Real-time Data Analysis, Structural Health Monitoring . T1:Chapter 10-10.1,10.2,10.3,10.4,10.5,10.6,10.7,10.8	7
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course outcomes:

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

CO1: Interpret the impact and challenges posed by IoT networks

CO2: Appraise the role of IoT protocols for efficient network communication

CO3: Deployment of different sensor technologies and Layers to connect the network.

CO4: To Deploy the role of IoT design in various domains of Industry

CO5:Elaborate the need for Data Analytics

Sub Title: Management and Entrepreneurship		
Sub Code: 18HS61	No. of Credits : 3	No. of Lecture hours/week : 3
Exam Duration :3 hours	CIE + Assignment + SEE =100 = 45 + 5 + 50 = 100	Total No. of Contact Hours: 39

Course Objectives :

1. To help students understand the Management concepts & its evolution.
2. To impart the knowledge about various Managerial functions.
3. To make the student learn the Entrepreneurial process.
4. To understand the role of SSI in economic development and gain an insight of funding agencies.
5. To have a clear understanding of preparation of project & its screening.

UNIT NO	Syllabus Content	No. of Hours
1	<p>MANAGEMENT: Introduction- Meaning, characteristics of management, functions of Management- POSDCORB, Levels and Skills of Management, Roles of Managers Management as science or an art or profession, Management and Administration, Development of management thought - Early management approaches: Psychological Development, Bureaucratic, Scientific and Administrative, Human Relations Approach, Modern management approaches: Behavioral, Systems, Quantitative and Contingency Approach.</p>	07 Hours
2	<p>PLANNING: Meaning, Types of Plans (Single use & Standing plans), Steps in Planning process.</p> <p>ORGANIZING: – Meaning, Types of organization (Line, Staff, Line & Staff, Matrix and Committee form) Departmentation (Functional, Product, Process, Territorial and Customer), Span of Control, MBO and MBE.</p> <p>STAFFING: Meaning and importance of staffing, Sources of recruitment, process of selection.</p> <p>DIRECTING: Meaning, Leadership: Definition, Leadership styles (Autocratic, Democratic, Charismatic, Laissez faire and Participative.) Introduction to motivation: Meaning & Definition – Maslow, Herzberg & McGregor’s Theory X & Y.</p> <p>Communication– Meaning, types, communication process and barriers of communication, Co-ordination: Meaning and importance.</p> <p>CONTROLLING: Meaning, steps in controlling, types of controlling.</p> <p><i>Case study discussion with respect to Indian context.</i></p>	08 Hours
3	<p>ENTREPRENEUR: Definition & Meaning, Characteristics, types of entrepreneurs(Imitative, Innovative, Fabian and drone), Intrapreneur- meaning, Difference between Entrepreneurs, Intrapreneur & Manager, Stages in Entrepreneurial process, barriers to entrepreneurs, Role of Entrepreneurs in economic development.</p> <p>Rural entrepreneurship– Definition, challenges & opportunities. Women Entrepreneurs – Definition, challenges, and Institutional support to Women Entrepreneurs in India</p> <p>Family Business: Meaning and Definition, succession planning in family business and reasons for failure of family business.</p> <p>Corporate Social Responsibility- Meaning, definition and benefits.</p> <p><i>Case study discussion with respect to Indian context.</i></p> <p><i>Activity: Profile of successful entrepreneur.</i></p>	08 Hours

4	<p>MSME: Definition of MSME (latest). SMALL SCALE INDUSTRY: Meaning, and definition, Characteristics, forms of ownership, sources of financing, Steps to start SSI, Problems faced by SSI. Introduction to GATT, WTO & LPG.</p> <p>Institutional Support: <i>Central level Institutions</i> – KVIC, NSIC, SIDBI, EDI and NABARD. <i>State level Institutions-</i> DIC, KSFC, KIADB, TECSOK.</p> <p>STARTUP COMPANIES-Meaning and Challenges. Make in India concept and MUDRA Bank Initiative.</p> <p><i>Activity for students: Schemes for startup companies.</i></p>	09 Hours
5	<p>PREPARATION OF PROJECT:</p> <p>Project- Meaning, Project identification, Project selection, Project Appraisal, Project implementation. Project Report –Outline, Feasibility Study- –PESTLE and errors in preparation of project report.</p> <p><i>Activity for students: Writing of a business plan.</i></p>	7 Hours

Note: Every unit will have an internal choice question for SEE.

Course Outcomes :

- CO1 : The students will gain knowledge on management concepts & its evolution.
- CO2 : The students will learn the application of managerial skills & attributes.
- CO3 : The students will get an in depth knowledge of entrepreneurial process & contribute to the betterment of the society.
- CO4 : Students will be able to compile information about setting up an MSME & explore the sources of funding agencies.
- CO5 : Students will be able to identify business opportunities & design a project report.

Sub Title : MACHINE LEARNING		
Sub Code: 18IS62	No. of Credits: 4 =4:0:0:0	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 52
<p>Course objectives: This course will enable students to:</p> <ol style="list-style-type: none"> 1. Define machine learning and understand about various machine learning applications 2. Differentiate supervised, unsupervised and reinforcement learning methods 3. Apply decision trees, neural networks, Bayes classifier, Kmeans clustering and k-nearest neighbour methods for problems in machine learning 		

Unit No.	Syllabus Content	No. of Hours
1	<p>INTRODUCTION TO MACHINE LEARNING: Introduction; Human learning and types of human learning; What is machine learning?; Types of machine learning; Well-posed learning problems; Designing a learning system; Applications of machine learning; Tools in machine learning; Machine learning activities; Issues in machine learning.</p> <p>CONCEPT LEARNING AND THE GENERAL-TO-SPECIFIC ORDERING: Concept learning task; Concept learning as search; Find-S algorithm; Version spaces and the Candidate-elimination algorithm.</p> <p>T2: Ch 1: 1.1- 1.8 ,T1: 1.1-1.3 ; T1:Ch 2:2.1-2.5 ,T2: 2.2 .</p>	11
2	<p>DECISION TREE LEARNING: Decision tree representation; Appropriate problems for decision tree learning; Basic decision tree learning algorithm; Hypothesis space search in decision tree learning; Inductive bias in decision tree learning; Issues in decision tree learning;</p> <p>T1:Ch 3: 3.2-3.7.</p>	11
3	<p>ARTIFICIAL NEURAL NETWORKS: Introduction; Neural Network representations; Appropriate problems for neural network learning; Perceptrons; Backpropagation algorithm.</p> <p>BAYESIAN LEARNING-I: Introduction; Bayes theorem; Bayes theorem and concept learning;</p> <p>T1:Ch 4: 4.1-4.4 (Only 4.4.1), 4.5 ;T1:Ch 6: 6.1-6.3(Only 6.3.1)</p>	10
4	<p>BAYESIAN LEARNING-II: Bayes optimal classifier; Naive Bayes classifier; Bayesian belief networks.</p> <p>CLUSTERING: Introduction; Kmeans clustering</p> <p>T1:Ch 6: 6.7, 6.9, 6.11</p>	10
5	<p>INSTANCE BASED LEARNING: Introduction; k-nearest neighbor learning</p>	10

REINFORCEMENT LEARNING: Introduction; Learning task. T1:Ch 8: 8.1-8.3; T1:Ch 13: 13.1-13.3 Use Cases: Applications of Reinforcement Learning in Finance, Banking	
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks: Assignment – I from Units 1 and 2. Assignment – II from Units 3 and 4 . Assignment -III from Unit 5

Course Outcomes:

After completion of course students will be able to:

CO1: Identify problems of machine learning and it's methods

CO2: Apply apt machine learning strategy for any given problem

CO3: Design systems that uses appropriate models of machine learning

CO4: Solve problems related to various learning techniques

COs	Mapping with POs
CO1	PO1, PO2
CO2	PO3, PO4
CO3	PO2,PO3, PO5,PO12
CO4	PO4, PO9, PO12

TEXT BOOKS:

1. Tom M. Mitchell, "Machine Learning", McGraw Hill Education. India Edition 2013.
2. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, "Machine Learning" , Pearson India Education Services Pvt. Ltd., 2019.

REFERENCE BOOKS/WEB LINKS:

1. Ethem Alpaydin, "Introduction to Machine Learning", 2nd Ed., PHI Learning Pvt. Ltd., 2013.
2. T. Hastie, R. Tibshirani, J. H. Friedman, "The Elements of Statistical Learning", Springer; 1st edition, 2001.
3. Peter Harrington , "Machine Learning in Action", MANNING Shelter Island Publication, ISBN 9781617290183, 2012.

Weblinks:

1. [NPTEL course by Balaram Ravindran](#)
2. [FAST.ai course on ML](#)

Sub Title : CLOUD COMPUTING		
SubCode:18IS63	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To study the history and the fundamental concepts of Cloud Computing, Parallel, Distributed Computing and Virtualization.
2. To understand the concept of cloud computing architecture and different Cloud models.
3. To impart Cloud offerings which enhances the usage of Cloud.
4. To analyze the Cloud Storage and Security maintenances.
5. To become familiar with the different applications of Cloud Computing.

UNIT No	Syllabus Content	No of Hours
1	Introduction to Cloud Computing: Cloud Computing at a Glance, Historical Developments, Building Cloud Computing Environments Computing Platforms and Technologies. T1: Ch1: 1.1-1.3	7
2	Principles of Parallel and Distributed Computing: Eras of Computing , Parallel vs. Distributed Computing, Elements of Parallel Computing, Elements of Distributed Computing, Technologies for Distributed Computing Virtualization: Introduction, Characteristics of Virtualized Environments, Virtualization and Cloud Computing, Pros & Cons of Virtualization. Technology examples: Xen: paravirtualization, VMware: full virtualization, Microsoft Hyper-V. T1: Ch 2: 2.1-2.5, Ch 3: 3.1-3.6	9
3	Cloud Computing Architecture: Introduction, Cloud Reference Model, types of Clouds, Economics of the cloud, Open challenges. T1: Ch 4: 4.1-4.5	7
4	Cloud offerings: Cloud Analytics, Testing under cloud, Information Security, Virtual Desktop Infrastructure, Storage Cloud. Cloud management: Introduction, Resiliency, Provisioning, Asset management. Cloud governance, High availability and disaster recovery, Charging models, Usage reporting, Billing and metering. T2: Ch 3: 3.1-3.4	7
5	Cloud Platforms in Industry: Amazon Web Services, Google AppEngine. Cloud Applications: Scientific Applications, Business and Consumer Applications. T1: Ch 9: 9.1-9.2, Ch: 10: 10.1-10.2	9

Note 1: All chapters will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks: Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 . Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the student will be able to:

CO1: Analyze core concepts and fundamentals of the Cloud Computing.

CO2: Identify systems, protocols and mechanisms to support Cloud Infrastructure.

CO3: Analyze the Software and Hardware necessities for Cloud Computing.

CO4: Develop applications and host on Cloud Environment.

CO5: To manage the Cloud Environment.

COs	Mapping with Pos
CO1	PO4,PO5,PO10,PO11,PO12
CO2	PO1,PO2,PO4,PO7,PO8,PO9
CO3	PO2,PO3, PO4,PO5,PO9,PO10
CO4	PO3,PO4,PO5,PO7,PO8, PO9,PO10,PO11,PO12
CO5	PO4,PO5,PO6,PO7,PO8,PO10,PO11,PO12

TEXT BOOKS:

1. Rajkumar Buyya, Christian Vecchiola, S Thamarai Selvi ,Mastering Cloud Computing , Tata McGraw Hill Education Private Limited, 2013.
2. Dr. Kumar Saurabh , Cloud Computing , Wiley India, 2011.

REFERENCE BOOKS:

1. Dinkar Sitaram, Geetha Manjunath ,Moving to the Cloud. Elsevier Publications, 2011.
- Barrie Sosinsky, Cloud Computing Bible , Wiley Publishing, Inc, 2011.

Sub Title : ADVANCED JAVA AND J2EE		
Sub Code:18IS641	No. of Credits: 3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + Group Activity + SEE = 40 + 5 +5+ 50 =100	Total No. of Contact Hours : 39
Course Objectives:		
<ol style="list-style-type: none"> 1. Identify the need for advanced Java concepts like Enumerations and Collections 2. Construct client-server applications using Java socket API. 3. Make use of JDBC to access database through Java Programs. 4. Adapt servlets to build server side programs. 5. Demonstrate the use of JavaBeans to develop component-based Java software 		

Unit No.	Syllabus Content	Noof Hours
1	<p>Enumerations, Autoboxing and Annotations(metadata): Enumerations, Enumeration fundamentals, the values() and valueOf() Methods, java enumerations are class types, enumerations Inherits Enum, example, type wrappers, Autoboxing, Autoboxing and Methods, Autoboxing/Unboxing occurs in Expressions, Autoboxing/Unboxing, Boolean and character values, Autoboxing/Unboxing helps prevent errors, A word of Warning. Annotations, Annotation basics, specifying retention policy, Obtaining Annotations at run time by use of reflection, Annotated element Interface, Using Default values, Marker Annotations, Single Member annotations, Built-In annotations. T1:Ch 12</p>	7
2	<p>The collections and Framework: Collections Overview, Recent Changes to Collections, The Collection Interfaces, The Collection Classes, Accessing a collection Via an Iterator, Storing User Defined Classes in Collections, The Random Access Interface, Working With Maps, Comparators, The Collection Algorithms, Why Generic Collections?, The legacy Classes and Interfaces, Parting Thoughts on Collections. T1: Ch.17</p>	8
3	<p>String Handling :The String Constructors, String Length, Special String Operations, String Literals, String Concatenation, String Concatenation with Other Data Types, String Conversion and toString() Character Extraction, charAt(), getChars(), getBytes() toCharArray(), String Comparison, equals() and equalsIgnoreCase(), regionMatches() startsWith() and endsWith(), equals() Versus == , compareTo() Searching Strings, Modifying a String, substring(), concat(), replace(), trim(), Data Conversion Using valueOf(), Changing the Case of Characters Within a String, Additional String Methods, StringBuffer , StringBuffer Constructors, length() and capacity(), ensureCapacity(), setLength(), charAt() and setCharAt(), getChars(),append(), insert(), reverse(), delete() and deleteCharAt(), replace(), substring(), Additional StringBuffer Methods, StringBuilder T 1: Ch 15</p>	08

4	Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet; The Servlet API; The Javax.servlet Package; Reading Servlet Parameter; The 08 Javax.servlet.http package; Handling HTTP Requests and Responses; Using Cookies; Session Tracking. Java Server Pages (JSP): JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects T1: Ch 31, T2: Ch 11	08
5	The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process; Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data types; Exceptions. T2: Ch 06	08

Note 1: All Units will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks: Assignment – I from Units 1 and 2; Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

TEXT BOOK:

1. Herbert Schildt: JAVA the Complete Reference, 7th/9th Edition, Tata McGraw Hill, 2007.
2. Jim Keogh: J2EE-TheCompleteReference, McGraw Hill, 2007.

REFERENCE BOOKS:

1. Y. Daniel Liang: Introduction to JAVA Programming, 7thEdition, Pearson Education, 2007.
2. Stephanie Bodoff et al: The J2EE Tutorial, 2nd Edition, Pearson Education,2004.
3. Uttam K Roy, Advanced JAVA programming, Oxford University press, 2015.

Course Outcomes:

After the completion of the course students will be able to

CO1: Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs

CO2:Build client-server applications and TCP/IP socket programs

CO3: Illustrate database access and details for managing information using the JDBC API

CO4: Describe how servlets fit into Java-based web application architecture

CO5:Develop reusable software components using Java Beans

COs	Mapping with POs
CO1	PO1,PO2
CO2	PO1,PO2,PO3
CO3	PO1,PO3,PO4
CO4	PO1,PO4
CO5	PO1,PO2,PO3

Sub Title: MACHINE LEARNING LAB		
SubCode: 18ISL65	No. of Credits:1=0: 0 : 1 (L-T-P)	No. of lecture hours/week : 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 =100	
Course Objectives : This course will enable students to: <ol style="list-style-type: none"> 1. Define machine learning and understand about various machine learning applications 2. Differentiate supervised, unsupervised and reinforcement learning methods 3. Apply decision trees, neural networks, Bayes classifier, K-means clustering and k-nearest neighbor methods for problems in machine learning 		

LIST OF PROGRAMS PART-A:

Execute the following programs using Google Colab/Anaconda/Jupyter Notebook:

1. Demonstrate the following:
 - a. Creation of .CSV files
 - b. insert synthetic data manually into .CSV files
 - c. uploading of .CSV files from local drive to python environment.
 - d. uploading of .CSV files from Google drive to python environment.
2. Demonstrate how to generate synthetic datasets(not manual entry) and generate at least 4 features.
3. Demonstrate the working of Find-S algorithm for finding the most specific hypothesis using appropriate training samples.
4. Implement Candidate Elimination algorithm and display all the consistent hypotheses using appropriate training samples.
5. Create a .CSV file for the datasets containing the following fields(age, income, student, credit_rating, Buys_computer) where Buys_computer is the target attribute and implement ID3 algorithm for the same.
6. Demonstrate the working of XOR gate using Artificial Neural network with Backpropagation method using Tanh activation function.
7. Implement KNN algorithm to classify “iris dataset” using Kaggle or Machine learning repositories.
8. Implement K-means algorithm using suitable dataset from Kaggle repository or any other Machine Learning repositories

PART-B: Virtual Lab

- 1.Implementation of AND/OR/NOT Gate using Single Layer Perceptron.
- 2.Understanding the concepts of Perceptron Learning Rule.
- 3.Understanding the concepts of Correlation Learning Rule.

Web link for 1,2 and 3:

http://vlabs.iitb.ac.in/vlabs-dev/labs/machine_learning/labs/index.php 4.Neural networks simulation

Web link for 4: <https://playground.tensorflow.org/>

Course Outcomes:

After completion of course students will be able to:

- CO1: Identify problems of machine learning and it's methods
 CO2: Apply apt machine learning strategy for any given problem
 CO3: Design systems that uses appropriate models of machine learning
 CO4: Solve problems related to various learning techniques

COs	Mapping with POs
CO1	PO1, PO2
CO2	PO3, PO4
CO3	PO3, PO5, PO6
CO4	PO4, PO9, PO12

Sub Title : CLOUD COMPUTING LAB		
Sub Code:18ISL66	No of Credits : 0:0:1(L:T:P)	No. of Lecture Hours/Week : 02
Exam Duration : 3 hours	Exam Marks : CIE + SEE = 50 + 50 = 100	

Course Objectives:

1. To understand the working and usage of different cloud service models.
2. To study the basic understanding of Installation and Configuration of Cloud environment.
3. To understand the concept of Service Model and its usage in Cloud Computing.
4. To learn development of applications using IaaS, PaaS and SaaS.
5. Understand how Cloud environment works, for various deployment models.

I. LIST OF PROGRAMS

PART A

1. Demonstrate the working of Google Drive to make spreadsheet and notes.
2. Installation, Configuration and working on Dropbox.
3. Demonstrate the working in Cloudanywhere to demonstrate different development stacks.
4. Demonstrate the working of Google Form to develop event feedback system.
5. Create an application in Salesforce.com to maintain product information.
6. Create an application in Salesforce.com to demonstrate master-child relationship on invoice bill.
7. Develop a Visual Force Page to demonstrate the working of dependent field.
8. Develop a Visual Force Page to demonstrate the working of basic visual components.
9. Demonstrate the working in Codenvy to illustrate Provisioning and Scaling of a Website.
10. Demonstrate Virtualization using VMware/Hypervisor.

II. OPEN ENDED QUESTIONS

1. Installation and Configuration of Cloudsim cloud software.
2. Installation and Configuration of OpenStack or any equivalent cloud software.

3. Design and implement Cloud based application(mini-project)

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.

2. STUDENT IS REQUIRED TO EXECUTE ONE PROGRAM FROM PART A and ONE PROGRAM FROM PART B .

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Analyze the requirements to setup: Cloud Environment using IaaS Environment

CO2: Develop the ability to solve real-world problems through software development on Cloud Environment.

CO3: Implement, compile, test and run Java/Php/Python programs comprising on PaaS to address a particular software problem.

CO4: Design and develop useful Cloud applications with elegant user interfaces using SaaS.

COs	Mapping with POs
CO1	PO1,PO2,PO5,PO7,PO11
CO2	PO1,PO2, PO5, PO7,PO12
CO3	PO1,PO7,PO9,PO10,PO12
CO4	PO1,PO2,PO6,PO9,PO12

Sub. Title : DIGITAL IMAGE PROCESSING		
Sub.Code: 18IS642	No. of Credits: 3 =3:0:0(L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	CIE + Assignment+Group activity+SEE = 40+5+5+50=100	Total No. of Contact Hours : 39
Course objectives: The objectives of the course are : 1. To overview of Digital image processing 2.To gain knowledge of image enhancement. 3.To be aware of image restoration techniques. 4.To acquire knowledge of colour fundamentals and morphological image processing.		

Unit No.	Syllabus	No. of Hours
1	Introduction: What is Digital Image Processing, Origins of Digital Image Processing, Examples of fields that use DIP, Fundamental Steps in Digital Image Processing, Components of an Image Processing System. Digital Image Fundamentals: Basic Concepts in Sampling and Quantization, Representing Digital Images, Spatial and Gray-level Resolution, Some Basic Relationships Between Pixels, Linear and Nonlinear Operations.	8
2	Image Enhancement in the Spatial Domain: Some Basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic/Logic Operations, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters. Image Enhancement in the Frequency Domain: Introduction to the Fourier Transform and the Frequency Domain, Smoothing frequency-Domain Filters, Sharpening Frequency-Domain Filters, Homomorphic Filtering.	8
3	Image Restoration: A Model of the Image degradation/Restoration process, Noise Models, Restoration in the Presence of Noise Only– Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Linear, Position-Invariant Degradations, Estimating the Degradation Function, Inverse Filtering ,Minimum Mean Square Error (Wiener) Filtering, Constrained Least Square Filtering, Geometric Mean Filter.	8
4	Color Fundamentals: Color Models, Pseudocolor Image Processing, Basics of Full-Color Image Processing, Color Transformations, Smoothing and Sharpening, Color Segmentation, Color Image Compression. Wavelets and Multiresolution Processing: Image Pyramids, Subband coding, The Haar Transform, Multiresolution Expansions, Wavelet Transforms in one Dimension, Fast Wavelet Transform, Wavelet Transforms in Two Dimensions, Wavelet Packets.	8

5	Image Compression: Fundamentals, Image Compression Models, Error-free (Lossless) compression, Lossy Compression Morphological Image Processing: Preliminaries, Dilation and Erosion, Opening and Closing, The Hit-or-Miss Transformation, Some Basic Morphological Algorithms. Image Segmentation: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation.	7
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 10 marks: Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 Assignment -III from Unit 5

Course Outcomes:

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

CO1: understand image processing concepts.

CO2: Analyze image enhancement techniques.

CO3: Choose image restoration applications.

CO4: Identify color fundamentals and its transformations.

CO5: Analyze morphological image concepts

Course Title: BIG DATA & ANALYTICS		
Course code: IS73	No. of Credits: 3=4 : 0 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks : CIE + Assignment + SEE = 45 + 5 + 50 = 100	Total No. of Contact Hours: 52

Course Objectives:

- Understand Big data for industry applications.
- Analyze business case studies for Big data analytics
- Define managing of Big data without SQL
- Develop Mapreduce analytics using Hadoop and related tools.

UNIT No.	Syllabus Content	No. of Hours
1	Overview of Big Data and its Use in Business Context : Big Data definition. Evolution of Big Data. Structuring Big Data. Elements of Big Data. Big Data Analytics. Use of Big Data in - Social Networking, Preventing Fraudulent Activities, Detecting Fraudulent Activities, Insurance Sector, Retail Industry. Text1: 1.1-1.4, 2.1-2.4	10
2	NOSQL Data Management: Introduction to NoSQL–Aggregate data models–Aggregates–Key-value and Document data models–Relationships–Graphdatabases–Schemaless databases–Materialized views–Distribution models–Sharding—Version–Mapreduce–Partitioning and combining – Composing Mapreduce calculations. Text2: Chapter 1.1-1.5, 2.1-2.4, 3.1-3.5	10

3	<p>Understanding Hadoop Ecosystem, YARN Architecture: Hadoop Ecosystem, Hadoop Distributed File System, MapReduce, Hadoop YARN, Introducing HBase, Combining HBase and HDFS, Hive, Pig and Pig Latin, Sqoop, ZooKeeper, Flume, Oozie. Background of YARN, Advantages of YARN, YARN Architecture, Working of YARN, YARN Schedulers, Backward Compatibility with YARN, YARN Configurations, YARN Commands, YARN Containers, Registry, Log Management in Hadoop Text1: 4.1-4.5,12.1-12.3,12.5</p>	11
4	<p>MapReduce Fundamentals, Processing Data and Implementing MapReduce Program and HBase: The MapReduce Framework, Techniques to Optimize MapReduce Jobs, Uses of MapReduce, Role of HBase in Big Data Processing. , Developing Simple MapReduce Application, Points to Consider while Designing MapReduce, Controlling MapReduce Execution with InputFormat, Reading Data with Custom RecordReader, Organizing Output Data with OutputFormats, Customizing Data with RecordWriter, Optimizing MapReduce Execution with Combiner, Controlling Reducer Execution with Partitioners, Customizing the MapReduce Execution in Terms of YARN, Implementing a MapReduce Program for Sorting Text Data. Text1: 5.1-5.4,10.1-10.7</p>	11
5	<p>Exploring Hive, Analyzing Data with Pig: Introducing Hive, Getting Started with Hive, Hive Services, Data Types in Hive, Built-In Functions in Hive, Hive DDL, Data Manipulation in Hive, Data Retrieval Queries, Using JOINS in Hive,. Introducing Pig, Running Pig, Getting Started with Pig Latin, Working with Operators in Pig, Debugging Pig, Working with Functions in Pig, Error Handling in Pig. Text1: 13.1-13.4,14.1-14.4</p>	10

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Describe Big data and use cases from selected industry domains.

CO2: Discuss about NoSQL Big data management.

CO3: Install, configure, and run Hadoop.

CO4: Perform Mapreduce analytics using Hadoop.

CO5: Use Hadoop related tools such as HBase, Cassandra, Pig and Hive for Big Data Analytics.

COs	Mapping with PO's
CO1	PO2, PO8
CO2	PO4,PO5, PO8
CO3	PO3, PO4, PO5
CO4	PO4, PO5
CO5	PO3, PO4, PO5, PO11.

TEXT BOOK:

1. Big Data, Black Book- DT Editorial Services Wiley Publications 2ed.
2. Pramod J. Sadalage, Martin Fowler, “NoSQL Distilled”, Pearson Education, ISBN-13: 978-0-321-82662-6, 2013.

REFERENCE BOOKS:

1. Tom White,"Hadoop:TheDefinitiveGuide",ThirdEdition,O'Reilley,2012.
2. EricSammer,"HadoopOperations",O'Reilley,2012.

Sub Title : C# PROGRAMMING AND .NET		
Sub Code:IS744	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Understand the nature of .Net application development and build C# applications.
2. Familiarize with Object-oriented Programming concepts as associated with C#, Inheritance, Interfaces, Exception Handling, Reflection, Standard I/O programming, File Handling, Generics,
3. Understand Windows Application using Winforms, File I/O, XML in .NET.Web Services and Deployment.
4. Overview of .NET framework 3.0 features like WPF, WCF and WF.

Unit No.	Syllabus Content	No of Hours
1	<p>The Philosophy Of .Net: Understanding the Previous State of Affairs, The .NET Solution, The Building Block of the .NET Platform (CLR,CTS, and CLS), The Role of the .NET Base Class Libraries, What C# Brings to the Table, An Overview of .NET Binaries (aka Assemblies), the Role of the Common Intermediate Language , The Role of .NET Type Metadata, The Role of the Assembly Manifest, Compiling CIL to Platform –Specific Instructions, Understanding the Common Type System, Intrinsic CTS Data Types, Understanding the Common Languages Specification, Understanding the Common Language Runtime A tour of the .NET Namespaces, Increasing Your Namespace Nomenclature, Deploying the .NET Runtime.</p> <p>Building C# Applications: The Role of the Command Line Compiler (csc.exe), Building C # Application using csc.exe Working with csc.exe Response Files, Generating Bug Reports , Remaining C# Compiler Options, The Command Line Debugger (cordbg.exe) Using the, Visual Studio .NET IDE, Other Key Aspects of the VS.NET IDE, C# “Preprocessor:” Directives, An Interesting Aside: The System. Environment Class.Text1:Ch1,Ch2</p>	10

2	<p>C# Language Fundamentals: The Anatomy of a Basic C# Class, Creating objects: Constructor Basics, The Composition of a C# Application, Default Assignment and Variable Scope, The C# Member Initialization Syntax, Basic Input and Output with the Console Class, Understanding Value Types and Reference Types, The Master Node: System, Object, The System Data Types (and C# Aliases), Converting Between Value Types and Reference Types: Boxing and Unboxing, Defining Program Constants, C# Iteration Constructs, C# Controls Flow Constructs, The Complete Set of C# Operators, Defining Custom Class Methods, Understating Static Methods, Methods Parameter Modifies, Array Manipulation in C #, String Manipulation in C#, C# Enumerations, Defining Structures in C#, Defining Custom Namespaces. Text1:Ch3</p>	12
3	<p>Object- Oriented Programming With C#: Forms Defining of the C# Class, Definition the “Default Public Interface” of a Type, Recapping the Pillars of OOP, The First Pillars: C#’s Encapsulation Services, Pseudo-Encapsulation: Creating Read-Only Fields, The Second Pillar: C#’s Inheritance Supports, keeping Family Secrets: The “Protected” Keyword, Nested Type Definitions, The Third Pillar: C #’s Polymorphic Support, Casting Between.</p> <p>Exceptions And Object Lifetime: Ode to Errors, Bugs, and Exceptions, The Role of .NET Exception Handling, the System. Exception Base Class, Throwing a Generic Exception, Catching Exception, CLR System – Level Exception (System. System Exception), Custom Application-Level Exception (System. System Exception), Handling Multiple Exception, The Family Block, the Last Chance Exception Dynamically Identifying Application – and System Level Exception Debugging System Exception Using VS. NET, Understanding Object Lifetime, the CIT of “new”, The Basics of Garbage Collection,, Finalization a Type, The Finalization Process, Building an Ad Hoc Destruction Method, Garbage Collection Optimizations, The System. GC Type. Text1:Ch4,Ch5,Ch6</p>	10
4	<p>Interfaces And Collections: Defining Interfaces Using C# Invoking Interface Members at the object Level, Exercising the Shapes Hierarchy, Understanding Explicit Interface Implementation, Interfaces As Polymorphic Agents, Building Interface Hierarchies, Implementing, Implementation, Interfaces Using VS .NET, understanding the IConvertible Interface, Building a Custom Enumerator (IEnumerable and Enumerator), Building Cloneable objects (ICloneable), Building Comparable Objects (I Comparable), Exploring the system. Collections Namespace, Building a Custom Container (Retrofitting the Cars Type).</p> <p>Understanding Callback Interfaces, Understanding the .NET Delegate Type,Members of System. Multicast Delegate, The Simplest Possible DelegateExample, , Building More a Elaborate Delegate Example, UnderstandingAsynchronous Text1:Ch7,Ch8</p>	10

5	Delegates, Understanding (and Using)Events.The Advances Keywords of C#, A Catalog of C# Keywords Building aCustom Indexer, A Variation of the Cars Indexer Internal Representation ofType Indexer . Using C# Indexer from VB .NET. Overloading operators, TheInternal Representation of Overloading Operators, interacting with OverloadOperator from Overloaded- Operator- Challenged Languages, CreatingCustom Conversion Routines, Defining Implicit Conversion Routines, TheInternal Representations of Customs Conversion Routines Understanding .Net Assembles: Problems with Classic COM Binaries, An Overview of .NET Assembly, Building a Simple File Test Assembly, A C#. Client Application, A Visual Basic .NET Client Application, Cross Language Inheritance, Exploring the CarLibrary’s, Manifest, Exploring the CarLibrary’s Types, Building the Multifile Assembly, Using Assembly, Understanding Private Assemblies, Probing for Private Assemblies (The Basics), Private A Assemblies XML Configurations Files, Probing for Private Assemblies (The Details), Understanding Shared Assembly, Understanding Shared Names, Building a Shared Assembly, Understanding Delay Signing, Installing/Removing Shared Assembly, Using a Shared Assembly. Text1:Ch9,Ch10,Ch11	10
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1:Analyze the nature of .Net application development .

CO2:Apply OOAD concepts to build C# applications

CO3:Design and develop console based applications using C#

CO4:Develop Windows Application using Winforms, File I/O, XML in .NET.Web Services and deployment.

CO5:Analyze .NET framework 3.0 features like WPF, WCF and WF.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO4,PO5,PO8,PO12
CO2	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO3	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO4	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO5	PO1,PO2,PO3,PO4,PO5,PO7,PO12

TEXT BOOKS:

1. Pro C# with .NET 3.0 - Andrew Troelsen, Special Edition, Dream Tech Press, India, 2013.

2. Programming in C# - E. Balagurusamy, 5th Reprint, Tata McGraw Hill, 2011.

REFERENCE BOOKS/WEB LINKS:

1. Inside C# - Tom Archer, WP Publishers, 2011.

Sub Title : BIG DATA AND ANALYTICS LAB		
Sub Code:ISL76	No of Credits : 1:0:1.5	No. of Lecture Hours/Week : 03
Exam Duration : 3hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	

<p>Course Objectives:</p> <ol style="list-style-type: none"> 1. To understand the concept of Big data with hands on. 2. Understand installation of various Big data tools under Hadoop. 3. To apply Hadoop concepts to various applications and NoSQL implementation.

I. LIST OF PROGRAMS

1. Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.
 - a. Review the commands available for the Hadoop Distributed File System:
 - b. Copy file `foo.txt` from local disk to the user's directory in HDFS
 - c. Get a directory listing of the user's home directory in HDFS
 - d. Get a directory listing of the HDFS root directory
 - e. Display the contents of the HDFS file `user/fred/bar.txt`

2. Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.
 - a. Move that file to the local disk, named as `baz.txt`
 - b. Create a directory called `input` under the user's home directory
 - c. Delete the directory `input` and all its contents
 - d. Verify the copy by listing the directory contents in HDFS.

3. Demonstrate word count on an input file using MapReduce program.
4. Using movie ratings data, Develop the queries in Hive for the following-
 - a. List all the Users who have rated the movies (Users who have rated at least one movie)
 - b. List of all the User with the max, min, average ratings they have given against any movie
 - c. List all the Movies with the max, min, average ratings given by any user

5. In this program you will use HiveQL to filter and aggregate click data to build facts about user's movie preferences. The query results will be saved in a staging table used to populate the Oracle Database.

The `moveapp_log_json` table contains an activity column. Activity states are as follows:

- RATE_MOVIE
- COMPLETED_MOVIE
- PAUSE_MOVIE
- START_MOVIE
- BROWSE_MOVIE
- LIST_MOVIE

- SEARCH_MOVIE
 - LOGIN
 - LOGOUT
 - INCOMPLETE_MOVIE.
 - PURCHASE_MOVIE
- a. Write a query to select only those clicks which correspond to starting, browsing, completing, or purchasing movies. Use a CASE statement to transform the RECOMMENDED column into integers where 'Y' is 1 and 'N' is 0. Also, ensure GENREID is not null. Only include the first 25 rows.
 - b. Write a query to select the customer ID, movie ID, recommended state and most recent rating for each movie.
6. The moveapp_log_json table contains an activity column. Activity states are as follows:
- RATE_MOVIE
 - COMPLETED_MOVIE
 - PAUSE_MOVIE
 - START_MOVIE
 - BROWSE_MOVIE
 - LIST_MOVIE
 - SEARCH_MOVIE
 - LOGIN
 - LOGOUT
 - INCOMPLETE_MOVIE.
- a. Load the results of the previous two queries into a staging table. First, create the staging table:
 - b. Next, load the results of the queries into the staging table.
7. Write R program to:
- a. Create two matrices and perform multiplication & division on those matrices.
 - b. Create a data frame and print the: data frame, structure of data frame and summary of data frame.
 - c. Create a Bar chart and sketch the Bar chart by taking months as input & plot it against revenue. Also, add legend to the chart that includes regions.

II. OPEN ENDED QUESTIONS

1. Installation and Configuration of Hadoop software on stand alone system.
2. Installation and Configuration of Hadoop software on Ubuntu cluster system.
3. Highest temperature year wise using MapReduce.

NOTE:

1. **STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.**
2. **STUDENT IS REQUIRED TO EXECUTE ONE PROGRAM FROM PART A and ONE PROGRAM FROM PART B .**

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Elucidate installation of various Big data tools under Haoop.

CO2: Implement HiveQL statements.

CO3: Differentiate between SQL and NoSQL commands.

COs	Mapping with POs
CO1	PO2,PO5,PO7,PO11
CO2	PO5, PO7,PO12
CO3	PO7,PO9,PO10,PO12

Sub. Title : MOBILE APPLICATION DEVELOPMENT LAB		
Sub Code:ISL75	No. of Credits : 0:0:1	No. of lecture hours/week : 03
Exam Duration : 3 hours	CIE +Assignment + SEE = 45 + 5 + 50 =100	

Course objectives:

1. To understand the Mobile - Android OS architecture and life cycle.
2. To analyze and use appropriate tools for Android Application development.
3. To be familiar with managing application resources.
4. To build elegant user interfaces with views, layouts & form widgets.
5. To understand the usage of Database, Notifications and Clock in Android Apps.

I. LIST OF PROGRAMS

1. Develop an android application that uses GUI components, Font and Colors.
2. Design an android application that uses Layout Managers and event listeners.
3. Develop a native android calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an android application that makes use of databases.
6. Implement an android application that implements Multi-threading concept.
7. Develop an application to demonstrate the frame-by-frame animation.
8. Implement an application that writes data to the SD card.
9. Implement an application that creates an alert upon receiving a message.
10. Develop an application to display time in Analog Clock and Digital Clock.
11. Write a mobile application that creates an alarm clock.
12. Design an application for a Hotel to display a Food List by using the concept of Menus.

2.

OPEN ENDED QUESTIONS

Develop an android application using Android Studio/ADT Bundle for any one of the

following:

1. Mobile Based Attendance System.
2. Android Campus Recruitment System.
3. Android Book Store Project.
4. Student Faculty Document Sharing Android Project
5. Android Based Feedback System.

NOTE :

1. Students are permitted to submit open ended solutions OR any other open ended question apart from the list above. But it has to be approved by the staff in charge.
2. In the examination each student picks one question from a lot of all 12 questions.

Course Outcomes:

After completing the course the students are able to:

CO1: Analyze the fundamentals of Mobile application development.

CO2: Analyze the problems to build Mobile apps by assessing the basic framework and usage of SDK.

CO3: Design and develop Android applications using various resources and built-in classes.

CO4: Develop the skills in designing and deploying the sophisticated mobile applications.

CO5: Design and deploy Android applications with compelling User Interfaces.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO5
CO2	PO1,PO2,PO4,PO5,PO6
CO3	PO1,PO3,PO4,PO6,PO7
CO4	PO6,PO7,PO9,PO11,PO12
CO5	PO1,PO3,PO4,PO5,PO6,PO7,PO8,PO12

Sub Title : SOFTWARE TESTING		
Sub Code:IS81	No. of Credits:4=4 : 0 : 0 (L-T-P)	No.of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks:CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours :52

Course Objectives:

1. Discuss about terminologies of software testing .
2. Familiarize with strengths and weaknesses of a variety of test generation.
3. Analyze different types of software testing.
4. Infer functional and non functional testing.
5. Integrating the applications of Test management and automation in software testing

Unit No	Syllabus Content	No of Hours
1	<p>Basics of Software Testing: Humans, Errors and Testing(1.1), Software Quality(1.2); Requirements, Behavior and Correctness(1.3), Correctness versus Reliability(1.4), Testing and Debugging(1.5), Test Metrics(1.6), Software and Hardware Testing(1.7), Testing and Verification(1.8), Defect Management(1.9),Test-generation Strategies(1.10), Static Testing(1.11), Model-Based Testing and Model Checking(1.12), Control-Flow Graph(2.2), Execution History(2.3).</p> <p>Text book 1:</p>	12
2	<p>Test Generation: Introduction(3.1), The Test-Selection Problem(3.2), Equivalence Partitioning(3.3), Boundary Value Analysis(3.4), Category-Partition Method(3.5), Cause-Effect Graphing(4.3)</p> <p>Text book 1:</p>	10
3	<p>Types of Testing – 1: White Box Testing (T2:3), Static Testing (T2:3.2), Structural Testing (T2:3.3), Challenges in White box testing (T2:3.4), Black Box Testing(T2:4), Integration Testing(T2:5 and 5.1), Integration testing as a Type of Testing(T2:5.2), Integration testing as a Phase of Testing (T2:5.3), Scenario Testing(T2:5.4), Defect Bash(T2:5.5).</p> <p>T2:Text book 2:</p>	10
4	<p>Types of Testing – 2:</p> <p>System and Acceptance Testing: System Testing Overview(T2:6 and 6.1), why is system testing done? (T2:6.3),Functional versus non-functional Testing(T2:6.3), Functional System Testing(T2:6.4), Non-functional Testing(T2:6.5), Acceptance Testing(T2:6.6); Summary of Testing Phases(T2:6.7), Regression Testing(T2:8 to 8.3), How to do regression Testing(T2:8.4.1 to 8.4.6), Best Practices in regression testing (T2:8.5).</p> <p>T2:Text book 2:</p>	10
5	<p>Test Management and automation: Introduction (T2:15.1), Test planning (T2:15.2), Test management (T2:15.3), Test process(T2:15.4), Test reporting(T2:15.5), Test planning checklists(T2:Appendix A), Test plan template(T2:Appendix B).</p> <p>Software test Automation: What is Test automation?(T2:16.1) Terms used in Automation(T2:16.2), Skills needed for Automation(T2:16.3), what to automate? Scope of automation(T2:16.4), Design and architecture for automation(T2:16.5).</p> <p>T2:Text book 2:</p>	10

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Apply terms associated with software testing.

CO2: Design various test generation strategies.

CO3: Implement different types of software testing in application development.

CO4: Summarize aspects of functional and non functional testing.

CO5: Apply the usage of test Management and automation in software testing.

COs	Mapping with Pos
CO1	PO1,PO2,PO7,PO12
CO2	PO1,PO2,PO3,PO5,PO7
CO3	PO1,PO2,PO3,PO5,PO7,PO9,PO10
CO4	PO1,PO2,PO3,PO4,PO5,PO7
CO5	PO5,PO7,PO8,PO9,P10,PO11,PO12

TEXT BOOKS:

1. Aditya P Mathur, Foundations of Software Testing, Pearson Education, First Edition, 2010.ISBN-9788131707951
2. Srinivasan Desikan, Gopalaswamy Ramesh, Software Testing - Principles and Practices, Pearson Education, First Edition, 2010. ISBN-978-8-177-58121-8

REFERENCE BOOKS/WEBLINKS:

Ron Patton, Software Testing, Pearson Education, Second Edition, 2010.
ISBN-978-81-7758-030

Course Title : MACHINE LEARNING		
CourseCode: IS823	No.of Credits:4 =4:0:0(L-T-P)	No.of lecture hours/week : 4
Exam Duration : 3 hours	CIE + Assignment+ SEE = 45+5+50=100	Total No. of Contact Hours : 52

Course objectives:

1. To understand the basic concepts of machine learning along with decision trees.
2. To understand the neural networks and genetic algorithms
3. To understand the Bayesian techniques
4. To understand the instant based learning
5. To understand the analytical learning and reinforced learning

Unit No.	Syllabus	No. of Hours
1	<p>INTRODUCTION and DECISION TREES: Machine learning basics: What is machine learning? Key terminology , Key tasks of machine learning,How to choose the right algorithm, Steps in developing a machine learning application , Why Python. Classifying with k-Nearest Neighbors Classifying with distance measurements, Prepare: importing data with Python , Putting the kNN classification, algorithm into action, How to test a classifier, Example: improving matches with kNN, Prepare: parsing data from a text file, Analyze: creating scatter plots with Matplotlib, Prepare: normalizing numeric values, Test: testing the classifier as a whole program, Use: putting together a useful system, Example: a handwriting recognition system, Prepare: converting images.</p>	11
2	<p>NEURAL NETWORKS and GENETIC ALGORITHMS: Biological Multilayer Networks and Back Propagation Algorithms, Genetic Algorithms, Neural Network Representation, Problems, Perceptrons,</p>	10
3	<p>BAYESIAN AND COMPUTATIONAL LEARNING Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probably Learning – Sample Complexity for Finite and Infinite Hypothesis Spaces – Mistake Bound Model.</p>	10
4	<p>K- Nearest Neighbor Learning – Locally Weighted Regression – Radial Basis Functions – Case-Based Reasoning – Sequential Covering Algorithms – Learning Rule Sets – Learning First Order Rules – Learning Sets of First Order Rules – Induction as Inverted Deduction – Inverting Resolution</p>	10

5	MODULE V ANALYTICAL LEARNING AND REINFORCED LEARNING Perfect Domain Theories – Explanation Based Learning – Inductive-Analytical Approaches - FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning	11
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

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

CO1: Choose the learning techniques with this basic knowledge. Also, obtain knowledge on decision tree learning.

CO2: Apply and comprehend neural network and genetic algorithms techniques.

CO3: Obtain knowledge about supervised and semi-supervised learning.

CO4: Differentiate between reinforcement and analytical learning techniques.

CO5: Differentiate different machine learning applications.

COs	Mapping with PO's
CO1	PO1,PO4
CO2	PO2,PO3,PO4
CO3	PO3,PO4
CO4	PO3,PO4,PO5,PO6
CO5	PO4,PO8,PO9,PO11


Text Books:

1. Peter Harrington , “Machine Learning in Action”, MANNING Shelter Island Publication, ISBN 9781617290183, 2012. Unit1: Chapter 1-2.4 (page no 1 to 36)
2. Tom M. Mitchell, “Machine Learning”, McGraw-Hill Education, 2013. Unit2, Unit3, Unit4 and Unit5: Chapter 4 to chapter 8 (Page no: 81 to 247)

Reference Books:

1. Ethem Alpaydin, “Introduction to Machine Learning”, 2nd Ed., PHI Learning Pvt. Ltd., 2013.
2. T. Hastie, R. Tibshirani, J. H. Friedman, “The Elements of Statistical Learning”, Springer; 1st edition, 2001.

2019-2020

	SOFT SKILLS		
	Subject Code: 18HS33	Mandatory Course	No of lecture hours per week: 2 Hrs
	Exam Duration:	Exam marks: NIL	Total No. of lecture hours: 26 hrs per semester

COURSE OBJECTIVES:

1. The lessons under unit 1 is to help students to recognize oneself as an individual being aware of one's knowledge, personality, environment and lifestyle, through different base and measures like SWOC analysis, personal developments.
2. The lessons under this unit make students to understand the importance of soft skills and hard skills and how to think critically and also learn the importance of creative thinking.
3. The lessons under this unit make students to understand the importance of attitude, time, and also learn to manage them.
4. The objective of this unit is to help a student to learn the art of goal setting and being motivated in achieving his goal in spite of all the hardships with different problems along with teamwork, and leadership qualities.
5. The unit 5 aims at teaching the students about importance of handwriting, punctuation marks, spellings, which helps them, improve in writing skills.

UNIT NO	SYLLABUS CONTENT	HRS /COS
1	a. SWOC ANALYSIS b. SELF – AWARENESS AND PERSONAL DEVELOPMENT c. ETTIQUTTE AND MANNERS	5 CO1
2	d. INTRODUCTION TO SOFT SKILLS AND HARD SKILLS e. CREATIVITY f. CRITICAL THINKING	5 CO2
3	g. ATTITUDE h. ADAPTABILITY i. TIME MANAGEMENT/ PRIORITY j. STRESS MANAGEMENT	5 CO3
4	k. GOAL SETTING l. MOTIVATION m. TEAM WORK n. PROBLEM SOLVING o. LEADERSHIP	5 CO4

5	<p>p. GUIDELINES FOR HANDWRITING</p> <p>q. PUNCTUATION MARKS</p> <p>r. SPELLING</p> <p>s. VISUAL NARRATIVES(Ramayana, Mahabharata, Short Stories, films and advertisements)</p>	6 CO5
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COURSE OUTCOME:

1. After the completion of this unit students will know about their self assessments and personality that how to handle various situations in a positive way.
2. At the end of this unit student will be able to see how important it is to consider things carefully and from different angles, something one sees, hears, experiences or reads in order to understand it fully. The student will also have understood the importance of soft skills and thinking creatively.
3. After the completion of this unit students will have learnt about attitude and adaptability and also how to deal with problems and stress in the present world.
4. At the end of this unit students will have learnt some simple ways of planning to achieve his dream and also feel enthusiastic about doing something individually and as well in team.
5. After the completion of this unit students writing skills will have improved.

REFERENCE:

- English for Job Seekers (Language and Soft Skills for the Aspiring) by Geetha Rajeevan, C.L.N. Prakash at al) Cambridge University Press pvt,Ltd.
- New International Business English by Leo Jones and Richard Alexander. Cambridge University Press pvt,Ltd
- Business Benchmark by Norman Whitby. Cambridge University Press pvt,Ltd
- Grammar practice Activities (practical guide for teachers) Cambridge University Press pvt,Ltd

Sub Title : OBJECT ORIENTED CONCEPTS		
Sub Code:18IS43	No. of Credits:4 = 4 : 0 : 0 (L-T-P)	No.of Lecture Hours/Week: 4
Exam Duration : 3 hours	Exam Marks: CIE + Assignment + SEE = 45 + 5 + 50 = 100	Total No. of Contact Hours : 52

Course Objectives:

1. To understand the object oriented concepts.
2. To understand the concepts of java.
3. To understand the concept of inheritance and exception handling.
4. To understand the concept of event handling and threads.
5. To design and write a applet and swing programs.

Unit No.	Syllabus Content	No. of Hours
1	Introduction to Object Oriented Concepts: A Review of structures, Procedure–Oriented Programming system, Object Oriented Programming System, Comparison of Object Oriented Language with C, Console I/O, variables and reference variables, Function Prototyping, Function Overloading. Class and Objects: Introduction, member functions and data, objects and functions, objects and arrays, Namespaces, Nested classes, Constructors, Destructors. Text book 1: Ch 1: 1.1 to 1.9 Ch 2: 2.1 to 2.6 Ch 4: 4.1 to 4.2	10
2	Introduction to Java: Java’s magic: the Byte code; Java Development Kit (JDK); the Java Buzzwords, Object-oriented programming; Simple Java programs. Data types, variables and arrays, Operators, Control Statements. Text book 2: Ch:1 Ch: 2 Ch:3 Ch:4 Ch:5	10
3	Classes, Inheritance, Exceptions, Packages and Interfaces: Classes: Classes fundamentals; Declaring objects; Constructors, this keyword, garbage collection. Inheritance: inheritance basics, using super, creating multi level hierarchy, method overriding. Exception handling: Exception handling in Java. Packages, Access Protection, Importing Packages, Interfaces. Text book 2: Ch:6 Ch: 8 Ch:9 Ch:10	10
4	Multi Threaded Programming, Event Handling: Multi Threaded Programming: What are threads? How to make the classes threadable ; Extending threads; Implementing runnable; Synchronization; Changing state of the thread; Bounded buffer problems, read-write problem, producer consumer problems. Event Handling: Two event handling mechanisms; The delegation event model; Event classes; Sources of events; Event listener interfaces; Using the delegation event model; Adapter classes; Inner classes. Text book 2: Ch 11: Ch: 22	11

5	<p>The Applet Class: Introduction, Two types of Applets; Applet basics; Applet Architecture; An Applet skeleton; Simple Applet display methods; Requesting repainting; Using the Status Window; The HTML APPLET tag; Passing parameters to Applets; getDocumentbase() and getCodebase(); ApletContext and showDocument(); The AudioClip Interface; The AppletStub Interface;Output to the Console. Swings: Swings: The origins of Swing; Two key Swing features; Components and Containers; The Swing Packages; A simple Swing Application; Create a Swing Applet; Jlabel and ImageIcon; JTextField;The Swing Buttons; 08 Hours JTabbedPane; JScrollPane; JList; JComboBox; JTable.</p> <p>Text book 2: Ch 21: Ch: 29 Ch: 30</p>	11
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Course Outcomes:

After the completion of the course students will be able to

CO1: Explain the object-oriented concepts and JAVA.

CO2: Develop computer programs to solve real world problems in Java.

CO3: Develop simple GUI interfaces for a computer program to interact with users, and to comprehend the event-based GUI handling principles using Applets and swings.

COs	Mapping with POs
CO1	PO1,PO2, PO4,PO5,PO7
CO2	PO1,PO2, PO4,PO5
CO3	PO1, PO2,PO4,PO5,
CO4	PO1,PO2,PO3, PO4,
CO5	PO1,PO2, PO4,PO5, PO7

TEXT BOOK:

1. Sourav Sahay, Object Oriented Programming with C++ , 2nd Ed, Oxford University Press,2006 (Chapters 1, 2, 4)
2. Herbert Schildt, Java The Complete Reference, 7th Edition, Tata McGraw Hill, 2007. (Chapters 1, 2, 3, 4, 5, 6, 8, 9,10, 11, 21, 22, 29, 30)

REFERENCE BOOKS:

1. Mahesh Bhawe and Sunil Patekar, "Programming with Java", First Edition, Pearson Education,2008, ISBN:9788131720806
2. Herbert Schildt, The Complete Reference C++, 4th Edition, Tata McGraw Hill, 2003.
3. Stanley B.Lippmann, Josee Lajore, C++ Primer, 4th Edition, Pearson Education, 2005.
4. Rajkumar Buyya,S Thamarasi selvi, xingchen chu, Object oriented Programming with java, Tata McGraw Hill education private limited.
5. Richard A Johnson, Introduction to Java Programming and OOAD, CENGAGE Learning.
6. E Balagurusamy, Programming with Java A primer, Tata McGraw Hill companies.

Sub Title : PYTHON PROGRAMMING		
Sub Code: 18IS44	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. Understanding the syntax and semantics of the Python language.
2. To create Functions in Python.
3. To handle Files & Regular expressions in Python.
4. To apply Object Oriented Programming concepts in Python.

To create Threaded and Networking applications in Python .

UNIT No	Syllabus Content	No of Hours
1	Introduction to Python, Writing Our First Python Program, Datatypes in Python, Operators in Python, Input and Output, Control Statements Ch1,Ch2,Ch3,Ch4,Ch5,Ch6	7
2	Arrays in Python, Strings and Characters, Functions, Lists and Tuples, Dictionaries Ch7,Ch8,Ch9,Ch10,Ch11	7
3	Introduction to OOPS, Classes and Objects, Inheritance and Polymorphism, Exceptions Ch12,Ch13,Ch14,Ch16	7
4	Files in Python, Regular Expressions in Python, Data Structures in Python, Date and Time Ch17,Ch18,Ch19,Ch20	9
5	Threads, Graphical User Interface, Networking in Python, Python's Database Connectivity Ch20,Ch21,Ch22,Ch23	9

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of the above course students will be able to

CO1: Demonstrate the understanding and usage of core python scripting elements python constructs, data types.

CO2 : Demonstrate the understanding and usage of functions ,lists, tuples and dictionaries.

CO3: Demonstrate the understanding and usage of modules, packages and regular expressions.

CO4: Demonstrate usage of object oriented features such as Inheritance, Polymorphism, operator overloading.

CO5:Apply the knowledge of python and use the language scripting elements and constructs to develop threaded and networking applications

Text Books:

1. Core Python Programming: Dr.R.Nageshwara Rao,Dreadm Tech Press 2018

Reference Books:

1. Think Python, Allen Downey, Green Tea Press.
2. Learning Python, Mark Lutz, Orielly.

COs	Mapping with POs
CO1	PO1,PO2,PO4
CO2	PO1,PO2,PO4
CO3	PO1,PO2,PO4,PO5,PO8
CO4	PO1,PO2,PO4,PO5,PO8
CO5	PO1,PO2,PO4,PO5,PO8

Sub Title : OBJECT ORIENTED CONCEPTS LAB		
Sub Code:: 18ISL46	No. of Credits:1= 0:0:1 (L-T-P)	No. of Lecture Hours/Week: 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 = 100	

Course Objectives:

1. Design programs using classes and objects for java
2. Build programs for automatic initialization of objects and destroy objects that are no longer required through constructors and destructors.
3. Construct applications to provide flexible options for the creation of new definitions for some of the operators.
4. Specifying mechanism of deriving a new class from older classes through inheritance.
5. Implement methods to select appropriate member function during run time.

I. LIST OF PROGRAMS

1	Create a class called Student with the following details as variables within it. (i) USN (ii) Name (iii) Branch (iv) Phone Write a Java/c++ program to create nStudent objects and print the USN, Name, Branch, and Phone of these objects with suitable headings.
2	Design a. Java/c++ Program to demonstrate Constructor Overloading and method overloading b. Develop a Java/c++ Program to implement Inner class and demonstrate its Access Protections.
3	Write a Java/c++ program to implement the Stack using arrays. Write Push(), Pop(), and Display() methods to demonstrate its working.
4	Design a superclass called Staff with details as StaffId, Name, Phone, Salary. Extend this class by writing three subclasses namely Teaching (domain, publications), Technical (skills), and Contract (period). Write a Java program to read and display at least 3 staff objects of all three categories.
5	Write a Java class called Customer to store their name and date_of_birth. The date_of_birth format should be dd/mm/yyyy. Write methods to read customer data as and display as using StringTokenizer class considering the delimiter character as “/”.
6	Write a Java/c++ program to read two integers a and b. Compute a/b and print, when b is not zero. Raise an exception when b is equal to zero.
7	Write a Java program that implements a multi-thread application that has three threads. First thread generates a random integer for every 1 second; second thread computes the square of the number and prints; third thread will print the value of cube of the number.
8	Design a JAVA program using Synchronized Threads, which demonstrates Producer Consumer concept.
9	Develop JAVA programs which demonstrates utilities of Linked List Class
10	Develop JAVA Applet programs which handles Key Board Event

Note: In the examination each student picks one question from a lot of all 12 questions.

II. OPEN ENDED QUESTIONS

Identify the different objects in the following environments and implement different suitable operations

1. Banking System
2. Library
3. Automobile Industry
4. Home Appliances
5. User Interface design etc

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY APPROVED BY THE STAFF IN CHARGE.

2.IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 12 QUESTIONS

Course Outcomes:

After completing the course the students are able to:

CO1:Design programs using classes and objects using JAVA/C++


CO2:Develop programs for automatic initialization of objects and destroy objects that are no longer required.

CO3:Develop applications to provide flexible options for the creation of new definitions for some of the operators.

CO4:Specify mechanism of deriving a new class from older classes through inheritance .

CO5:Design a program using Templates & Exception Handling.

COs	Mapping with POs
CO1	PO2,PO3,PO5
CO2	PO2,PO3,PO6,PO9
CO3	PO2,PO3,PO5,PO6
CO4	PO2,PO3,PO5,PO9
CO5	PO2,PO3,PO5,PO6

EMPLOYABILITY SKILLS		
	Subject Code: 18HS43	Mandatory Course
	Exam Duration:	Exam marks: NIL
		No of lecture hours per week: 2 Hrs
		Total No. of lecture hours: 26 hrs per semester

COURSE OBJECTIVE:

1. According to the present day requirement, this unit is designed on job seeking topics, adopting a task based approach with activities and worksheets.
2. In this unit students will be taught to prepare project report effectively which is integral part of their academics by making use of referencing skills. And also they will be taught how to write an abstract and will be familiarized with research paper guidelines.
3. The unit 3 aims at preparing the student to face interviews confidently.
4. Under the topics like synonyms, antonyms and homophones students' vocabulary will be enhanced.
5. The lessons under this unit help students' to use idioms and phrases, decoding the analogies and the correct usage of collective nouns

UNI T NO	SYLLABUS CONTENT	HRS/COS
1	a. Employability Skills b. PRESENTATION SKILLS c. RESUME WRITING d. COVERING LETTER e. E-MAIL WRITING	8 CO1
2	a. PROJECT REPORT b. REFERENCING SKILLS c. ABSTRACT WRITING d. RESERCH PAPER GUIDELINE AND FORMAT	2 CO2
3	e. INTERVIEW SKILLS	8 CO3
4	f. SYNONYMS g. ANTONYMS h. HOMOPHONES	4 CO4
5	i. IDIOMS & PHRASES j. ANALOGY k. COLLECTIVE NOUNS	4 CO5

COURSE OUTCOME:

1. After the completion of this unit students will have learnt to make presentations both in formal and informal situations. And also will have learnt the art of resume writing.
2. After the completion of this unit student will have learnt how to do a project report using referencing skills. And also they will have learnt how to write abstract and will have been familiarized with research paper guidelines.
3. This unit will have helped student to communicate with various skills required for job interviews.
4. After the completion of this unit the students will have learnt the strategies of vocabulary.
5. After the completion of this unit student will have learnt to use idioms and phrases in everyday conversation.

REFERENCE:

- English Skills for Technical Students by British Council, Orient Black Swan.
- A course in Grammar and Composition by Geetha Nagaraj, Cambridge University Press India Pvt. Ltd.
- Communication Skills for Professionals by Nira Konar, PHI learning Pvt. Ltd.
- Enhancing English and Employability Skills by State Board of Technical Education.

Sub Title : JAVA PROGRAMMING		
Sub Code:IS52	No. of Credits:3=3 : 1 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Identify the different object oriented concepts and implement basic programs.
2. Present inheritance and interface concepts.
3. Introduce multithreading programming concepts and handling errors efficiently.
4. Present different ways of implementing event handling and creating user interfaces using Java.
5. Introduce to Java Database Access, Servlets, collection and Framework Concepts.

UNI T No.	Syllabus Content	No. of Hours
1	Introduction To Java: How java changed the internet; Java Buzz words, Byte Code; Object oriented programming; First Simple Java program, Introducing Classes : Classes Fundamentals; Declaring Objects, Assigning Object Reference Variable; Introducing Methods,constructors,this keyword; Inheritance Basics- using Super; Creating Multilevel Hierarchy, When constructors are called, method Overriding, Dynamic Method Dispatch, Abstract classes, final with inheritance TextBook 1:Ch1,Ch2,ch6,ch8.	10
2	Packages and Interfaces: Packages and Interface: Packages, Access Protection, Importing Packages, Interfaces MultiThreaded Programming ; The java tread model,The main thread, Creating thread, creating multiple threads, Using isAlive() and join()Thread priorities; Synchronization; Interthread communication,Suspending , resuming and stopping threads; Textbook 1:Ch9,ch11	10
3	Applets ,Event Handling The Applet Class: Two types of Applets; Appletbasics; Applet Architecture; An Applet skeleton; Simple Applet displaymethods; Requesting repainting; Using the Status Window; The HTMLAPPLET tag; Passing parameters to Applets; getDocumentbase() andgetCodebase(); AppletContext and showDocument() ; The AudioClipInterface ; The AppletStub Interface; Outputting to the Console. Event Handling: Two event handling mechanisms; The delegation event model; Event classes; Sources of events; Event listener interfaces; Using the delegation event model; Adapter classes; Inner classes; Textbook 1:Ch23,,ch24	10

4	Database Access, Servlets : J2EE and J2SE.The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process;Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data type ,Exceptions s; Servlets: Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet ; The Servlet API; The Javax. Servlet Package; Reading Servlet Parameter; The Javax.servlet.http package;Handling HTTP Requests and Responses; Using Cookies; Session Tracking; Textbook 2:ch1,ch6 Textbook1: Ch38	12
5	The collections and Framework, Networking: Collections Overview, Recent Changes to Collections, The Collection Interfaces, The Collection Classes, Accessing a collection Via an Iterator, Storing User Defined Classes in Collections, The Random Access Interface, Working With Maps, Comparators, The Collection Algorithms, Why Generic Collections?, The legacy Classes and Interfaces, Parting Thoughts on Collections Networking: Networking basics, Networking classes and Interfaces, InetAddress, Inet4 Address and Inet6 Address, TCP/IP ClientSockets, URL, URLconnection HttpURL Connection,URIclass,Datagrams Textbook1:ch 18,Ch22,	10

Course Outcomes

After completing the course the students are able to:

CO1: Apply object oriented programming, exception handling and multithreading concepts in problem solving.

CO2: Use java aspects in graphical interactive application development and JDBC for database transactions, Handling HTTP requests and responses.

CO3: Build client-server applications and TCP/IP socket programs using networking concepts.

CO4: Design client server applications for connection oriented and connection less services.

Cos	Mapping with POs
CO1	PO2,PO5,PO6,PO10
CO2	PO2,PO4,PO5,PO10
CO3	PO2,PO6,PO10
CO4	PO2,PO4,PO6,PO10
CO5	PO2,PO4,PO5,PO10

TEXT BOOK:

- Herbert Schildt: Java - The Complete Reference, 9th Edition, Tata McGraw Hill, 2014. (Chapters 1, 2, 3, 4, 5, 6, 8, 9,10, 11,12,14,15,20, 21, 22, 29, 30).
- Jim Keogh:J2EE-The complete Reference, McGraw Hill, 2002

REFERENCE BOOKS / WEBLINKS:

- Y. Daniel Liang: Introduction to JAVA Programming, 7th Ed, Pearson Education, 2013.
- Java ProgrammingbyHariMohan Pandey,PearsonEducation,2012.

Sub Title : WEB TECHNOLOGIES		
Sub Code: IS53	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To create a web page using XHTML using Cascading Style Sheets
2. To do data validation and user interaction using JavaScript
3. To create XML documents and provide styling to documents.
4. To develop web applications using CGI/Perl.
5. To design web applications using the concepts of PHP.

UNIT No	Syllabus Content	No of Hours
1	XHTML : Origins and evolution of HTML and XHTML; Basic syntax; Standard XHTML document structure; Basic text markup. Images; Hypertext Links; Lists; Tables; Forms; Frames; Syntactic differences between HTML and XHTML. CSS: Introduction; Levels of style sheets; Style specification formats; Selector forms; Property value forms; Font properties; List properties; Color; Alignment of text; The Box model; Background images [Text1 Chap2,3]	9
2	Javascript: Overview of JavaScript; Object orientation and JavaScript; General syntactic characteristics; Primitives, operations, and expressions; Screen output and keyboard input; Control statements; Object creation and modification; Arrays; Functions; Constructor; Pattern matching using regular expressions ,Introduction JQuery Text1 Chap4 Text2 Chap1	8
3	Javascript and HTML documents: The Javascript execution environment; The Document Object Model; Element access in Javascript; Events and event handling; Handling events from the Body elements, Button elements, Text box and Password elements; The DOM 2 event model [Text1 Chap5]	7
4	XML: Introduction; Syntax; Document structure; Document Type definitions; Namespaces; XML schemas; Displaying XML documents with CSS; XSLT style sheets; XML processors; Web services. [Text1 Chap 7]	7

5	<p>Perl: Origins and uses of Perl; Scalars and their operations; Assignment statements and simple input and output, Fundamentals of arrays; Hashes; References; Functions; Pattern matching.</p> <p>CGI Programming The Common Gateway Interface; CGI linkage; Query string format; CGI.pm module.</p> <p>PHP: Origins and uses of PHP, Overview of PHP, General syntactic characteristics, Arrays, Form handling, Files, Cookies, Session Tracking. [Text1 Chap 8,9,11]</p>	8
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

Students will demonstrate the knowledge and the skills acquired with respect to:

CO1: Design simple web pages using different tags of XHTML and Classify and use different levels of style sheets

CO2 : Validate and provide user functionality using JavaScript

CO3 : Design and develop XML document and use the style sheet to display.

CO4: Develop web pages using PERL and CGI programs.

CO5: Design and develop PHP programs to perform database access, session tracking

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO6,PO7,PO9
CO2	PO2,PO3,PO5,PO6,PO9
CO3	PO1
CO4	PO1, PO5
CO5	PO1, PO4, PO5

TEXT BOOKS:

1. Robert W. Sebesta: Programming the World Wide Web, 4th Edition, Pearson education, 2011.
2. Learning jQuery , Better interaction, design, and web development with simple javaScript techniques , Fourth Edition , Jonathan Chaffer, Karl Swedberg 2013.

REFERENCE BOOKS / WEBLINKS:

1. M. Deitel, P.J. Deitel, A. B. Goldberg: Internet & World Wide Web How to Program, 4th Edition, Pearson education, 2011.
2. Pro PHP and jQuery- JASON LENGSTORF,2010.
3. <http://nptel.ac.in>
4. <http://www.w3schools.com/>

Sub Title : WEB TECHNOLOGIES LAB

Sub Code: ISL58

No. of Credits:1=0: 0 : 1 (L:T:P)

No. of lecture hours/week : 2

**Exam Duration :
3 hours**

Exam Marks: CIE + SEE = 50 + 50 =100

Course Objectives:

1. Create a web page with text, images, links, lists, tables, and frames
2. To use Cascading style sheet in designing web pages
3. To use Javascript
4. To create XML schema and XSLT style sheet.
5. To create and execute PHP to access database, cookies and do session tracking.
6. Use PERL for CGI programming and access MySQL databases.

I. LIST OF PROGRAMS

1. I) Create a simple file to demonstrate the use of different tags
 - a) Moving text= “Simple HTML Tags”
 - b) Different heading tags(h1 to h6)
 - c) Paragraph
 - d) Horizontal line
 - e) Line break
 - f) Block quote
 - g) Pre tag
 - h) Different logical styles(,<i>,<sub>,<sup>
2. Write code to create an html file to link different html pages which contains images, tables,lists and also link within a page
3. Design a web page using the different styles using inline, external & internal style sheets.
4. Develop and demonstrate a XHTML file that includes Javascript script for the following problems:
 - a) Input: A number n obtained using prompt
Output: The first n Fibonacci numbers
 - b) Input: A number n obtained using prompt
Output: A table of numbers from 1 to n and their squares using alert
5. Design an XML document to store information about a student in an engineering college affiliated to VTU. The information must include USN, Name, and Name of the College, Brach, Year of Joining, and e-mail address. Make up sample data for three students. Create a CSS style sheet and use it to display the document.
6. a) Write a Perl script to demonstrate the string concatenation and repetition.
b)Write a Perl program to display various Server Information like Server Name, Server Software, Server protocol, CGI Revision etc.
7. a) Write a perl script to demonstrate built-in array functions (PUSH, POP, SHIFT, UNSHIFT).

- b) Write a Perl program to accept UNIX command from a HTML form and to display the output of the command executed.
8. a) Write a Perl program to display a digital clock which displays the current time of the server.
- b) Write a Perl program to accept the User Name and display a greeting message randomly chosen from a list of 4 greeting messages.
9. Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.
- 10 a) Write a PHP program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page.
- b) Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.

II. OPEN ENDED QUESTIONS

Develop web based applications for any of the following

1. Simple employee portal.
2. Shopping cart.
3. Quiz application.
4. Reservation system.
5. Search engine.
6. Any Application

NOTE :

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.

2 IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 10 QUESTIONS.

Course Outcomes:

Students will demonstrate the knowledge and the skills acquired with respect to:

CO1: Design simple web pages using different tags of XHTML and Classify and use different levels of style sheets

CO2 : Validate and provide user functionality using JavaScript

CO3 : Design and develop XML document and use the style sheet to display.

CO4: Develop web pages using PERL and CGI programs.

CO5: Design and develop PHP programs to perform database access, session tracking

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO6,PO7,PO9
CO2	PO2,PO3,PO5,PO6,PO9
CO3	PO1, PO4
CO4	PO1, PO4
CO5	PO1, PO4

Sub Title : JAVA PROGRAMMING LAB		
Sub Code:ISL59	No. of Credits: 0 : 0 :1	No. of lecture hours/week : 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 =100	

Course Objectives:

1. Design & Develop the fundamentals of Object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
2. Design & Develop exception handling and multithreading concepts.
3. Develop efficient Java applets and applications using OOP concepts.
4. Design & Develop basic understanding of network application programs.

I. LIST OF PROGRAMS

1. a. Design a JAVA Program to demonstrate Constructor Overloading and method overloading.
b. Develop a JAVA Program to implement Inner class and demonstrate its Access Protections.
2. a. Develop a JAVA Program to demonstrate Inheritance.
b. Write a JAVA Program to demonstrate Exception Handling (Using Nested try catch and finally).
3. Develop a JAVA program which has
 - i. A Class called Account that creates account with 500Rs minimum balance, a deposit() method to deposit amount, a withdraw() method to withdraw amount and also throws LessBalanceException if an account holder tries to withdraw money which makes the balance become less than 500Rs.
 - ii. A Class called LessBalanceException which returns the statement that says withdraw amount (___Rs) is not valid.
 - iii. A Class which creates 2 accounts, both account deposit money and one account tries to withdraw more money which generates a LessBalanceException take appropriate action for the same.
4. Design a JAVA program using Synchronized Threads, which demonstrates Producer Consumer concept.
5. Develop a JAVA program which has
 - i. A Interface class for Stack Operations
 - ii. A Class that implements the Stack Interface and creates a fixed length Stack.

- iii. A Class that implements the Stack Interface and creates a Dynamic length Stack.
 - iv A Class that uses both the above Stacks through Interface reference and does the Stack operations that demonstrates the runtime binding.
6. Develop JAVA programs which demonstrates utilities of LinkedList Class
 7. Write a JAVA Program which uses FileInputStream / FileOutPutStream Classes.
 8. Develop a JAVA program which uses Datagram Socket for Client Server Communication.
 9. Design JAVA Applet programs which handles MouseEvent
 10. Develop JAVA Applet programs which handles KeyBoardEvent

II. OPEN ENDED QUESTIONS

Develop applications for data base access, servlet request/response, rmi, jsp, userinterface for any application using javaFX, any gaming application etc

NOTE :

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.
2. IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 10 QUESTIONS.

Course Outcomes:

After completing the course the students are able to:

- CO1.** Recognize the basic object oriented concepts & apply them to create java applications.
- CO2.** Demonstrate java application with inheritance and interface concepts.
- CO3.** Design java applications with multithreading concepts and demonstrate the error handling concepts.
- CO4.** Create GUI applications with the help of javaFX and handle events.
- CO5.** Design client server applications and security models.

COs	Mapping with POs
CO1	PO2,PO5,PO6,PO10
CO2	PO2,PO4,PO5,PO10
CO3	PO2,PO6,PO10
CO4	PO2,PO4,PO6,PO10
CO5	PO2,PO4,PO5,PO10

Management and Entrepreneurship		
Sub Code: HS03	No. Of Credits : 4	No. of Lecture hours/week : 4
Exam Duration : 3 hours	CIE + Assignment + SEE =100 45 + 5 + 50 = 100	Total No. of Contact Hours: 52

Course Objectives :

1. To help students understand the Management concepts & its evolution.
2. To impart the knowledge about various Managerial functions.
3. To make the student learn the Entrepreneurial process.
4. To gain an insight of funding agencies & understand the role of SSI in economic development.
5. To have a clear understanding of various business opportunities & designing the Business plan.

UNIT NO	Syllabus Content	No. of Hours
1	MANAGEMENT: Introduction- Meaning, characteristics of management, scope, functions of management, Management as science or an art or profession, Management and Administration, Roles of managers. Levels of management, Development of management thought -Early management approaches, Modern management approaches.	08 Hours
2	PLANNING: Definition & Meaning, Types of Plans (Single use & Standing), Steps in Planning process. ORGANIZING: – Definition & Meaning, Types of organization. Departmentation, Committees, Centralization Vs Decentralization, Authority and responsibility, span of control, MBO and MBE. Decision Making: Definition, Decision Making Process. STAFFING: Nature and importance of staffing, process of selection and recruitment. DIRECTING: Meaning, Leadership: Definition, Leadership styles – Autocratic, Democratic, Charismatic, Laissez faire and Participative. Leadership theories – Trait, Behavioral and Contingency. <i>Introduction to motivation theories</i> – Maslow, Herzberg, & McGregor’s Theory of X & Y. <i>Communication</i> – Meaning and importance, communication process, barriers of communication, overcoming barriers. <i>Co-ordination:</i> Meaning and importance, stages of group forming, types of groups. CONTROLLING: Meaning and steps in controlling, Types of control, Method of establishing control (in brief). <i>Case study discussion with respect to Indian context.</i>	12 Hours

3	<p>ENTREPRENEUR: Definition & Meaning, Characteristics, types of entrepreneur, Difference between Entrepreneurs, Intrapreneur & Manager, Stages in Entrepreneurial process, barriers to entrepreneurs, Role of Entrepreneurs in economic development.</p> <p>Rural entrepreneurs - Meaning & schemes. Women entrepreneurs – Concept, challenges, women entrepreneurship in India, Institutional support & special bank scheme. Family Business: Meaning, Roles & responsibility, types of family business, challenges faced by family business, reasons for failure of family business.</p> <p><i>Case study discussion with respect to Indian context.</i></p> <p><i>Activity: Profile of successful entrepreneur.</i></p>	10 Hours
4	<p>MSME: Definition & Concept of MSME, role & importance, current schemes for MSME. SMALL SCALE INDUSTRY: Meaning, Characteristics, Steps to start an SSI, problems faced by SSI. Introduction to GATT, WTO & LPG. Sources of financing, forms of ownership. Institutional Support: Different schemes. <i>Central level Institutions</i> – SIDBI, NABARD, HUDCO, TCO. <i>State level Institutions</i>- DIC, SFC, KIADB, TECKSOK. STARTUP COMPANIES-Meaning and Challenges. <i>Activity for students: Schemes for startup companies.</i></p>	12 Hours
5	<p>PREPARATION OF PROJECT: Meaning, Project identification, Project selection, Project Appraisal, Project Report – Contents, Errors of project report, Feasibility Study-Market Feasibility Study, Technical Feasibility Study, Financial Feasibility Study, Social Feasibility Study. Business plan: Meaning, contents of business plan, reasons for failure of business plan. <i>Activity for students: Writing of a business plan.</i></p>	10 Hours

Note 1: Unit 2 and Unit 3 will have internal choice.

Note 2: Two assignments are evaluated for 5 marks:

Assignment -1 from units 1 and 2

Assignment – 2 from units 3, 4 and 5.

Course Outcomes :

CO1 : The students will gain knowledge on management concepts & its evolution.

CO2 : The students will learn the application of managerial skills & attributes.

CO3 : The students will get an in depth knowledge of entrepreneurial process & will be able to apply the entrepreneurial skills.

CO4 : Students compile information & explore the sources of funding agencies.

CO5 : Students will be able to identify business opportunities & prepare the business plan.

TEXT BOOK:

Entrepreneurship and Management- S Nagendra and V S Manjunath- Pearson Publication 4 /e,

2009.

1. Dynamics of Entrepreneurial Development and Management-Vasant Desai-Himalaya Publishing House.

2. Principles of Management – PC Tripathi, and P N Reddy – Tata MacGraw Hill.

3. Management and Entrepreneurship- N V R Nidu and T Krishna Rao. I K International Publishing house.

REFERENCE BOOKS:

1. Entrepreneurship Development – Poornima M Charanthimath Pearson Education 2nd Edition.
2. Entrepreneurship and management - Shashi k Gupta- Kalyani publishers, Latest edition.
3. Organizational behaviour, Stephen P Robbins, Timothy A. Judge, Neharika Vohra, Pearson, 14/e, 2012.
4. Financial Management- Shashi k Gupta- Kalyani publishers, Latest edition.

Sub Title : MOBILE APPLICATION DEVELOPMENT		
Sub Code:IS61	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To understand fundamentals of Android OS, and use appropriate tools for Android Application development.
2. To be familiar with managing of application resources to build elegant user interfaces with views, layouts & fragments
3. To design styling, and common design patterns found among applications
4. To understand storing of application data using preferences, files and directories, SQLite, and content providers.
5. Develop, test, debug and publish mobile applications using android Platform.

UNIT No	Syllabus Content	No of Hours
1	<p>Platform Overview: Introducing Android – History of Mobile Software Development, The Open Handset Alliance, Android Platform Uniqueness, The Android Platform, Setting Up Your Android Development Environment - Configuring Your Development environment, Exploring the Android SDK. Creating first android application - Testing Your Development Environment, Building Your First Android Application.</p> <p>Application Basics : Understanding Application Components - Mastering Important Android Terminology, The Application Context, Performing Application Tasks with Activities, Organizing Activity Components with Fragments, Managing Activity Transitions with Intents TB1: Ch1, Ch2, Ch3,ch4</p>	7
2	<p>Application Basics Continued – Defining the Manifest , Managing Application Resources- What Are Resources?, Adding Simple Resource Values in Android Studio, Working with Different Types of Resources, Working with Layouts, Exploring Building Blocks, Positioning with Layouts, Partitioning with Fragments TB1: Ch5,ch6,ch7,ch8,ch9</p>	9

3	<p>Application Design Essentials: Architecting with Patterns-Architecting Your Application's Navigation, Encouraging Action,, Appealing with Style-Styling with Support, Themes and Styles, Colors, Layout, Embracing Material Design-Understanding Material, The Default Material Theme, Designing Compatible Applications -Maximizing Application Compatibility, Designing User Interfaces for Compatibility, Providing Alternative Application Resources, Targeting Tablets and TVs, Extending Application to Watches and Cars. TB1: Ch10, ch11,ch12,ch13</p>	7
4	<p>Application Development Essentials: Using Android Preferences-Working with Application Preferences, Finding Preferences Data on the File System, Creating Manageable User Preferences, Auto Backup for Android Applications. Accessing Files and Directories: Working with Application Data on a Device, Practicing Good File Management, Understanding Android File Permissions, Working with Files and Directories, Saving with SQLite : Working with Databases Leveraging Content Providers - Exploring Android's Content Providers, Modifying Content Providers Data, Using Third-Party Content Providers TB1: Ch14,Ch15,Ch16, Ch17</p>	9
5	<p>Application Delivery Essentials: Testing Your Applications - Best Practices in Testing Mobile Applications, Android Application Testing Essentials, More Android Automated Testing Programs and APIs, Distributing Your Applications - Choosing the Right Distribution Model, Packaging Your Application for Publication, Publishing to Google Play, Google Play Staged Rollouts, Publishing to the Google Play Private Channel, Translating Your Application, Publishing Using Other Alternatives, Self-Publishing Your Application. TB1: Ch21 and Ch22</p>	7

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Analyze the fundamentals to build Mobile apps by assessing the basic framework by usage of Android SDK.

CO2: Design Android applications using various resources and built-in classes.

CO3:Apply creative skills in designing and deploying the sophisticated mobile applications.

CO4: Design and deploy Android applications with compelling User Interfaces and databases.

CO5: Develop and publish the Android Application in the global marketplace for download.

COs	Mapping with POs
CO1	PO1, PO2, PO3, PO4
CO2	PO2, PO3, PO4, PO5, PO7
CO3	PO4, PO5, PO6, PO8, PO9
CO4	PO4, PO5, PO9, PO10
CO5	PO6, PO7, PO8, PO11, PO12

TEXT BOOK:

1. Joseph Annuzzi, Jr., Lauren Darcey, and Shane Conder - Introduction to Android Application Development - Android Essentials, Fifth Edition, Pearson education, 2016.

REFERENCE BOOKS:

1. Reto Meier: Professional Android 4 Application Development , Wrox Publication,2015

Sub Title : CLOUD COMPUTING		
SubCode:IS63	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To study the history and the fundamental concepts of Cloud Computing, Parallel, Distributed Computing and Virtualization.
2. To understand the concept of cloud computing architecture and different Cloud models.
3. To impart Cloud offerings which enhances the usage of Cloud.
4. To analyze the Cloud Storage and Security maintenances.
5. To become familiar with the different applications of Cloud Computing.

UNIT No	Syllabus Content	No of Hours
1	Introduction to Cloud Computing: Cloud Computing at a Glance, Historical Developments, Building Cloud Computing Environments Computing Platforms and Technologies. Text1: Chapter 1.1-1.3	7
2	Principles of Parallel and Distributed Computing: Eras of Computing , Parallel vs. Distributed Computing, Elements of Parallel Computing, Elements of Distributed Computing, Technologies for Distributed Computing Virtualization: Introduction, Characteristics of Virtualized Environments, Virtualization and Cloud Computing, Pros & Cons of Virtualization. Text1: Chapter 2.1-2.5, 3.1-3.4	7

3	Cloud Computing Architecture: Introduction, Cloud Reference Model, types of Clouds, Economics of the cloud, Open challenges. Text1: Chapter 4.1-4.5	7
4	Cloud offerings: Cloud Analytics, Testing under cloud, Information Security, Virtual Desktop Infrastructure, Storage Cloud. Cloud management: Introduction, Resiliency, Provisioning, Asset management. Cloud governance, High availability and disaster recovery, Charging models, Usage reporting, Billing and metering. Technology examples: Xen: paravirtualization, VMware: full virtualization, Microsoft Hyper-V. Text2: Chapter 3.1-3.4, Text1: Chapter 3.6	9
5	Cloud Platforms in Industry: Amazon Web Services, Google AppEngine. Cloud Applications: Scientific Applications, Business and Consumer Applications. Text1: Chapter 9.1-9.2, 10.1-10.2	9

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the student will be able to:

CO1: Analyze core concepts and fundamentals of the Cloud Computing.

CO2: Analyze systems, protocols and mechanisms to support Cloud Infrastructure.

CO3: Identify the hardware necessary for Cloud Computing.

CO4: Develop applications and host on Cloud Computing.

CO5: To manage the Cloud Environment.

COs	Mapping with POs
CO1	PO1,PO7,PO11,PO12
CO2	PO1,PO4,PO7,PO11,PO12
CO3	PO1,PO2,PO3, PO5,PO8
CO4	PO1,PO8, PO10,PO11,PO12
CO5	PO4,PO5,PO6,PO7,PO8

TEXT BOOKS:

1. Rajkumar Buyya, Christian Vecchiola, S Thamarai Selvi ,Mastering Cloud Computing , Tata McGraw Hill Education Private Limited, 2013.
2. Dr. Kumar Saurabh , Cloud Computing , Wiley India, 2011.

REFERENCE BOOKS:

1. Dinkar Sitaram, Geetha Manjunath ,Moving to the Cloud. Elsevier Publications, 2011.
2. Barrie Sosinsky, Cloud Computing Bible , Wiley Publishing, Inc, 2011.

Sub Title : PYTHON PROGRAMMING		
Sub Code: IS653	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of lecture hours/week : 04
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Understanding the syntax and semantics of the Python language.
2. To create Functions in Python.
3. To handle Files & Regular expressions in Python.
4. To apply Object Oriented Programming concepts in Python.
5. To create Threaded and Networking applications in Python

UNIT No.	Syllabus Content	No. of Hours
1	Introduction: History of Python, Need of Python Programming, Applications, Basics of Python Programming, Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input- Output, Indentation. Data Types - Integers, Strings, Booleans; Operators and Expressions: Operators- Arithmetic Operators, Relational Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations. Data Structures: Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences. Comprehensions. Text1:Ch1,Ch2,Ch3,Ch4	10
2	Control Flow - if, if-elif-else, for, while, break, continue, pass. Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions, Scope of the Variables in a Function - Global and Local Variables. Modules: Creating modules, import statement, from .import statement, name spacing, Python packages , Introduction to PIP, Installing Packages via PIP, Using Python Packages. Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions. Files in Python: Types of files, Working with Text files, Working with Binary Files, Pickle Module. Text1:Ch5,Ch6,Ch7,Ch8	10

3	Brief Tour of the Standard Library - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Data Compression. Date and Time: The Epoch, Date and Time Now, Combining date and time, Formatting date and Time, Comparing Two Dates, Working with Calendar Module. Object Oriented Programming in Python: Creating a class, The Self Variable, Namespaces, Types of Methods, Inner classes Inheritance and Polymorphism: Constructors in Inheritance, The Super() Method, Types of Inheritance: Single/Multiple, Method Resolution order, Polymorphism, Operator Overloading, Method overloading, Method Overriding. Text1:Ch9,Ch10,Ch12,Ch13	10
4	Regular Expressions in Python: Sequence Characters in Regular Expressions, Quantifiers in Regular Expressions, Special Characters in Regular Expressions, Using Regular Expressions in a File, Retrieving Information from HTML File. Data Structures in Python: Linked Lists, Stacks, Queues, Deques. Threads: Creating Threads in Python, Thread class Methods, Thread Synchronization, Communication between Threads, Daemon Threads. Text1:Ch14,Ch15,Ch16,Ch17	10
5	Networking in Python: Sockets, Reading the source code of Web Page, A TCP/IP Server and Client, A UDP Server and Client, A File Server and Client, Graphical User Interface, Python's Database Connectivity: Working With MySQL Database, Using MySQL from Python, Retrieving all rows from a table, Inserting, deleting, updating table, Creating Data base tables through python, Graphical User Interface: The Root Window, Canvas, Frame, Widgets, Button Widget ,Label Widget, Message Widget, Text Widget, Menu Widget. Text1:Ch18,Ch19,Ch20,Ch21.	12

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes

After completing the course the students are able to:

CO1: Demonstrate the understanding and usage of core python scripting elements python constructs, data types.

CO2 : Demonstrate the understanding and usage of functions ,lists, tuples and dictionaries.

CO3: Demonstrate the understanding and usage of modules, packages and regular expressions.

CO4: Demonstrate usage of object oriented features such as Inheritance, Polymorphism, operator overloading.

CO5:Apply the knowledge of python and use the language scripting elements and constructs to develop threaded and networking applications.

COs	Mapping with POs
CO1	PO1,PO2,PO4
CO2	PO1,PO2,PO4
CO3	PO1,PO2,PO4,PO5,PO8
CO4	PO1,PO2,PO4,PO5,PO8
CO5	PO1,PO2,PO4,PO5,PO8

TEXT BOOK:

1. Core Python Programming: Dr.R.Nageshwara Rao,Dreadm Tech Press 2018

REFERENCE BOOKS/WEB LINKS:

1. Think Python, Allen Downey, Green Tea Press.
2. Core Python Programming, W. Chun, Pearson.
3. Introduction to Python, Kenneth A. Lambert, Cengage.
4. Learning Python, Mark Lutz, Orielly.

Course Title : MACHINE LEARNING		
Course Code: IS654	No. of Credits: 4 =4:0:0:0	No. of lecture hours/week : 4
Exam Duration : 3 hours	CIE+Assignment + SEE = 45+ 5+50=100	Total No. of Contact Hours : 52

Course objectives:

1. To understand the basic concepts of machine learning along with decision trees.
2. To understand the neural networks and genetic algorithms
3. To understand the Bayesian techniques
4. To understand the instant based learning
5. To understand the analytical learning and reinforced learning

Unit No.	Syllabus	No. of Hours
1	<p>INTRODUCTION and DECISION TREES:</p> <p>Machine learning basics: What is machine learning? Key terminology , Key tasks of machine learning, How to choose the right algorithm, Steps in developing a machine learning application , Why Python.</p> <p>Classifying with k-Nearest Neighbors Classifying with distance measurements, Prepare: importing data with Python , Putting the kNN classification, algorithm into action, How to test a classifier, Example: improving matches with kNN, Prepare: parsing data from a text file, Analyze: creating scatter plots with Matplotlib, Prepare: normalizing numeric values, Test: testing the classifier as a whole program, Use: putting together a useful system, Example: a handwriting recognition system, Prepare: converting images</p>	11
2	<p>NEURAL NETWORKS and GENETIC ALGORITHMS: Biological Multilayer Networks and Back Propagation Algorithms, Genetic Algorithms, Neural Network Representation, Problems, Perceptrons,</p>	10

3	BAYESIAN AND COMPUTATIONAL LEARNING Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probably Learning – Sample Complexity for Finite and Infinite Hypothesis Spaces – Mistake Bound Model.	10
4	K- Nearest Neighbor Learning – Locally Weighted Regression – Radial Basis Functions – Case-Based Reasoning – Sequential Covering Algorithms – Learning Rule Sets – Learning First Order Rules – Learning Sets of First Order Rules – Induction as Inverted Deduction – Inverting Resolution	10
5	MODULE V ANALYTICAL LEARNING AND REINFORCED LEARNING Perfect Domain Theories – Explanation Based Learning – Inductive-Analytical Approaches - FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning	11

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

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

CO1: Choose the learning techniques with this basic knowledge. Also, obtain knowledge on decision tree learning.

CO2: Apply and comprehend neural network and genetic algorithms techniques.

CO3: Obtain knowledge about supervised and semi-supervised learning.

CO4: Differentiate between reinforcement and analytical learning techniques.

CO5: Differentiate different machine learning applications.

COs	Mapping with PO's
CO1	PO1,PO4
CO2	PO2,PO3,PO4
CO3	PO3,PO4
CO4	PO3,PO4,PO5,PO6
CO5	PO4,PO8,PO9,PO11

Text Books:

1. Peter Harrington , “Machine Learning in Action”, MANNING Shelter Island Publication, ISBN 9781617290183, 2012. Unit1: Chapter 1-2.4 (page no 1 to 36)

- Tom M. Mitchell, "Machine Learning", McGraw-Hill Education, 2013.
Unit2, Unit3, Unit4 and Unit5: Chapter 4 to chapter 8 (Page no: 81 to 247)

Reference Books:

- Ethem Alpaydin, "Introduction to Machine Learning", 2nd Ed., PHI Learning Pvt. Ltd., 2013.
- T. Hastie, R. Tibshirani, J. H. Friedman, "The Elements of Statistical Learning", Springer; 1st edition, 2001.

Sub Title : CLOUD COMPUTING LAB		
Sub Code:ISL67	No of Credits : 0:0:1 (L:T:P)	No. of lecture hours/week : 02
Exam Duration : 3 hours	Exam Marks: CIE + + SEE = 50 + 50 =100	

Course Objectives:

- To understand the working and usage of different cloud service models.
- To study the basic understanding of Installation and Configuration of Cloud environment.
- To understand the concept of Service Model and its usage in Cloud Computing.
- To learn development of applications using IaaS, PaaS and SaaS.
- Understand how Cloud environment works, for various deployment models

I. LIST OF PROGRAMS

- Demonstrate the working of Google Drive/ Dropbox to make spreadsheet and notes.
- Demonstrate the working of Google Form to develop event feedback system.
- Demonstrate the program on Stack operations using Python/Java/C+++ in Cloudanywhere.
- Design a simple Hospital Management website in Codenvy.
- Create an application in Salesforce .com to maintain product information.
- Create an application in Salesforce.com to demonstrate master-detail relationship on invoice bill.
- Creating an Application in SalesForce.com using Apex programming Language.
- Demonstrate Virtualization using VMware/Hypervisor.

II. OPEN ENDED QUESTIONS

1. Working on Google App Business Solutions and various features.
2. Installation and Configuration of AWS/OpenStack or any equivalent cloud software.
3. Design and implement Cloud based application (mini-project).

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.

2. STUDENT IS REQUIRED TO EXECUTE ONE PROBLEM FROM THE LOT OF 8 QUESTIONS.

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Develop applications and host on Cloud.

CO2: Develop the ability to solve real-world problems through software development on Cloud Environment.

CO3: Implement, compile, test and run programs on PaaS by solving defined software problem.

CO4: Design and develop useful Cloud applications with elegant user interfaces using SaaS.

CO5: To deploy developed cloud applications on the market place.

COs	Mapping with POs
CO1	PO1,PO3, PO4,PO5
CO2	PO2,PO3, PO4, PO5, PO7
CO3	PO4, PO5, PO6, PO8, PO9
CO4	PO4, PO5, PO9, PO10
CO5	PO6, PO7, PO8, PO11, PO12

Course Title: BIG DATA & ANALYTICS		
Course code:IS73	No. of Credits:3=4 : 0 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours:52

Course Objectives:

- Understand Big data for industry applications.
- Analyze business case studies for Big data analytics
- Define managing of Big data without SQL
- Develop Mapreduce analytics using Hadoop and related tools.

UNIT No.	Syllabus Content	No. of Hours
1	Overview of Big Data and its Use in Business Context : Big Data definition. Evolution of Big Data. Structuring Big Data. Elements of Big Data. Big Data Analytics. Use of Big Data in - Social Networking, Preventing Fraudulent Activities, Detecting Fraudulent Activities, Insurance Sector, Retail Industry. Text1: 1.1-1.4,2.1-2.4	10
2	NOSQL Data Management: Introduction to NoSQL–Aggregate data models–Aggregates–Key-value and Document data models–Relationships–Graphdatabases–Schemaless databases–Materialized views–Distribution models–Sharding—Version–Mapreduce–Partitioning and combining – Composing Mapreduce calculations. Text2: Chapter1.1-1.5,2.1-2.4,3.1-3.5	10
3	Understanding Hadoop Ecosystem, YARN Architecture: Hadoop Ecosystem, Hadoop Distributed File System, MapReduce, Hadoop YARN, Introducing HBase, Combining HBase and HDFS, Hive, Pig and Pig Latin, Sqoop, ZooKeeper, Flume, Oozie. Background of YARN, Advantages of YARN, YARN Architecture, Working of YARN, YARN Schedulers, Backward Compatibility with YARN, YARN Configurations, YARN Commands, YARN Containers, Registry, Log Management in Hadoop Text1: 4.1-4.5,12.1-12.3,12.5	11

4	<p>MapReduce Fundamentals, Processing Data and Implementing MapReduce Program and HBase: The MapReduce Framework, Techniques to Optimize MapReduce Jobs, Uses of MapReduce, Role of HBase in Big Data Processing. , Developing Simple MapReduce Application, Points to Consider while Designing MapReduce, Controlling MapReduce Execution with InputFormat, Reading Data with Custom RecordReader, Organizing Output Data with OutputFormats, Customizing Data with RecordWriter, Optimizing MapReduce Execution with Combiner, Controlling Reducer Execution with Partitioners, Customizing the MapReduce Execution in Terms of YARN, Implementing a MapReduce Program for Sorting Text Data. Text1: 5.1-5.4,10.1-10.7</p>	11
5	<p>Exploring Hive, Analyzing Data with Pig: Introducing Hive, Getting Started with Hive, Hive Services, Data Types in Hive, Built-In Functions in Hive, Hive DDL, Data Manipulation in Hive, Data Retrieval Queries, Using JOINS in Hive,. Introducing Pig, Running Pig, Getting Started with Pig Latin, Working with Operators in Pig, Debugging Pig, Working with Functions in Pig, Error Handling in Pig. Text1: 13.1-13.4,14.1-14.4</p>	10

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Describe Big data and use cases from selected industry domains.

CO2: Discuss about NoSQL Big data management.

CO3: Install, configure, and run Hadoop.

CO4: Perform Mapreduce analytics using Hadoop.

CO5: Use Hadoop related tools such as HBase, Cassandra, Pig and Hive for Big Data Analytics.

COs	Mapping with PO's
CO1	PO2, PO8
CO2	PO4,PO5, PO8
CO3	PO3, PO4, PO5
CO4	PO4, PO5
CO5	PO3, PO4, PO5, PO11.

TEXT BOOK:

1. Big Data, Black Book- DT Editorial Services Wiley Publications 2ed.
2. Pramod J. Sadalage, Martin Fowler, "NoSQL Distilled", Pearson Education, ISBN-13: 978-0-321-82662-6, 2013.

REFERENCE BOOKS:

1. Tom White,"Hadoop:TheDefinitiveGuide",ThirdEdition,O'Reilley,2012.
2. EricSammer,"HadoopOperations",O'Reilley,2012.

Sub Title : C# PROGRAMMING AND .NET

Sub Code:IS744	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Understand the nature of .Net application development and build C# applications.
2. Familiarize with Object-oriented Programming concepts as associated with C#, Inheritance, Interfaces, Exception Handling, Reflection, Standard I/O programming, File Handling, Generics,
3. Understand Windows Application using Winforms, File I/O, XML in .NET.Web Services and Deployment.
4. Overview of .NET framework 3.0 features like WPF, WCF and WF.

Unit No.	Syllabus Content	No of Hours
1	<p>The Philosophy Of .Net: Understanding the Previous State of Affairs, The .NET Solution, The Building Block of the .NET Platform (CLR,CTS, and CLS), The Role of the .NET Base Class Libraries, What C# Brings to the Table, An Overview of .NET Binaries (aka Assemblies), the Role of the Common Intermediate Language , The Role of .NET Type Metadata, The Role of the Assembly Manifest, Compiling CIL to Platform –Specific Instructions, Understanding the Common Type System, Intrinsic CTS Data Types, Understanding the Common Languages Specification, Understanding the Common Language Runtime A tour of the .NET Namespaces, Increasing Your Namespace Nomenclature, Deploying the .NET Runtime.</p> <p>Building C# Applications: The Role of the Command Line Compiler (csc.exe), Building C # Application using csc.exe Working with csc.exe Response Files, Generating Bug Reports , Remaining C# Compiler Options, The Command Line Debugger (cordbg.exe) Using the, Visual Studio .NET IDE, Other Key Aspects of the VS.NET IDE, C# “Preprocessor:” Directives, An Interesting Aside: The System. Environment Class.Text1:Ch1,Ch2</p>	10

2	<p>C# Language Fundamentals: The Anatomy of a Basic C# Class, Creating objects: Constructor Basics, The Composition of a C# Application, Default Assignment and Variable Scope, The C# Member Initialization Syntax, Basic Input and Output with the Console Class, Understanding Value Types and Reference Types, The Master Node: System, Object, The System Data Types (and C# Aliases), Converting Between Value Types and Reference Types: Boxing and Unboxing, Defining Program Constants, C# Iteration Constructs, C# Controls Flow Constructs, The Complete Set of C# Operators, Defining Custom Class Methods, Understating Static Methods, Methods Parameter Modifies, Array Manipulation in C #, String Manipulation in C#, C# Enumerations, Defining Structures in C#, Defining Custom Namespaces. Text1:Ch3</p>	12
3	<p>Object- Oriented Programming With C#: Forms Defining of the C# Class, Definition the “Default Public Interface” of a Type, Recapping the Pillars of OOP, The First Pillars: C#’s Encapsulation Services, Pseudo-Encapsulation: Creating Read-Only Fields, The Second Pillar: C#’s Inheritance Supports, keeping Family Secrets: The “Protected” Keyword, Nested Type Definitions, The Third Pillar: C #’s Polymorphic Support, Casting Between.</p> <p>Exceptions And Object Lifetime: Ode to Errors, Bugs, and Exceptions, The Role of .NET Exception Handling, the System. Exception Base Class, Throwing a Generic Exception, Catching Exception, CLR System – Level Exception (System. System Exception), Custom Application-Level Exception (System. System Exception), Handling Multiple Exception, The Family Block, the Last Chance Exception Dynamically Identifying Application – and System Level Exception Debugging System Exception Using VS. NET, Understanding Object Lifetime, the CIT of “new”, The Basics of Garbage Collection,, Finalization a Type, The Finalization Process, Building an Ad Hoc Destruction Method, Garbage Collection Optimizations, The System. GC Type. Text1:Ch4,Ch5,Ch6</p>	10
4	<p>Interfaces And Collections: Defining Interfaces Using C# Invoking Interface Members at the object Level, Exercising the Shapes Hierarchy, Understanding Explicit Interface Implementation, Interfaces As Polymorphic Agents, Building Interface Hierarchies, Implementing, Implementation, Interfaces Using VS .NET, understanding the IConvertible Interface, Building a Custom Enumerator (IEnumerable and Enumerator), Building Cloneable objects (ICloneable), Building Comparable Objects (I Comparable), Exploring the system. Collections Namespace, Building a Custom Container (Retrofitting the Cars Type).</p> <p>Understanding Callback Interfaces, Understanding the .NET Delegate Type,Members of System. Multicast Delegate, The Simplest Possible DelegateExample, , Building More a Elaborate Delegate Example, UnderstandingAsynchronous Text1:Ch7,Ch8</p>	10

5	Delegates, Understanding (and Using)Events.The Advances Keywords of C#, A Catalog of C# Keywords Building aCustom Indexer, A Variation of the Cars Indexer Internal Representation ofType Indexer . Using C# Indexer from VB .NET. Overloading operators, TheInternal Representation of Overloading Operators, interacting with OverloadOperator from Overloaded- Operator- Challenged Languages, CreatingCustom Conversion Routines, Defining Implicit Conversion Routines, TheInternal Representations of Customs Conversion Routines Understanding .Net Assembles: Problems with Classic COM Binaries, An Overview of .NET Assembly, Building a Simple File Test Assembly, A C#. Client Application, A Visual Basic .NET Client Application, Cross Language Inheritance, Exploring the CarLibrary’s, Manifest, Exploring the CarLibrary’s Types, Building the Multifile Assembly, Using Assembly, Understanding Private Assemblies, Probing for Private Assemblies (The Basics), Private A Assemblies XML Configurations Files, Probing for Private Assemblies (The Details), Understanding Shared Assembly, Understanding Shared Names, Building a Shared Assembly, Understanding Delay Signing, Installing/Removing Shared Assembly, Using a Shared Assembly. Text1:Ch9,Ch10,Ch11	10
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Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1:Analyze the nature of .Net application development .

CO2:Apply OOAD concepts to build C# applications

CO3:Design and develop console based applications using C#

CO4:Develop Windows Application using Winforms, File I/O, XML in .NET.Web Services and deployment.

CO5:Analyze .NET framework 3.0 features like WPF, WCF and WF.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO4,PO5,PO8,PO12
CO2	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO3	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO4	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO5	PO1,PO2,PO3,PO4,PO5,PO7,PO12

TEXT BOOKS:

1. Pro C# with .NET 3.0 - Andrew Troelsen, Special Edition, Dream Tech Press, India, 2013.

2. Programming in C# - E. Balagurusamy, 5th Reprint, Tata McGraw Hill, 2011.

REFERENCE BOOKS/WEB LINKS:

1. Inside C# - Tom Archer, WP Publishers, 2011.

Sub Title : BIG DATA AND ANALYTICS LAB		
Sub Code:ISL76	No of Credits : 1:0:1.5	No. of Lecture Hours/Week : 03
Exam Duration : 3hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	

Course Objectives:

1. To understand the concept of Big data with hands on.
2. Understand installation of various Big data tools under Hadoop.
3. To apply Hadoop concepts to various applications and NoSQL implementation.

I. LIST OF PROGRAMS

1.Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.

- a. Review the commands available for the Hadoop Distributed File System:
- b. Copy file `foo.txt` from local disk to the user's directory in HDFS
- c. Get a directory listing of the user's home directory in HDFS
- d. Get a directory listing of the HDFS root directory
- e. Display the contents of the HDFS file `user/fred/bar.txt`

2. Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.

- a. Move that file to the local disk, named as `baz.txt`
- b. Create a directory called `input` under the user's home directory
- c. Delete the directory `input` and all its contents
- d. Verify the copy by listing the directory contents in HDFS.

3. Demonstrate word count on an input file using MapReduce program.

4. Using movie ratings data, Develop the queries in Hive for the following-

- a. List all the Users who have rated the movies (Users who have rated at least one movie)
- b. List of all the User with the max, min, average ratings they have given against any movie
- c. List all the Movies with the max, min, average ratings given by any user

5. In this program you will use HiveQL to filter and aggregate click data to build facts about user's movie preferences. The query results will be saved in a staging table used to populate the Oracle Database.

The moveapp_log_json table contains an activity column. Activity states are as follows:

- RATE_MOVIE
 - COMPLETED_MOVIE
 - PAUSE_MOVIE
 - START_MOVIE
 - BROWSE_MOVIE
 - LIST_MOVIE
 - SEARCH_MOVIE
 - LOGIN
 - LOGOUT
 - INCOMPLETE_MOVIE.
 - PURCHASE_MOVIE
- a. Write a query to select only those clicks which correspond to starting, browsing, completing, or purchasing movies. Use a CASE statement to transform the RECOMMENDED column into integers where 'Y' is 1 and 'N' is 0. Also, ensure GENREID is not null. Only include the first 25 rows.
 - b. Write a query to select the customer ID, movie ID, recommended state and most recent rating for each movie.

6. The moveapp_log_json table contains an activity column. Activity states are as follows:

- RATE_MOVIE
 - COMPLETED_MOVIE
 - PAUSE_MOVIE
 - START_MOVIE
 - BROWSE_MOVIE
 - LIST_MOVIE
 - SEARCH_MOVIE
 - LOGIN
 - LOGOUT
 - INCOMPLETE_MOVIE.
- a. Load the results of the previous two queries into a staging table. First, create the staging table:
 - b. Next, load the results of the queries into the staging table.

7. Write R program to:

- a. Create two matrices and perform multiplication & division on those matrices.
- b. Create a data frame and print the: data frame, structure of data frame and summary of data frame.
- c. Create a Bar chart and sketch the Bar chart by taking months as input & plot it against revenue. Also, add legend to the chart that includes regions.

II. OPEN ENDED QUESTIONS

1. Installation and Configuration of Hadoop software on stand alone system.
2. Installation and Configuration of Hadoop software on Ubuntu cluster system.
3. Highest temperature year wise using MapReduce.

NOTE:

1. **STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.**
2. **STUDENT IS REQUIRED TO EXECUTE ONE PROGRAM FROM PART A and ONE PROGRAM FROM PART B .**

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Elucidate installation of various Big data tools under Hadoop.

CO2: Implement HiveQL statements.

CO3: Differentiate between SQL and NoSQL commands.

COs	Mapping with POs
CO1	PO2,PO5,PO7,PO11
CO2	PO5, PO7,PO12
CO3	PO7,PO9,PO10,PO12

Sub Title : SOFTWARE TESTING

Sub Code:IS81	No. of Credits:4=4 : 0 : 0 (L-T-P)	No.of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks:CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours :52

Course Objectives:

1. Discuss about terminologies of software testing .
2. Familiarize with strengths and weaknesses of a variety of test generation.
3. Analyze different types of software testing.
4. Infer functional and non functional testing.
5. Integrating the applications of Test management and automation in software testing

Unit No	Syllabus Content	No of Hours
1	<p>Basics of Software Testing: Humans, Errors and Testing(1.1), Software Quality(1.2); Requirements, Behavior and Correctness(1.3), Correctness versus Reliability(1.4), Testing and Debugging(1.5), Test Metrics(1.6), Software and Hardware Testing(1.7), Testing and Verification(1.8), Defect Management(1.9),Test-generation Strategies(1.10), Static Testing(1.11), Model-Based Testing and Model Checking(1.12), Control-Flow Graph(2.2), Execution History(2.3).</p> <p>Text book 1:</p>	12

2	<p>Test Generation: Introduction(3.1), The Test-Selection Problem(3.2), Equivalence Partitioning(3.3), Boundary Value Analysis(3.4), Category-Partition Method(3.5), Cause-Effect Graphing(4.3)</p> <p>Text book 1:</p>	10
3	<p>Types of Testing – 1: White Box Testing (T2:3), Static Testing (T2:3.2), Structural Testing (T2:3.3), Challenges in White box testing (T2:3.4), Black Box Testing(T2:4), Integration Testing(T2:5 and 5.1), Integration testing as a Type of Testing(T2:5.2), Integration testing as a Phase of Testing (T2:5.3), Scenario Testing(T2:5.4), Defect Bash(T2:5.5).</p> <p>T2:Text book 2:</p>	10
4	<p>Types of Testing – 2:</p> <p>System and Acceptance Testing: System Testing Overview(T2:6 and 6.1), why is system testing done? (T2:6.3),Functional versus non-functional Testing(T2:6.3), Functional System Testing(T2:6.4), Non-functional Testing(T2:6.5), Acceptance Testing(T2:6.6); Summary of Testing Phases(T2:6.7), Regression Testing(T2:8 to 8.3), How to do regression Testing(T2:8.4.1 to 8.4.6), Best Practices in regression testing (T2:8.5).</p> <p>T2:Text book 2:</p>	10
5	<p>Test Management and automation: Introduction (T2:15.1), Test planning (T2:15.2), Test management (T2:15.3), Test process(T2:15.4), Test reporting(T2:15.5), Test planning checklists(T2:Appendix A), Test plan template(T2:Appendix B).</p> <p>Software test Automation: What is Test automation?(T2:16.1) Terms used in Automation(T2:16.2), Skills needed for Automation(T2:16.3), what to automate? Scope of automation(T2:16.4), Design and architecture for automation(T2:16.5).</p> <p>T2:Text book 2:</p>	10

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Apply terms associated with software testing.

CO2: Design various test generation strategies.

CO3: Implement different types of software testing in application development.

CO4: Summarize aspects of functional and non functional testing.

CO5:Apply the usage of test Management and automation in software testing.

COs	Mapping with Pos
CO1	PO1,PO2,PO7,PO12
CO2	PO1,PO2,PO3,PO5,PO7
CO3	PO1,PO2,PO3,PO5,PO7,PO9,PO10
CO4	PO1,PO2,PO3,PO4,PO5,PO7
CO5	PO5,PO7,PO8,PO9,P10,PO11,PO12

TEXT BOOKS:

1. Aditya P Mathur, Foundations of Software Testing, Pearson Education, First Edition, 2010.ISBN-9788131707951
2. Srinivasan Desikan, Gopaldaswamy Ramesh, Software Testing - Principles and Practices, Pearson Education, First Edition, 2010. ISBN-978-8-177-58121-8

REFERENCE BOOKS/WEBLINKS:

Ron Patton, Software Testing, Pearson Education, Second Edition, 2010.
ISBN-978-81-7758-030

Course Title : MACHINE LEARNING AND APPLICATIONS		
CourseCode: IS823	No.of Credits:4 =4:0:0:0(L-T-P)	No.of lecture hours/week : 4
Exam Duration : 3 hours	CIE + Assignment+ SEE = 45+5+50=100	Total No. of Contact Hours : 52

Course objectives:

1. To understand the basic concepts of machine learning along with decision trees.
2. To understand the neural networks and genetic algorithms
3. To understand the Bayesian techniques
4. To understand the instant based learning
5. To understand the analytical learning and reinforced learning

Unit No.	Syllabus	No. of Hours
1	<p>INTRODUCTION and DECISION TREES: Machine learning basics: What is machine learning? Key terminology , Key tasks of machine learning,How to choose the right algorithm, Steps in developing a machine learning application , Why Python. Classifying with k-Nearest Neighbors Classifying with distance measurements, Prepare: importing data with Python , Putting the kNN classification, algorithm into action, How to test a classifier, Example: improving matches with kNN, Prepare: parsing data from a text file, Analyze: creating scatter plots with Matplotli, Prepare: normalizing numeric values, Test: testing the classifier as a whole program, Use: putting together a useful system, Example: a handwriting recognition system, Prepare: converting images.</p>	11
2	<p>NEURAL NETWORKS and GENETIC ALGORITHMS: Biological Multilayer Networks and Back Propagation Algorithms, Genetic Algorithms, Neural Network Representation, Problems, Perceptrons,</p>	10
3	<p>BAYESIAN AND COMPUTATIONAL LEARNING Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probably Learning – Sample Complexity for Finite and Infinite Hypothesis Spaces – Mistake Bound Model.</p>	10
4	<p>K- Nearest Neighbor Learning – Locally Weighted Regression – Radial Basis Functions – Case-Based Reasoning – Sequential Covering Algorithms – Learning Rule Sets – Learning First Order Rules – Learning Sets of First Order Rules – Induction as Inverted Deduction – Inverting Resolution</p>	10
5	<p>MODULE V ANALYTICAL LEARNING AND REINFORCED LEARNING Perfect Domain Theories – Explanation Based Learning – Inductive-Analytical Approaches - FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning</p>	11

Note 1: All units will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4

Assignment -III from Unit 5

Course Outcomes:

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

CO1: Choose the learning techniques with this basic knowledge. Also, obtain knowledge on decision tree learning.

CO2: Apply and comprehend neural network and genetic algorithms techniques.

CO3: Obtain knowledge about supervised and semi-supervised learning.

CO4: Differentiate between reinforcement and analytical learning techniques.

CO5: Differentiate different machine learning applications.

COs	Mapping with PO's
CO1	PO1,PO4
CO2	PO2,PO3,PO4
CO3	PO3,PO4
CO4	PO3,PO4,PO5,PO6
CO5	PO4,PO8,PO9,PO11

Text Books:

1. Peter Harrington , “Machine Learning in Action”, MANNING Shelter Island Publication, ISBN 9781617290183, 2012. Unit1: Chapter 1-2.4 (page no 1 to 36)
2. Tom M. Mitchell, “Machine Learning”, McGraw-Hill Education, 2013. Unit2, Unit3, Unit4 and Unit5: Chapter 4 to chapter 8 (Page no: 81 to 247)

Reference Books:

1. Ethem Alpaydin, “Introduction to Machine Learning”, 2nd Ed., PHI Learning Pvt. Ltd., 2013.
2. T. Hastie, R. Tibshirani, J. H. Friedman, “The Elements of Statistical Learning”, Springer; 1st edition, 2001.

Sub Title : OBJECT ORIENTED PROGRAMMING WITH C++

Sub Code:IS43	No. of Credits:4 = 4 : 0 : 0 (L-T-P)	No.of Lecture Hours/Week: 4
Exam Duration : 3 hours	Exam Marks: CIE + Assignment + SEE = 45 + 5 + 50 = 100	Total No. of Contact Hours : 52

2018-2019

Course Objectives:

1. Understand concepts of Object Oriented Programming and design programs using classes and objects for C++ .
2. Construct applications to provide flexible options for the creation of new definitions for some of the operators.
3. Specifying mechanism of deriving a new class from older classes through inheritance.
4. Implement methods to select appropriate member function during run time.
5. Design programs using Templates, exceptions and handle file I/Os

UNIT No	Syllabus Content	No of Hours
1	Introduction: Review of structures, Programming paradigms, Overview of C++, Sample C++ program, Console I/O , variables in C++, statements, arrays and strings, pointers & user-defined types,Function Components, argument passing, inline functions, function overloading. Classes & Objects–I: Class Specification, Class Objects, Scope resolution operator, Access members, Defining member functions, Data hiding, Constructors, Destructors, Parameterized constructors, Static data members and static member Functions.	10
2	Classes & Objects –II: Friend functions, Passing objects as arguments, Returning objects, Arrays of objects, Dynamic objects, Pointers to objects, Copy constructors, Generic functions and classes, Applications. Operator overloading : operator member functions to overload +, - , pre-increment, post-increment, pre-decrement, post decrement operators , friend operator function to overload << and >> operators, Operator overloading of special operator [].	10
3	Inheritance-I: Base Class, Inheritance and protected members, Protected base class inheritance, Inheriting multiple base classes. Inheritance – II: Constructors, Destructors and Inheritance, Passing parameters to base class constructors, Granting access, Virtual base classes.	10
4	Virtual functions: Virtual function, Calling a Virtual function through a base class reference, Virtual attribute is inherited, Virtual functions are hierarchical, Pure virtual functions, Abstract classes, Using virtual functions. Polymorphism: Early and late binding. Exception Handling: Exception handling fundamentals, Exception handling options.	10
5	C++ I/O System Basics : Old vs. Modern C++ I/O, C++ Streams, The C++ Stream	12

	<p>Classes, C++'s Predefined Streams, Formatted I/O, Formatting Using the ios Members, Setting the Format Flags, Clearing Format Flags, An Overloaded Form of setf(), Examining the Formatting Flags, Setting All Flags, Using width(), precision(), and fill(), Using Manipulators to Format I/O, Overloading << and >>, Creating Your Own Inserters, Creating Your Own Extractors, Creating Your Own manipulator Functions</p> <p>C++ File I/O: fstream and the File Classes, Opening and Closing a File, Reading and Writing Text Files, Unformatted and Binary I/O, Characters vs. Bytes, put() and get(), read() and write(), More get() Functions, getline(), Detecting EOF, The ignore() Function, peek() and putback(), flush(), Random Access, Obtaining the Current File Position, I/O Status, Customized I/O and Files.</p> <p>STL: An overview, containers, vectors, lists, maps.</p>	
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Note 1: Unit 1 & Unit 5 will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment - III from Unit 5.

Course Outcomes:

After the completion of the above course students will be able to

CO1: Demonstrate the need of using Object Oriented Programming in the real world applications and design programs using classes and objects for C++.

CO2: Design and analyze programs for automatic initialization and destruction of objects.

CO3: Develop applications by providing new definitions for some of the operators.

CO4: Design and develop applications through inheritance, Virtual Base classes and dynamic polymorphism.

CO5: Apply concepts of Templates, Exceptions and File handling in designing programs.

COs	Mapping with POs
CO1	PO2,PO3,PO5
CO2	PO1, PO2,PO3,PO6,PO7,PO9,PO11
CO3	PO2,PO3, PO5,PO6
CO4	PO2,PO3, PO5,PO6,PO9
CO5	PO2,PO3,PO5,PO6,PO12

TEXT BOOK:

Herbert Schildt: C++ The Complete Reference, 4th Edition, Tata McGraw Hill, 2014

REFERENCE BOOKS:

1. Stanley B.Lippmann, Josee Lajore: C++ Primer, 4th Edition, Addison Wesley, 2005.
2. Paul J Deitel, Harvey M Deitel: C++ for Programmers, Pearson Education, 2009.
3. K R Venugopal, Rajkumar Buyya, T Ravi Shankar: Mastering C++, Tata McGraw Hill, 1999.
4. Sourav Sahay: Object-Oriented Programming with C++, Oxford University Press, 2006.

Sub Title : OBJECT ORIENTED PROGRAMMING WITH C++ LAB		
Sub Code:: ISL46	No. of Credits:1.5= 0:0:1.5 (L-T-P)	No. of Lecture Hours/Week: 3
Exam Duration : 3 hours	Exam Marks: CIE + Assignment + SEE = 50 + 50 = 100	

Course Objectives:

1. Design programs using classes and objects for C++.
2. Build programs for automatic initialization of objects and destroy objects that are no longer required through constructors and destructors.
3. Construct applications to provide flexible options for the creation of new definitions for some of the operators.
4. Specifying mechanism of deriving a new class from older classes through inheritance.
5. Implement methods to select appropriate member function during run time.
6. Design and implement programs using Templates and Exceptions .

I. LIST OF PROGRAMS

- 1 Given that an EMPLOYEE class contains following members:
Data members : Employee Number, Employee Name, Basic, DA, IT, Net Salary
Member functions: to read the data, to calculate Net Salary and to print data members. Write a C++ program to read the data of N employees and compute Net Salary of each employee.
(Dearness Allowance (DA) = 52% of Basic and Income Tax (IT) = 30% of the gross salary.
Net_Salary = Basic + DA - IT)
- 2 Define a STUDENT class with
Data members : USN, Name, and Marks in 3 tests of a subject.
Using appropriate functions, find the average of two better marks for each student. Print the USN, Name, and the average marks of all the students. Declare an array of 10 STUDENT objects and demonstrate the functionality.
- 3 Write a C++ program to create a class called COMPLEX and implement the following overloading functions ADD that return a COMPLEX number.
 - i. $s2 = s1.add(a)$ – where a is an integer (real part) and s1, s2 are complex numbers.
 - ii. $s3 = s1.add(s2)$ – where s1 ,s2 and s3 are complex numbers.
- 4 Create a class called STRING using dynamic memory allocation technique and implement the following operations. Display the results after every operation by overloading the operator <<.
 - i. `STRING s1 = "Dr AIT"`
 - ii. `STRING s2 = "Bangalore"`
 - iii. `STIRNG s3 = s1 + s2` (Use copy constructor).

- 5 Create a template function for bubble sort and demonstrate sorting of integers and doubles.
- 6 Create a template class called STACK with member functions to add an element and to delete an element from the queue. Implement a stack of integers and doubles.
- 7 Implement the concept of operator overloading: Create a class called COMPLEX and overload +, -, * operators to perform addition, subtraction and multiplication operations on 2 complex numbers. Also overload the operators >> and << to accept and print the complex numbers.
- 8 Implement the concept of operator overloading: Create a class called MATRIX using a two-dimensional array of integers. Implement the following operations by overloading the operator == which checks the compatibility of two matrices m1 and m2 to be added and subtracted. Perform the addition and subtraction by overloading the operators + and - respectively. Display the results (sum matrix m3 and difference matrix m4) by overloading the operator <<.

```

if(m1 == m2)
{
m3 = m1 + m2;
m4 = m1 - m2;
}
else
display error

```

- 9 Create a class called STUDENT with data members USN, Name and Age. Using inheritance, create the classes UGSTUDENT and PGSTUDENT having fields as Semester, Fees and Stipend. Enter the data for at least 5 students. Find the semester wise average age for all UG and PG students separately.
- 10 Create a class called Number which has the characteristics of a decimal number. Derive a class OCTAL, which has the characteristics of an octal number inheriting the decimal value from the Number class. Derive a class HEX, which has the characteristics of a hexadecimal number inheriting the decimal value from the Number class. Derive a class BINARY which has the characteristics of a binary number inheriting the decimal value from the Number class.

Implement the following operations (operator overloading).

- i. int i = j + k where i is decimal, j is hexadecimal, k is OCTAL
- ii. int y = h + k; where h is an OCTAL object and k is an integer.

Display the Result by overloading the operator <<.

- 11 Create a class Account having data members Account No, Name, balance and member functions like input, display, deposit, withdrawal. The withdrawal function must handle an exception of type low balance. (balance should not be less than Rs 500). Implement try/throw/catch in C++ style.

- 12 Implement the concept of dynamic polymorphism to demonstrate the conversion of an expression from infix to postfix form.

Note: In the examination each student picks one question from a lot of all 12 questions.

II. OPEN ENDED QUESTIONS

Identify the different objects in the following environments and implement different suitable operations

1. Banking System
2. Library
3. Automobile Industry
4. Home Appliances
5. User Interface design etc

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY APPROVED BY THE STAFF IN CHARGE.

2.IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 12 QUESTIONS

Course Outcomes:

After completing the course the students are able to:

CO1: Design programs using classes and objects using C++.

CO2: Develop programs for automatic initialization of objects and destroy objects that are no longer required.

CO3: Develop applications to provide flexible options for the creation of new definitions for some of the operators.

CO4: Specify mechanism of deriving a new class from older classes through inheritance .

CO5: Design a program using Templates & Exception Handling.

COs	Mapping with POs
CO1	PO2,PO3,PO5
CO2	PO2,PO3,PO6,PO9
CO3	PO2,PO3,PO5,PO6
CO4	PO2,PO3,PO5,PO9
CO5	PO2,PO3,PO5,PO6

Sub Title : JAVA PROGRAMMING		
Sub Code:IS52	No. of Credits:4=3 : 1 : 0 (L-T-P)	No. of lecture hours/week : 5
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Identify the different object oriented concepts and implement basic programs.
2. Present inheritance and interface concepts.
3. Introduce multithreading programming concepts and handling errors efficiently.
4. Present different ways of implementing event handling and creating user interfaces using javaFX.
5. Introduce to Java Database Access, Servlets, JSP,RMI Concepts.

UNIT No.	Syllabus Content	No. of Hours
1	Introduction To Java: How java changed the internet; Java Buzz words, Byte Code; Object oriented programming; First Simple Java program, Introducing Classes :Classes Fundamentals, Declaring Objects, Assigning Object Reference Variable; Introducing Methods; Inheritance Basics- using Super; Creating Multilevel Hierarchy, When constructors are called, method Overriding, Dynamic Method Dispatch, Abstract classes, final with inheritance	10
2	Packages and Interfaces: Packages and Interface: Packages, Access Protection, Importing Packages, Interfaces MultiThreaded Programming ; The java tread model,The main thread, Creating thread creating multiple threads, Using isAlive() and join()Thread priorities; Synchronization Suspending , resuming and stopping threads ;	10
3	Applets ,Event Handling The Applet Class: Two types of Applets; Appletbasics; Applet Architecture; An Applet skeleton; Simple Applet displaymethods; Requesting repainting; Using the Status Window; The HTMLAPPLET tag; Passing parameters to Applets; getDocumentbase() andgetCodebase(); ApletContext and showDocument() ; The AudioClipInterface ; The AppletStub Interface; Output to the Console.producer-consumer problems. Event Handling: Two event handling mechanisms; The delegation event model; Event classes; Sources of events; Event listener interfaces; Using the delegation event model; Adapter classes; Inner classes;	10
4	Database Access, Servlets : Overview of J2EE and J2SE.The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process;Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data type ,Exceptions s; Servlets: Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet ; The Servlet API; The Javax. Servlet Package; Reading Servlet Parameter; The Javax.servlet.http package;Handling HTTP Requests and Responses; Using Cookies; Session Tracking;	12

5	<p>JSP and RMI , JavaFX, Networking: Java Server Pages (JSP): JSP, JSP Tags, Tomcat Request String, User Sessions, Cookies, Session Objects. Java Remote Method Invocation. JavaFX Basics ,JavaFX Layouts and Shapes ,JavaFX Event Driven ,JavaFX Animation and Listeners ,JavaFX UI Controls ,JavaFX Review,Multimedia & Making a Games</p> <p>Networking:Networking basics, Networking classes and Interfaces, InetAddress, Inet4 Address and Inet6 Address, TCP/IP ClientSockets, URL, URLconnection HttpURL Connection,URIclass,Datagrams</p>	10
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Note 1: Unit 1 & Unit 4 will have internal choice.

Note 2: Three assignments are evaluated for 5 marks:

Assignment – I from units 1 and 2.

Assignment - II from units 3 and 4

Assignment – III from unit 5

Course Outcomes

After completing the course the students are able to:

CO1: Apply object oriented programming, exception handling and multithreading concepts in problem solving.

CO2: Design and implement Applets, Parameterized Applets incorporating multithreading and event handling mechanisms.

CO3: Use javaFX aspects in graphical interactive application development and JDBC for database transactions, Handling HTTP requests and responses.

CO4: Develop applications using RMI and JSP

CO5: Design client server applications for connection oriented and connection less services.

COs	Mapping with POs
CO1	PO2,PO5,PO6,PO10
CO2	PO2,PO4,PO5,PO10
CO3	PO2,PO6,PO10
CO4	PO2,PO4,PO6,PO10
CO5	PO2,PO4,PO5,PO10

TEXT BOOK:

Herbert Schildt: Java - The Complete Reference, 9th Edition, Tata McGraw Hill, 2014. (Chapters 1, 2, 3, 4, 5, 6, 8, 9,10, 11,12,14,15,20, 21, 22, 29, 30).

REFERENCE BOOKS / WEBLINKS:

1. Y. Daniel Liang: Introduction to JAVA Programming, 7th Ed, Pearson Education, 2013.
2. Java Programming by Hari Mohan Pandey, Pearson Education, 2012.
3. Java 6 Programming, Black Book, KoGenT, dreamtech Press, 2012.
4. www.tutorialspoint.com/java/
5. www.javatpoint.com/java-tutorial
6. <https://www.youtube.com/watch?v=rXhdP4sKSME&list=PLrodECPviD6dUfQsc5c72>

Sub Title : WEB TECHNOLOGIES		
Sub Code: IS53	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To create a web page using XHTML using Cascading Style Sheets
2. To do data validation and user interaction using JavaScript
3. To create XML documents and provide styling to documents.
4. To develop web applications using CGI/Perl.
5. To design web applications using the concepts of PHP.

UNIT No	Syllabus Content	No of Hours
1	XHTML : Origins and evolution of HTML and XHTML; Basic syntax; Standard XHTML document structure; Basic text markup. Images; Hypertext Links; Lists; Tables; Forms; Frames; Syntactic differences between HTML and XHTML. CSS: Introduction; Levels of style sheets; Style specification formats; Selector forms; Property value forms; Font properties; List properties; Color; Alignment of text; The Box model; Background images	9
2	Javascript: Overview of JavaScript; Object orientation and JavaScript; General syntactic characteristics; Primitives, operations, and expressions; Screen output and keyboard input; Control statements; Object creation and modification; Arrays; Functions; Constructor; Pattern matching using regular expressions ,Introduction JQuery	8
3	Javascript and HTML documents: The Javascript execution environment; The Document Object Model; Element access in Javascript; Events and event handling; Handling events from the Body elements, Button elements, Text box and Password elements; The DOM 2 event model	7
4	XML: Introduction; Syntax; Document structure; Document Type definitions; Namespaces; XML schemas; Displaying XML documents with CSS; XSLT style sheets; XML processors; Web services.	7
5	Perl: Origins and uses of Perl; Scalars and their operations; Assignment statements and simple input and output, Fundamentals of arrays; Hashes; References; Functions; Pattern matching. CGI Programming The Common Gateway Interface; CGI linkage; Query string format; CGI.pm module.	8

	PHP: Origins and uses of PHP, Overview of PHP, General syntactic characteristics, Arrays, Form handling, Files, Cookies, Session Tracking.	
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Note 1: Unit 1 & Unit 5 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

Students will demonstrate the knowledge and the skills acquired with respect to:

CO1: Design simple web pages using different tags of XHTML and Classify and use different levels of style sheets

CO2 : Validate and provide user functionality using JavaScript

CO3 : Design and develop XML document and use the style sheet to display.

CO4: Develop web pages using PERL and CGI programs.

CO5: Design and develop PHP programs to perform database access, session tracking

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO6,PO7,PO9
CO2	PO2,PO3,PO5,PO6,PO9
CO3	PO1
CO4	PO1, PO5
CO5	PO1, PO4, PO5

TEXT BOOKS:

1. Robert W. Sebesta: Programming the World Wide Web, 4th Edition, Pearson education, 2011.
2. Learning jQuery , Better interaction, design, and web development with simple javaScript techniques , Fourth Edition , Jonathan Chaffer, Karl Swedberg 2013.

REFERENCE BOOKS / WEBLINKS:

1. M. Deitel, P.J. Deitel, A. B. Goldberg: Internet & World Wide Web How to Program, 4th Edition, Pearson education, 2011.
2. Pro PHP and jQuery- JASON LENGSTORF,2010.
3. <http://nptel.ac.in>
4. <http://www.w3schools.com/>

Sub Title : WEB TECHNOLOGIES LAB		
Sub Code: ISL58	No. of Credits:1=0: 0 : 1 (L:T:P)	No. of lecture hours/week : 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 =100	

Course Objectives:

1. Create a web page with text, images, links, lists, tables, and frames
2. To use Cascading style sheet in designing web pages
3. To use Javascript
4. To create XML schema and XSLT style sheet.
5. To create and execute PHP to access database, cookies and do session tracking.
6. Use PERL for CGI programming and access MySQL databases.

I. LIST OF PROGRAMS

1. I) Create a simple file to demonstrate the use of different tags
 - a) Moving text= “Simple HTML Tags”
 - b) Different heading tags(h1 to h6)
 - c) Paragraph
 - d) Horizontal line
 - e) Line break
 - f) Block quote
 - g) Pre tag
 - h) Different logical styles(,<i>,<sub>,<sup>
2. Write code to create an html file to link different html pages which contains images,tables,lists and also link within a page
3. Design a web page using the different styles using inline, external & internal style sheets.
4. Develop and demonstrate a XHTML file that includes Javascript script for the following problems:
 - a) Input: A number n obtained using prompt
Output: The first n Fibonacci numbers
 - b) Input: A number n obtained using prompt
Output: A table of numbers from 1 to n and their squares using alert
5. Design an XML document to store information about a student in an engineering college affiliated to VTU. The information must include USN, Name, Name of the College, Brach, Year of Joining, and e-mail address. Make up sample data for three students. Create a CSS style sheet and use it to display the document.
6. a) Write a Perl script to demonstrate the string concatenation and repetition.
b)Write a Perl program to display various Server Information like Server Name, Server Software, Server protocol, CGI Revision etc.
7. a) Write a perl script to demonstrate built-in array functions (PUSH, POP, SHIFT, UNSHIFT).

b) Write a Perl program to accept UNIX command from a HTML form and to display the output of the command executed.

8. a) Write a Perl program to display a digital clock which displays the current time of the server.

b) Write a program to demonstrate hide and show effects of html elements using jquery.

9. Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.

10 a) Write a PHP program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page.

b) Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.

II. OPEN ENDED QUESTIONS

Develop web based applications for any of the following

1. Simple employee portal.
2. Shopping cart.
3. Quiz application.
4. Reservation system.
5. Search engine.
6. Any Application

NOTE :

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.

2 IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 10 QUESTIONS.

Course Outcomes:

Students will demonstrate the knowledge and the skills acquired with respect to:

CO1: Design simple web pages using different tags of XHTML and Classify and use different levels of style sheets

CO2 : Validate and provide user functionality using JavaScript

CO3 : Design and develop XML document and use the style sheet to display.

CO4: Develop web pages using PERL and CGI programs.

CO5: Design and develop PHP programs to perform database access, session tracking

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO6,PO7,PO9
CO2	PO2,PO3,PO5,PO6,PO9
CO3	PO1, PO4
CO4	PO1, PO4
CO5	PO1, PO4

Sub Title : JAVA PROGRAMMING LAB		
Sub Code:ISL59	No. of Credits: 0 : 0 :1	No. of lecture hours/week : 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 =100	

Course Objectives:

1. Design & Develop the fundamentals of Object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
2. Design & Develop exception handling and multithreading concepts.
3. Develop efficient Java applets and applications using OOP concepts.
4. Design & Develop basic understanding of network application programs.

I. LIST OF PROGRAMS

1. a. Design a JAVA Program to demonstrate Constructor Overloading and method overloading.
b. Develop a JAVA Program to implement Inner class and demonstrate its Access Protections.
2. a. Develop a JAVA Program to demonstrate Inheritance.
b. Write a JAVA Program to demonstrate Exception Handling (Using Nested try catch and finally).
3. Develop a JAVA program which has
 - i. A Class called Account that creates account with 500Rs minimum balance, a deposit() method to deposit amount, a withdraw() method to withdraw amount and also throws LessBalanceException if an account holder tries to withdraw money which makes the balance become less than 500Rs.
 - ii. A Class called LessBalanceException which returns the statement that says withdraw amount (___Rs) is not valid.
 - iii. A Class which creates 2 accounts, both account deposit money and one account tries to withdraw more money which generates a LessBalanceException take appropriate action for the same.
4. Design a JAVA program using Synchronized Threads, which demonstrates Producer Consumer concept.
5. Develop a JAVA program which has
 - i. A Interface class for Stack Operations
 - ii. A Class that implements the Stack Interface and creates a fixed length Stack.
 - iii. A Class that implements the Stack Interface and creates a Dynamic length Stack.
 - iv A Class that uses both the above Stacks through Interface reference and does the Stack operations that demonstrates the runtime binding.
6. Develop JAVA programs which demonstrates utilities of LinkedList Class

7. Write a JAVA Program which uses FileInputStream / FileOutPutStream Classes.
8. Develop a JAVA program which uses Datagram Socket for Client Server Communication.
9. Design JAVA Applet programs which handles MouseEvent
10. Develop JAVA Applet programs which handles KeyboardEvent

II. OPEN ENDED QUESTIONS

Develop applications for data base access, servlet request/response, rmi, jsp, userinterface for any application using javaFX, any gaming application etc

NOTE :

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.
2. IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 10 QUESTIONS.

Course Outcomes:

After completing the course the students are able to:

- CO1.** Recognize the basic object oriented concepts & apply them to create java applications.
- CO2.** Demonstrate java application with inheritance and interface concepts.
- CO3.** Design java applications with multithreading concepts and demonstrate the error handling concepts.
- CO4.** Create GUI applications with the help of javaFX and handle events.
- CO5.** Design client server applications and security models.

COs	Mapping with POs
CO1	PO2,PO5,PO6,PO10
CO2	PO2,PO4,PO5,PO10
CO3	PO2,PO6,PO10
CO4	PO2,PO4,PO6,PO10
CO5	PO2,PO4,PO5,PO10

Sub Title: MANAGEMENT AND ENTREPRENEURSHIP		
Sub Code: HS03	No. of Credits : 4:0:0(L:T:P)	No. of Lecture hours/week : 4
Exam Duration : 3 Hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours: 52

Course Objectives :

1. To help students understand the Management concepts & its evolution.
2. To impart the knowledge about various Managerial functions.
3. To make the student learn the Entrepreneurial process.
4. To gain an insight of funding agencies & understand the role of SSI in economic development.
5. To have a clear understanding of various business opportunities & designing the Business plan.

UNIT No.	Syllabus Content	No. of Hours
1	MANAGEMENT: Introduction-meaning-nature, characteristics of management, scope, functions of management and functional areas of management, management as a science or an art or profession, management and administration, roles of management, levels of management, Development of management thought -Early management approaches, Modern management approaches.	08
2	PLANNING, ORGANIZING, DIRECTING AND CONTROLLING: PLANNING: Meaning and Nature, Types of Plans and Steps in Planning process. ORGANIZING: as a Managerial function – Nature and purpose of organization, principles of organization, types of organization. Departmentation, Committees, Centralization Vs Decentralization of authority and responsibility span of control, MBO and MBE (only concepts), Staffing: Nature and importance of staffing, process of selection and recruitment, Decision Making: Definition, Types and Decision Making Process. DIRECTING: Meaning and nature of directing, leadership styles – Autocratic, Democratic, Charismatic, Laissez faire and Participative. Leadership theories – Trait, Behavioral and Contingency. Introduction to Motivation theories – Maslow, Herzberg, Carrot & Stick & Mc. Gregor’s Theory of X & Y. CO-ORDINATION: Meaning and importance of Co-ordination, Team Building & Group Dynamics, Communication – meaning and importance, types and barriers of communication. CONTROLLING: Meaning and steps in controlling-Essentials of a sound control system-Types of control, Method of establishing control (in brief).	12
3	ENTREPRENEUR: Meaning, evolution of the concept, Scope of Entrepreneur, functions of an Entrepreneur, Characteristics of an Entrepreneur, types of entrepreneur, Intrapreneur – an emerging class. Difference between Entrepreneur, Intrapreneur & Manager, Stages in Entrepreneurial process, Problems faced by an Entrepreneur, Role of	10

	Entrepreneurs in economic development, Entrepreneurship- Meaning & Importance of Entrepreneurship in India, barriers, Women entrepreneur – Concept & steps to develop Women Entrepreneur.	
4	SMALL SCALE INDUSTRY: Concept of MSME, Ancillary Industry and Tiny Industry, Definition;, Characteristics; Objectives, Scope and role of SSI in economic Development, Advantages of SSI, problems of SSI, Steps to start an SSI, Government Policy towards SSI; Introduction to GATT/ WTO/ LPG. Forms of ownership. SUPPORTING AGENCIES OF GOVERNMENT FOR SSI: Meaning, Nature of support; Objectives, functions. INSTITUTIONAL SUPPORT: Different Schemes, TECKSOK, KIADB, KSSIDC, DIC,SISI NSIC, SIDBI, KSFC. Sources of financing an enterprise- long term and short term.	12
5	PREPARATION OF PROJECT: Meaning, Project identification, Project selection, Project Report - Need of Project, Contents: formulation, Errors of project report, Project Appraisal, Feasibility Study-Market Feasibility Study, Technical Feasibility Study, Financial Feasibility Study, Social Feasibility Study. Business opportunities, Business plan: Definition, components of business plan, reasons for failure of business plan.	10

Note 1 : Unit 2 and Unit 4 will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes :

CO1 : The students will gain knowledge on management concepts & its evolution.

CO2 : The students will learn the application of managerial skills & attributes.

CO3 : The students will get an in depth knowledge of entrepreneurial process & will be able to apply the entrepreneurial skills.

CO4 : Students compile information & explore the sources of funding agencies.

CO5 : Students will be able to identify business opportunities & prepare the business plan.

COs	Mapping with POs
CO1	PO12
CO2	PO9,PO10,PO11,PO12
CO3	PO11,PO12
CO4	PO11
CO5	PO7,PO11,PO12

TEXT BOOKS:

1. Entrepreneurship and Management- S Nagendra and V S Manjunath- Pearson Publication 4 /e, 2009.

2. Dynamics of Entrepreneurial Development and Management-Vasant Desai-Himalaya Publishing House.
3. Principles of Management – PC Tripathi, and P N Reddy – Tata MacGraw Hill.

REFERENCE BOOKS:

1. Entrepreneurship Development – Poornima M Charanthimath Pearson Education 2006.
2. Entrepreneurship and management - Shashi k Gupta- Kalyani publishers, Latest edition.
3. Organizational behaviour, Stephen P Robbins, Timothy A. Judge, Neharika Vohra, Pearson, 14/e, 2012.
4. Financial Management- Shashi k Gupta- Kalyani publishers, Latest edition.

Sub Title : MOBILE APPLICATION DEVELOPMENT		
Sub Code:IS61	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To understand the Mobile - Android OS architecture and life cycle.
2. To analyze and use appropriate tools for Android Application development.
3. To be familiar with managing of application resources.
4. To build elegant user interfaces with views, layouts & form widgets.
5. To understand the usage of Services and Notifications in Android Apps.

UNIT No	Syllabus Content	No of Hours
1	An Overview of Android: Introducing Android – History of Mobile Software Development, The Open Handset Alliance, Android Platform differences, Android Platform. Setting Up Your Android Development Environment - Configuring Your Development environment, Exploring Android software development Kit. Writing first android application - Testing Your Development Environment, Building Your First Android Application. Android Application Design Essentials: Understanding the Anatomy of an Android Application - Mastering Important Android Terminology, Using the Application Context, Receiving and Broadcasting Intents.	7
2	Defining the application using Android Manifest File – Understanding and Configuring the Android Manifest File. Managing Application Resources: Resources, Working with Resources	7

	Designing User Interfaces with Layouts: Creating User Interfaces in Android, Using Built-In Layout Classes.	
3	Android User Interface Design Essentials: Exploring User Interface Screen Elements, Introducing Android Views and Layouts, Displaying Text to Users with TextView, Retrieving Data from Users, Using Buttons, Check Boxes, and Radio Groups, Getting Dates and Times from Users, Using Indicators to Display Data to Users, Adjusting Progress with SeekBar, Providing Users with Options and Context Menus, Working with Dialogs	9
4	Drawing and Working with Animation -Working with Animation - Working with Frame-by-Frame Animation, Working with Tweened Animations. Working with Files and Directories: Exploring with the Android Application Directories, Working with Other Directories and Files on the Android File System Storing Structured Data Using SQLite Databases: Creating a SQLite Database,Creating, Updating, and Deleting Database Records, Querying SQLite Databases, Closing and Deleting a SQLite Database	9
5	Working with Services: Determining When to Use Services, Understanding the Service Lifecycle, Creating a Service, Controlling a Service. Working with Notifications: Notifying the User, Notifying with the Status Bar, Vibrating the Phone, Blinking the Lights.	7

Note 1: Unit 3 & Unit 4 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Analyze the fundamentals of Mobile application development.

CO2: Analyze the problems to build Mobile apps by assessing the basic framework and usage of SDK.

CO3: Design and develop Android applications using various resources and built-in classes.

CO4: Develop the skills in designing and deploying the sophisticated mobile applications.

CO5: Design and deploy Android applications with compelling User Interfaces.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO5
CO2	PO1,PO2,PO4,PO5,PO6
CO3	PO1,PO3,PO4,PO6,PO7
CO4	PO6,PO7,PO9,PO11,PO12

CO5	PO1,PO3,PO4,PO6,PO7
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TEXT BOOK:

Shane Conder, Lauren Darcey: Android Wireless Application Development, Pearson education, 2010.

REFERENCE BOOKS:

1. Reto Meier: Professional Android 4 Application Development , Wrox Publication,2015
2. ZigurdMednieks, Laird Dornin, G. Blake Meike, Masumi Nakamura: Programming Android, 2nd Edition , O'Reilly Publication, 2012.
3. SatyaKomatineni , Dave MacLean , SayedHashimi : Pro Android 3, Apress publication ,2011.

Sub Title : CLOUD COMPUTING		
SubCode:IS63	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To study the history and the fundamental concepts of Cloud Computing, Parallel, Distributed Computing and Virtualization.
2. To understand the concept of cloud computing architecture and different Cloud models.
3. To impart Cloud offerings which enhances the usage of Cloud.
4. To analyze the Cloud Storage and Security maintenances.
5. To become familiar with the different applications of Cloud Computing.

UNIT No	Syllabus Content	No of Hours
1	Introduction to Cloud Computing: Cloud Computing at a Glance, Historical Developments, Building Cloud Computing Environments Computing Platforms and Technologies	7
2	Principles of Parallel and Distributed Computing: Eras of Computing , Parallel vs. Distributed Computing, Elements of Parallel Computing, Elements of Distributed Computing, Technologies for Distributed Computing Virtualization: Introduction, Characteristics of Virtualized Environments, Virtualization and Cloud Computing, Pros & Cons of Virtualization	7
3	Cloud Computing Architecture: Introduction, Cloud Reference Model, types of Clouds, Economics of the cloud, Open challenges	7
4	Cloud offerings: Cloud Analytics, Testing under cloud, Information Security, Virtual Desktop Infrastructure, Storage Cloud. Cloud management: Introduction, Resiliency, Provisioning, Asset	9

	management. Cloud governance, High availability and disaster recovery, Charging models, Usage reporting, Billing and metering.	
5	Cloud Platforms in Industry: Amazon Web Services, Google AppEngine Cloud Applications: Scientific Applications, Business and Consumer Applications	9

Note 1: Unit 4 & Unit 5 will have internal choice.

Note 2: Three assignments are evaluated for 5 marks

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the student will be able to:

CO1: Analyze core concepts and fundamentals of the Cloud Computing.

CO2: Analyze systems, protocols and mechanisms to support Cloud Infrastructure.

CO3: Identify the hardware necessary for Cloud Computing.

CO4: Develop applications and host on Cloud Computing.

CO5: To manage the Cloud Environment.

COs	Mapping with POs
CO1	PO1,PO7,PO11,PO12
CO2	PO1,PO4,PO7,PO11,PO12
CO3	PO1,PO2,PO3, PO5,PO8
CO4	PO1,PO8, PO10,PO11,PO12
CO5	PO4,PO5,PO6,PO7,PO8

TEXT BOOKS:

1. Rajkumar Buyya, Christian Vecchiola, S Thamarai Selvi ,Mastering Cloud Computing , Tata McGraw Hill Education Private Limited, 2013.
2. Dr. Kumar Saurabh , Cloud Computing , Wiley India, 2011.

REFERENCE BOOKS:

1. Dinkar Sitaram, Geetha Manjunath ,Moving to the Cloud. Elsevier Publications, 2011.
2. Barrie Sosinsky, Cloud Computing Bible , Wiley Publishing, Inc, 2011.

Sub Title : ARTIFICIAL INTELLIGENCE		
Sub Code:IS651	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Understand about agent, behavior and structure
2. Learn different search strategies
3. Representation of knowledge and reasoning
4. Gain knowledge about planning and learning strategies

Unit No.	Syllabus Content	No. of Hours
1	Intelligent agents: Agents and environments, good behavior, concept of rationality, nature of environments, structure of agents	10
2	Problem-solving through Search: Problem solving agents, searching for solutions, uninformed search strategies, A*, minimax	10
3	Knowledge Representation and Reasoning: ontologies, representing and reasoning about objects, relations, events, actions, time, and space; predicate logic, syntax and semantics of first order logic, Propositional vs. First order inference, Forward chaining and backward chaining.	11
4	Planning: planning as search, partial order planning, construction and use of planning graphs	10
5	Machine Learning and Knowledge Acquisition: forms of learning, inductive learning, learning decision trees, Learning nearest neighbor, Reinforcement learning, passive and active RL.	11

Note 1: Unit 3 & Unit 5 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Identify agent and environment.

CO2: Apply different Search strategies in problem solving .

CO3: Represent knowledge and perform reasoning.

CO4: Apply Planning strategies and machine learning techniques.

COs	Mapping with POs
CO1	PO1,PO12
CO2	PO7,PO12
CO3	PO1,PO2
CO4	PO5,PO7,PO12

TEXT BOOK:

Artificial Intelligence: A Modern Approach, 3rd Edition, by Stuart Russell and Peter Norvig.2.1,2.2,2.3,2.4,3.1,3.3,3.4,4.1,4.2,6.2,8.1,8.2,9.1,9.3,9.4,10.1,10.2,10.3,10.4,11.2,11.3,11.4,18.1,18.2,18.3,19.3,20.4,21.1,21.2,21.3)

REFERENCE BOOKS:

1. Luger, G. F., & Stubblefield, W. A., Artificial Intelligence - Structures and Strategies for Complex Problem Solving. New York, NY: Addison Wesley, 5th edition (2005).
2. Nilsson, N. J. Artificial Intelligence - A Modern Synthesis. Palo Alto: Morgan Kaufmann. (1998).
3. Nilsson, N. J., Principles of Artificial Intelligence. Palo Alto, CA: Tioga (1981).
4. Rich, E., & Knight, K., Artificial Intelligence. New York: McGraw-Hill (1991).

Sub Title : PYTHON PROGRAMMING		
Sub Code:IS653	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Understanding the syntax and semantics of the Python language.
2. To create Functions in Python.
3. To handle Files & Regular expressions in Python.
4. To apply Object Oriented Programming concepts in Python.
5. To create Threaded and Networking applications in Python .

Unit No.	Syllabus Content	No of Hours
1	Introduction to Python, Writing First python program, Datatypes in Python, Operators in python, Input and output, Control statements	10
2	Arrays in Python, Strings and characters, Functions, Lists and Tuples, Dictionaries	10
3	Files in Python, , Exceptions, Regular Expressions, Date and Time, modules and packages	10

4	Introduction to OOPS, Classes and Objects, Inheritance and Polymorphism, Abstract classes and Interfaces	10
5	Data Structures in Python, Threads, Networking in Python, Python Database Connectivity	12

Note 1: Unit 4 & Unit 5 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course the student will be able to:

CO1: Demonstrate the understanding and usage of core python scripting elements python constructs, data types

CO2 : Demonstrate the understanding and usage of functions ,lists,tuples and dictionaries.

CO3: Demonstrate the understanding and usage of modules, packages and regular expressions

CO4: Demonstrate usage of object oriented features such as Inheritance, Polymorphism, operator overloading.

CO5: Apply the knowledge of python and use the language scripting elements and constructs to develop threaded and networking applications.

COs	Mapping with POs
CO1	PO1,PO2,PO4
CO2	PO1,PO2,PO4
CO3	PO1,PO2,PO4,PO5,PO8
CO4	PO1,PO2,PO4,PO5,PO8
CO5	PO1,PO2,PO4,PO5,PO8

TEXT BOOK :

Introducing Python- Modern Computing in Simple Packages – Bill Lubanovic, O’Reilly Publication 2015

REFERENCE BOOKS/WEB LINKS:

1. How to Think Like a Scientist–Learning with Python “,Allen Downey, Jeffrey Elkner, Chris Meyers, Green Tea Press, 2012, Third Edition.
2. Introduction to Computer Science Using Python–Charles Dierbach, Wiley Publication Learning with Python “,Green Tea Press, 2014, First Edition.
3. Beginning Python –From Novice to Professional,–Magnus Lie Hetland, Second Edition, A Press Publication 2014.

Course Title : INTERNET OF THINGS		
Course Code:IS72	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	CIE + SEE = 50 + 50 =100	Total No. of Contact Hours :52

Course Objectives

1. To learn the basic issues, policy and challenges in the IoT
2. To understand the Mechanism and Key Technologies in IoT
3. To analyze the managing of the resources in the IoT
4. To deploy the resources into business
5. To comprehend Data Analytics for IoT

UNIT No	Syllabus Content	No of Hours
1	Introduction to IoT Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs. IoT & M2M Machine to Machine, Difference between IoT and M2M, Software define Network	12
2	Fundamentals IoT Mechanism and Key Technologies-Identification of IoT Object and Services, Structural Aspects of the IoT, Key IoT Technologies. Evolving IoT Standards-Overview and Approaches,IETF IPV6 Routing Protocol for RPL Roll, Constrained Application Protocol, Representational State Transfer, ETSI M2M,Third Generation Partnership Project Service Requirements for Machine-Type Communications, CENELEC, IETF IPv6 Over Lowpower .	10
3	Challenges in IoT Design challenges, Development challenges, Security challenges, Other challenges	10
4	Domain specific applications of IoT Home automation, Industry applications, Surveillance applications, Other IoT applications	10
5	Data Analytics for IoT – Introduction, Apache Hadoop, Using Hadoop MapReduce for Batch Data Analysis, Apache Oozie, Apache Spark, Apache Storm, Using Apache Storm for Real-time Data Analysis, Structural Health Monitoring Case Study.	10

Note 1: Unit 2 & Unit 5 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course outcomes:

On successful completion of the course, the student will

CO1: Understand the concepts of Internet of Things.

CO2: Identify different technologies of IoT with machine type communication.

CO3: Design IoT applications in different domain and be able to analyze their performance.

CO4: Implement basic IoT applications on embedded platform.

CO5: Understand data sets received through IoT devices and tools used for analysis

COs	Mapping with PO's
CO1	PO3,PO4,PO5,PO6,PO9,PO10
CO2	PO3,PO4,PO5,PO6,PO7,PO9,PO10
CO3	PO4,PO6,PO7,PO8,PO9,PO11
CO4	PO4,PO5,PO8,PO9,PO10,PO11
CO5	PO4,PO5,PO6,PO7,PO9,PO10

TEXT BOOK:

1. ArshdeepBahga, Vijay Madiseti, "Internet of Things : A Hands on Approach"
Universities Press., 2015
2. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6:The Evolving
World of M2M Communications", Wiley, 2013

REFERENCE BOOKS/WEBLINKS

1. Michael Miller, "The Internet of Things", First Edition, Pearson, 2015.
2. Claire Rowland, Elizabeth Goodman et.al., "Designing Connected Products", First
Edition, O'Reilly, 2015

Sub Title : BIG DATA ANALYTICS		
Sub Code: IS73	No. of Credits: 4 =4 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 4
Exam Duration : 3 hours	CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. To impart fundamental concepts about data and its identification.
2. Understand the basic concepts of Big data, methodologies for analyzing structured and unstructured data.
3. Discuss different technologies used for Big data along with its architecture.

Unit No.	Syllabus Content	No. of Hours
1	<p>Providing Structure to Unstructured Data: Background, Machine Translation, Autocoding, Indexing and Term Extraction.</p> <p>Identification, Deidentification, and Reidentification: Background, Features of an Identifier System, Registered Unique Object Identifiers, Really Bad Identifier Methods, Embedding Information in an Identifier: Not Recommended, One-Way Hashes, Use Case: Hospital Registration, Deidentification, Data Scrubbing, Reidentification.</p> <p>Ontologies and Semantics: Background, Classification, the Simplest of Ontologies, Ontologies, Classes with Multiple Parents, Choosing a Class Model, Introduction to Resource Description Framework Schema, Common Pitfalls in Ontology Development.</p> <p>Data Integration and Software Interoperability: Background, The Committee to Survey Standards, Standard Trajectory, Specifications and Standards, Versioning, Compliance Issues, Interfaces to Big Data Recourses.</p>	12
2	<p>Immutability and Immortality: Background, Immutability and Identifiers, Data Objects, Legacy Data, Data Born from Data, Reconciling Identifiers across Institutions, Zero-knowledge Reconciliation, The Curator's Burden.</p> <p>Simple but Powerful Big Data Techniques: Background, Look at the Data, Data Range, Denominator, Frequency Distributions, Mean and Standard Deviation, Estimation-Only Analyses, Use Case: Estimating Move Preferences.</p>	8
3	<p>Getting Value Predictive Analytics and Big Data: Why Do Predictive Analytics on Big Data?; Moving Predictive Analytics to the Front Lines; Gaining Real Business Value from Predictive Analysis; Publishing Data and Analytics to Cloud Service.</p> <p>Ten Things to Consider with Big Data Analytics.</p> <p>Analytics and Big Data: Using Big Data to Get Results; Basic analytics; Advanced analytics.</p>	10
4	<p>Analysis: Background, Analytic Tasks, Clustering, Classifying, Recommending, and Modeling, Data Reduction, Normalizing and Adjusting Data, Big Data Software: Speed and Scalability, Find Relationships, Not Similarities.</p> <p>Special Considerations in Big Data Analysis: Background, Theory in</p>	10

	Search of Data, Data in Search of Theory, Overfitting, Too Much Data, Fixing Data, Data Subsets in Big Data: Neither Additive nor Transitive, Additional Big Data Pitfalls.	
5	<p>Stepwise Approach to Big Data Analysis.</p> <p>Big Data Infrastructures ,Technologies and Applications: Hadoop: Architecture, Introduction to MapReduce; HDFS: Architecture; R language: Programming features, Examples; Zookeeper; MongoDB.</p> <p>Other Hadoop Related tools: Hbase: Data model and implementations – Hbase clients – Hbase examples –praxis; Cassandra : Cassandra data model – Cassandra examples – Cassandra clients –Hadoop integration; PIG: Grunt – Pig data model – Pig Latin – developing and testing Pig Latin scripts. Hive – data types and file formats – HiveQL data definition – HiveQL data manipulation – HiveQL queries.</p> <p>Big Data Applications: Healthcare, Insurance industry, Telecom services, Financial services, Retail, Marketing etc.</p>	12

Unit 1 & Unit 5 will have internal choice.

Note : Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Identify the differences between Big data & small data and structured & unstructured data. Also, analyze the Ontologies and Measurement techniques of Big data along with data integration.

CO2: Discuss about various powerful Big data techniques.

CO3: Differentiate between Statistics, Data Mining & Analytics.

CO4: Apply special considerations in Big Data Analysis along with stepwise approach in Big Data analytics.

CO5: Discuss different infrastructure & technologies for Big Data and its applications.

COs	Mapping with POs
CO1	PO2, PO3, PO4, PO12.
CO2	PO2, PO3, PO12
CO3	PO2,PO3, PO4, PO9
CO4	PO2,PO3, PO9
CO5	PO3,PO4, PO5, PO10, PO12

TEXT BOOKS:

1. Principles of Big Data: Preparing, Sharing and Analyzing Complex Information, Jules.J. Berman, First Edition, MK Publishers, 2013.
2. Judith Hurwitz, Alan Nugent, Dr. Fern Halper, Marcia Kaufman, Big Data For Dummies, Published by John Wiley & Sons, Inc., 2013.

3. Unit 5 (Not limited to following resource) :

i. Challenges and Opportunities with Big Data by Divyakant Agrawal et al , Whitepaper, 2011.

REFERENCE BOOKS/WEB LINKS:

1. Ken W. Collier, Agile Analytics: A Value-Driven Approach to Business Intelligence and Data Warehousing, Author: Pearson Education, ISBN-13:- 9788131786826, 2012
2. Michael Wessler, Big Data For Dummies, Published by John Wiley & Sons, Inc. , Alteryx Special Edition, 2013.
3. Big Data Applications: <http://www.nasscom.in>.
4. Big Data case studies:
 - i. http://racunarstvo.hr/wp-content/uploads/2016/03/OA_day_Big_Data_Tomasz_Przybysewski.pdf.

Sub. Title : MOBILE APPLICATION DEVELOPMENT LAB		
Sub Code: ISL75	No. of Credits : 0:0:1.5	No. of lecture hours/week : 03
Exam Duration : 3 hours	CIE + Assignment + SEE = 45 + 5 + 50 = 100	

ii. <https://www.datameer.com/pdf/eBook-Top-Five-High-Impact-UseCases-for->

Course objectives:

6. To understand the Mobile - Android OS architecture and life cycle.
7. To analyze and use appropriate tools for Android Application development.
8. To be familiar with managing of application resources.
9. To build elegant user interfaces with views, layouts & form widgets.
10. To understand the usage of Services and Notifications in Android Apps.

Big-Data-Analytics.pdf

I. LIST OF PROGRAMS

1. Develop an android application that uses GUI components, Font and Colors.
2. Design an android application that uses Layout Managers and event listeners.
3. Develop a native android calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an android application that makes use of database.
6. Implement an android application that implements Multi-threading concept.
7. Develop a native application that uses GPS location information.
8. Implement an application that writes data to the SD card.
9. Implement an application that creates an alert upon receiving a message.
10. Write a mobile application that creates alarm clock

II. OPEN ENDED QUESTIONS

Develop an android application using Android Studio/ADT Bundle for any of the following:

- 1.Mobile Based Attendance System.
- 2.Android Campus Recruitment System.
- 3.Android Book Store Project.
- 4.Student Faculty Document Sharing Android Project
- 5.Android Based Feedback System.

NOTE :

1. Student is permitted to submit open ended solution to any other open ended question apart from the list above . but it has to be approved by the staff in charge.
2. In the examination each student picks one question from a lot of all 10 questions.

Course Outcomes:

After completing the course the students are able to:

CO1: Analyze the fundamentals of Mobile application development.

CO2: Analyze the problems to build Mobile apps by assessing the basic framework and usage of SDK.

CO3: Design and develop Android applications using various resources and built-in classes.

CO4: Develop the skills in designing and deploying the sophisticated mobile applications.

CO5: Design and deploy Android applications with compelling User Interfaces.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO5
CO2	PO1,PO2,PO4,PO5,PO6
CO3	PO1,PO3,PO4,PO6,PO7
CO4	PO6,PO7,PO9,PO11,PO12
CO5	PO1,PO3,PO4,PO6,PO7

Sub Title : BIG DATA LAB		
Sub Code:ISL76	No of Credits : 0:0:1.5	No. of Lecture Hours/Week : 03
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	

Course Objectives:

1. To understand the concept of Big data with hands on.
2. Understand installation of various Big data tools.
3. To apply Hadoop concepts to various applications and NoSQL implementation.

I. LIST OF PROGRAMS

1. Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.
 - a. Review the commands available for the Hadoop Distributed File System:
 - b. Copy file `foo.txt` from local disk to the user's directory in HDFS
 - c. Get a directory listing of the user's home directory in HDFS
 - d. Get a directory listing of the HDFS root directory
 - e. Display the contents of the HDFS file `user/fred/bar.txt`
2. Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.
 - a. Move that file to the local disk, named as `baz.txt`
 - b. Create a directory called `input` under the user's home directory
 - c. Delete the directory `input` and all its contents
 - d. Verify the copy by listing the directory contents in HDFS.

3.MapReduce Programs:

Using movie lens data

- a. List all the movies and the number of ratings
- b. List all the users and the number of ratings they have done for a movie
- c. List all the Movie IDs which have been rated (MovieId with at least one user rating it).

4. Hive Programs:

Hive allows for the manipulation of data in HDFS using a variant of SQL. This makes it excellent for transforming and consolidating data for load into a relational database. In this exercise you will use HiveQL to filter and aggregate click data to build facts about user's movie preferences. The query results will be saved in a staging table used to populate the Oracle Database.

The moveapp_log_json table contains an activity column. Activity states may be as follows:

- RATE_MOVIE
- COMPLETED_MOVIE
- PAUSE_MOVIE
- START_MOVIE
- BROWSE_MOVIE
- LIST_MOVIE
- SEARCH_MOVIE
- LOGIN
- LOGOUT
- INCOMPLETE_MOVIE.

Hive maps queries into Map Reduce jobs, simplifying the process of querying large datasets in HDFS. HiveQL statements can be mapped to phases of the Map Reduce framework. Selection and transformation operations occur in map tasks, while aggregation is handled by reducers. Join operations are flexible: they can be performed in the reducer or mappers depending on the size of the leftmost table. Write query to:

- a. Create the database "movieworks" and its corresponding table.
- b. Write a query to insert movie details into the query.
- c. Load the table with the data.
- d. Create an external table(example: movieapp_log). An external table is created for the conversion text file to binary file which can then be sent to HDFS through the operating system. Avro system is used for conversion of text file to binary file
- e. Insert the details of internally created table(movie_details1) using insert overwrite command to the external table (loading the external table with the data).

5. R-PROGRAMMING:

Write R program to:

- a. Create two matrices and perform multiplication & division on those matrices.
- b. Create a data frame and print the: data frame, structure of data frame and summary of data frame.
- c. Create a Bar chart and sketch the Bar chart by taking months as input & plot it against revenue. Also, add legend to the chart that includes regions.

II. OPEN ENDED QUESTIONS

1. Word count using MapReduce.
2. Execute basic PIG commands.

NOTE:

1.STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.

2. STUDENT IS REQUIRED TO EXECUTE ONE QUESTION FROM A LOT OF ALL 5 QUESTIONS.

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Elucidate installation of various Big data tools.

CO2: Implement HiveQL statements.

CO3: Differentiate between SQL and NoSQL commands.

COs	Mapping with POs
CO1	PO2,PO5,PO7,PO11
CO2	PO5, PO7,PO12
CO3	PO7,PO9,PO10,PO12

Sub Title : C# PROGRAMMING AND .NET

Sub Code:IS744	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Understand the nature of .Net application development and build C# applications.
2. Familiarize with Object-oriented Programming concepts as associated with C#, Inheritance, Interfaces, Exception Handling, Reflection, Standard I/O programming, File Handling, Generics,
3. Understand Windows Application using Winforms, File I/O, XML in .NET.Web Services and Deployment.
4. Overview of .NET framework 3.0 features like WPF, WCF and WF.

Unit No.	Syllabus Content	No of Hours
1	The Philosophy Of .Net: Understanding the Previous State of Affairs, The .NET Solution, The Building Block of the .NET Platform (CLR,CTS, and CLS), The Role of the .NET Base Class Libraries, What C# Brings to the Table, An Overview of .NET Binaries (aka Assemblies), the Role of the Common Intermediate Language , The Role of .NET Type Metadata, The Role of the Assembly Manifest, Compiling CIL to Platform –Specific Instructions, Understanding the Common Type System, Intrinsic CTS Data Types, Understanding the Common Languages Specification, Understanding the Common Language Runtime	10

	A tour of the .NET Namespaces, Increasing Your Namespace Nomenclature, Deploying the .NET Runtime.	
2	<p>Building C# Applications: The Role of the Command Line Compiler (csc.exe), Building C # Application using csc.exe Working with csc.exe Response Files, Generating Bug Reports , Remaining C# Compiler Options, The Command Line Debugger (cordbg.exe) Using the, Visual Studio .NET IDE, Other Key Aspects of the VS.NET IDE, C# “Preprocessor:” Directives, An Interesting Aside: The System. Environment Class.</p> <p>C# Language Fundamentals: The Anatomy of a Basic C# Class, Creating objects: Constructor Basics, The Composition of a C# Application, Default Assignment and Variable Scope, The C# Member Initialization Syntax, Basic Input and Output with the Console Class, Understanding Value Types and Reference Types, The Master Node: System, Object, The System Data Types (and C# Aliases), Converting Between Value Types and Reference Types: Boxing and Unboxing, Defining Program Constants, C# Iteration Constructs, C# Controls Flow Constructs, The Complete Set of C# Operators, Defining Custom Class Methods, Understating Static Methods, Methods Parameter Modifies, Array Manipulation in C #, String Manipulation in C#, C# Enumerations, Defining Structures in C#, Defining Custom Namespaces.</p>	12
3	<p>Object- Oriented Programming With C#: Forms Defining of the C# Class, Definition the “Default Public Interface” of a Type, Recapping the Pillars of OOP, The First Pillars: C#’s Encapsulation Services, Pseudo-Encapsulation: Creating Read-Only Fields, The Second Pillar: C#’s Inheritance Supports, keeping Family Secrets: The “Protected” Keyword, Nested Type Definitions, The Third Pillar: C #’s Polymorphic Support, Casting Between.</p> <p>Exceptions And Object Lifetime: Ode to Errors, Bugs, and Exceptions, The Role of .NET Exception Handling, the System. Exception Base Class, Throwing a Generic Exception, Catching Exception, CLR System – Level Exception (System. System Exception), Custom Application-Level Exception (System. System Exception), Handling Multiple Exception, The Family Block, the Last Chance Exception Dynamically Identifying Application – and System Level Exception Debugging System Exception Using VS. NET, Understanding Object Lifetime, the CIT of “new’, The Basics of Garbage Collection,, Finalization a Type, The Finalization Process, Building an Ad Hoc Destruction Method, Garbage Collection Optimizations, The System. GC Type.</p>	10
4	<p>Interfaces And Collections: Defining Interfaces Using C# Invoking Interface Members at the object Level, Exercising the Shapes Hierarchy, Understanding Explicit Interface Implementation, Interfaces As Polymorphic Agents, Building Interface Hierarchies, Implementing, Implementation, Interfaces Using VS .NET, understanding the IConvertible Interface, Building a Custom Enumerator (IEnumerable and Enumerator), Building Cloneable objects (ICloneable), Building</p>	10

	Comparable Objects (I Comparable), Exploring the system. Collections Namespace, Building a Custom Container (Retrofitting the Cars Type).	
5	Understanding .Net Assembles: Problems with Classic COM Binaries, An Overview of .NET Assembly, Building a Simple File Test Assembly, A C#. Client Application, A Visual Basic .NET Client Application, Cross Language Inheritance, Exploring the CarLibrary's, Manifest, Exploring the CarLibrary's Types, Building the Multifile Assembly, Using Assembly, Understanding Private Assemblies, Probing for Private Assemblies (The Basics), Private A Assemblies XML Configurations Files, Probing for Private Assemblies (The Details), Understanding Shared Assembly, Understanding Shared Names, Building a Shared Assembly, Understanding Delay Signing, Installing/Removing Shared Assembly, Using a Shared Assembly.	10

Note 1: Unit 2 & Unit 3 will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment - III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1:Analyze the nature of .Net application development .

CO2:Apply OOAD concepts to build C# applications

CO3:Design and develop console based applications using C#

CO4:Develop Windows Application using Winforms, File I/O, XML in .NET.Web Services and deployment.

CO5:Analyze .NET framework 3.0 features like WPF, WCF and WF.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO4,PO5,PO8,PO12
CO2	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO3	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO4	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO5	PO1,PO2,PO3,PO4,PO5,PO7,PO12

TEXT BOOKS:

1. Pro C# with .NET 3.0 - Andrew Troelsen, Special Edition, Dream Tech Press, India, 2013.
2. Programming in C# - E. Balagurusamy, 5th Reprint, Tata McGraw Hill, 2011.

REFERENCE BOOKS/WEB LINKS:

1. Inside C# - Tom Archer, WP Publishers, 2011.
2. The Complete Reference C# - Herbert Schildt, Tata McGraw Hill, 20014.

Sub Title : SOFTWARE TESTING		
Sub Code:IS81	No. of Credits:4=4 : 0 : 0 (L-T-P)	No.of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks:CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours :52

Course Objectives:

1. Discuss about terminologies of software testing .
2. Familiarize with strengths and weaknesses of a variety of test generation.
3. Analyze different types of software testing.
4. Infer functional and non functional testing.
5. Integrating the applications of Test management and automation in software testing .

Unit No	Syllabus Content	No of Hours
1	Basics of Software Testing: Human Errors and Testing, Software Quality; Requirements, Behavior and Correctness, Correctness versus Reliability, Testing and Debugging, Test Metrics, Software and Hardware Testing, Testing and Verification, Defect Management, Execution History, Test-generation Strategies, Static Testing, Model-Based Testing and Model Checking, Control-Flow Graph.	12
2	Test Generation from Requirements: Introduction, The Test-Selection Problem, Equivalence Partitioning, Boundary Value Analysis, Category-Partition Method, Cause-Effect Graphing,	10
3	Types of Testing – 1: White Box Testing, Introduction, Static Testing, Structural Testing, Challenges in Whit box testing, Black Box Testing: Introduction, Testing methods. Integration Testing: Introduction, Integration testing as a Type of Testing, Integration testing as a Phase of Testing, Scenario Testing, Defect Bash.	10
4	Types of Testing – 2: System and Acceptance Testing, Overview, Functional System Testing, Non-functional Testing, Acceptance Testing; Summary of Testing Phases, Regression Testing: Introduction, Methodologies, Best Practices.	10
5	Test Management and automation: Introduction, Test planning, Test management, Test process, Test reporting, Test planning checklists, Test plan template. What is Test automation? Terms used in Automation, Skills needed for Automation ,what to automate, scope of automation, design and	10

	architecture for automation.	
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Note 1: Unit 1 & Unit 5 will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Apply terms associated with software testing.

CO2: Design various test generation strategies.

CO3: Implement different types of software testing in application development.

CO4: Summarize aspects of functional and non functional testing.

CO5: Apply the usage of test Management and automation in software testing.

COs	Mapping with Pos
CO1	PO1,PO2,PO7,PO12
CO2	PO1,PO2,PO3,PO5,PO7
CO3	PO1,PO2,PO3,PO5,PO7,PO9,PO10
CO4	PO1,PO2,PO3,PO4,PO5,PO7
CO5	PO5,PO7,PO8,PO9,P10,PO11,PO12

TEXT BOOKS:

1. Aditya P Mathur, Foundations of Software Testing, Pearson Education, First Edition, 2010.ISBN-9788131707951
2. Srinivasan Desikan, Gopaldaswamy Ramesh, Software Testing - Principles and Practices, Pearson Education, First Edition, 2010. ISBN-978-8-177-58121-8

REFERENCE BOOKS/WEBLINKS:

Ron Patton, Software Testing, Pearson Education, Second Edition, 2010.
ISBN-978-81-7758-030

2017-2018

Sub Title : OBJECT ORIENTED PROGRAMMING WITH C++		
Sub Code:IS43	No. of Credits:4 = 4 : 0 : 0 (L-T-P)	No.of Lecture Hours/Week: 4
Exam Duration : 3 hours	Exam Marks: CIE + Assignment + SEE = 45 + 5 + 50 = 100	Total No. of Contact Hours : 52

Course Objectives:

1. Understand concepts of Object Oriented Programming and design programs using classes and objects for C++ .
2. Construct applications to provide flexible options for the creation of new definitions for some of the operators.
3. Specifying mechanism of deriving a new class from older classes through inheritance.
4. Implement methods to select appropriate member function during run time.
5. Design programs using Templates, exceptions and handle file I/Os

UNIT No	Syllabus Content	No of Hours
1	<p>Introduction: Review of structures, Programming paradigms, Overview of C++, Sample C++ program, Console I/O , variables in C++, statements, arrays and strings, pointers & user-defined types,Function Components, argument passing, inline functions, function overloading.</p> <p>Classes & Objects–I: Class Specification, Class Objects, Scope resolution operator, Access members, Defining member functions, Data hiding, Constructors, Destructors, Parameterized constructors, Static data members and static member Functions.</p>	10
2	<p>Classes & Objects –II: Friend functions, Passing objects as arguments, Returning objects, Arrays of objects, Dynamic objects, Pointers to objects, Copy constructors, Generic functions and classes, Applications.</p> <p>Operator overloading : operator member functions to overload +, - , pre-increment, post-increment, pre-decrement, post decrement operators , friend operator function to overload << and >> operators, Operator overloading of special operator [].</p>	10
3	<p>Inheritance-I: Base Class, Inheritance and protected members, Protected base class inheritance, Inheriting multiple base classes.</p> <p>Inheritance – II: Constructors, Destructors and Inheritance, Passing parameters to</p>	10

	base class constructors, Granting access, Virtual base classes.	
4	<p>Virtual functions: Virtual function, Calling a Virtual function through a base class reference, Virtual attribute is inherited, Virtual functions are hierarchical, Pure virtual functions, Abstract classes, Using virtual functions.</p> <p>Polymorphism: Early and late binding.</p> <p>Exception Handling: Exception handling fundamentals, Exception handling options.</p>	10
5	<p>C++ I/O System Basics : Old vs. Modern C++ I/O, C++ Streams, The C++ Stream Classes, C++'s Predefined Streams, Formatted I/O, Formatting Using the iosMembers, Setting the Format Flags, Clearing Format Flags, An Overloaded Form of setf(), Examining the Formatting Flags, Setting All Flags, Using width(), precision(), and fill(), Using Manipulators to Format I/O, Overloading << and >>, Creating Your Own Inserters, Creating Your Own Extractors, Creating Your Own manipulator Functions</p> <p>C++ File I/O: fstream> and the File Classes, Opening and Closing a File, Reading and Writing Text Files, Unformatted and Binary I/O, Characters vs. Bytes, put() and get(), read() and write(), More get() Functions, getline(), Detecting EOF, The ignore() Function, peek() and putback(), flush(), Random Access, Obtaining the Current File Position , I/O Status, Customized I/O and Files.</p> <p>STL: An overview, containers, vectors, lists, maps.</p>	12

Note 1: Unit 1 & Unit 5 will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment - III from Unit 5.

Course Outcomes:

After the completion of the above course students will be able to

CO1: Demonstrate the need of using Object Oriented Programming in the real world applications and design programs using classes and objects for C++.

CO2: Design and analyze programs for automatic initialization and destruction of objects.

CO3: Develop applications by providing new definitions for some of the operators.

CO4: Design and develop applications through inheritance, Virtual Base classes and dynamic polymorphism.

CO5: Apply concepts of Templates, Exceptions and File handling in designing programs.

COs	Mapping with POs
CO1	PO2,PO3,PO5
CO2	PO1, PO2,PO3,PO6,PO7,PO9,PO11
CO3	PO2,PO3, PO5,PO6
CO4	PO2,PO3, PO5,PO6,PO9
CO5	PO2,PO3,PO5,PO6,PO12

TEXT BOOK:

Herbert Schildt: C++ The Complete Reference, 4th Edition, Tata McGraw Hill, 2014

REFERENCE BOOKS:

1. Stanley B.Lippmann, JoseeLajore: C++ Primer, 4th Edition, Addison Wesley, 2005.
2. Paul J Deitel, Harvey M Deitel: C++ for Programmers, Pearson Education, 2009.
3. K R Venugopal, RajkumarBuyya, T Ravi Shankar: Mastering C++, Tata McGraw Hill, 1999.
4. Sourav Sahay: Object-Oriented Programming with C++, Oxford University Press, 2006.

Sub Title : OBJECT ORIENTED PROGRAMMING WITH C++ LAB		
Sub Code:: ISL46	No. of Credits:1.5= 0:0:1.5 (L-T-P)	No. of Lecture Hours/Week: 3
Exam Duration : 3 hours	Exam Marks: CIE + Assignment + SEE = 50 + 50 = 100	

Course Objectives:

1. Design programs using classes and objects for C++.
 2. Build programs for automatic initialization of objects and destroy objects that are no longer required through constructors and destructors.
 3. Construct applications to provide flexible options for the creation of new definitions for some of the operators.
 4. Specifying mechanism of deriving a new class from older classes through inheritance.
 5. Implement methods to select appropriate member function during run time.
- Design and implement programs using Templates and Exceptions

I. LIST OF PROGRAMS

- 1 Given that an EMPLOYEE class contains following members:
Data members : Employee Number, Employee Name, Basic, DA, IT, Net Salary
Member functions: to read the data, to calculate Net Salary and to print data members. Write a C++ program to read the data of N employees and compute Net Salary of each employee.
(Dearness Allowance (DA) = 52% of Basic and Income Tax (IT) = 30% of the gross salary.
Net_Salary = Basic + DA - IT)
- 2 Define a STUDENT class with
Data members : USN, Name, and Marks in 3 tests of a subject.
Using appropriate functions, find the average of two better marks for each student. Print the USN, Name, and the average marks of all the students. Declare an array of 10 STUDENT objects and demonstrate the functionality.
- 3 Write a C++ program to create a class called COMPLEX and implement the following overloading functions ADD that return a COMPLEX number.
i.s2 = s1.add (a) – where a is an integer (real part) and s1, s2 are complex numbers.
i.s3 = s1.add (s2) – where s1 ,s2 and s3 are complex numbers.

- 4 Create a class called `STRING` using dynamic memory allocation technique and implement the following operations. Display the results after every operation by overloading the operator `<<`.
 - i. `STRING s1 = "Dr AIT"`
 - ii. `STRING s2 = "Bangalore"`
 - iii. `STRING s3 = s1 + s2` (Use copy constructor).

- 5 Create a template function for bubble sort and demonstrate sorting of integers and doubles.

- 6 Create a template class called `STACK` with member functions to add an element and to delete an element from the queue. Implement a stack of integers and doubles.

- 7 Implement the concept of operator overloading: Create a class called `COMPLEX` and overload `+`, `-`, `*` operators to perform addition, subtraction and multiplication operations on 2 complex numbers. Also overload the operators `>>` and `<<` to accept and print the complex numbers.

- 8 Implement the concept of operator overloading: Create a class called `MATRIX` using a two-dimensional array of integers. Implement the following operations by overloading the operator `==` which checks the compatibility of two matrices `m1` and `m2` to be added and subtracted. Perform the addition and subtraction by overloading the operators `+` and `-` respectively. Display the results (sum matrix `m3` and difference matrix `m4`) by overloading the operator `<<`.


```
if(m1 == m2)
{
m3 = m1 + m2;
m4 = m1 - m2;
}
else
display error
```

- 9 Create a class called `STUDENT` with data members `USN`, `Name` and `Age`. Using inheritance, create the classes `UGSTUDENT` and `PGSTUDENT` having fields as `Semester`, `Fees` and `Stipend`. Enter the data for at least 5 students. Find the semester wise average age for all `UG` and `PG` students separately.

- 10 Create a class called `Number` which has the characteristics of a decimal number.

Derive a class `OCTAL`, which has the characteristics of an octal number inheriting the decimal value from the `Number` class.

Derive a class `HEX`, which has the characteristics of a hexadecimal number inheriting the decimal value from the `Number` class.

Derive a class `BINARY` which has the characteristics of a binary number inheriting the decimal value from the `Number` class.

Implement the following operations (operator overloading).

i. `inti = j + k` where `i` is decimal, `j` is hexadecimal, `k` is `OCTAL`

ii. `int y = h + k`; where `h` is an `OCTAL` object and `k` is an integer.

Display the Result by overloading the operator `<<`.

- 11 Create a class `Account` having data members `Account No`, `Name`, `balance` and member

functions like input, display, deposit, withdrawal. The withdrawal function must handle an exception of type low balance.(balance should not be less than Rs 500).
Implement try/throw/catch in C++ style.

- 12 Implement the concept of dynamic polymorphism to demonstrate the conversion of an expression from infix to postfix form.

Note: In the examination each student picks one question from a lot of all 12 questions.

II. OPEN ENDED QUESTIONS

Identify the different objects in the following environments and implement different suitable operations

1. Banking System
2. Library
3. Automobile Industry
4. Home Appliances
5. User Interface design etc

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY APPROVED BY THE STAFF IN CHARGE.

2.IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 12 QUESTIONS

Course Outcomes:

After completing the course the students are able to:

CO1:Design programs using classes and objects using C++.

CO2:Develop programs for automatic initialization of objects and destroy objects that are no longer required.

CO3:Develop applications to provide flexible options for the creation of new definitions for some of the operators.

CO4:Specify mechanism of deriving a new class from older classes through inheritance .

CO5:Design a program using Templates & Exception Handling.

COs	Mapping with POs
CO1	PO2,PO3,PO5
CO2	PO2,PO3,PO6,PO9
CO3	PO2,PO3,PO5,PO6
CO4	PO2,PO3,PO5,PO9
CO5	PO2,PO3,PO5,PO6

Sub Title : JAVA PROGRAMMING		
Sub Code:IS52	No. of Credits:4=3 : 1 : 0 (L-T-P)	No. of lecture hours/week : 5
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Identify the different object oriented concepts and implement basic programs.
2. Present inheritance and interface concepts.
3. Introduce multithreading programming concepts and handling errors efficiently.
4. Present different ways of implementing event handling and creating user interfaces using javaFX.
5. Introduce to Java Database Access, Servlets, JSP,RMI Concepts.

UNI T No.	Syllabus Content	No. of Hours
1	Introduction To Java: How java changed the internet; Java Buzz words, Byte Code; Object oriented programming; First Simple Java program, Introducing Classes :Classes Fundamentals; Declaring Objects, Assigning Object Reference Variable; Introducing Methods; Inheritance Basics- using Super; Creating Multilevel Hierarchy, When constructors are called, method Overriding, Dynamic Method Dispatch, Abstract classes, final with inheritance	10
2	Packages and Interfaces: Packages and Interface: Packages, Access Protection, Importing Packages, Interfaces MultiThreaded Programming ; The java tread model,The main thread, Creating thread, creating multiple threads, Using isAlive() and join()Thread priorities; Synchronization; Suspending , resuming and stopping threads ;	10
3	Applets ,Event Handling The Applet Class: Two types of Applets; Appletbasics; Applet Architecture; An Applet skeleton; Simple Applet displaymethods; Requesting repainting; Using the Status Window; The HTMLAPPLET tag; Passing parameters to Applets; getDocumentbase() andgetCodebase(); ApletContext and showDocument() ; The AudioClipInterface ; The AppletStub Interface; Output to the Console.producer-consumer problems. Event Handling: Two event handling mechanisms; The delegation event model; Event classes; Sources of events; Event listener interfaces; Using the delegation event model; Adapter classes; Inner classes;	10
4	Database Access, Servlets : Overview of J2EE and J2SE.The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process;Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data type ,Exceptions s; Servlets: Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet ; The Servlet API; The Javax. Servlet Package; Reading Servlet Parameter; The Javax.servlet.http package;Handling HTTP Requests and Responses; Using Cookies; Session Tracking;	12

5	<p>JSP and RMI , JavaFX, Networking: Java Server Pages (JSP): JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects. Java Remote Method Invocation. JavaFX Basics ,JavaFX Layouts and Shapes ,JavaFX Event Driven ,JavaFX Animation and Listeners ,JavaFX UI Controls ,JavaFX Review,Multimedia & Making a Games</p> <p>Networking:Networking basics, Networking classes and Interfaces, InetAddress, Inet4 Address and Inet6 Address, TCP/IP ClientSockets, URL, URLconnection HttpURL Connection,URIclass,Datagrams</p>	10
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Note 1: Unit 1 & Unit 4 will have internal choice.

Note 2: Three assignments are evaluated for 5 marks:

Assignment – I from units 1 and 2.

Assignment - II from units 3 and 4

Assignment – III from unit 5

Course Outcomes

After completing the course the students are able to:

CO1: Apply object oriented programming, exception handling and multithreading concepts in problem solving.

CO2: Design and implement Applets, Parameterized Applets incorporating multithreading and event handling mechanisms.

CO3: Use javaFX aspects in graphical interactive application development and JDBC for database transactions, Handling HTTP requests and responses.

CO4: Develop applications using RMI and JSP

CO5: Design client server applications for connection oriented and connection less services.

COs	Mapping with POs
CO1	PO2,PO5,PO6,PO10
CO2	PO2,PO4,PO5,PO10
CO3	PO2,PO6,PO10
CO4	PO2,PO4,PO6,PO10
CO5	PO2,PO4,PO5,PO10

TEXT BOOK:

Herbert Schildt: Java - The Complete Reference, 9th Edition, Tata McGraw Hill, 2014. (Chapters 1, 2, 3, 4, 5, 6, 8, 9,10, 11,12,14,15,20, 21, 22, 29, 30).

REFERENCE BOOKS / WEBLINKS:

1. Y. Daniel Liang: Introduction to JAVA Programming, 7th Ed, Pearson Education, 2013.
2. Java Programming by Hari Mohan Pandey, Pearson Education, 2012.
3. Java 6 Programming, Black Book, KoGenT, dreamtech Press, 2012.
4. www.tutorialspoint.com/java/
5. www.javatpoint.com/java-tutorial
6. https://www.youtube.com/watch?v=rXhdP4sKSME&list=PLrodECPviD6dUfQsc5c72Yi_7TlKR0uuF

Sub Title : WEB TECHNOLOGIES		
Sub Code: IS53	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To create XML documents and provide styling to documents.
2. To develop web applications using CGI/Perl.
3. To design web applications using the concepts of PHP.
4. To understand and analyze JQuery , node .js framework, basics of ajax.

UNIT No	Syllabus Content	No of Hours
1	XML: Introduction; Syntax; Document structure; Document Type definitions; Namespaces; XML schemas; Displaying XML documents with CSS; XSLT style sheets; XML processors; Web services.	7
2	Perl: Origins and uses of Perl; Scalars and their operations; Assignment statements and simple input and output, Fundamentals of arrays; Hashes; References; Functions; Pattern matching. CGI Programming The Common Gateway Interface; CGI linkage; Query string format; CGI.pm module.	8
3	PHP: Origins and uses of PHP, Overview of PHP, General syntactic characteristics, Arrays, Form handling, Files, Cookies, Session Tracking.	7
4	Ajax: What is Ajax? The real Ajax, Ajax Principles, Technologies behind Ajax, Who is using Ajax? Node.js- Introduction - Why Node.js?, What Exactly Is Node.js?, Installing Node.js, Building Web Applications with Express-Routing and Layers in Express, REST API Design and Modules.	8
5	JQuery- What jQuery does, Why jQuery works well, Selecting Elements, Using the \$() function, CSS selectors, Attribute selectors, Custom selectors, Handling Events- Handling simple events, Styling and Animating- modifying CSS with inline properties, Hiding and showing elements, effects and duration.	9

Note 1: Unit 4 & Unit 5 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Describe the syntactic structure of XML documents and provide styling to documents.

CO2: Design and develop web pages using CGI/Perl.

CO3: Implement PHP programming to develop web application.

CO4: Analyze basics of ajax.

CO5: Analyze, design web applications using the JQuery , node .jsFramework.

COs	Mapping with POs
CO1	PO1
CO2	PO1, PO5
CO3	PO1, PO4, PO5
CO4	PO1, PO5
CO5	PO1, PO4, PO5

TEXT BOOKS:

1. Robert W. Sebesta: Programming the World Wide Web, 4th Edition, Pearson education, 2011.
2. Learning jQuery , Better interaction, design, and web development with simple javaScript techniques , Fourth Edition , Jonathan Chaffer, Karl Swedberg 2013.
3. Learning Node.js , A Hands-On Guide to Building Web Applications in JavaScript, Marc Wandschneider, 2013
4. Professional AJAX – Nicholas C Zakas et al, Wrox publications, 2006.

REFERENCE BOOKS / WEBLINKS:

1. M. Deitel, P.J. Deitel, A. B. Goldberg: Internet & World Wide Web How to Program, 4th Edition, Pearson education, 2011.
2. Ajax: The Complete Reference – Thomas A. Powel, McGraw Hill, 2008.
3. Pro PHP and jQuery- JASON LENGSTORF,2010.
4. <http://nptel.ac.in>
5. <http://www.w3schools.com/>

Sub Title : WEB TECHNOLOGIES LAB		
Sub Code: ISL58	No. of Credits:1=0: 0 : 1 (L:T:P)	No. of lecture hours/week : 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 =100	

Course Objectives:

1. To create XML schema and XSLT style sheet.
2. To create and execute PHP to access database, cookies and do session tracking.
3. Use PERL for CGI programming and access MySQL databases.
4. Use XHTML programming to access the database.
5. Analyze jquery effects

I. LIST OF PROGRAMS

1. Design an XML document to store information about a student in an engineering college affiliated to VTU. The information must include USN, Name, Name of the College, Brach, Year of Joining, and e-mail address. Make up sample data for three students. Create a CSS style sheet and use it to display the document.
2. Design an XML document to store information about employee in a software company. The information must include employee id, Name, qualification, Year of Joining, e-mail address, contact no. Make up sample data for three employee. Create an XSLT style sheet and use it to create a display of that element.
3. a) Write a Perl script to demonstrate the string concatenation and repetition.
b) Write a Perl program to display various Server Information like Server Name, Server Software, Server protocol, CGI Revision etc.
4. a) Write a perl script to demonstrate built-in array functions (PUSH, POP, SHIFT, UNSHIFT).
b) Write a Perl program to accept UNIX command from a HTML form and to display the output of the command executed.
5. a) Write a Perl script to calculate the value of any given expression using functions.
[Ex: 10ab-((c-1)/17.44)]
b) Write a Perl program to accept the User Name and display a greeting message randomly chosen from a list of 4 greeting messages.
6. a) Write a Perl program to display a digital clock which displays the current time of the
7. server.
- b) Write a program to demonstrate hide and show effects of html elements using jquery.
8. Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.

9. a) Write a PHP program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page.

b) Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.

10. Create a XHTML form with Name, Address Line 1, Address Line 2, and E-mail text fields. On submitting, store the values in MySQL table. Retrieve and display the data based on Name.

11. Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.

II. OPEN ENDED QUESTIONS

Develop web based applications for any of the following

1. Simple employee portal.
2. Shopping cart.
3. Quiz application.
4. Reservation system.
5. Search engine.
6. Any Application

NOTE :

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.

2) IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 10 QUESTIONS.

Course Outcomes:

Students will demonstrate the knowledge and the skills acquired with respect to:

CO1: Design and develop XML document and use the style sheet to display.

CO2: Develop web pages using PERL and CGI programs.

CO3: Design and develop PHP programs to perform database access, session tracking and Implement jquery effects.

CO4: Design and develop XHTML programs to perform database access.

COs	Mapping with POs
CO1	PO1, PO4
CO2	PO1, PO4
CO3	PO1, PO4
CO4	PO1, PO4

Sub Title : JAVA PROGRAMMING LAB		
Sub Code:ISL59	No. of Credits: 0 : 0 :1	No. of lecture hours/week : 2
Exam Duration : 3 hours	Exam Marks: CIE + SEE = 50 + 50 =100	

Course Objectives:

1. Design & Develop the fundamentals of Object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
2. Design & Develop exception handling and multithreading concepts.
3. Develop efficient Java applets and applications using OOP concepts.
4. Design & Develop basic understanding of network application programs.

LIST

1. a. Design a JAVA Program to demonstrate Constructor Overloading and method overloading.
b. Develop a JAVA Program to implement Inner class and demonstrate its Access Protections.
2. a. Develop a JAVA Program to demonstrate Inheritance.
b. Write a JAVA Program to demonstrate Exception Handling (Using Nested try catch and finally).
3. Develop a JAVA program which has
 - i. A Class called Account that creates account with 500Rs minimum balance, a deposit() method to deposit amount, a withdraw() method to withdraw amount and also throws LessBalanceException if an account holder tries to withdraw money which makes the balance become less than 500Rs.
 - ii. A Class called LessBalanceException which returns the statement that says withdraw amount (Rs) is not valid.
 - iii. A Class which creates 2 accounts, both account deposit money and one account tries to withdraw more money which generates a LessBalanceException take appropriate action for the same.
4. Design a JAVA program using Synchronized Threads, which demonstrates Producer Consumer concept.
5. Develop a JAVA program which has
 - i. A Interface class for Stack Operations
 - ii. A Class that implements the Stack Interface and creates a fixed length Stack.
 - iii. A Class that implements the Stack Interface and creates a Dynamic length Stack.
 - iv A Class that uses both the above Stacks through Interface reference and does the Stack operations that demonstrates the runtime binding.
6. Develop JAVA programs which demonstrates utilities of LinkedList Class

7. Write a JAVA Program which uses FileInputStream / FileOutputStream Classes.
8. Develop a JAVA program which uses Datagram Socket for Client Server Communication.
9. Design JAVA Applet programs which handles MouseEvent
10. Develop JAVA Applet programs which handles KeyboardEvent

II. OPEN ENDED QUESTIONS

Develop applications for data base access, servlet request/response, rmi, jsp, userinterface for any application using javaFX, any gaming application etc

NOTE :

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.
2. IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 10 QUESTIONS.

Course Outcomes:

After completing the course the students are able to:

- CO1. Recognize the basic object oriented concepts & apply them to create java applications.
- CO2. Demonstrate java application with inheritance and interface concepts.
- CO3. Design java applications with multithreading concepts and demonstrate the error handling concepts.
- CO4. Create GUI applications with the help of javaFX and handle events.
- CO5. Design client server applications and security models.

COs	Mapping with POs
CO1	PO2,PO5,PO6,PO10
CO2	PO2,PO4,PO5,PO10
CO3	PO2,PO6,PO10
CO4	PO2,PO4,PO6,PO10
CO5	PO2,PO4,PO5,PO10

Sub Title: MANAGEMENT AND ENTREPRENEURSHIP		
Sub Code: HS03	No. of Credits : 4:0:0(L:T:P)	No. of Lecture hours/week : 4
Exam Duration : 3 Hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours: 52

<p>Course Objectives :</p> <ol style="list-style-type: none"> To help students understand the Management concepts & its evolution. To impart the knowledge about various Managerial functions. To make the student learn the Entrepreneurial process. To gain an insight of funding agencies & understand the role of SSI in economic development. To have a clear understanding of various business opportunities & designing the Business plan.

UNIT No.	Syllabus Content	No. of Hours
1	<p>MANAGEMENT: Introduction-meaning-nature, characteristics of management, scope, functions of management and functional areas of management, management as a science or an art or profession, management and administration, roles of management, levels of management, Development of management thought -Early management approaches, Modern management approaches.</p>	08
2	<p>PLANNING, ORGANIZING, DIRECTING AND CONTROLLING:</p> <p>PLANNING: Meaning and Nature, Types of Plans and Steps in Planning process.</p> <p>ORGANIZING: as a Managerial function – Nature and purpose of organization, principles of organization, types of organization. Departmentation, Committees, Centralization Vs Decentralization of authority and responsibility span of control, MBO and MBE (only concepts), Staffing: Nature and importance of staffing, process of selection and recruitment, Decision Making: Definition, Types and Decision Making Process.</p> <p>DIRECTING: Meaning and nature of directing, leadership styles – Autocratic, Democratic, Charismatic, Laissez faire and Participative. Leadership theories – Trait, Behavioral and Contingency. Introduction to Motivation theories – Maslow, Herzberg, Carrot & Stick & Mc. Gregor’s Theory of X & Y.</p> <p>CO-ORDINATION: Meaning and importance of Co-ordination, Team Building & Group Dynamics, Communication – meaning and importance, types and barriers of communication.</p> <p>CONTROLLING: Meaning and steps in controlling-Essentials of a sound control system-Types of control, Method of establishing control (in brief).</p>	12
3	<p>ENTREPRENEUR: Meaning, evolution of the concept, Scope of Entrepreneur, functions of an Entrepreneur, Characteristics of an Entrepreneur, types of entrepreneur, Intrapreneur – an emerging class. Difference between Entrepreneur, Intrapreneur & Manager, Stages in Entrepreneurial process, Problems faced by an Entrepreneur, Role of Entrepreneurs in economic development, Entrepreneurship-Meaning & Importance of Entrepreneurship in India, barriers, Women entrepreneur – Concept & steps to develop Women Entrepreneur.</p>	10

4	<p>SMALL SCALE INDUSTRY: Concept of MSME, Ancillary Industry and Tiny Industry, Definition;, Characteristics; Objectives, Scope and role of SSI in economic Development, Advantages of SSI, problems of SSI, Steps to start an SSI, Government Policy towards SSI; Introduction to GATT/ WTO/ LPG. Forms of ownership.</p> <p>SUPPORTING AGENCIES OF GOVERNMENT FOR SSI: Meaning, Nature of support; Objectives, functions. INSTITUTIONAL SUPPORT: Different Schemes, TECKSOK, KIADB, KSSIDC, DIC,SISI NSIC, SIDBI, KSFC. Sources of financing an enterprise- long term and short term.</p>	12
5	<p>PREPARATION OF PROJECT: Meaning, Project identification, Project selection, Project Report - Need of Project, Contents: formulation, Errors of project report, Project Appraisal, Feasibility Study-Market Feasibility Study, Technical Feasibility Study, Financial Feasibility Study, Social Feasibility Study. Business opportunities, Business plan: Definition, components of business plan, reasons for failure of business plan.</p>	10

Note 1 : Unit 2 and Unit 4 will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

<p>Course Outcomes :</p> <p>CO1 : The students will gain knowledge on management concepts & its evolution.</p> <p>CO2 : The students will learn the application of managerial skills & attributes.</p> <p>CO3 : The students will get an in depth knowledge of entrepreneurial process & will be able to apply the entrepreneurial skills.</p> <p>CO4 : Students compile information & explore the sources of funding agencies.</p> <p>CO5 : Students will be able to identify business opportunities & prepare the business plan.</p>
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COs	Mapping with POs
CO1	PO12
CO2	PO9,PO10,PO11,PO12
CO3	PO11,PO12
CO4	PO11
CO5	PO7,PO11,PO12

TEXT BOOKS:

1. Entrepreneurship and Management- S Nagendra and V S Manjunath- Pearson Publication 4 /e, 2009.
2. Dynamics of Entrepreneurial Development and Management-Vasant Desai-Himalaya Publishing House.
3. Principles of Management – PC Tripathi, and P N Reddy – Tata MacGraw Hill.

REFERENCE BOOKS:

1. Entrepreneurship Development – Poornima M Charanthimath Pearson Education 2006.
2. Entrepreneurship and management - Shashi k Gupta- Kalyani publishers, Latest edition.
3. Organizational behaviour, Stephen P Robbins, Timothy A. Judge, Neharika Vohra, Pearson, 14/e, 2012.
4. Financial Management- Shashi k Gupta- Kalyani publishers, Latest edition.

Sub Title : MOBILE APPLICATION DEVELOPMENT		
Sub Code:IS61	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To understand the Mobile - Android OS architecture and life cycle.
2. To analyze and use appropriate tools for Android Application development.
3. To be familiar with managing of application resources.
4. To build elegant user interfaces with views, layouts & form widgets.
5. To understand the usage of Services and Notifications in Android Apps.

UNIT No	Syllabus Content	No of Hours
1	<p>An Overview of Android: Introducing Android – History of Mobile Software Development, The Open Handset Alliance, Android Platform differences, Android Platform. Setting Up Your Android Development Environment - Configuring Your Development environment, Exploring Android software development Kit. Writing first android application - Testing Your Development Environment, Building Your First Android Application.</p> <p>Android Application Design Essentials: Understanding the Anatomy of an Android Application - Mastering Important Android Terminology, Using the Application Context, Receiving and Broadcasting Intents.</p>	7
2	<p>Defining the application using Android Manifest File – Understanding and Configuring the Android Manifest File.</p> <p>Managing Application Resources: Resources, Working with Resources</p> <p>Designing User Interfaces with Layouts: Creating User Interfaces in Android, Using Built-In Layout Classes.</p>	7
3	<p>Android User Interface Design Essentials: Exploring User Interface Screen Elements, Introducing Android Views and Layouts, Displaying Text to Users with TextView, Retrieving Data from Users, Using Buttons, Check Boxes, and Radio Groups, Getting Dates and Times from Users, Using Indicators to Display Data to Users, Adjusting Progress with SeekBar, Providing Users with Options and Context Menus, Working with Dialogs</p>	9

4	<p>Drawing and Working with Animation -Working with Animation - Working with Frame-by-Frame Animation, Working with Tweened Animations.</p> <p>Working with Files and Directories: Exploring with the Android Application Directories, Working with Other Directories and Files on the Android File System</p> <p>Storing Structured Data Using SQLite Databases: Creating a SQLite Database,Creating, Updating, and Deleting Database Records, Querying SQLite Databases, Closing and Deleting a SQLite Database</p>	9
5	<p>Working with Services: Determining When to Use Services, Understanding the Service Lifecycle, Creating a Service, Controlling a Service.</p> <p>Working with Notifications: Notifying the User, Notifying with the Status Bar, Vibrating the Phone, Blinking the Lights.</p>	7

Note 1: Unit 3 & Unit 4 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Analyze the fundamentals of Mobile application development.

CO2: Analyze the problems to build Mobile apps by assessing the basic framework and usage of SDK.

CO3: Design and develop Android applications using various resources and built-in classes.

CO4: Develop the skills in designing and deploying the sophisticated mobile applications.

CO5: Design and deploy Android applications with compelling User Interfaces.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO5
CO2	PO1,PO2,PO4,PO5,PO6
CO3	PO1,PO3,PO4,PO6,PO7
CO4	PO6,PO7,PO9,PO11,PO12
CO5	PO1,PO3,PO4,PO6,PO7

TEXT BOOK:

Shane Conder, Lauren Darcey: Android Wireless Application Development, Pearson education, 2010.

REFERENCE BOOKS:

1. Reto Meier: Professional Android 4 Application Development , Wrox Publication,2015
2. ZigurdMednieks, Laird Dornin, G. Blake Meike, Masumi Nakamura: Programming Android, 2nd Edition , O'Reilly Publication, 2012.
3. SatyaKomatineni , Dave MacLean , SayedHashimi : Pro Android 3, Apress publication ,2011.

Sub Title : CLOUD COMPUTING		
SubCode:IS63	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of lecture hours/week : 3
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. To study the history and the fundamental concepts of Cloud Computing, Parallel, Distributed Computing and Virtualization.
 2. To understand the concept of cloud computing architecture and different Cloud models.
 3. To impart Cloud offerings which enhances the usage of Cloud.
 4. To analyze the Cloud Storage and Security maintenances.
- To become familiar with the different applications of Cloud Computing

UNIT No	Syllabus Content	No of Hours
1	Introduction to Cloud Computing: Cloud Computing at a Glance, Historical Developments, Building Cloud Computing Environments Computing Platforms and Technologies	7
2	Principles of Parallel and Distributed Computing: Eras of Computing , Parallel vs. Distributed Computing, Elements of Parallel Computing, Elements of Distributed Computing, Technologies for Distributed Computing Virtualization: Introduction, Characteristics of Virtualized Environments, Virtualization and Cloud Computing, Pros & Cons of Virtualization	7
3	Cloud Computing Architecture: Introduction, Cloud Reference Model, types of Clouds, Economics of the cloud, Open challenges	7
4	Cloud offerings: Cloud Analytics, Testing under cloud, Information Security, Virtual Desktop Infrastructure, Storage Cloud. Cloud management: Introduction, Resiliency, Provisioning, Asset management. Cloud governance, High availability and disaster recovery, Charging models, Usage reporting, Billing and metering.	9
5	Cloud Platforms in Industry: Amazon Web Services, Google AppEngine Cloud Applications: Scientific Applications, Business and Consumer Applications	9

Note 1: Unit 4 & Unit 5 will have internal choice.

Note 2: Three assignments are evaluated for 5 marks

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the student will be able to:

CO1: Analyze core concepts and fundamentals of the Cloud Computing.

CO2: Analyze systems, protocols and mechanisms to support Cloud Infrastructure.

CO3: Identify the hardware necessary for Cloud Computing.

CO4: Develop applications and host on Cloud Computing.

CO5: To manage the Cloud Environment.

COs	Mapping with POs
CO1	PO1,PO7,PO11,PO12
CO2	PO1,PO4,PO7,PO11,PO12
CO3	PO1,PO2,PO3, PO5,PO8
CO4	PO1,PO8, PO10,PO11,PO12
CO5	PO4,PO5,PO6,PO7,PO8

TEXT BOOKS:

1. Rajkumar Buyya, Christian Vecchiola, S Thamarai Selvi ,Mastering Cloud Computing , Tata McGraw Hill Education Private Limited, 2013.
2. Dr. Kumar Saurabh , Cloud Computing , Wiley India, 2011.

REFERENCE BOOKS:

1. Dinkar Sitaram, Geetha Manjunath ,Moving to the Cloud. Elsevier Publications, 2011.
2. Barrie Sosinsky, Cloud Computing Bible , Wiley Publishing, Inc, 2011.

Sub Title : ARTIFICIAL INTELLIGENCE		
Sub Code:IS651	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of lecture hours/week : 4
Exam Duration : 3 hours	Exam Marks: CIE +Assignment + SEE = 45 + 5+ 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Understand about agent, behavior and structure
2. Learn different search strategies
3. Representation of knowledge and reasoning
4. Gain knowledge about planning and learning strategies

Unit No.	Syllabus Content	No. of Hours
1	Intelligent agents: Agents and environments, good behavior, concept of rationality, nature of environments, structure of agents	10
2	Problem-solving through Search: Problem solving agents, searching for solutions, uninformed search strategies, A*, minimax	10
3	Knowledge Representation and Reasoning: ontologies, representing and reasoning about objects, relations, events, actions, time, and space; predicate logic, syntax and semantics of first order logic, Propositional vs. First order inference, Forward chaining and backward chaining.	11
4	Planning: planning as search, partial order planning, construction and use of planning graphs	10
5	Machine Learning and Knowledge Acquisition: forms of learning, inductive learning,	11

	learning decision trees, Learning nearest neighbor, Reinforcement learning, passive and active RL.	
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Note 1: Unit 3 & Unit 5 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After completing the course the students are able to:

CO1: Identify agent and environment.

CO2: Apply different Search strategies in problem solving .

CO3: Represent knowledge and perform reasoning.

CO4: Apply Planning strategies and machine learning techniques.

COs	Mapping with POs
CO1	PO1,PO12
CO2	PO7,PO12
CO3	PO1,PO2
CO4	PO5,PO7,PO12

TEXT BOOK:

Artificial Intelligence: A Modern Approach, 3rd Edition, by Stuart Russell and Peter Norvig.2.1,2.2,2.3,2.4,3.1,3.3,3.4,4.1,4.2,6.2,8.1,8.2,9.1,9.3,9.4,10.1,10.2,10.3,10.4,11.2, 11.3,11.4,18.1,18.2,18.3,19.3,20.4,21.1,21.2,21.3)

REFERENCE BOOKS:

1. Luger, G. F., & Stubblefield, W. A., Artificial Intelligence - Structures and Strategies for Complex Problem Solving. New York, NY: Addison Wesley, 5th edition (2005).
2. Nilsson, N. J. Artificial Intelligence - A Modern Synthesis. Palo Alto: Morgan Kaufmann. (1998).
3. Nilsson, N. J., Principles of Artificial Intelligence. Palo Alto, CA: Tioga (1981).
4. Rich, E., & Knight, K., Artificial Intelligence. New York: McGraw-Hill (1991).

Sub Title : PYTHON PROGRAMMING		
Sub Code:IS72	No. of Credits:3=3 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 3
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours : 39

Course Objectives:

1. Understanding the syntax and semantics of the Python language.
2. To create Functions in Python.
3. To handle Files & Regular expressions in Python.
4. To apply Object Oriented Programming concepts in Python.
5. To create Threaded and Networking applications in Python .

Unit No.	Syllabus Content	No of Hours
1	Introduction to Python, Writing First python program, Datatypes in Python, Operators in python, Input and output, Control statements	7
2	Arrays in Python, Strings and characters, Functions, Lists and Tuples, Dictionaries	7
3	Files in Python, , Exceptions, Regular Expressions, Date and Time, modules and packages	8
4	Introduction to OOPS, Classes and Objects, Inheritance and Polymorphism, Abstract classes and Interfaces	8
5	Data Structures in Python, Threads, Networking in Python, Python Database Connectivity	9

Note 1: Unit 4 & Unit 5 will have internal choice

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course the student will be able to:

CO1: Demonstrate the understanding and usage of core python scripting elements python constructs, data types

CO2 :Demonstrate the understanding and usage of functions ,lists,tuples and dictionaries.

CO3: Demonstrate the understanding and usage of modules, packages and regular expressions

CO4: Demonstrate usage of object oriented features such as Inheritance, Polymorphism, operator overloading.

CO5:Apply the knowledge of python and use the language scripting elements and constructs to develop threaded and networking applications.

COs	Mapping with POs
CO1	PO1,PO2,PO4
CO2	PO1,PO2,PO4
CO3	PO1,PO2,PO4,PO5,PO8
CO4	PO1,PO2,PO4,PO5,PO8
CO5	PO1,PO2,PO4,PO5,PO8

TEXT BOOK :

Introducing Python- Modern Computing in Simple Packages – Bill Lubanovic, O’Reilly
Publication 2015

REFERENCE BOOKS/WEB LINKS:

1. How to Think Like a Scientist–Learning with Python “,Allen Downey, Jeffrey Elkner, Chris Meyers, Green Tea Press, 2012, Third Edition.
2. Introduction to Computer Science Using Python-Charles Dierbach, Wiley Publication
Learning with Python “,Green Tea Press, 2014, First Edition.
3. Beginning Python –From Novice to Professional,-Magnus Lie Hetland, Second Edition,
Apress Publication 2014.

Sub Title : BIG DATA ANALYTICS		
Sub Code: IS73	No. of Credits: 4 = 4 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 4
Exam Duration : 3 hours	CIE + Assignment + SEE = 45 + 5 + 50 = 100	Total No. of Contact Hours : 52

Course Objectives:

1. To impart fundamental concepts about data and its identification.
2. Understand the basic concepts of Big data, methodologies for analyzing structured and unstructured data.
3. Discuss different technologies used for Big data along with its architecture.

Unit No.	Syllabus Content	No. of Hours
1	<p>Providing Structure to Unstructured Data: Background, Machine Translation, Autocoding, Indexing and Term Extraction.</p> <p>Identification, Deidentification, and Reidentification: Background, Features of an Identifier System, Registered Unique Object Identifiers, Really Bad Identifier Methods, Embedding Information in an Identifier: Not Recommended, One-Way Hashes, Use Case: Hospital Registration, Deidentification, Data Scrubbing, Reidentification.</p> <p>Ontologies and Semantics: Background, Classification, the Simplest of Ontologies, Ontologies, Classes with Multiple Parents, Choosing a Class Model, Introduction to Resource Description Framework Schema, Common Pitfalls in Ontology Development.</p> <p>Data Integration and Software Interoperability: Background, The Committee to Survey Standards, Standard Trajectory, Specifications and Standards, Versioning, Compliance Issues, Interfaces to Big Data Recourses.</p>	12
2	<p>Immutability and Immortality: Background, Immutability and Identifiers, Data Objects, Legacy Data, Data Born from Data, Reconciling Identifiers across</p>	8

	Institutions, Zero-knowledge Reconciliation, The Curator's Burden. Simple but Powerful Big Data Techniques: Background, Look at the Data, Data Range, Denominator, Frequency Distributions, Mean and Standard Deviation, Estimation-Only Analyses, Use Case: Estimating Move Preferences.	
3	Getting Value Predictive Analytics and Big Data: Why Do Predictive Analytics on Big Data?; Moving Predictive Analytics to the Front Lines; Gaining Real Business Value from Predictive Analysis; Publishing Data and Analytics to Cloud Service. Ten Things to Consider with Big Data Analytics. Analytics and Big Data: Using Big Data to Get Results; Basic analytics; Advanced analytics.	10
4	Analysis: Background, Analytic Tasks, Clustering, Classifying, Recommending, and Modeling, Data Reduction, Normalizing and Adjusting Data, Big Data Software: Speed and Scalability, Find Relationships, Not Similarities. Special Considerations in Big Data Analysis: Background, Theory in Search of Data, Data in Search of Theory, Overfitting, Too Much Data, Fixing Data, Data Subsets in Big Data: Neither Additive nor Transitive, Additional Big Data Pitfalls.	10
5	Stepwise Approach to Big Data Analysis. Big Data Infrastructures ,Technologies and Applications: Hadoop: Architecture, Introduction to MapReduce; HDFS: Architecture; R language: Programming features, Examples; Zookeeper; MongoDB. Other Hadoop Related tools:Hbase: Data model and implementations – Hbase clients – Hbase examples –praxis; Cassandra : Cassandra data model – Cassandra examples – Cassandra clients –Hadoop integration; PIG: Grunt – Pig data model – Pig Latin – developing and testing Pig Latin scripts. Hive – data types and file formats – HiveQL data definition – HiveQL data manipulation – HiveQL queries. Big Data Applications: Healthcare, Insurance industry, Telecom services, Financial services, Retail, Marketing etc.	12

Unit 1 & Unit 5 will have internal choice.

Note : Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Identify the differences between Big data & small data and structured & unstructured data. Also, analyze the Ontologies and Measurement techniques of Big data along with data integration.

CO2:Discuss about various powerful Big data techniques.

CO3: Differentiate between Statistics, Data Mining & Analytics.

CO4:Apply special considerations in Big Data Analysis along with stepwise approach in Big Data analytics.

CO5: Discuss different infrastructure & technologies for Big Data and its applications.

COs	Mapping with POs
CO1	PO2, PO3, PO4, PO12.
CO2	PO2, PO3, PO12
CO3	PO2,PO3, PO4, PO9
CO4	PO2,PO3, PO9
CO5	PO3,PO4, PO5, PO10, PO12

TEXT BOOKS:

1. Principles of Big Data: Preparing, Sharing and Analyzing Complex Information, Jules.J. Berman, First Edition, MK Publishers, 2013.
2. Judith Hurwitz, Alan Nugent, Dr. Fern Halper, Marcia Kaufman, Big Data For Dummies, Published by John Wiley & Sons, Inc., 2013.
3. Unit 5 (Not limited to following resource) :
 - i. Challenges and Opportunities with Big Data by Divyakant Agrawal et al , Whitepaper, 2011.

REFERENCE BOOKS/WEB LINKS:

1. Ken W. Collier, Agile Analytics: A Value-Driven Approach to Business Intelligence and Data Warehousing, Author: Pearson Education, ISBN-13:- 9788131786826,2012
2. Michael Wessler, Big Data For Dummies, Published by John Wiley & Sons, Inc. ,Alteryx Special Edition,2013.
3. Big Data Applications: <http://www.nasscom.in>.
4. Big Data case studies:
 - i. http://racunarstvo.hr/wp-content/uploads/2016/03/OA_day_Big_Data_Tomasz_Przybysewski.pdf.
 - ii. <https://www.datameer.com/pdf/eBook-Top-Five-High-Impact-UseCases-for-Big-Data-Analytics.pdf>

Sub Title : C# PROGRAMMING AND .NET		
Sub Code:IS744	No. of Credits:4=4 : 0 : 0 (L-T-P)	No. of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours : 52

Course Objectives:

1. Understand the nature of .Net application development and build C# applications.
2. Familiarize with Object-oriented Programming concepts as associated with C#, Inheritance, Interfaces, Exception Handling, Reflection, Standard I/O programming, File Handling, Generics,
3. Understand Windows Application using Winforms, File I/O, XML in .NET.Web Services and Deployment.
4. Overview of .NET framework 3.0 features like WPF, WCF and WF.

Unit No.	Syllabus Content	No of Hours
1	The Philosophy Of .Net: Understanding the Previous State of Affairs, The .NET Solution, The Building Block of the .NET Platform (CLR,CTS, and CLS), The Role of the .NET Base Class Libraries, What C# Brings to the	10

	Table, An Overview of .NET Binaries (aka Assemblies), the Role of the Common Intermediate Language , The Role of .NET Type Metadata, The Role of the Assembly Manifest, Compiling CIL to Platform –Specific Instructions, Understanding the Common Type System, Intrinsic CTS Data Types, Understanding the Common Languages Specification, Understanding the Common Language Runtime A tour of the .NET Namespaces, Increasing Your Namespace Nomenclature, Deploying the .NET Runtime.	
2	<p>Building C# Applications: The Role of the Command Line Compiler (csc.exe), Building C # Application using csc.exe Working with csc.exe Response Files, Generating Bug Reports , Remaining C# Compiler Options, The Command Line Debugger (cordbg.exe) Using the, Visual Studio .NET IDE, Other Key Aspects of the VS.NET IDE, C# “Preprocessor:” Directives, An Interesting Aside: The System. Environment Class.</p> <p>C# Language Fundamentals: The Anatomy of a Basic C# Class, Creating objects: Constructor Basics, The Composition of a C# Application, Default Assignment and Variable Scope, The C# Member Initialization Syntax, Basic Input and Output with the Console Class, Understanding Value Types and Reference Types, The Master Node: System, Object, The System Data Types (and C# Aliases), Converting Between Value Types and Reference Types: Boxing and Unboxing, Defining Program Constants, C# Iteration Constructs, C# Controls Flow Constructs, The Complete Set of C# Operators, Defining Custom Class Methods, Understating Static Methods, Methods Parameter Modifies, Array Manipulation in C #, String Manipulation in C#, C# Enumerations, Defining Structures in C#, Defining Custom Namespaces.</p>	12
3	<p>Object- Oriented Programming With C#: Forms Defining of the C# Class, Definition the “Default Public Interface” of a Type, Recapping the Pillars of OOP, The First Pillars: C#’s Encapsulation Services, Pseudo- Encapsulation: Creating Read-Only Fields, The Second Pillar: C#’s Inheritance Supports, keeping Family Secrets: The “Protected” Keyword, Nested Type Definitions, The Third Pillar: C #’s Polymorphic Support, Casting Between.</p> <p>Exceptions And Object Lifetime: Ode to Errors, Bugs, and Exceptions, The Role of .NET Exception Handling, the System. Exception Base Class, Throwing a Generic Exception, Catching Exception, CLR System – Level Exception (System. System Exception), Custom Application-Level Exception (System. System Exception), Handling Multiple Exception, The Family Block, the Last Chance Exception Dynamically Identifying Application – and System Level Exception Debugging System Exception Using VS. NET, Understanding Object Lifetime, the CIT of “new”, The Basics of Garbage Collection,, Finalization a Type, The Finalization Process, Building an Ad Hoc Destruction Method, Garbage Collection Optimizations, The System. GC Type.</p>	10
4	<p>Interfaces And Collections: Defining Interfaces Using C# Invoking Interface Members at the object Level, Exercising the Shapes Hierarchy, Understanding Explicit Interface Implementation, Interfaces As Polymorphic Agents, Building Interface Hierarchies, Implementing, Implementation, Interfaces Using VS .NET, understanding the IConvertible Interface, Building a Custom Enumerator (IEnumerableable and Enumerator), Building Cloneable objects (ICloneable), Building Comparable Objects (I Comparable), Exploring the system. Collections Namespace, Building a Custom Container (Retrofitting the Cars Type).</p>	10
5	<p>Understanding .Net Assembles: Problems with Classic COM Binaries, An Overview of .NET Assembly, Building a Simple File Test Assembly, A C#.</p>	10

	Client Application, A Visual Basic .NET Client Application, Cross Language Inheritance, Exploring the CarLibrary's, Manifest, Exploring the CarLibrary's Types, Building the Multifile Assembly, Using Assembly, Understanding Private Assemblies, Probing for Private Assemblies (The Basics), Private A Assemblies XML Configurations Files, Probing for Private Assemblies (The Details), Understanding Shared Assembly, Understanding Shared Names, Building a Shared Assembly, Understanding Delay Signing, Installing/Removing Shared Assembly, Using a Shared Assembly.	
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Note 1:Unit 2 & Unit 3 will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment - III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1:Analyze the nature of .Net application development .

CO2:Apply OOAD concepts to build C# applications

CO3:Design and develop console based applications using C#

CO4:Develop Windows Application using Winforms, File I/O, XML in .NET.Web Services and deployment.

CO5:Analyze .NET framework 3.0 features like WPF, WCF and WF.

COs	Mapping with POs
CO1	PO1,PO2,PO3,PO4,PO5,PO8,PO12
CO2	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO3	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO4	PO1,PO2,PO3,PO4,PO5,PO7,PO12
CO5	PO1,PO2,PO3,PO4,PO5,PO7,PO12

TEXT BOOKS:

1. Pro C# with .NET 3.0 - Andrew Troelsen, Special Edition, Dream Tech Press, India, 2013.
2. Programming in C# - E. Balagurusamy, 5th Reprint, Tata McGraw Hill, 2011.

REFERENCE BOOKS/WEB LINKS:

1. Inside C# - Tom Archer, WP Publishers, 2011.
2. The Complete Reference C# - Herbert Schildt, Tata McGraw Hill, 20014.

Sub. Title :PYTHON PROGRAMMING LAB		
Sub Code:ISL75	No. of Credits : 0:0:1.5	No. of lecture hours/week : 03
Exam Duration : 3 hours	CIE +Assignment + SEE = 45 + 5 + 50 =100	

Course objectives:

1. Understanding the syntax and semantics of the Python language.
2. To create Functions in Python.
3. To handle Files & Regular expressions in Python.
4. To apply Object Oriented Programming concepts in Python.
5. To create Threaded and Networking applications

I. LIST OF PROGRAMS

1. Write a python program using functions to search an element in an array using binary search algorithm.
2. Design a python program using regular expressions to search and print mail-id's in a text file.
3. Develop a python program to count the frequency of each word in a given file using dictionaries.
4. Write a python counting number of words, characters and lines present in a given file.
5. Develop a python program implement a stack using lists.
6. Write a python program to implement a queue using lists.
7. Design a python program to demonstrate data hiding principle of OOP.
8. Write a python program to demonstrate multiple inheritance.
9. Develop a python program to implement the multilevel inheritance.
10. Develop a python program to create singly linked linear list.
11. Write a python program to create doubly linked linear list.
12. Design a python program to illustrate the operator overloading.
13. Design a python program to illustrate the Multithreaded programming concept.
14. Develop a python program to illustrate client server programming concept.

II.OPEN ENDED QUESTIONS

Develop a standalone/ web application using python for any of the following:

1. Crime Data Analysis.
2. Twitter Feed Sentiment Analysis.
3. Smart Agriculture And Storage.
4. Health Care Recommendation
5. Multi Label Text Classification
6. Twitter Sentiment Analysis

NOTE :

- 1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDEDQUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.**
- 2.IN THE EXAMINATION EACH STUDENT PICKS ONE QUESTION FROM A LOT OF ALL 14 QUESTIONS.**

Course Outcomes:

After completing the course the students are able to:

CO1: Demonstrate the understanding and usage of core python scripting elements
Python constructs ,datatypes.

CO2: Demonstrate the understanding and usage of functions ,lists, tuples and dictionaries.

CO3: Demonstrate the understanding and usage of modules, packages, and regular expressions

CO4: Demonstrate usage of object oriented features such as Inheritance, Polymorphism, operator overloading.

CO5: Apply the knowledge of python and use the language scripting elements and constructs to develop threaded and networking applications.

COs	Mapping with POs
CO1	PO1,PO2,PO4
CO2	PO1,PO2,PO4
CO3	PO1,PO2,PO4,PO5,PO8
CO4	PO1,PO2,PO4,PO5,PO8
CO5	PO1,PO2,PO4,PO5,PO8

Sub Title : CLOUD COMPUTING AND BIG DATA LAB

Sub Code:ISL76	No of Credits : 0:0:1.5	No. of Lecture Hours/Week : 03
Exam Duration : 3 hours	Exam Marks :CIE +Assignment + SEE = 45 + 5 + 50 =100	

Course Objectives:

1. To understand the working and usage of different cloud service models.
2. To study the basic understanding of Installation and Configuration of Cloud environment.
3. To understand the concept of Service Model and its usage in Cloud Computing.
4. To learn development of applications using IaaS, PaaS and SaaS.
5. Understand how Cloud environment works, for various deployment models.
6. To apply Hadoop concepts to various applications and NoSQL implementation

I. LIST OF PROGRAMS

PART A

CLOUD COMPUTING:

1. Demonstrate the working of Google Drive to make spreadsheet and notes.

2. Installation, Configuration and working on Justcloud.
3. Demonstrate the working in Cloudfoundry Cloud9 to demonstrate different language.
4. Demonstrate the working in Codenvy to demonstrate Provisioning and Scaling of a website.
5. Demonstrate the working and installation of Google App Engine.
6. Working and installation of Microsoft Azure.

PART B

BIG DATA :

1. Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.

- a. Review the commands available for the Hadoop Distributed File System:
- b. Copy file `foo.txt` from local disk to the user's directory in HDFS
- c. Get a directory listing of the user's home directory in HDFS
- d. Get a directory listing of the HDFS root directory
- e. Display the contents of the HDFS file `user/fred/bar.txt`

2. Start by reviewing HDFS. You will find that its composition is similar to your local Linux file system. You will use the `hadoop fs` command when interacting with HDFS.

- a. Move that file to the local disk, named as `baz.txt`
- b. Create a directory called `input` under the user's home directory
- c. Delete the directory `input` and all its contents
- d. Verify the copy by listing the directory contents in HDFS.

3. Using movie lens data

- a. List all the movies and the number of ratings
- b. List all the users and the number of ratings they have done for a movie
- c. List all the Movie IDs which have been rated (MovieId with at least one user rating it)

4. Using movie lens data:

- a. List all the Users who have rated the movies (Users who have rated at least one movie)
- b. List of all the User with the max, min, average ratings they have given against any movie
- c. List all the Movies with the max, min, average ratings given by any user

5. Hive allows for the manipulation of data in HDFS using a variant of SQL. This makes it excellent for transforming and consolidating data for load into a relational database. In this exercise you will use HiveQL to filter and aggregate click data to build facts about user's movie preferences. The query results will be saved in a staging table used to populate the Oracle Database.

The `moveapp_log_json` table contains an activity column. Activity states are as follows:

- RATE_MOVIE
- COMPLETED_MOVIE
- PAUSE_MOVIE
- START_MOVIE
- BROWSE_MOVIE
- LIST_MOVIE

- SEARCH_MOVIE
- LOGIN
- LOGOUT
- INCOMPLETE_MOVIE.

PURCHASE_MOVIE

Hive maps queries into Map Reduce jobs, simplifying the process of querying large datasets in HDFS. HiveQL statements can be mapped to phases of the Map Reduce framework. Selection and transformation operations occur in map tasks, while aggregation is handled by reducers. Join operations are flexible: they can be performed in the reducer or mappers depending on the size of the leftmost table.

- a. Write a query to select only those clicks which correspond to starting, browsing, completing, or purchasing movies. Use a CASE statement to transform the RECOMMENDED column into integers where 'Y' is 1 and 'N' is 0. Also, ensure GENREID is not null. Only include the first 25 rows.
- b. Write a query to select the customer ID, movie ID, recommended state and most recent rating for each movie.

6. The moveapp_log_json table contains an activity column. Activity states are as follows:

- RATE_MOVIE
- COMPLETED_MOVIE
- PAUSE_MOVIE
- START_MOVIE
- BROWSE_MOVIE
- LIST_MOVIE
- SEARCH_MOVIE
- LOGIN
- LOGOUT
- INCOMPLETE_MOVIE.

- a. Load the results of the previous two queries into a staging table. First, create the staging table:
- b. Next, load the results of the queries into the staging table.

II. OPEN ENDED QUESTIONS

1. Working with Mangrasoft Aneka Software.
2. Installation and Configuration of Hadoop/Eucalyptus or any equivalent cloud software.
3. Word count using MapReduce.

NOTE:

1. STUDENT IS PERMITTED TO SUBMIT OPEN ENDED SOLUTION TO ANY OTHER OPEN ENDED QUESTION APART FROM THE LIST ABOVE . BUT IT HAS TO BE APPROVED BY THE STAFF IN CHARGE.

2. STUDENT IS REQUIRED TO EXECUTE ONE PROGRAM FROM PART A and ONE PROGRAM FROM PART B .

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Analyze the requirements to setup: Cloud Environment using IaaS, Hadoop Environment .
 CO2: Develop the ability to solve real-world problems through software development on Cloud Environment.
 CO3: Implement, compile, test and run Java programs comprising on PaaS to address a particular software problem.
 CO4: Design and develop useful Cloud applications with elegant user interfaces using SaaS.
 CO5: Analyze the problem and build Cloud applications using Services models using Google/Microsoft, implement HiveQL statements.

COs	Mapping with POs
CO1	PO1,PO2,PO5,PO7,PO11
CO2	PO1,PO2, PO5, PO7,PO12
CO3	PO1,PO7,PO9,PO10,PO12
CO4	PO1,PO2,PO6,PO9,PO12
CO5	PO1,PO5,PO6,PO7,PO11

Sub Title : SOFTWARE TESTING

Sub Code:IS81	No. of Credits:4=4 : 0 : 0 (L-T-P)	No.of Lecture Hours/Week : 4
Exam Duration : 3 hours	Exam Marks:CIE +Assignment + SEE = 45 + 5 + 50 =100	Total No. of Contact Hours :52

Course Objectives:

1. Discuss about terminologies of software testing .
 2. Familiarize with strengths and weaknesses of a variety of test generation.
 3. Analyze different types of software testing.
 4. Infer functional and non functional testing.
- Integrating the applications of Test management and automation in software testing

Unit No	Syllabus Content	No of Hours
1	Basics of Software Testing: Human Errors and Testing, Software Quality; Requirements, Behavior and Correctness, Correctness versus Reliability, Testing and Debugging, Test Metrics, Software and Hardware Testing, Testing and Verification, Defect Management, Execution History, Test-generation Strategies, Static Testing, Model-Based Testing and Model Checking, Control-Flow Graph.	12
2	Test Generation from Requirements: Introduction, The Test-Selection Problem, Equivalence Partitioning, Boundary Value Analysis, Category-Partition Method, Cause-Effect Graphing,	10
3	Types of Testing – 1: White Box Testing, Introduction, Static Testing, Structural Testing, Challenges in Whit box testing, Black Box Testing:	10

	Introduction, Testing methods. Integration Testing: Introduction, Integration testing as a Type of Testing, Integration testing as a Phase of Testing, Scenario Testing, Defect Bash.	
4	Types of Testing – 2: System and Acceptance Testing, Overview, Functional System Testing, Non-functional Testing, Acceptance Testing; Summary of Testing Phases, Regression Testing: Introduction, Methodologies, Best Practices.	10
5	Test Management and automation: Introduction, Test planning, Test management, Test process, Test reporting, Test planning checklists, Test plan template. What is Test automation? Terms used in Automation, Skills needed for Automation ,what to automate, scope of automation, design and architecture for automation.	10

Note 1: Unit 1 & Unit 5 will have internal choice.

Note 2: Three Assignments are evaluated for 5 marks:

Assignment – I from Units 1 and 2.

Assignment – II from Units 3 and 4 .

Assignment -III from Unit 5

Course Outcomes:

After the completion of course, the students will be able to:

CO1: Apply terms associated with software testing.

CO2: Design various test generation strategies.

CO3: Implement different types of software testing in application development.

CO4: Summarize aspects of functional and non functional testing.

CO5: Apply the usage of test Management and automation in software testing.

COs	Mapping with Pos
CO1	PO1,PO2,PO7,PO12
CO2	PO1,PO2,PO3,PO5,PO7
CO3	PO1,PO2,PO3,PO5,PO7,PO9,PO10
CO4	PO1,PO2,PO3,PO4,PO5,PO7

CO5	PO5,PO7,PO8,PO9,P10,PO11,PO12
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TEXT BOOKS:

1. Aditya P Mathur, Foundations of Software Testing, Pearson Education, First Edition, 2010.ISBN-9788131707951
2. Srinivasan Desikan, Gopaldaswamy Ramesh, Software Testing - Principles and Practices, Pearson Education, First Edition, 2010. ISBN-978-8-177-58121-8

REFERENCE BOOKS/WEBLINKS:

Ron Patton, Software Testing, Pearson Education, Second Edition, 2010.

ISBN-978-81-7758-030