Dr. Babasaheb Ambedkar Technological University
Lonere - 402 103

Institute of Petrochemical Engineering

(Curriculum Revision Project from Academic Year 2017-18)

Proposed Curriculum

for the Programmes

Diploma in Computer Engineering (Third Year)
and
Diploma in Information Technology (Third Year)

(w.e.f. A.Y. 2019-20)

PROGRAMME: DIPLOMA IN COMPUTER ENGINEERING

VISION:

To create persistently changing environment for the rural masses to make them state-of-the-art computer professionals for nation building and humanity at large.

MISSION:

No.	Mission
M1	To train rural pupils for their all-dimensional development with various aspects like personality development and state-of-the-art technology training.
M2	To maintain and upgrade computing facilities for quality learning environment.
M3	To develop in rural masses professional attitude, ethical and intellectual standards.
M4	To train the students to cope-up with ever-changing field of computing and to pursue advanced graduate studies.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs): PEOs are the broad statements that describe career and professional accomplishments that the programme is preparing the diploma graduates to achieve.

After about four to five years of professional experience, diploma computer engineers will be able to:

NO.	PEO
PEO1	Become computer professional who are knowledgeable and technically competent in the field of computing and able to adapt themselves to the state-of-art technologies.
PEO2	Effective in oral and written communication, efficient contributor to the team with a capability of being a leader.
PEO3	Solve computing and information technology problems innovatively, creatively, ethically with social responsibility towards country, community and human kind at large.
PEO4	Demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement.

PROGRAM OUTCOMES (POs) (As Given by NBA – January 2019)

No.	PO
PO1	**Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
PO2	**Problem analysis:** Identify and analyse well-defined engineering problems using codified standard methods.
PO3	**Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specifiedneeds.
PO4	**Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
PO5	**Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.

| PO6 | **Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities. |
| PO7 | **Life-long learning**: Ability to analyse individual needs and engage in updating in the context of technological changes. |

PROGRAM SPECIFIC OUTCOMES (PSOs): What students will be able to do in the Computer Engineering specific industry soon after diploma programme):

NO	PSO
PSO1	An ability to use problem-solving techniques for development of quality application software.
PSO2	An ability to maintain computing systems and networks.

PROGRAMME: DIPLOMA IN INFORMATION TECHNOLOGY

VISION

To impart quality technical education to produce highly skilled technologist in the era of information technology and serve the society for helping the country to attain new height in Information Technology.

MISSION

NO	MISSION
M1	Implement Effective & efficient Teaching–Learning practices and provide the lifelong learning and leadership skills
M2	Promote collaboration with industry to bridge the gap between academic and industrial application in emerging IT Technologies

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs are the broad statements that describe career and professional accomplishments that the programme is preparing the diploma graduates to achieve.

After about four to five years of professional experience, diploma in Information technology engineers will be able to:

NO	PEO
PEO1	Provide socially responsible, environment friendly solutions to Information technology related broad-based problems adapting professional ethics
PEO2	Adapt state-of-the-art Information Technology broad-based techniques to work in multi-disciplinary work environments
PEO3	Solve broad-based problems individually and as a team member communicating effectively in the world of work

PROGRAM OUTCOMES (POs) (As Given by NBA – January 2019)

No.	PO
PO1	**Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
PO2	**Problem analysis:** Identify and analyse well-defined engineering problems using codified standard methods.
PO3	**Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
PO4	**Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
PO5	**Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.

PO6	**Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
PO7	**Life-long learning**: Ability to analyse individual needs and engage in updating in the context of technological changes.

PROGRAM SPECIFIC OUTCOMES (PSOs)

NO	PSO
PSO1	**Modern Information Technology:** Use latest technologies for operation and application of information
PSO2	**Information Technology Process:** Maintain the information processes using modern information and communication technologies

Dr. Babasaheb Ambedkar Technological University's Institute of Petrochemical Engineering

First Year Diploma Program (Curriculum w.e.f. A.Y. 2017-18)

Semester-I

Group A: Diploma in **Electrical**, **Electronics and Telecommunication**, **Information Technology** and **Computer Engineering**

Sr. No.	Course Code	Course Title	Teaching Scheme/Contact Hours			Examination Scheme					
			TH	TU	PR	Credits	MSE	ESE	TW	PR/OR	Total
1	DEN1101	English	03		-	03	30	70	-	-	100
2	DMA1101	Basic Mathematics	04	03	-	07	30	70	-	-	100
3	DPH1101	Applied Physics	04	-	-	04	30	70	-	-	100
4	DME1101	Engineering Drawing	03	-	-	03	30	70#	-	-	100
5	DCE1101	Fundamentals of ICT (lab)	02 (##)	-	02	04	-	-	25	25 @	50
6	DPH1102	Applied Physics (Lab)	-	01	03	04	-	-	50	50 (€)	100
7	DME1102	Engineering Drawing (Lab)	-	--	04	04	-	-	50	-	50
8	DEN1102	English (Lab.)	-	01	-	01	-	-	25	25 @	50
		Total	**16**	**05**	**09**	**30**	**120**	**280**	**150**	**100**	**650**

@ : Internal evaluation (Oral exam);   (€) : External Practical Examination. (##): No theory Examination.

In case of term work there will be continuous assessment. Examination Duration: MSE: 90 Min, ESE: 3Hrs,   # ESE: 4Hr, TH: Theory Lecture, TU: Tutorial,   PR: Practical,   MSE: Mid semester Exam., ESE: End Semester Exam , TW: Term Work;   OR: oral

Dr. Babasaheb Ambedkar Technological University's Institute of Petrochemical Engineering
First Year Diploma Program (Curriculum w.e.f. 2017-18)
Semester-II
Group A: Diploma in **Electrical**, **Electronics and Telecommunication**, **Information Technology** and **Computer Engineering**

Sr. No.	Course Code	Course Title	Teaching Scheme/Contact Hours			Examination Scheme					
			TH	TU	PR	Credits	MSE	ESE	TW	PR/OR	Total
1	DMA1201	Applied Mathematics	04	02	-	06	30	70	-	-	100
2	DCY1201	Applied Chemistry	04	-	-	04	30	70	-	-	100
3	DEN1201	Language Lab	-		02	02	-	-	25	25@	50
4	DEE1201 DET1202	Basic Electrical Engineering (Electrical/ ETC) Electrical and Electronics Engg (Comp/IT)	04	-	-	04	30	70	-	-	100
5	DET1201 DCE1202	Elements of Electronics (Electrical/ETC) Programming in C (Computer/IT)	03			03	30	70	-	-	100
6	DME1203	Workshop Practices (Lab)	01(##)	-	04	05	-	-	50	-	50
7	DCY1202	Applied Chemistry (Lab)	-	-	02	02	-	-	25	25 (€)	50
8	DEE1202 DET1204	Basic Electrical Engineering (Lab)(Electrical/ETC) Electrical and Electronics Engg (Lab) Comp/IT)	-	-	02	02	-	-	25	25 (€)	50
9	DET1203 DCE1203	Elements of Electronics(Lab) (Electrical/ETC) Programming in C (Lab) (Computer/IT)	-	-	02	02	-	-	25	25 (€)	50
		Total	**16**	**02**	**12**	**30**	**120**	**280**	**150**	**100**	**650**

@: Internal evaluation based on oral examination; (€): External Practical Examination ; (##): No theory Examination. In case of term work there will be continuous assessment. Examination Duration: MSE: 90 Min, ESE: 3Hrs, TH: Theory Lecture, TU: Tutorial, PR: Practical, MSE: Mid Semester Exam. ESE: End Semester Exam TW: term Work, OR: oral

Dr. Babasaheb Ambedkar Technological University's
Institute of Petrochemical Engineering

(Curriculum Revision Project w.e.f. Academic Year 2017-18)

Diploma in Computer Engineering/Information Technology
Year: Second   Semester: Third (w.e.f. Academic Year 2018-19)

Sr. No.	Course Code	Course Title	Teaching Scheme – Hours per week			Examination Scheme - Marks					
			TH	TU	PR	Credits	MSE	ESE	TW	PR/ OR	Total
1	DCE2101	Database Management Systems	3	1		4	30	70			100
2	DCE2102	Digital Techniques	3	1		4	30	70			100
3	DCE2103	Object Oriented Programming	3	1		4	30	70			100
4	DCE2104	Environmental and Sustainable Energy Technologies	3	1		4	30	70			100
5	DCE2105	Web Page Design Lab	2		4	6			50	50(€)	100
6	DCE2106	Database Lab			2	2			25	50(@)	75
7	DCE2107	Digital Lab			2	2			25	50(@)	75
8	DCE2108	Object Oriented Programming Lab			4	4			50	50(€)	100
		Total	14	4	12	30	120	280	150	200	750

TH: Theory   TU: Tutorial
TW: Term Work with continuous assessment   PR/OR: Practical/Oral
MSE: Mid-Semester Examination   ESE: End Semester Examination
@: Examination with Internal Examiner   €: Examination with External examiner

Dr. Babasaheb Ambedkar Technological University's
Institute of Petrochemical Engineering

(Curriculum Revision Project w.e.f. Academic Year 2017-18)

Diploma in Computer Engineering/Information Technology
Year: Second   Semester: Fourth (w.e.f. Academic Year 2018-19)

Sr. No.	Course Code	Course Title	Teaching Scheme – Hours per week			Examination Scheme - Marks					
			TH	TU	PR	Credits	MSE	ESE	TW	PR/OR	Total
1	DCE2201	Microprocessor and Interfacing	3	1		4	30	70			100
2	DCE2202	Data Communication and Networks	4			4	30	70			100
3	DCE2203	Software Engineering	3			3	30	70			100
4	DCE2204	Data Structure and Algorithms	3	1		4	30	70			100
5	DCE2205	Programming in Java	3			3	30	70			100
6	DCE2206	Hardware and Networks Lab			4	4			50	50(€)	100
7	DCE2207	Microprocessor Lab			2	2			25	25(@)	50
8	DCE2208	Java Lab			2	2			25	25(@)	50
9	DCE2209	Data Structures Lab			4	4			25	25(€)	50
		Total	16	2	12	30	150	350	125	125	750

TH: Theory   TU: Tutorial
TW: Term Work with continuous assessment PR/OR: Practical/Oral
MSE: Mid-Semester Examination   ESE: End Semester Examination
@: Examination with Internal Examiner   €: Examination with External examiner

Dr. Babasaheb Ambedkar Technological University's
Institute of Petrochemical Engineering

(Curriculum Revision Project w.e.f. Academic Year 2017-18)

Diploma in Computer Engineering/Information Technology
Year: Third   Semester: Fifth (w.e.f. Academic Year 2019-20)

Sr. No.	Course Code	Course Title	Teaching Scheme – Hours per week			Examination Scheme - Marks					
			TH	TU	PR	Credits	MSE	ESE	TW	PR/OR	Total
1	DCE3101	Operating Systems	3			3	30	70			100
2	DCE3102	Advanced Java Programming	3			3	30	70			100
3	DCE3103	Computer and Network Security	3	1		4	30	70			100
4	DCE3104/ DIT3101	Elective-I	3	1		4	30	70			100
5	DCE3105	Entrepreneurship Development	3			3	30	70			100
6	DCE3106	OS Lab	1		2	3			25	25(@)	50
7	DCE3107	Advanced Java Lab			2	2			25	25(€)	50
8	DCE3108/ DIT3102	Elective-I Lab			2	2			25	25(€)	50
9	DCE3109	Project Phase – I and Seminar			4	4			50	50(€)	100
10	DCE3110	Industrial Training (During summer break after fourth Semester)($)			2	2			25	25(@)	50
		Total	16	2	12	30	150	350	150	150	800

TH: Theory   TU: Tutorial
TW: Term Work with continuous assessment   PR/OR: Practical/Oral
MSE: Mid-Semester Examination   ESE: End Semester Examination
@: Examination with Internal Examiner   €: Examination with External examiner
 $: Four weeks Industrial Training during summer vacation after fourth semester examination.

Elective-I:
Computer Engineering (DCE3104): 1) DCE3104A: GUI Application Development Using C#
2) DCE3104B: JavaScript and PHP
Information Technology (DIT3101): 1) DIT3101A: Active Server Pages 2) DIT3101B: Perl Programming
Elective-I Lab:
Computer Engineering (DCE3108): 1) DCE3108A: C# Lab 2) DCE3108B: JavaScript and PHP Lab
Information Technology (DIT3102): 1) DIT3102A: ASP Lab 2) DIT3102B: PERL Lab
 # Students of TY computer can register for elective course offered by IT department and vice versa, from any of the above course offered by respective departments.

Dr. Babasaheb Ambedkar Technological University's
Institute of Petrochemical Engineering

(Curriculum Revision Project we.f. Academic Year 2017-18)

Diploma in Computer Engineering/Information Technology
Year: Third   Semester: Sixth (w.e.f. Academic Year 2019-20)

Sr. No.	Course Code	Course Title	Teaching Scheme – Hours per week			Examination Scheme - Marks					
			TH	TU	PR	Credits	MSE	ESE	TW	PR/OR	Total
1	DCE3201	Programming in Python	3	1		4	30	70			100
2	DCE3202	Human Computer Interaction	3	1		4	30	70			100
3	DCE3203	Mobile Application Development	3	1		4	30	70			100
4	DCE3204/ DIT3201	Elective-II	3	1		4	30	70			100
5	DCE3205	Python Lab			2	2			50	25(€)	75
6	DCE3206	Linux Lab	2		2	4			50	50(@)	100
7	DCE3207	Android Lab			2	2			50	25(@)	75
8	DCE3208	Project			6	6			75	75(€)	150
		Total	14	4	12	30	120	280	225	175	800

TH: Theory   TU: Tutorial
TW: Term Work with continuous assessment   PR/OR: Practical/Oral
MSE: Mid-Semester Examination   ESE: End Semester Examination
@: Examination with Internal Examiner   €: Examination with External Examiner

Elective-II:
Computer Engineering: (DCE3204)
1) DCE3204A: Cloud Computing 2) DCE3204B: Data Warehousing and Mining
Information Technology: (DIT3201)
1) DIT3201A: Computer Graphics 2) DIT3201B: Software Testing

 # Students of TY computer can register for elective course offered by IT department and vice versa, from any of the above course offered by respective departments.

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Semester: V   **Course: Operating Systems**   **Course code: DCE3101**

Teaching and Examination Scheme: **Credits: 3**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	--	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Classify different operating systems.

2. Analyse various process scheduling algorithms.

3. Detect deadlock in the given situation.

4. Detect page fault during memory allocation.

5. Map physical and logical addresses.

6. Classify different file access methods.

COURSE CONTENTS

Unit	Contents	Hours	Marks
I	**Introduction:** What Operating Systems Do? Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management. **System Structures:** Operating-System Services, User Operating-System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating-System Structure, Protection and Security, Distributed Systems, Special-Purpose Systems, Computing Environments, Open-Source Operating Systems, Virtual Machines, Operating-System Debugging, Operating-System Generation, System Boot	8	18
II	**Process Concept:** Process Scheduling, Operations on Processes, Interprocess Communication, Examples of IPC Systems, Communication in Client Server Systems, Multithreaded Programming, Multithreading Models, Thread Libraries, Threading Issues, Process Scheduling, Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling, Multiple-Processor Scheduling, Operating System Examples, Algorithm Evaluation.	6	16
III	**Process Co-ordination:** Synchronization, Background, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.	6	16
IV	**Deadlocks:** Deadlocks, System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. **Memory-Management Strategies:** Background, Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation.	6	16

V	**Virtual-Memory Management:** Background, Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory, Other Considerations, Operating-System Examples.	8	18
VI	**File System:** File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection. **Implementing File Systems:** File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	S. Galvin	Operating Systems	PHI, 9th Edition, 2013
2	Achyut Godbole and Atul Kahate	Operating Systems	McGraw Hill Pub, 3rd Edition, July 2017
3	Rajiv Chopra	Operating Systems: A practical approach	S. Chand Pub, Jan. 2016

B) Websites:

1. https://nptel.ac.in/courses/106106144/

Semester: V   Course: Advanced Java Programming   Course code: DCE3102

Teaching and Examination Scheme: Credits: 3

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	---	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Design and develop systems that are easily extensible to demonstrate polymorphic behaviour
2. Design and Develop layered software systems
3. Develop heavy weight based and lightweight-based front-end interfaces.
4. Design of TCP/IP and UDP based client server networking
5. Front end back end connectivity using JDBC. Study of two-tier database architecture.
6. Design and develop Life cycle of thread.

COURSE CONTENTS

Unit	Contents	Hours	Marks
I	**Object-Oriented Programming : Polymorphism** Concept of Polymorphism, use overridden methods to effect polymorphism, distinguish between abstract and concrete classes, to declare abstract methods to create abstract classes, final methods and classes, creating and using interfaces.	8	18
II	**GUI-Components-I:** Introduction, AWT and Swing(lightweight Vs heavyweight), Overview of Swing Components, Simple GUI-based input/output with JOptionPane, Displaying Text and Images in a window, Introduction to Event Handling, common GUI types and Listener Interfaces, How event handling works	6	16
III	**GUI –Components -II(Swings):** JButton, JLabel, JFrame, JCheckBox, JRadioButton, JComboBox, JList, Mutliple-Selection List, Mouse Event Handling, Adapter Classes, Key Event Handling, Layout Managers, JTextArea,	6	16
IV	**Multithreading:**Introduction, Life cycle of a thread, Using thread methods, Thread Priorities and Thread Scheduling, Creating and Executing Threads, thread Synchronization, Implementing Runnable Interface	6	16
V	**Networking:** Introduction, Manipulating URLs, Reading a File on a Web Server, Establishing a simple Server using Stream Sockets, Establishing a simple client using stream sockets, Client-Server Interaction with stream socket connection, Connectionless Client/Server Interaction with Datagrams.	8	18
VI	**Working with Database:** JDBC, ODBC, & Other API's JDBC two tier & three tier models. **Connecting to Database**: Driver Interface, Driver Manager class, Connection Interface, Statement Interface, the java.sql.package Establishing connection & retrieving information ResultSet interface.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Herbert Sheild	Complete Reference	Tata McGraw
2	Kogent learning Solution	Advance JAVA	DreamTech Press
3	Sharnam Shah & Vaishali Shah	Java EE6 for Beginners	SPD
4	Kogent learning Solution	Java Server Programming Black	DreamTech Press
5	Deitel and Dietel	How to Program Java	Prentice Hall

B) Websites:

1. https://onlinecourses.nptel.ac.in/noc19_cs07

Semester: V   **Course: Computer and Network Security**   **Course code: DCE3103**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Understand basics need of security, services, attacks and secure E-mail system.
2. Understand the concept of Cryptography and its techniques.
3. Understand the Key Encryption algorithms and digital certificates.
4. Configure firewall and understand the types of viruses.
5. Understand basic features of operating system, protection methods, memory, file and web security.
6. Understand the overview of IP Security and its architecture.

COURSE CONTENTS

Unit	Contents	Hours	Marks
I	**Security in Computing Environment:** Need for Security, Security Attack, Security Services, Information Security, Methods of Protection. Electronic Mail Security: Threats to E-Mail, Requirements and Solutions, Encryption for Secure E-Mail, Secure E-Mail System	8	18
II	**Basics of Cryptography**: Terminologies used in Cryptography, Substitution Techniques, and Transposition Techniques. Encryption and Decryption: Characteristics of Good Encryption Technique, Properties of Trustworthy Encryption Systems, Types of Encryption Systems, Confusion and Diffusion, Cryptanalysis	6	16
III	**Symmetric Key Encryption**: Data Encryption Standard (DES) Algorithm, Double and Triple DES, Security of the DES, Advanced Encryption Standard (AES) Algorithm, DES and AES Comparison. Public Key Encryption: Characteristics of Public Key System, RSA Technique, Key Exchange, Diffie-Hellman Scheme, Cryptographic Hash Functions, Digital Signature, Certificates, Certificate Authorities	6	16
IV	**Protection of Computing Resources**: Secure Programs, Non-malicious Program Errors, Viruses and Other Malicious Code, Targeted Malicious Code, Methods of Control. Firewalls: Firewalls – Types, Comparison of Firewall Types, Firewall Configurations	6	16
V	**Security Features in Operating System**: Objects to be Protected, Protection Methods of Operating Systems, Memory Protection, File Protection, User Authentication. Web Security: Web Security Requirements, Secure Socket Layer (SSL), Transport Layer Security (TLS), Secure Electronic Transaction (SET)	8	18
VI	**Network Security**: Network Concepts, Threats in Networks, Network Security Controls. : IP Security: Overview of IP Security (IPSec), IP Security Architecture, Modes of Operation, Security Associations (SA), Authentication Header (AH), Encapsulating Security Payload (ESP), Internet Key Exchange.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Behroute A Fourzan	Cryptography & Network Security	Special Indian edition
2	William Stalling	Cryptography & Network Security	Pearsons Education
3	Chris Mcvab	Network Security Assessment	Shroff Publications
4	A.A Ukidve, S.S.Velankar	Computer Security	Nirali Publications

B) Websites:

1. https://nptel.ac.in/courses/106105031/

Semester: V   Course: GUI Application development using C# (Elective – I)   Course code: DCE3104A

Credits: 4

Teaching and Examination Scheme:

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Analyse the advantages of .NET platform over other frameworks.
2. Analyse the garbage collection algorithm in memory management.
3. Select appropriate control and data structure for solution of given problem.
4. Establish connectivity between application and database
5. Apply OOP concepts in creating a console-based application.
6. Create a windows forms setup application.

COURSE CONTENTS:

Units	Contents	Hours	Marks
I	**DOTNET framework 4.5 and OOP with C#:** Framework architecture, Common Language Runtime, Garbage collection and MSIL. OOP concepts, Partial classes and partial methods, managing types, properties, methods and parameters, named parameters and optional parameters, string handling, abstract classes and interfaces, exception handling in .NET 4.0.	8	18
II	**C# advanced features:** Delegates and events, attributes, familiarizing collections and generics, Language Integrated Query (LINQ), Object and collection initializes, Query expressions, Console application development using C#.NET.	6	16
III	**Creating User Interface Application using Standard Controls:** Add and configure a windows form, manage control layout on a windows form, managing form properties, add and configure a windows forms control, create and configure menus, create event handlers for windows forms and controls, construct print documents, create a customized print preview component, implement globalization and localization for a windows application, implement accessibility features, create and configure MDI forms, drag and drop functionality in C#, create a user control in C#, create a composite windows forms control, create an extended control by inheriting from existing windows control.	6	16
IV	**Designing and implementing databases with SQL Server 2008:** Introduction to ADO.NET, creating tables and relationships, SQL fundamentals, stored procedures, introduction to data bound controls, insert, update, and delete, select commands in both connected and disconnected environment.	6	16

V	**WPF Application Fundamentals:** Windows applications, navigation applications/ XAML Browser applications, binding to a WPF element, transformations - Render, Skew, Rotate.	8	18
VI	**Create a windows forms setup application:** Create a setup using click once technology, deploy an application using setup project.	6	16

Learning Resources:

A) Books:

Sr. No.	Author	Title	Publication
1	Anders Hejlsberg	C# Programming Language 2/e	Pearson Education
2	Jesse Liberty	Learning C#	O'Reilly

B) Websites:

https://www.tutorialspoint.com/csharp/

Semester: V   Course: JavaScript and PHP (Elective – I)   Course code: DCE3104B

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successfully completion of this course, the students will be able to:
1. Make use of JavaScript in the client side scripting.
2. Design form for web based application.
3. Develop java server page.
4. Make use of PHP at server side scripting.
5. Use PHP inbuilt functions.
6. Create web sessions at client side using PHP session functionality.
7. Connect and access database using PHP.

Course Details:

UNIT	CONTENTS	HOURS	MARKS
I	**Introduction to JavaScript:** The nature of JavaScript, Script writing basics, Addition of interactivity to a webpage, Syntax, External & Internal using, Variables, Operators, Functions, Events, Comparison conditions, Loops, Creating dynamic web pages, scripting your forms, Scrolling messages, Animating graphics, Creating floating toolbars, Setting up toolbar windows, Designing an image map navigation.	8	18
II	**Form handling in JavaScript:** Form Validation, Form Validation introduction, Regular Expressions – introduction, Regular Expression – Syntax, Text, Number, Space & Special character validation using Regular Expression, Email Validation using Regular Expressions. Java server pages: Introduction to JSP, JSP architectures, JSP servers, JSP tags, Request object, Response object, JSP and Database, DSN, JDBC, JSP benefits.	6	16
III	**Introduction To PHP:** History of PHP, Installing PHP-XAMPP, WAMPP, LAMPP Servers, Installing & Configuring PHP ON windows & Linux OS. PHP: Syntax, Variables, Datatypes Strings, Constants, Operators, Echo/Print, Conditional Statements, Looping Statements.	6	16
IV	**String literals and functions in PHP:** Quoting string , Constants, printing Strings, Accessing individual characters, Cleaning string, Escaping string, encoding string, Manipulating and searching string. Functions: Calling a function, Defining a Function, Variable Scope, Function parameters, Return values, Variable function, Anonymous functions.	6	16

V	**Concept of array, cookies and session:** Types of arrays, Identifying elements of array, Storing, Data in array, Array index, Multidimensional arrays, Extracting Multiple values from array , associative array, Converting between arrays and variables and strings, Traversing array, sorting, Array functions. Setting a cookie, Reading a cookie, Setting cookie expiration, Deleting a cookie, Start a Session , Modify Session, session variables, Destroy Session.	8	18
VI	**Database Connectivity:** Reading a data in webpage, Setting a webpage to communicate with database, Writing a data in web page, form handling, File Uploading, Handling buttons. Working with database, Access the database, Reading, displaying, Closing the connection to database, MYSQLI database basics, CREATE, READ, UPDATE, DELETE Operations through SQLI Queries. CRATE, ALTER, DELETE, DROP Tables, WHERE conditions ▪ AND, OR, IN, BETWEEN, LIKE, DISTINCT, ORDER BY, GROUP BY, UNION ▪ Sub-queries.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Evan bayross Sharman shah	PHP 5.1 for beginners	SPD Publications
2	Steven holzner Mc Graw	PHP 5.2 The complete reference	Hill edition 2008
3	RasmusLerdorf Kevin Tetroe	Programming in php	Orilly Publications

B) Websites:

1. https://nptel.ac.in/courses/106105084/25

2. http://www.nptelvideos.com/php/php_video_tutorials.php

Semester: V   **Course: Active Server Pages (Elective – I)**   **Course code: DIT3101A**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Identify need of ASP
2. Design ASP forms and objects
3. Develop ASP applications.
4. Utilize ASP libraries
5. Connect and access databases.
6. Use ADO objects

COURSE CONTENTS

UNIT	CONTENTS	HOURS	MARKS
I	**Active server pages:** ASP Introduction, Concept of ASP, Features of ASP, ASP syntax, ASP variables, ASP procedures, ASP conditional statements, ASP looping statements	8	18
II	ASP forms, ASP objects: Application object, Request object, Response object, Session object, ASP query string and forms, ASP cookies, ASP session	6	16
III	ASP applications, Response Objects, properties of request and response object, ASP #include, ASP global.asa, ASP send e-mail	6	16
IV	**ASP References**: ASP VB Functions, ASP keywords, ASP response, ASP application, ASP session, ASP server, ASP error, ASP file system, ASP text stream, ASP drive, ASP file , ASP folder, ASP dictionary, ASP browser cap, ASP content linking, ASP content rotator, ASP quick ref.	6	16
V	**ASP Database Connectivity:** Introduction of database, Connecting with database, DSN, DSN less Object Connection, Using DSN, Active server pages and Microsoft database using ADO	8	18
VI	**ActiveX Data Objects (ADO):** ADO introduction, ADO connect, ADO recordset, ADO display, ADO query, ADO sort, ADO add, ADO update ,ADO delete, ADO command, ADO connection, ADO error, ADO parameter, ADO property, ADO record, ADO stream, ADO data types.	6	16

Learning Resources:

A) Books:

Sr. No.	Author	Title	Publication
1	Ramesh Bangia	Multimedia & Web Technology	Firewall Media
2	Kris Jamsa, Konrad king and Andy anderson	HTML & Web Design Tips & techniques	Indian Edition
3	Alberto Manuel Ricart Stephen ASbury	Active Server Pages 3 Developers Guide	IDG books India

B) Websites:

1. https://www.tutorialspoint.com/asp.net/

Semester: V   **Course: Perl Programming (Elective I)**   **Course code: DIT3101B**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Introduce the concept of Perl programming and Perl Environment.
2. Use the Control statements.
3. Implement Arrays and Hash Tables.
4. To use Perl Functions, Subroutines, File Handling & Directory.
5. Perform Error Handling and Socket Programming.
6. Understand and implement Database Access and Database Connection and Related Query.

COURSE CONTENTS

Unit	Contents	Hours	Marks
I	**Introduction to Perl** **1.1 Introduction:** What is Perl, Perl Features, Perl and the Web, Perl is Interpreted, Perl Environment, Perl Syntax Overview, Perl Data Types, Perl Variables, Perl Scalars 1.2 Introduction to CGI programming	8	18
II	**Perl - Control Statement** **2.1 If…Else Loop:** if statement, if...else statement, if...else if...else statement, unless statement, unless...else statement ,unless...else if..else statement **2.2 Case Control:** switch statement **2.3 Conditional Loop:** The? : Operator **2.4 Perl** – **Loops:** while loop, until loop, for loop, for each loop, do...while loop, nested loops, Loop Control Statements, next statement, last statement, continue statement, redo statement, goto statement.	6	16
III	**Perl** – **Arrays and Hashes** **3.1 Arrays:** Introduction to Array, Types of Array, Perl Array with Loops Multidimensional Array Table with Numbered Cells, An element example, Assigning a list to an Array, Adding elements to and removing them from array, Other Operations on Arrays. Perl Strings['Perl String Perl Escaping Characters Perl Namespace Modules & Namespace. **3.2 Hashes:** Introduction to Hash Table, Table Index by String, Creating a Hash, Working through a hash tables, Hashes versus references to Hashes verses reference Hash Table.	6	16
IV	**Perl Functions, Subroutines, File Handling & Directory** **4.1 Functions:** Define and Call a Subroutine, Passing Arguments to a Subroutine, Passing Lists to Subroutines, Passing Hashes to Subroutines, Returning Value from a Subroutine Private Variables in a Subroutine, Temporary Values via local(), State Variables via state()	6	16

		4.2 Perl File Handling: Opening and Closing Files, Open Function, Sysopen Function, Close Function, The <FILEHANDL> Operator, getc Function, read Function, print Function, Copying Files Renaming a file, Deleting an Existing File, <u>Perl chop() vs chomp()</u> **4.3 Perl Directory:** Display all files, Create new Directory, Remove a Directory, Change a Directory.		
V		**Perl – Error Handling and Socket Programming** **5.1 Error Handling:** The if statement, The unless Function, The ternary Operator, The warn Function, The die Function, Errors within Modules, The carp Function, The cluck Function, The croak Function, The confess Function **5.2 Socket Programming:** What is a Socket? Server Side Socket Calls, Client Side Socket Calls, Client - Server Example	8	18
VI		**Perl – Database Access** Database Connection, INSERT Operation, READ Operation, UPDATE Operation DELETE Operation	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Tom Christiansen and Larry Wall	Programming in Perl	O'REILLY Publication
2	Randal L. Schwartz	Learning Perl	O'REILLY Publication

B) Websites:

1. https://nptel.ac.in/courses/106105084/21

Semester: V   **Course: Entrepreneurship Development**   **Course code: DCE3105**

Teaching and Examination Scheme: **Credits: 3**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	---	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Identify need of entrepreneurship and various risks associated with entrepreneurship.
2. Classify different costs related to entrepreneurship.
3. Identify product selection criteria.
4. Study product report format.
5. Identify factors affecting working capital and components of working capital.
6. Study different industry acts.

COURSE CONTENTS

Unit	Contents	Hours	Marks
I	**Introduction:** Entrepreneurship definition and scope, factors affecting entrepreneurial character, development of attitudes, need of promotion of entrepreneurship and small business, risk taking, types of risks, evolution of personal risks.	8	18
II	**Marketing:** Definition. Modern concept of marketing, marketing functions, need of marketing orientation. Costing and pricing, classification of costs, calculation of break-even point, packing und advertising. **Market Survey:** Raw material information, machinery and equipment information, market information including manufacturers, competitors, traders, consumers, customers and channels.	6	16
III	**Products Selection:** Selection criterion, venture ideas, product lifecycle, comparative evolution of product ideas depending upon present market potential, comparative cost, risk, description of market, outline of technological variants, availability of production factors, cost estimation, estimate of profit break advantage concept.	6	16
IV	**Project report preparation:** Project report and its utility, point to be included in report for compliance of the requirement of the financial institution development of products, Techno commercial feasibility, capital investment, product report format.	6	16
V	**Finance and Accounting:** Working and fixed capital, importance and scope, assessment of working capital and fixed capital, financial institutions, their procedure of financing. Factors affecting working capital and components of working capital.	8	18
VI	**Acts:** Boiler act, Electricity act, Factory E.S.I. act and Compensation act. **Managing the enterprise:** Understanding human behavior, self-management, coping with uncertainties, stress management and positive reinforcement, oral and written communication.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Harold Koontz and Heinz Weihrich	Essentials of Management: An International, Innovation and Leadership Perspective, 9th Edition	McGraw Hill Publ.
2	Banga and Sharma	Industrial Organization & Engineering Economics	Khanna Publications, New Delhi
3	Uday Pareek, T.V. Rao and D.M. Pestonjee	Behavioral Processes in Organization	India Book House Pvt Ltd
4	O.P. Khanna	Industrial Organization and Management 2018	Dhanpat Rai Publ.

B) Websites:

1. https://nptel.ac.in/courses/122106032/26

Semester: V   **Course: OS Lab**   **Course code: DCE3106**

Teaching and Examination Scheme: **Credits: 3**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
1	--	2	--	--	--	25	25(@)	50

@: Examination with Internal Examiner

Course Outcomes: On successful completion of this course, the students will be able to:

1. Make use of options and run general-purpose utilities in Linux
2. Execute File, directory and process management commands
3. Work with vi editor
4. Make use of wild cards on shell command line
5. Understand and configure the Linux Environment variables
6. Implement the scheduling algorithms

SUGGESTED LIST OF EXERCISES/PRACTICALS:

1. Study of Linux's kernel-shell-user relationship and Linux File system and directory structure
2. Browse manual pages/documentation: **man, apropos, whatis**
3. Use Linux general-purpose utilities: **cal, date, echo, printf, bc, script, passwd, who, uname, tty**
4. Work with vi editor and use its internal commands.
5. Use File Manipulation commands: **pwd, cd, mkdir, rmdir, cat, cp, rm, mv, more, less, file, wc**
6. Understand file attributes using options of ls command.
7. Use process management commands: **ps, nice, at, batch, cron, time**
8. Customise the environment variables: HOME, PATH, USER, SHELL, MAILTO, LOGNAME, PS1, PS2.
9. Implement Shortest Job First Scheduling Algorithm
10. Implement Priority Scheduling Algorithm
11. Implement Round Robin Scheduling Algorithm

Semester: V   **Course: Advanced Java Lab**   **Course code: DCE3107**

Teaching and Examination Scheme: **Credits: 2**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	2	--	--	--	25	25(€)	50

€: Examination with External examiner

Course Outcomes: On successful completion of this course, the students will be able to:

1. Design AWT based interfaces for Java applications(front end) and applets
2. Design Swing based interfaces front end for Java applications(front end) and applets
3. Design interfaces(front end) to demonstrate the use of Event Handlers for Back end
4. Design of TCP/IP and UDP based Client server architecture.
5. Use of JDBC for database connectivity in Java
6. Implement runnable interface

SUGGESTED LIST OF EXERCISES/PRACTICALS:

1.   Implement programs that are easily extensible demonstrating polymorphic behaviour.
2.   Implementing an interface
3.   Implementing GUI interface using AWT components
4.   Implementing GUI interface using various swing components
5.   Implementation of layout managers in Swing
6.   Implementation of Event Handling using Swing/AWT
7.   Implementation of Client-Server architecture using TCP/IP
8.   Implementation of Client Server using UDP
9.   Implementation of two-tier architecture using JDBC
10.   Implementation of Thread Life cycle
11.   Implementation of Runnable Interface

Semester: V   **Course: C# Lab (Elective I Lab)**   **Course code: DCE3108A**

Teaching and Examination Scheme: **Credits: 2**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	2	--	--	--	25	25(€)	50

€: Examination with External examiner

Course Outcomes:

After completing this course, the student will be able to:

1. Use the different tools in C#.NET
2. Debug, compile, and run a simple application.
3. Develop console based applications using C# on .NET
4. Develop windows based application using C# on .NET
5. Design and develop Web based applications on .NET
6. To create report using Crystal Tool.

SUGGESTED LIST OF EXERCISES/PRACTICALS:

1. Write a console application that obtains four int values from the user and displays the product. Hint: you may recall that the Convert.ToDouble() command was used to convert the input from the console to a double; the equivalent command to convert from a string to an int is Convert.ToInt32().
2. Generate various patterns (triangles, diamond and other patterns) with numbers.
3. Generate a Fibonacci series of numbers
4. Generate reverse of a number and find sum of digits of a number.
5. WAP in C#.Net to find factorial of a number
6. Find the prime numbers upto a given limit.
7. Programs using different controls.
8. Programs using ASP.NET Server controls.
9. Database programs with ASP.NET and ADO.NET
10. Programs using Language Integrated query.
11. Programs securing web pages.
12. Programs using Crystal Report

Semester: V   **Course: JavaScript & PHP Lab**   **Course code: DCE3108B**

Teaching and Examination Scheme: **Credits: 02**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	2	--	--	--	25	25(€)	50

Course Outcomes: On successful completion of this course, the students will be able to:
1. Embed JavaScript into html pages.
2. Design a form using GUI controls.
3. Implement application using object oriented concepts.
4. Create application using loop and control statements in PHP.
5. Develop PHP script to perform array operations.
6. Connect web based application with database server using PHP script.

List of Practical /Assignments / Experiments:
1. Embedding javascript in HTML pages.
2. Design a registration form and validate its field by using javascript.
3. To design the scientific calculator and make event for each button using javascript.
4. WAP to create popup boxes in javascript.
5. Program to create a class calculator that contains an overloaded method called "add" to calculate the sum of two integers, two float numbers and, one integer and one float.
6. Write a program to print date using JavaScript
7. Write a program to Sum and Multiply two numbers using JavaScript
8. Write a program to redirect, popup and print function in JavaScript
9. Write down a php program to find average number from all the given number using constant and variable.
10. Write a program to calculate electricity bill using control structure.
11. Write a program using loop structure to select a date using drop down listbox
12. Write a php program using different variable functions
13. Write php script for testing array function
14. Write a php script to connect php with mysql database.
15. Write a php script for exception handling.

Semester: V   **Course: ASP Lab (Elective I Lab)**   **Course code: DIT3102A**

Teaching and Examination Scheme: **Credits: 2**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	2	--	--	--	25	25(€)	50

€: Examination with External examiner

Course Outcomes: On successful completion of this course, the students will be able to:

After completing this course, the student will be able to:
1. Implement a form using different GUI controls and buttons.
2. Use Web controls in form.
3. Use cookies in ASP program
4. Develop interactive application
5. Track session in user authentication.
6. Establish connectivity between form and database server.

SUGGESTED LIST OF EXERCISES/PRACTICALS:

1. Write a program to display a feedback form. The different options for the list box must be ASP-XML, DotNET, JavaPro and Unix, C, C++. When the Submit Form button is clicked after entering the data, a message must be displayed.
2. Write a simple ASP.NET program to display the following Web Controls: 1. A button with text "click me". The button control must be in the center of the form. 2. A label with a text hello 3. A checkbox.   The form name must be Web Controls.
3. Write a program to display "Welcome To Radiant" in the form when the "click" button is clicked. The form title must be ASP.NET.
4. Write a program that displays a button in green color and it should change into yellow when the mouse moves over it.
5. Write a program containing the following controls:
   1. A ListBox 2. A Button 3. An Image 4. A Label   The listbox is used to list items available in a store. When the user clicks on an item in the listbox, its image is displayed in the image control. When the user clicks the button,the cost of the selected item is displayed in the control.
6. Write a Program in ASP that has a form taking the user"s name as input. Store this name in a permanent cookie & whenever the page is opened again, then value of the name field should be attached with the cookie"s content
7. Use ad-rotator to change advertisements on client side request.
8. Create a Session dictionary using object tag. In session-on start add keys for Time, UserAgent, RemoteIP & add appropriate values. Create a simple page to display the values.
9. Implement Session tracking using user authentication
10. Write a Program to delete all cookies of your web site that has created on the client's computer.
11. Write an ASP program to create a proxy.
12. Write a program for database Connection to display all the values in the table (ASP).

Semester: V   **Course: Perl Lab (Elective-I Lab)**   **Course code: DIT3102B**

Teaching and Examination Scheme: **Credits: 2**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	2	--	--	--	25	25(€)	50

€: Examination with External examiner

Course Outcomes: After completing this course, the student will be able to:

1. Understand the Perl Programming as well as CGI Environment.
2. Study various control loops and implement the logic accordingly.
3. Study and write logic of multidimensional array by Performing various Operation and also create Hash tables.
4. Understand the concept of various functions and File handling and implement the logic accordingly.
5. Study the concept of   Perl – Error Handling and create Socket Programming.
6. Study Perl Database and execute Query for creating and Accessing database

SUGGESTED LIST OF EXERCISES/PRACTICALS: (Any 10 of the following)

1. Edit/Compile/Execute a Program to display some text on the screen.
2. Edit/Compile/Execute a Program to perform the following
   a. To Perform Arithmetic Operation.
   b. Calculate the average of two numbers and display it on the Screen.
3. Edit/Compile/Execute a CGI Program with Perl.
4. Edit/Compile/Execute a Program to perform Control Statement
   a. Write a program to print   Table from 1 to 5
   b. Write a program to find greatest Number among three numbers
   c. Write a program to print star pattern
                         ******
                         ******
                         ******
5. Edit/Compile/Execute a Program to perform if-else statement
   a. Write a program to print Even or Odd Number.
   b. Write a program to print Grades on the basis of Marks.
6. Edit/Compile/Execute a Program to perform Case Control Statement.
   a. Write a program to print Days in Week.
   b. Write a program to print Colour in Rainbow.
7. Edit/Compile/Execute a Program to Create Three dimensional Array and Perform following
   a. Insert Array Element
   b. Delete Array Element at the particular position
   c. Update Array Element at the particular position
8. Edit/Compile/Execute a Program to Create Three dimensional Array and Perform following Operations.
   a. Multiplication and division of Array Element
    OR
   a. Addition and Subtraction of Array Element

9. Edit/Compile/Execute a Program to Create One dimensional Array and Find the largest Number in Array.

10. Write a Program to Create Hash Table and Perform Hash operation.

11. Write a Program to Create User Defined Function develops a program:
    a. Create a Function to find GCD of Given Number.
    b. Create a Function to find Factorial of Number.

12. Edit/Compile/Execute a Program to perform File Handling
    a. Write a Program to perform file handling function such as Open (), Close (), delete (),
    b. Write a Program to perform <u>Perl chop() vs chomp()</u> .

13. Edit/Compile/Execute a Program to create and remove new directory.

14. Edit/Compile/Execute a Program to perform Error Handling Function develop a program:
.   a. The Carp Function   b. The Cluck Function   c. The Croak Function

15. Edit/Compile/Execute a Program to Create Socket Program such as, Client Side Socket Calls .

16. Write a Program to Create Database in Perl and create connection, develop a program to perform the following function.
     a. INSERT Operation   b. READ Operation, c. UPDATE Operation d. DELETE Operation

Semester: V   **Course: Project Phase – I and Seminar**   **Course code: DCE3109**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	4	--	--	--	50	50(€)	100

€: Examination with External examiner

Course Outcomes: On successful completion of this course, the students will be able to:

1. Know and select seminar topic or problem statement in engineering field.
2. Draft Problem statement or topic of seminar.
3. Carry out literature survey from various resources.
4. Write review of information search.
5. Develop document preparation skills.
6. Make use of presentation skill for seminar delivery.
7. Be updated with latest trends in areas of engineering discipline.

Course Contents: The following activities would be monitored by the guide and project monitoring committee every week.

1. Briefing about selection for seminar topics in class: Discussion in class
2. Search seminar topics and approval of topic from guide from searched topics
3. Collection of data and literature for seminar from internet/visit/Journals/Books/ EBooks
4. Preparation of synopsis of seminar topic: print draft copy
5. Submission of seminar synopsis to guide (Printed copy)
6. Formation of Groups.
7. Selection of Project: Individual/Group discussions.
8. Define Problem statement for project work.
9. Requirement Gathering and Analysis
10. Project Design Phase (Use case diagrams, Data flow diagrams etc.)

HoD or Senior Faculty will head Project monitoring committee. Other members of the committee will be all guides of the department.

Semester: V   **Course: Industrial Training**   **Course code: DCE3110**

Teaching and Examination Scheme: **Credits: 2**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	2	--	--	--	25	25(@)	50

@: Examination with Internal Examiner

Course Outcomes: On successful completion of this course, the students will be able to:

After successful completion of the industrial training, the student will be able to:

1. Observe and develop work culture and industrial practices, to integrate theory with practice with the help of industrial practitioner

2. Develop culture of safety and environment awareness.

3. Use verbal and written communication skills and multimedia tools.

4. Develop the ability to work as an individual/group member with the capacity to be a supervisor or manager as well as an effective team member.

5. Become aware of all the latest changes and processes in technological world.

6. Interpret and solve routine technical problems through the application of scientific and engineering principles

Implementation and Assessment Strategy:

The students shall be sent for 4 weeks industrial training in summer vacation after the IV semester. The training organisation will issue a completion certificate that is to be submitted to the department. Upon submission of the certificate, the student will be allowed to prepare the training report that is to be submitted and evaluated during the Vth semester. Evaluation will be carried out by Training and place coordinator/faculty members of the department.

Semester: VI   **Course: Programming in Python**   **Course code: DCE3201**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Identify and use various in-built mathematical functions supported by Python
2. Recognize the importance of associability and operator precedence in Python
3. Explain and use conditional expressions to write programs
4. Create lists, sets, dictionaries and tuples and perform different operations on them
5. Apply different searching and sorting techniques to lists
6. Create super and sub classes using the concept of inheritance

COURSE CONTENTS

Unit	Contents	Hours	Marks
I	**Introduction to Python Programming:** Introduction, Overview of Programming Languages, History of Python, Installing Python, Running Python program, Commenting in Python, Internal Working of Python, Python Implementations **Basics of Python Programming:** Introduction, Python character set, token, Python core data type, the print() function, assigning value to a variable, Multiple assignments, writing simple programs in Python, the input() function, the eval() function, formatting number and strings, Python inbuilt functions **Operators and Expressions:** Operators and Expressions, Arithmetic Operators, Operator precedence and associativity, changing precedence and associativity of arithmetic operators, translating mathematical formulae into equivalent Python expressions, bitwise operator, the compound assignment operator	8	18
II	**Decision Statements:** Boolean type, Boolean operators, using numbers with Boolean operators, using string with Boolean operators, Boolean expressions and relational operators, decision making statements, conditional expressions **Loop control statements:** The while loop, the range function(), the for loop, nested loops, the break statement, the continue statement	6	16
III	**Functions:** Syntax and basics of a function, use of a function, parameters and arguments in a function, the local and global scope of a variable, the return statement, recursive function, the lambda function **Strings:** The str class, basic inbuilt Python functions for string, the index[] operator, traversing string with for and while loop, immutable strings, the string operators, string operations	6	16

IV	**Lists**: Creating Lists, accessing the elements. Tuples and Dictionaries: Tuples, Accessing values in Tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, of a list, negative list indices, list slicing[start: end] List slicing with step size, Python inbuilt functions for lists, the list operator, list comprehensions, list methods, list and strings, splitting a string in list, passing list to a function, returning list from a function **List Processing: Searching and sorting:** Searching techniques, Introduction to sorting, types of sorting, bubble sort, selection sort, insertion sort, quick sort, merge sort		6	16
V	**Object, classes and inheritance:** Defining classes, the self parameter and adding methods to a class, display class attributes and methods, special class attributes, accessibility, the init_method(constructor), passing an object as parameter to a method, _del_() (destructor method), class membership tests, method overloading in Python, operator overloading, inheritance, types of inheritance, the object class, inheritance in detail, subclass accessing attributes of parent class, multilevel inheritance in detail, multiple inheritance in detail, using super(), method overriding, precaution: overriding methods in multiple inheritance **Tuples, sets and dictionaries:** Introduction to tuples, sets, dictionaries		8	18
VI	**Graphics Programming: Drawing with turple graphics:** Introduction, getting started with the turtle module, moving the turtle in any direction, moving turtle to any location, the color, bgcolor, circle and speed method of turtle, drawing with colors, drawing basic shapes using iterations, changing color dynamically using list, turtles to create bar charts **File Handling:** Need of file handling, text input and output, the seek() function, binary files, accessing and manipulating files and directories on a disk		6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Ashok Kamthane, Amit Kamthane	Programming and problem solving with Python	McGraw Hill Education
2	Mark Summerfield	Programming in Python 3: A Complete Introduction to the Python Language	Pearson Education

B) Website:
1. http://www.mhhe.com/kamthane/python

Semester: VI   **Course: Human Computer Interaction**   **Course code: DCE3202**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction.
2. Describe the key design principles for user interfaces.
3. Carry out the steps of evaluation of human computer interaction systems.
4. Identify stakeholder's requirements.
5. Interact with multimodal software system.
6. Access various modern type groupware.

COURSE CONTENTS:

Unit	Contents	Hours	Marks
I	**Introduction to Human computer interaction system**: Historical evolution of the field: The Computer, The System and The Interaction.	8	18
II	**Design Process**: Interaction Design basics, Concept of usability definition and elaboration. HCI in the Software Process, Design Rules.	6	16
III	**Evaluation techniques:** Goals of evaluation, Evaluation through expert analysis: Cognitive walkthrough, Heuristic evaluation, Model-based evaluation through user participation: Styles of evaluation, Empirical methods: experimental evaluation, Observational techniques, Query techniques, Evaluation through monitoring physiological responses.	6	16
IV	**Models:** Cognitive Models, Socio-Organizational Issues and Stakeholders Requirements, Communication and Collaboration models.	6	16
V	**Universal design**: Universal design principles, Multi-modal interaction: Sound in the interface, Touch in the interface, Handwriting recognition, Gesture recognition. Designing for diversity: Designing for different age groups, Designing for cultural differences.	8	18
VI	**Modern System-Groupware**: Groupware systems, Computer-mediated communication: E-mail and bulletin boards, Structured message systems, txt is gr8, Video conferences and communication, Virtual collaborative environments, Meeting and decision support systems: Argumentation tools, Meeting rooms, shared work surfaces. Shared applications and artifacts: Shared PCs and shared window systems, Shared editors, Co-authoring systems, Shared diaries Communication through the artefact.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Alan Dix, Janet Finlay, Gregory D. Abowd, Russell Beale	Human-Computer Interaction	Pearson
2	Steven Jacobs, Ben Shneiderman, Catherine Plaisant, Maxine Cohen	Designing the User Interface: Strategies for Effective Human - Computer Interaction 5th Edition	Pearson
3	I. Scott MacKenzie	Human-Computer Interaction: an Empirical Research Perspective	Morgan Kaufmann

B) Websites:

1. https://nptel.ac.in/courses/106103115/
2. https://nptel.ac.in/courses/106106177/
3. https://onlinecourses.nptel.ac.in/noc18_cs23/preview

Semester: VI   **Course: Mobile Application Development**   **Course code: DCE3203**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

COURSE OUTCOMES: On successful completion of this course, the students will be able to:

1. Understand the concept of open source mobile development
2. Describe Android architecture framework.
3. Design Android UI Layout
4. Develop event driven programs.
5. Develop applications using menus and dialog boxes
6. Create Database using SQLite.

COURSE CONTENTS:

Unit	Content	Hours	Marks
I	**Android OS : Concepts** 1.1 Mobile technology : Overview of Android - An Open Platform for Mobile development 1.2 Open Handset Alliance 1.3 Use Android for mobile app development 1.4 Android Marketplaces 1.5 Android Development Environment setup 1.6 Android development Framework - Android-SDK, Eclipse Emulators / Android AVD. 1.7 Creating & setting up custom Android emulator 1.8 Android Project Framework and its applications.	8	18
II	**Android Architecture:** 2.1 Linux Kernel 2.2 Libraries 2.3 Android Runtime 2.4 Application Framework 2.5 Applications 2.6 Android Startup and Zygote 2.7 Android Debug bridge 2.8 Android Permission model 2.9 Android Manifest File	6	16
III	**Android Activities and UI Design:** 3.1 Android application components Intent, Activity, Activity Lifecycle, Broadcast receivers, Services and Manifest 3.2 Create Application and new Activities 3.3 Expressions and Flow control, Android Manifest 3.4 Simple UI -Layouts and Layout properties • Fundamental Android UI Design • Introducing Layouts • Creating new Layouts • Draw able Resources • Resolution and density independence (px,dp,sp)	6	16

IV	**Advanced UI Programming:** 4.1 Event driven Programming in Android (Text Edit, Button clicked etc.) 4.2 Creating a splash screen 4.3 Android Activity Lifecycle 4.4 Introduction to threads in Android	6	16
V	**Toast, Menu, Dialog, List and Adapters:** 5.1 Menu: Custom Vs. System Menus 5.2 Creating and Using Handset menu Button (Hardware) 5.3 Android Themes, Dialog, create an Alter Dialog 5.4 Toast in Android, List & Adapters 5.5 Android Manifest.xml File	8	18
VI	**Working with Database:** 6.1 SQLite: Open Helper and create database 6.2 Open and close a database	6	16

LEARNING RESOURCES:

A) Books:

Sr.No	Author	Title of Book	Publication
1	Reto Meier	Professional Android 2 Application Development	Wiley India Pvt Ltd
2	Mark L Murphy	Beginning Android	Wiley India Pvt Ltd
3	Sayed Y Hashimi and Satya Komatineni	Professional Android	Wiley India Pvt Ltd
4	Joseph Annuzzi Jr., Lauren Darcey, Shane Conder	Introduction to Android Application Development: Android Essentials (Developer's Library)	Addison Wesley; 4 edition (26 November 2013)

B) Web sites:

- https://nptel.ac.in/courses/106106156/
- Build your firs App http://developer.android.com/training/basics/firstapp/index.html
- Android App Development Tutorial http://www.codelearn.org/androidtutorial
- http://www.tutorialspoint.com/android/android_overview.htm

Semester: VI   **Course: Cloud Computing (Elective II)**   **Course code: DCE3204A**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Describe the basic concepts of cloud
2. Use the concept of virtualization in cloud computing
3. Select Cloud Storage System
4. Describe the cloud service provider and user
5. Use the concept of cloud security
6. Describe current trends and future scope of cloud

COURSE CONTENTS:

Unit	Contents	Hours	Marks
I	**Introduction to Cloud Computing:** 1.1 Defining cloud Computing, Essential characteristics of cloud computing 1.2 Cloud Deployment Model: Public cloud, Private cloud, Community cloud, Hybrid cloud 1.3 Cloud Service Models: IaaS, PaaS, SaaS 1.4 Cloud Economics and Benefits 1.5 Architecture of Cloud computing 1.6 Cloud Computing Infrastructure	8	18
II	**Virtualization:** 2.1 Introduction, Characteristics of virtualized environment 2.2 Virtualization Types 2.3 Technology Example: Vmware, Microsoft Hyper-V, KVM, Xen 2.4 Advantages: VM Migration, VM consolidation, VM Management 2.5 disadvantages of virtualization	6	16
III	**Storage in Clouds:** 3.1 Storage system architecture, 3.2 Virtualize Data Centre(VDC) architecture, VDC Environment, server, storage, networking 3.3 Block and file level storage virtualization, Virtual Provisioning, and automated storage tiering, VSAN and benefits, 3.4 Cloud file systems: GFS and HDFS, Comparisons among GFS, HDFS.	6	16
IV	**Cloud monitoring and management:** 4.1 Service Provider and users 4.2 An architecture of federated cloud computing 4.3 SLA management: Types of SLA, Life cycle of SLA. 4.4 Service catalog, management and functional interfaces of services 4.5 Cloud portal and its functions	6	16

		4.6 Cloud Service life cycle phases: Service planning, service creation, service operation and service termination 4.7 Software defined approach and techniques for managing IT resources		
V		**Security in Cloud Computing:** 5.1 Cloud Security Fundamentals 5.2 Cloud Risk 5.3 Cloud Risk division: Polity and Organizational Risks, Technical Risks, Legal risks 5.4 Technologies for Data security, Data security risk, 5.5 Digital identity and access management, 5.6 Content level security 5.7 Security-As-A-Cloud Service	8	18
VI		**Trends and future in cloud computing** 6.1 Cloud trends in supporting Ubiquitous Computing 6.2 Enabling Technologies with the Internet of Things(RFID, Sensor Networks and ZigBee Technologies, GPS) 6.3 Innovatove Applications with the Internet of Things(Ex: Smart Buildings and SmartPower Grid) 6.4 Future of Cloud-Based smart Devices, Faster time to Market for Software Applications, Home Based Cloud Computing, Energy Aware Cloud Computing 6.5 Cloud Platforms: Amazon EC2 and S3,Microdsoft Azure , Cloudstack, Intercloud, Google App Engine, Open Source cloud Eucalyptus, Open stack, Open Nebulla, etc.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Rajkumar Buyya, J.Broberg, A. Goscinski	Cloud Computing, Principals and Paradigms	A John Wilwy & Sons, Inc., Pubication , ISBN: 978-0-470-88799-8
2	Rishabh Sharma	Cloud Computing	Wiley Publication, ISBN: 978-81-265-5306-8
3	Rajkumar Buyya. Christian Vecchiola,	Mastering Cloud Computing	Tata McGraw Hill Publication, ISBN: 978-1-25-902995-0

B) Websites:

1. https://nptel.ac.in/courses/106105167/

Semester: VI   Course: Data Warehousing and Mining (Elective II)   Course code: DCE3204B

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	-	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Identify need of data warehousing and benefits of data mining.

2. Classify data mining systems.

3. Differentiate between OLAP and OLTP.

4. Apply classification techniques on different data sets.

5. Apply various clustering methods on different data sets.

6. Understand various text mining functions.

COURSE CONTENTS:

Unit	Contents	Hours	Marks
I	**Introduction to Data Mining:** Data Mining, Data Warehouse, Transactional Databases, Data Mining Functionalities Characterization and Discrimination, Mining frequent patterns, Association and correlation.	8	18
II	**Methodology of Data mining:** Classification and Prediction, Cluster Analysis, Classification of Data Mining Systems, Data Mining Task Primitive, Integration of Data Mining systems, Major issues in Data Mining, Data integration and transformation, Data reduction, Data discretization.	6	16
III	**Data Warehouse and OLAP technology:** Data Warehouse, Multidimensional data Model, Data warehouse architecture, Data Warehouse implementation, OLAP , Data Warehouse and data mining.	6	16
IV	**Association Rules and Classification**: Efficient and Scalable Frequent item set Mining methods, Mining various kind of association rules from association mining to Co-relation analysis. **Classification:** Issues, Classification by Decision tree induction, Bayesian Classification, Rule-based classification, Support Vector Machines	6	16
V	**Cluster Analysis**: Definition, Types of data in cluster analysis,Clustering methods- Partitioning methods, K-means and k-medoids, Hierarchical methods.	8	18
VI	**Mining Complex Data**: Spatial Data Mining, Text Mining and Mining WWW.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Jiawei Han and Micheline Kamber	Data Mining - Concepts and Techniques (Third Edition)	Elsevier, 2006
2	ADRIANS	**Data Mining**	Pearson
3	Joel Grus	Data Science from Scratch	O'Reilly

B) Websites:

1. https://nptel.ac.in/courses/106106093/31
2. https://nptel.ac.in/courses/110105076/28

Semester: VI   **Course: Computer Graphics (Elective II)**   **Course code: DIT3201A**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. To provide comprehensive introduction about computer graphics systems
2. Understand the basics principles of implementing computer graphics primitives
3. Familiarity with techniques of clipping and line drawing algorithms
4. Study and implementation of two dimensional algorithms
5. Familiarity with techniques of two dimensional and three dimensional transformations
6. To involve students in design, development and testing of computer graphics algorithm

COURSE CONTENTS

Unit	Contents	Hours	Marks
I	Demonstrate text mode and graphics mode, Raster scan display, Primitive operations: - moveto, lineto, Graphics file formats: Basics, advantages, disadvantages – BMP – GIF – JPEG – TIFF – PCX, Graphics Mode Functions- Text mode, Graphic mode Shapes, colors	8	18
II	Draw Lines using various algorithms, Generate circle with various algorithms, Draw polygons and demonstrate their filling procedures, Basic concepts in line drawing, Line drawing algorithms: DDA algorithms, Bresenham's algorithm.	6	16
III	Circle generating algorithms: Symmetry of circle, DDA circle drawing algorithm, Bresenham's circle drawing algorithm. Polygons – Types of polygons, inside –outside test, Polygon filling: Flood fill, Scanline algorithm.	6	16
IV	Demonstrate 2D transformation techniques, Demonstrate 3D transformation techniques. 2D Transformation: Scaling, Reflection, Shearing, Rotation, Translation, Rotation about an arbitrary point. 3D Transformation: Scaling, Rotation, Translation, Rotation about arbitrary axis.	6	16
V	Operate on various clipping algorithms. Summarize the different transformations. Line clipping: Cohen-Sutherland Line clipping algorithm, Midpoint subdivision algorithm. Polygon clipping: Sutherland – Hodgeman Polygon clipping algorithm.	8	18
VI	Draw various curves Predict various fractal types. Curve generation: Arc generation using DDA algorithm, Interpolation, Approximation, B-Spline, Bezier curves. Curves Fractals: Hilbert's Curve, Koch curve, Fractal lines, Fractal Surfaces.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	M. Pauline Baker, Donald Hearn	Computer Graphics	Pearson
2	Apurva Desai	Computer Graphics	PHI

B) Websites:

1. https://nptel.ac.in/courses/106106090

Semester: VI   **Course: Software Testing (Elective II)**   **Course code: DIT3201B**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
3	1	--	3	30	70	--	--	100

Course Outcomes: On successful completion of this course, the students will be able to:

1. Identify impact of software bug and importance of software testing.
2. Select appropriate method of software testing.
3. Test software logic flow.
4. Validate software functionality using test cases.
5. Design test cases for any software under test.
6. Generate test case report of software under test.

COURSE CONTENTS:

Unit	Contents	Hours	Marks
I	**Software Testing Background**: Software error case studies – Disney Lion King, Intel Floating Point Division Bug, NASA Mars Polar Lander, Y2K Bug, Terms for software Failures, A Formal Definition, Bug occurrence, cost of bugs, Goal of software tester, Traits for Good software tester, Software Development life cycle, Software Testing: Definition, goal of Software Tester, Testing Axioms. Software Testing Life Cycle. Software Testing Terms: Precision, and Accuracy, Verification and Validation, Quality and Reliability, Quality Control, Quality Assurance, V model.	8	18
II	**Testing methodologies:** Black Box and White Box Testing, Static and Dynamic Testing, Static Black Box Testing: Testing the Specification, Performing a High-level, Review of the Specification, Low level, Specification Test Techniques. **Dynamic Black Box Testing**: Test-to-pass and Test-to-Fail, Equivalence Partitioning, Data Testing: Boundary Conditions, Sub-Boundary Conditions, Default, Empty, Blank, Null, Zero and None, Invalid, Wrong, Incorrect and Garbage Data. State Testing: Testing Software's Logic Flow, Testing States to Fail.	6	16
III	**Code Examination:** Static White Box Testing, Formal reviews: Peer Reviews, Walkthrough, Inspection, Coding Standards and Guidelines, Generic Code Review Checklist: Data Reference Errors, Data Declaration Errors, Computation Errors, Comparison Errors, Control Flow Errors, Subroutine Parameter Errors, Input/output Errors. **Dynamic White Box Testing:** Testing the Pieces. Data Coverage: Data Flow, Sub Boundaries, Formulas and Equations, Error Forcing, Code Coverage, Dynamic White Box Testing Vs Debugging.	6	16
IV	**Types of testing:** Unit Testing: Stub and Driver, Integration Testing: Top-Down, Bottom-Up, Sandwich approach. System Testing: Functional Requirement testing and Non Functional Requirement Testing. Acceptance testing: Alpha and Beta.	6	16

V	**Test Documentation:** Test Planning: The goal of the test Planning, Test Planning Topics: high level expectations, people, places and things, definitions, Inter group Responsibilities, what will and won't be tested, test phases, test strategy, resource requirements, tester assignments, test schedule, test cases, Metrics and Statistics, Risk and Issues. **Writing and Tracking Test Cases:** Test case planning, test design, Test Case, test procedures, test case organization & tracking.	8	18
VI	**Software Testing Report:** Test Report: A bug's life cycle, Bug tracking system: Manual Bug, Reporting and Tracking, Automated bug reporting and tracking.	6	16

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Ron Patton	Software Testing	PEARSON
2	Srinivasan Desikan Gopalaswamy Ramesh	Software Testing: Principles and practices.	PEARSON
3	M. G. Limaye	Software Testing: Principles, Techniques and Tools	Tata McGraw-Hill

B) Websites:

1. https://nptel.ac.in/courses/106101163/
2. https://www.udemy.com/courses/development/software-testing/

Semester: VI   **Course: Python Lab**   **Course code: DCE3205**

Teaching and Examination Scheme: **Credits: 2**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	ESE	MSE	TW	PR/OR	TOTAL
--	--	2	--	--	--	50	25€	75

€: Examination with External examiner

Course Outcomes: On successful completion of this course, the students will be able to:

1. Use string related methods
2. Select appropriate control structure to solve a given problem.
3. Use methods related to list.
4. Implement different sorting algorithms.
5. Implement different searching algorithms.
6. Use sets, dictionaries and tuples.

SUGGESTED LIST OF EXERCISES/PRACTICAL:

1. Edit/compile/run a program to display the statements given below on two different lines.
2. Edit/compile/run a program to display "Hello World!" "Welcome to Python Programming"
3. Edit/compile/run a program to initialize the string "hello world" to a variable Str1 and convert the string into uppercase.
4. Edit/compile/run a program to read the radius of a circle and print the area of the circle.
5. Edit/compile/run a program to read a four digit number through the keyboard and calculate the sum of its digit.
6. Edit/compile/run a program to display the Floyd Triangle.
7. Edit/compile/run a program to read a string and display the total number of uppercase and lowercase letters.
8. Edit/compile/run a program to duplicate all the elements of a list.
9. Edit/compile/run a program to implement quick sort/ merge sort/ bubble sort.
10. Write a function which takes a tuple as a parameter and returns a new tuple as the output, where every other element of the input tuple is copied, starting from the first one.
11. Write the function called how_many, which returns the sum of the number of values associated with a dictionary.

Semester: VI   **Course: Linux Lab**   **Course code: DCE3206**

Teaching and Examination Scheme: **Credits: 4**

Teaching Scheme – Hours per week			Examination Scheme – Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
2	--	2	--	--	--	50	50(@)	100

@: Examination with Internal Examiner

COURSE OUTCOMES:

1. Install and configure Linux operating system.
2. Create user accounts and perform user management.
3. Take backup of files and restore them.
4. Use communication and networking commands and setup a LAN.
5. Develop shell script using control and loop statements.
6. Create arithmetic programs using PERL scripts.

Suggested List of experiments:

1. Installing Linux: Quick Installation, Detailed installation procedure, Special Installation topics.
2. Understanding System Administration: Using root login, Becoming super user, Administrative commands
3. Identify and use of the major desktop components of GNOME and KDE interfaces and their functions.
4. Setting up Linux as a Proxy server.
5. Setting up and supporting users: Creating user accounts, setting user defaults, modifying accounts, deleting accounts, Checking disk quotas, Sending mail to user.
6. Backing up and restoring files: Selecting backup strategy, Magnetic tape, Writable CD`s, Backing up hard drive, Backing up files with dump, Automating back up, Restoring backed up files.
7. Configure LAN and use communication and networking commands: **finger, talk, mesg, mailx, pine, telnet, ftp.** Resolving of IP addresses.
8. Use simple and advanced filters: **pr, head, tail, cut, paste, sort, uniq, te, grep, sed, awk.**
9. TCP/IP network administration: **ifconfig, ping, netstat, inetd, pppd**, etc.
10. Introduction to Shell programming: .sh files, simple shell scripts, execution of shell scripts, Arithmetic operations.
11. Edit/Compile/Execute a shell scripts: Relational operators, numeric comparisons, string comparisons, and control and loop statements.
12. PERL programming:.pl files, simple PERL scripts, execution of PERL scripts, Arithmetic operations, Relational operators, numeric comparisons, string comparisons, control and loop statements, split operation on array.

Learning Resources:

A) Books:

SR. No.	AUTHOR	TITLE	PUBLISHER
1	Sumitabha Das	UUNIX Concepts and Applications	Tata McGraw-Hill
2	J.N. Hall, J.A. McAdams and Brion D Foy	Effective Perl Programming: Ways to Write Better, More Idiomatic Perl	Pearson Education India
3	Tom Phoenix, Randal Schwartz and Brian Foy	Learning Perl	SPD/O'Reilly

B) Websites

1. https://nptel.ac.in/courses/117106113/

2. https://nptel.ac.in/courses/106108101/20

Semester: VI   **Course: Android Lab**   **Course code: DCE3207**

Teaching and Examination Scheme: **Credits: 2**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	2	--	--	--	50	25(@)	75

@: Examination with Internal Examiner

Course Outcomes: The student will be able to,

1. Describe Mobile Application development concepts.

2. Work with android application development and its structure

3. Use concepts of layout, GUI and design in Application development

4. Use event and exception handling for application development

5. Working with menus, application launching and working with database

SUGGESTED LIST OF EXERCISES/PRACTICAL (Any TEN of the following):

1) Installation and setup of java development kit(JDK), setup android SDK, setup Android IDE, setup android development tools (ADT) plugins, create android virtual device.
2) Create "Hello World" application to "Hello World" in the middle of the screen in the red colour with white background.
3) Create application for demonstration of android activity life cycle.
4) Create sample application with login module. (Check username and password), validate it for login screen or alert the user with a Toast.
5) Create and validate a login application using username as Email ID else login button must remain disabled.
6) Create and Login application and open a browser with any one search engine
7) Create an application to display "Hello World" string the number of times user inputs a numeric value. (Example. If user enters 5, the next screen should print "Hello World" five times.)
8) Create spinner with strings from the resource folder (res >> value folder). On changing spinner value, change image.
9) Create an application to change screen color as per the user choice from a menu.
10) Create an application that will display toast (Message) at some regular interval of time.
11) Create a background application that will open activity on specific time.
12) Create an application that will have spinner with list of animation names. On selecting animation name, that animation should effect on the images displayed below.

13) Create an UI listing the diploma engineering branches. If user selects a branch name, display the number of semesters and subjects in each semester
14) Use content providers and permissions by implementing read phonebook contacts with content providers and display in the list.
15) Create an application to call a phone number entered by the user the Edit Text.
16) Create an application that will create database to store username and password.
17) Create an application to insert, update and delete a record from the database.

Semester: VI   **Course: Project**   **Course code: DCE3208**

Teaching and Examination Scheme: **Credits: 6**

Teaching Scheme – Hours per week			Examination Scheme - Marks					
TH	TU	PR	PAPER HOURS	MSE	ESE	TW	PR/OR	TOTAL
--	--	6	--	--	--	75	75(€)	150

€: Examination with External examiner

Course Outcomes: On successful completion of this course, the students will be able to:

1. Participate effectively in group work.
2. Collect, analyse and synthesise the data.
3. Conduct a survey and investigate the activities.
4. Make appropriate decision.
5. Act as leader for group task.
6. Develop cost consideration.
7. Prepare technical reports.

Course Contents: The following activities shall be monitored and guided by the guide every week during the contact hours provided for the same:

1. Implementation of project ideas using the designs from phase I
2. Testing of the code
3. Packaging and deployment phase
4. Documentation of project work
5. Submission: soft & hard copies
6. Presentation and demonstration of project work during the final project examination