TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

VSEMESTER

Col No	SUBJECT CODE	SUBJECT	HOURS PER WEEK		
			THEORY	PRACTICAL	TOTAL
1	4052510	Python Programming	5		5
2	4052520	Cloud Computing and Internet of Things	6		6
3		**Elective Theory-I**	5		5
	4052531	Component Based Technology			
	4052532	Artificial Intelligence and Data analytics			
	4052533	Mobile Computing			
4	4052540	Python Programming Practical		4	4
5	4052550	Cloud Computing and Internet of Things Practical		4	4
6		**Elective Practical-I**		4	4
	4052561	Component Based Technology Practical			
	4052562	Data analytics using Python Practical			
	4052563	Mobile Computing Practical			
7	4052570	Entrepreneurship and Startup		4	4
			16	16	32
		Physical Education			2
		Library			1
	Total				35

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name   :   1052:Diploma in Computer Engineering

Subject Code   :   4052510

Semester   :   V

Subject title   : Python Programming

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per Semester: 16 Weeks

Subject	Instructions		Examination			Duration
	Hours/ Week	Hours / semester	Internal Assessment	End Semester Examination	Total	
Python Programming	5 hrs	80 Hrs	25	100*	100	3 Hrs

*Examination will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topic	Hours
I	INTRODUCTION	14
II	CONTROL STRUCTURE AND FUNCTIONS	15
III	STRINGS AND LISTS	14
IV	TUPLE, SET,DICTONARIES	15
V	FILES AND EXCEPTION HANDLING	15
TEST AND MODEL EXAM		7
TOTAL		80

RATIONALE:

To introduce the student to the basic features of industry standard programming language and impart skills to develop industry standard solutions to the problems. The python language is one of the most accessible programming languages available because it has simplified syntax and not complicated, which gives more emphasis on natural language. Due to its ease of learning and usage, python codes can be easily written and executed much faster than other programming languages. Python has several modules to write programs to solve Artificial Intelligence, Machine Learning, Data Analysis problems. Python is a cross-platform language used by many leading organizations such as Google and NASA.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- ➢ To read and write simple Python programs.
- ➢ To develop Python programs with conditionals and loops
- ➢ To define Strings in Python and operations on String.
- ➢ To define Python functions and call them.
- ➢ Decompose a Python program into functions.
- ➢ Represent compound data using Python lists, tuples, dictionaries.
- ➢ To use Python data structures -- lists, tuples, dictionaries.
- ➢ To do input/output with files in Python.
- ➢ To do exception handling in Python

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DETAILED SYLLABUS

Content: Theory

UNIT	Name of the Topics	Hours
I	**Introduction to Python** **Features of Python** - Installing and running Python - interpreter and Interactive mode - Identifiers - Reserved Keywords - Variables - Comments in Python	4
	Data Types – Numeric, String, List, Sets, Tuple, Dictionary, Boolean; Operators – Arithmetic, Relational, Assignment, Logical, Bitwise, Membership operator, identity operator.	4
	Statements and Expressions, String Operations; Boolean Expressions, Data Type Conversion, Type coercion; Input from keyboard - input function, raw_input function, Mutable and immutable Objects; Illustrative programs.	5
II	**Decision Making, Control structure and Functions** **Decision Making** – Simple if, if…else and if … elif statement;Control Statement - for loop, range(), while, break , continue, pass	5
	Functions: Built in functions-Mathematical functions , Date and Time, dir(), help() Functions; User defined functions-Return values, parameters and arguments, function calls, local and global scope, function composition, recursion, anonymous functions.	5
	Writing Scripts in Python; Illustrative programs.	5
III	**Strings and Lists** **Strings :**Strings in python, String functions and methods, string slicing, immutable property, string Traversal, Escape Characters, string formatting operators and functions.	5
	Lists — Creation of List, values and accessing elements, mutable property, Traversing a List, copying the list, altering values, deleting elements from list.	5
	Built-in List operators and built-in methods. Illustrative Programs	4

IV	**Tuples and Dictionaries**: **Tuples**-creating, accessing values, immutable property, assignment of tuples, returning tuples, tuples as arguments - variable length arguments - basic tuple operations, Built-in tuple functions.	**8**
	Dictionaries: Creating a Dictionary , accessing values, updating dictionary, deleting elements from dictionary; dictionary keys-Properties, operations in Dictionary, Built-in dictionary methods, Illustrative Programs.	**7**
V	**Files and Exception Handling** **Files:** Text files, opening a file, closing a file, reading from a file and writing into a file, file opening modes, closing a file, File Object Attributes, File positions, renaming, deleting a file and files related methods.	**7**
	Directory : Directory methods - mkdir(), chdir(), getcwd(), rmdir().	**2**
	Exceptions in Python: Definition - Built-in exceptions, Handling Exceptions-try…except, except with No Exception, except with Multiple Exceptions, try…finally; User defined exceptions. Illustrative programs	**6**

REFERENCES

S.No	Title	Author	Publisher	Year of Publishing Edition
1	Introduction to Computing and Problem Solving using Python	E.Balagurusamy	McGraw Hill Education(India) Pvt. Ltd.	1st Edition / 2016
2.	Learning Python Programming	Jeffrey Elkner, Allan B. Downey, Chris Meyers	Samurai Media Limited.	2016
3.	Taming Python By Programming	Jeeva Jose	Khanna Book Publishing Co(P) Ltd	2017 Reprinted 2019
4.	Python Programming	Ashok Namdev Kamthane and Amit Ashok Kamthane	McGraw HillEducation(India) Pvt. Ltd.	2018
5.	Learn and Practice Python programming	Swapnil Saurav	Eka Publishers	2nd Edition/ 2020
6.	Programming in Python	Dr.Pooja Sharma	BPB Publications	2017

Python Online Learning Resources:

https://www.learnpython.org

www.python.org ,

https://www.tutorialspoint.com/python

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name   : 1052:Diploma in Computer Engineering

Subject Code   : 4052520

Semester   : V

Subject Title   : Cloud Computing and Internet Of things.

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	End Semester Examinations	Total	
Cloud Computing and Internet Of things.	6	96	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	INTRODUCTION TO CLOUD COMPUTING	16
II	CLOUD COMPUTING ARCHITECTURE AND SERVICES	17
III	SECURITY IN THE CLOUD	16
IV	INTRODUCTION TO INTERNET OF THINGS	20
V	INTERNET OF THINGS PLATFORM: DESIGN AND DEVELOPMENT	20
	Test and Model Exam	7
Total		**96**

RATIONALE:

The course aims to groom the students to enable them to work on current technology scenarios: in specific about the Cloud Computing as well as Internet of Things and prepare the students to keep pace with the changing face of technology and the requirements of the growing IT industry. The course curriculum has been designed keeping in view the emerging trends in advanced Cloud Computing as well as IoT and futuristic human resource requirements of the IT industry.

OBJECTIVES:

- To understand an overview of the basic concepts of cloud Computing;
- To understand the highlight and advantages of deploying cloud Computing;
- To know the practical adoption of a cloud deployment through real life case studies.
- To Know the Advantages and limitations of cloud Computing and List the benefits of cloud computing
- To understanding Cloud architecture
- To Know the Cloud services and benefits
- To address the security issues in cloud
- To assess the vision of IoT
- To understand the dynamic, self-configuring and inter-operable network of things
- To understand the design and development methodology for IoT domains.
- To build simple IoT systems using Raspberry Pi

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DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**INTRODUCTION TO CLOUD COMPUTING**	
	Cloud computing overview – Origins of Cloud computing – Cloud components -Essential characteristics - on-demand self-service, Broad network access, Location independent resource pooling, Rapid elasticity, measured service	5
	Architectural influences – High-performance computing, utility and enterprise grid computing, Autonomic computing, Service consolidation, Horizontal scaling, Web services, High scalability architecture	6
	Cloud scenarios- Benefits - scalability, simplicity, vendors, security. Limitations – Sensitive information, Application development – Security concerns -privacy concern with a third party, security level of third party, security benefits. Regularity issues - Government policies	5
II	**CLOUD COMPUTING ARCHITECTURE & SERVICES**	
	Cloud architecture: Cloud delivery model - SPI framework, SPI evolution, SPI vs. traditional IT Model.	3
	Software as a Service (SaaS): SaaS service providers - Web Services –Web 2.0 – Web Operating system -Google App Engine, Salesforce.com and google platform – benefits – Operational benefits, Economic benefits – Evaluating SaaS	3
	Platform as a Service (PaaS): Cloud Plat form & Management –Computation& Storage - PaaS service providers – Right Scale –Salesforce.com - Rackspace - Force.com - services and benefits.	3
	Infrastructure as a Service (IaaS): IaaS service providers -Amazon EC2, GoGrid – Microsoft implementation and support – Amazon EC service level agreement – recent developments – benefits.	4
	Cloud deployment model: Public clouds - private clouds - community clouds - hybrid clouds - Advantages of Cloud computing.	4
III	**SECURITY IN THE CLOUD**	
	3.1 Understanding Cloud Security - Securing the Cloud - Security service boundary: CSA Cloud Reference Model - Securing Data – Brokered cloud storage access - Storage location and tenancy - Encryption	8

		3.2 Cloud Computing Security Challenges - Security Policy Implementation - Policy Types - Virtualization Security Management - Virtual Threat	8
IV	**INTRODUCTION TO INTERNET OF THINGS**		
		Definition and characteristics of IOT - Physical design of IOT - Things in IOT- IOT Protocols- Logical Design of IOT - IOT functional blocks- IOT communication Models - IoT communication API's	7
		IOT enabling Technologies: Wireless sensor networks — Cloud Computing- Big Data Analytics- Communication protocols- embedded systems.	6
		IOT Levels and Deployment templates: IOT Level-1- IOT Level-2- IOT Level-3-IoT Level-4 - IOT Level-5- IOT Level-6	7
V	**IOT PLATFORMS : DESIGN AND DEVELOPMENT**		
		Introduction- IOT Design and Methodology- Purpose and requirements specification- Process specification- Domain model specification- Information model specification- service Specification - IoT level specification- functional view specification -Operational view specification - Device and component integration- application development.	10
		What is an IOT device? - Basic Building blocks of an IoT Device - Exemplary Device: Raspberry Pi - About the Board - Linux on Raspberry Pi-Raspberry Pi Interfaces- Other IOT devices.	10

Reference Books

1	CLOUD SECURITY: A Comprehensive Guide to Secure Cloud Computing	Ronald L. Krutz Russell Dean Vines	Wiley Publishing, Inc
2	Cloud Computing A Practical Approach 2008 Edition	Cloud Computing A practical Approach	Tata McGrawHill
3.	Cloud Computing Bible	Barrie Sosinsky	Wiley Publishing, Inc
4	Internet of Things — A Hands on Approach	By Arshdeep Bahga and Vijay Madisetti	Universities Press, ISBN: 9788173719547
5	Designing the Internet of Things	Adrian McEwen & Hakim Cassimality	Wiley India, ISBN: 9788126556861

Course Name   : 1052:Diploma in Computer Engineering

Subject Code   :   4052531

Semester   :   V

Subject Title   :   Elective Theory – I Component Based Technology

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	End Semester Examinations	Total	
Component Based Technology	5	80	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	INTRODUCTION TO .NET FRAMEWORK AND C#.NET	15
II	APPLICATION DEVELOPMENT USING C#.NET	15
III	APPLICATION DEVELOPMENT USING ADO.NET	15
IV	INTRODUCTION TO ASP.NET	14
V	XML	14
Test and Model Exam		7
Total		80

RATIONALE:

.NET Framework is changing the way developers write applications. .NET Framework provides a number of components to create many types of applications including those for consoles, Windows, mobile units and the web. Using .NET framework the data can be made available anytime, anywhere and on any device.This subject introduces the basics of .NET Framework. Writing applications on C#.Net is covered in this course. Concepts of developing Window applications using C#.NET. Concepts of developing web applications using ASP.NET are discussed. This course helps to use ADO.NET to write the applications to connect with the back end database. The subject also enables the users to know the concepts of XML and the XML web services.

OBJECTIVES:

On completion of the following units of syllabus contents, the students must be able to

- List the major elements of the .NET Framework and describe some of the major enhancements to the new version of C#.
- Describe the basic structure of a C#.NET project and use the main features of the integrated development environment (IDE).
- Use the new language features and syntax in C# .NET.
- Explain and use the basic concepts and terminology of object-oriented design and programming in C#.NET.
- Use the basic concepts and terminology of object-oriented in C# .NET.
- Create applications by using Microsoft Windows Forms.
- Create applications that use ADO.NET.
- List down the features of ASP.NET.
- Create web controls using ASP.NET.
- Learn about server controls and events in ASP.NET.
- Set up and deploy various types of C# .NET-based applications.
- Develop Window applications using XML as back end database

DETAILED SYLLABUS

Unit	Name of the Topics	Hours
I	**INTRODUCTION TO .NET FRAMEWORK and C#.NET**	**15**
	Chapter: 1.1: **Introduction to .NET framework and DOT NET CORE:** Features of .NETframework, Features of .NET CORE,.Net Architecture – Managed Code and the CLR –Intermediate Language, Metadata and JIT Compilation-Automatic Memory Management. - Assembly, .NET objects, .NET web services, .net core Vs.net framework,	3
	Chapter: 1.2: **Visual Studio .NET** - Features, Using the .NETFramework, Exploring the Visual Studio Integrated Development Environment - System requirements - Versions	3
	Chapter: 1.3: **INTRODUCTION TO C#.NET**-- Variables and constants –data types– declaration. Operators- types- precedence – Expressions – Program flow – Decision statements – if .. then, if..then..else, switch..case, Loop statements- while, do...while, for..next, for..each..next, LINQ.	4
	Chapter: 1.4: **Types:** Value data types - Structures, Enumerations. Reference data types – Single dimensional- Multi-dimensional arrays- Jagged arrays- Dynamic arrays	3
	Chapter: 1.5: **Classes & objects** - Creating and using your own classes - Data members and member methods - Instantiate an object, abstract class – static class	2
II	**APPLICATION DEVELOPMENT USING C#.NET**	**15**
	Chapter: 2.1: **Windows programming**- Creating windows Forms- Working with Toolbox Controls - Button, Check Box, Combo Box, Label, List Box, Radio Button, Text Box, Group Boxes, Picture Box	4
	Chapter: 2.2: **Advanced Controls & Events** : Timer , Progress Bar, Month Calendar , ToolTips, Tab Controls, Panels -Events-Click, Close, Deactivate, Load, MouseMove, Mouse Down, MouseUp, Keypress ,KeyDown, KeyUp	3

	Chapter: 2.3: **Multiple Document Interface (MDI) Forms** – Creating MDI Applications – Creating MDI Child Windows -Arranging MDI Child Windows	4
	Chapter: 2.4: Menus and Dialog Boxes – Creating menus — Menu items – Creating Submenus , Menu Shortcuts, Context menu - Using dialog boxes – show Dialog() method.	4
III	**APPLICATION DEVELOPMENT USING ADO.NET**	**14**
	Chapter: 3.1: Features of ADO.NET. Architecture of ADO.NET - ADO.NET providers - Connection – Command – Data Adapter – Dataset.	5
	Chapter: 3.2: Accessing Data with ADO.NET: Connecting to Data Table data using Command Objects – Understanding Data Set and working with Data Column and DataRow - Data Tables - Working with Data Grid View	5
	Chapter: 3.3: Create an ADO.NET application – Using Stored Procedures	4
IV	**INTRODUCTION TO ASP.NET**	**14**
	Chapter: 4.1: ASP.NET Features: ASP .Net Life cycle, View state, session state, Change the Home Directory in IIS - Add a Virtual Directory in IIS Set a Default Document for IIS – Change Log File Properties for IIS – Stop, Start, or Pause a Web Site – Global.asax file	4
	Chapter: 4.2: Creating Web Controls: Web Controls - HTML Controls, Using Intrinsic Controls, Using Input Validation Controls, Selecting Controls for Applications – Adding web controls to a Page	4
	Chapter: 4.3: Creating Web Forms: Server Controls – Types of Server Controls - Adding ASP.NET Code to a Page.	3
	Chapter: 4.4: .NET CORE WEB API : What's web API?, Web API features, Restful services, Method of REST	3
V	**XML**	**14**
	Chapter: 5.1: Introduction: Advantages – HTML Vs XML – Browsing and parsing XML - Creating a XML file - Data island – Well formed XML document - XML components: elements - Entities - Comments - Processing instructions - Attributes	5

			5
Chapter: 5.2: **DTD:** Declarations in DTD: Element, Attribute, Entity and Notation – Construction of an XML document – XML Namespaces – Declaring namespaces - Default namespaces - XML schema – Need and use of Schema – Building blocks – Simple elements – Defining attributes – Complex elements			5
Chapter: 5.3: **XML with .NET:** XML Serialization in the .NET Framework – SOAP Fundamentals- Using SOAP with the .NET Framework.			4

Reference Books

S.No	Author Name	Title	Publisher
1.	Douglas J. Reilly	Designing Microsoft ASP.NET Applications	Microsoft Press
2.	ISRD Group	Applicationsof.NET Technology	TMGH Education PvtLtd.,New Delhi
3.	E. Balagurusamy	Programming In C#, 3E	Tata McGraw-Hill Education,
4.	Rebecca M. Riordan	ADO NET 2 0 Step by Step	
5.	David S. Platt	Introducing Microsoft .NET	Microsoft Press
6.	-	Introduction to Microsoft ASP.NET - Work Book	Microsoft Press

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DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name   : 1052:Diploma in Computer Engineering

Subject Code   : 4052562

Semester   V

Subject title   : Elective Theory -I   Artificial Intelligence and Data Analytics

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per Semester 16 Weeks

Subject	Instructions		Examination				
	Hours/ Week	Hours/ Semester	Marks				Duration
Artificial Intelligence and Data Analytics	5	80	**Internal Assessment**	**End Semester Examination**	**Total**		
			25	100 *	100		3 Hrs

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit No.	Topic	No. of Hours
I	Artificial Intelligence	15
II	Introduction to Machine Learning	14
III	Data Analytics and NumPy Library	15
IV	Data Analysis with Pandas	15
V	Visualization with Matplotlib	14
Test and Revision		7
Total		80

RATIONALE:

This course provides the foundations for AI problem solving techniques and data analytics and articulates the different dimensions of these areas. The syllabus is designed to provide exposure to the theory as well as practical systems and software used in data analysis. This course explains fundamental data science techniques and the various Python programming packages required for data science.

OBJECTIVES:

After studying this subject students will be able

- To understand the fundamentals of Artificial Intelligence and its importance.

- To understand the techniques used in AI.

- To understand how the knowledge is represented, and the characteristics of intelligent agents.

- To Identify and formulate appropriate AI methods for solving a problem.

- To understand some of the search strategies and the constraint satisfaction problems.

- To understand the principles of Machine Learning.

- To explore some of the real-world applications of Machine learning techniques.

- To understand a range of topics and concepts related to data analytics.

- To familiarize with the Python NumPy library for array processing.

- To utilize the Pandas packages in Python for exploratory data analytics.

- To create informative visualizations with matplotlib to identify patterns.

DETAILED SYLLABUS

Unit	Name of the Topics	Hours
I	**Artificial Intelligence**	**15**
	1.1 Artificial Intelligence: What is AI?-Types of AI-History of AI-Turing Test- Structure of AI-Goals of AI-Importance of AI-Techniques used in AI-Perception, Understanding and Action-Technological drivers of modern AI.	4
	1.2 Knowledge: Definition-Knowledge Representation-objectives and requirements-practical aspects of representation-Components **Intelligent Agents**: Agents and Environments-Properties of environments-characteristics of agents- classification of agents -	4
	1.3 Problem Solving: Problem Formulation-Goal Formulation-State Space Search-Search Problem-Basic search algorithm-Search Tree-Search strategies -Uninformed and informed search-Breadth First Search, Depth First Search, Best First Search-Constraint Satisfaction Problem (CSP)-Backtracking Search. Problem Definitions: N Queen Problem, 8 Puzzle Problem, Tic-Tac-Toe.	7
II	**Introduction to Machine Learning**	**14**
	2.1 Learning: Strategies of Learning- Learning Model- Classes of Learning (Supervised, Unsupervised, Reinforcement)- Process of ML- Common types of ML algorithms.	5
	2.2 Neural Network: Biological and Artificial, Mathematical model of a neuron	3
	2.3 Machine Learning Applications: Learning Associations, Regression, Classification, Prediction-Natural Language Processing (NLP)- Automatic Speech Recognition (ASR)- Machine Vision-Robotics.	6
III	**Data Analytics and Computing with NumPy**	**15**
	3.1 Data Analytics: Data-Types of Data- Importance of Data- Data Analysis Vs Data Analytics-Types of Data Analytics- Elements of Analytics- Data Analysis Process- Qualitative and Quantitative analyses- Open-Source Data.	4
	3.2 Introduction to Python: Features of Python-Installing Python-	5

		Python IDEs- PyPI Python Package Index- Pip Python package manager- Importing Libraries and Functions- Python data structures (list, set, tuple, dict)- Functional programming (map, filter, reduce, lamda, list comprehension).	
		3.3 NumPy Library: Introduction- Installation- Ndarray: creating an array, intrinsic creation of an array, Data types- basic operations- aggregate functions- Indexing, slicing, Iterating- Conditions and Boolean arrays- Array manipulation: Joining, splitting, shape changing, sorting- Structured arrays- Reading and Writing array data on a File.	6
IV		**Data Analysis with Pandas**	15
		4.1 Introduction: Pandas data structures: **Series** - Declaration, selecting elements, assigning values, Filtering values, operations, mathematical functions, evaluating values, Handling missing data, creating series from dictionaries, adding two series.	5
		4.2 Data Frame: Defining, Selecting elements, assigning values, membership, deleting a column, filtering. **Index Objects**: Indexing, Reindexing, Dropping- sorting and ranking- Descriptive Statistics	4
		Data Loading: Reading and Writing csv, xls, text data files- **Data Cleaning and Preparation**: Handling missing data, Removing duplicates, replacing values- Vectorized String Methods- Hierarchical Indexing- Merging and Combining- Data aggregation and Grouping.	6
V		**Visualization with Matplotlib**	14
		5.1 Data Visualization: Introduction to Matplotlib -PyPlot package- Figures and Subplots-showing plots and images	4
		5.2 Customizing Plots: Colors, Markers, Line Styles, Limits, Tics, Labels, Legends, Grids - Annotating with text-Matplotlib configuration	4
		5.3 Chart types: Line, Bar, stacked bar, Box plots, pie chart - Histogram and Density plots- Scatter plot- Saving Plots to a file- Close and clear plots.	6

Reference books

1. Tom Taulli - Artificial Intelligence Basics.
   A Non-Technical Introduction-A press (2019)

2. Chowdhary K.R - Fundamentals of artificial intelligence-Springer (2020)

3. Stuart J.Russell,Peter Norvig- Artificial Intelligence A Modern Approach-(Prentice Hall- 2010, Edition 3)

4. NPTEL Web Content-Artificial Intelligence, Prof.P.Mitra, Prof.S.Sarkar, IIT Kharagpur (Link: https://nptel.ac.in/courses/106/105/106105078/)

5. Fabio Nelli, Python Data Analytics, APRESS, 2015

6. Wes McKinney, Python for Data Analysis: Data Wrangling with Pandas, NumPy,and IPython, O'REILLY 2018, Second Edition

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name   : 1052:Diploma in Computer Engineering

Subject Code   4052533

Semester   : VI

Subject   : Elective Theory -I Mobile Computing

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per Semester 16 Weeks

Subject	Instructions		Examination				
Mobile Computing	Hours/ Week	Hours/ Semester	Marks				Duration
	5	80	Internal Assessment	**End Semester** Examination	Total		
			25	100 *	100		3 Hrs

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit No.	Topic	No. of Hours
I	Introduction to Mobile Computing	14
II	Mobile and Smart TV OS	14
III	Android Development Environment	15
IV	Basic and Advanced Views	15
V	Location Based Services and SQLite	15
Test and Revision		07
Total		80

RATIONALE:

Mobile Application development is the very hot business domain. Majority of the corporate have a separate division for the development of mobile applications. It is imperative that students must know the way to apply advanced data communicating methods and networking protocols for wireless and mobile devices.

Students must utilize and employ application frameworks for developing mobile applications including under disconnected and weakly connected environment. They should be in a position to select components and networks for particular application , creatively analyze mobile and wireless networks and critically analyze security issues of mobile and wireless computing systems

OBJECTIVES:

Students will be able

- To introduce the characteristics, basic concepts and systems issues in mobile Computing
- To illustrate architecture and protocols in Mobile computing and to identify the trends and latest development of the technologies in the area
- To understand the network protocols governing the mobile communication
- To know the different kinds of mobile OS prevailing in the market
- To know Android OS in detail
- To know Apple iOS and Smart TV OS
- To understand the components of a Mobile App.
- To give practical experience in the area through the development of Mobile apps
- To design successful mobile computing applications and services
- To evaluate critical design tradeoffs associated with different mobile technologies, architectures, interfaces and business models and how they impact the usability, security, privacy and commercial viability of mobile and pervasive computing services and applications
- To know the development of Mobile apps using SQLite database
- To know the cross platform application development tools

DETAILED SYLLABUS

Elective- I   Mobile Computing

Unit	Name of the Topics	Hours
I	**Introduction to Mobile Computing**	**14**
	Chapter 1.1 Introduction to Mobile Computing Evolution of Mobile Computing - Important terminologies	4
	Chapter 1.2 Wireless LAN and Protocols WI-FI and WI-MAX , Bluetooth ,RFID, Wi-Fi-Direct, Li-Fi, LTE, and 6LoWPAN , VoLTE	5
	Chapter 1.3 Cellular Network Generations : Features of 1G,2G ,3G ,4G ,5G	5
II	**Mobile and Smart TV Operating System**	**14**
	Chapter 2.1 Mobile Operating Systems : Evaluation of Mobile Operating System-Handset Manufactures and their Mobile OS- Mobile OS and their features. Linux Kernel based Mobile OS	4
	Chapter 2.2Apple Mobile Operating Systems : History and features of Apple Operating Systems - iPadOS, tvOS, and watchOS	3
	Chapter 2.3 Smart TV operating systems Smart TV Operating System development History - versions and their features	3
	Chapter 2.4 Android Operating System : Android Operating System development History - versions and its feature - The various Android devices on the market , The Android Market application store	4
III	**Android Development Environment**	**16**
	Chapter 3.1 Android Development Environment System Requirements, Android SDK, Installing Java, and ADT bundle - Eclipse Integrated Development Environment (IDE), Creating Android Virtual Devices (AVDs) – Android Studio	4

	Chapter 3.2 Android Architecture Android Architecture - The Linux Kernel, Android Runtime - Dalvik Virtual Machine, Android Runtime – Core Libraries, Dalvik VM Specific Libraries, Java Interoperability Libraries, Android Libraries, Application Framework,	4	
	Chapter 3.3 Creating a New Android Project Defining the Project Name and SDK Settings, Project Configuration Settings, Configuring the Launcher Icon,	4	
	Chapter 3.4 Activity Creating an Activity, Running the Application in the AVD, Stopping a Running Application, Modifying the Example Application, Reviewing the Layout and Resource Files	4	
IV	**Basic and Advanced Views**	**16**	
	Chapter 4.1 Basic Views : Text View, Button, Image Button, EditText, CheckBox, ToggleButton, RadioButton and RadioGroup Views, ProgressBar View, Auto Complete Text View	4	
	Chapter 4.2 Advanced Views : Time Picker View and Date Picker View – List Views – Image View – Menus – Analog and Digital View – Dialog Boxes	4	
	Chapter 4.3 Displaying Pictures & Menus with Views: Image View – Gallery View – ImageSwitcher – GridView - Creating the Helper Methods – Options Menu – Context Menu	5	
	Chapter 4.4 SMS and Dailer : Sending SMS – Receiving SMS – Making phone call	3	
v	**Location Based Services and SQLite**	**16**	

Chapter 5.1 Location Based Services : Obtaining the Maps API Key- Displaying the Map – Zoom Control – Navigating to a specific location – Adding Marker – Geo Coding andreverse Geo coding	5
Chapter 5.2 Content Provider and Storage: Sharing data – view contacts – Add contacts – Modify contacts –Delete Contacts - Store and Retire data's in Internal and ExternalStorage – SQLite - Creating and using databases	5
Chapter 5.3 Android Service : Consuming Web service using HTTP , downloading binary Data –Downloading Text Content – Accessing Web Service	4
Chapter 5.4 Cross Platform App Development : Cross platform application development tools and their features:	
	2

REFERENCE BOOK:

1. J. F. DiMarzio (Author) -Beginning Android Programming with Android Studio, 4th Edition (2016) - Wiley

2. Wei-MengLee -Beginning Android 4 Application Development,2012 - Wiley India Edition

3 Asoke K Talukder,Hasan Ahmed, Roopa R Yavagal Mobile Computing,2005 - MGH

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N - 20 SCHEME

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name   : 1052:Diploma in Computer Engineering

Subject Code   4052540

Semester   : V Semester

Subject   : Python Programming Practical

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 Weeks

Subject	Instructions		Examination			Duration
	Hours/ Week	Hours / semester	Internal Assessment	End Semester Examination	Total	
Python Programming Practical	4	64	25	100*	100	3 Hrs

* Examinatiion will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

To write, debug and run programs in Python to understand the basic concepts of industry standard modern programming language.

Objectives:

- ➢ To write, test and debug simple Python programs
- ➢ To Implement Python Programs with conditionals and Loops
- ➢ To use functions for structuring Python Programs
- ➢ To implement string manipulation functions using Python Program
- ➢ To implement List and its built-in functions and methods
- ➢ To implement Tuples and passing tuple as arguments
- ➢ To create Python Dictionaries and updating Dictionaries

- ➤ To develop programs to read and write data from or to files in Python
- ➤ To Develop programs with Exception Handling

DETAILED SYLLABUS

Contents: Practical

PART – A

1. i) Write a Python program to compute GCD of two numbers
    ii) Write a Python Program to print prime numbers in the given range.

2. i) Write a Python Program to check the given year is leap year or not.
    ii) Write a Python Program to print Armstrong numbers between given range.

3. i) Write a Python Program to do basic trim and slice operations on String.
    ii) Write a Python Program to accept line of text and find the number ofcharacters, vowels and blank spaces on it

4. i) Write a Python Program using function to display all such numbers which is divisible by 3 but are not multiple of 5 in a given range.
    ii) Write a Python Program using recursion to print 'n' terms in Fibonacci series.

5. Write a Python Program to add 'ing' at the end of a given string if the string has 3 or more characters . If the given string is already ends with 'ing' then add 'ly' instead. If the string has less than 3 characters, leave it unchanged.

6. Write a Python program to find minimum and maximum of a list of numbers

7. Write a Python program to display a list in reverse order.

8. Write a Python Program to print the first half values of tuple in one line and last half values in next line.

PART – B

9. Write a Python Program to take a list of words and return the length of the longest one using string.

10. Write a Python Program to find an element in a given set of elements using Linear Search

11. Write a Python Program to sort a set of elements using Selection sort.

12. Write a Python Program to multiply two matrices.

13. Write a Python program to demonstrate different operations on Tuple.

14. Write a Python Program to demonstrate to use Dictionary and related functions.

15. Write a Python Program to copy file contents from one file to another and display number of words copied.

AUTONOMOUS EXAMINATION

Note:
Students should write one program from **PART A** and one program from **PART B.**

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION		
1.	Any one program from PART - A	20 Marks
2.	Execution	20 Marks
3.	Result with Print out (Part A)	5 Marks
4.	Any one program from PART - B	25 Marks
5.	Execution	20 Marks
6.	Result with Print out (Part B)	5 Marks
7.	Viva voce	5 Marks
TOTAL		**100 Marks**

LIST OF EQUIPMENTS

HARDWARE:

1. Desktop Computers   - 30 Nos.
2. Printer – 1 No

SOFTWARE:

1. Windows / Linux Operating System
2. Python (to run as interactive mode and IDLE mode)

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name : 1052:Diploma in Computer Engineering

Subject Code : 4053550

Semester : V

Subject Title : Cloud Computing and Internet of Things Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	End Semester Examinations	Total		
Cloud Computing and Internet of Things Practical	4	64	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75marks.

RATIONALE:

1. To understand the Key concepts of virtualization.
2. To implement the various deployment models such as private, public, hybrid and community with SaaS, Iaas and Paas.
3. To train student show to design and program the Cloud based IoT based system.
4. To understand innovative application's needs such as Smart City, Smart Health, Smart Manufacturing, Smart Agriculture, etc.
5. To build industry capable talent, start-up community and entrepreneurial ecosystem for IoT.

OBJECTIVES
On completion of the following exercises, the students must be able to

1. Adapt different types of virtualization and increase resource utilization.
2. Build a private cloud using open source technologies.
3. Explain the concept and Application of Internet of Things
4. Application of IOT in automation of Commercial and Real-World examples
5. Design a simple IOT system comprising sensors, edge devices and wireless network connections involving prototyping, programming and data analysis.

LIST OF EXPERIMENTS

Experiment No.	Part – A : List of Experiments Performed for Cloud Computing
1	To implement program on SaaS to Create an word document of your class time table and store locally and on cloud with doc and pdf format
2	To implement program on SaaS to Create a spread sheet to generate a mark sheet for student progress report.
3	To implement web services by create your BlogSpot and Collaborating via Wikis
4	To implement on PaaS to Install Google App Engine, create a program to validate user; create a database login(username, password)in mysql and deploy to cloud
5	Install Virtual box / VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8.
6	Install OpenStack and use it as Infrastructure as a Service and use technology own Cloud.
7	Case Study on any one Open source and commercial Cloud-Microsoft Azure , Eucalyptus , Amazon EC2
Experiment No.	Part – B : List of Experiments Performed for IoT
8	To implement LED Blink and LED Pattern With Arduino
9	To implement LED Pattern with Push Button Control With Arduino
10	To display "Hello World " in LCD 16X2 Display With Arduino
11	To implement the Servo Motor Control with Arduino
12	To implement and monitor the LM35 Temperature Sensor and Ultrasonic Distance Measurement With Arduino
13	To implement the IR Sensor Analog Input With Arduino
14	Using ThinkSpeak Cloud Reading Temperature Sensor Monitoring with NodeMCU /Raspberry Pi

AUTONOMOUS EXAMINATION

Note:
Students should write one program from **PART A** and one program from **PART B.**

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION		
1.	Any one program from PART - A	20 Marks
2.	Execution (Part A)	20 Marks
3.	Result with Print out (Part A)	5 Marks
4.	Any one program from PART - B	25 Marks
5.	Execution (Part B)	20 Marks
6.	Result (Part B)	5 Marks
7.	Viva voce	5 Marks
TOTAL		**100 Marks**

LIST OF EQUIPMENTS

Software Requirement:
1. Arduino SDK

Components Requirement:
1. Arduino kit   - 10 Numbers
2. Node MCU / Raspberry Pi - 10 Numbers
3. LED Blub   – 10 Numbers
4. 330K Resistor   - 10 Numbers
5. Push Button   - 10 Number
6. Servo Motor 5 V DC   - 10 Numbers
7. 5V DC Relay   - 10 Numbers
8. Mini Bread Board   - 10 Numbers
9. 16x2 LCD Display   - 10 Numbers
10. IR Sensor   - 10 Numbers
11. LM35 Temperature Sensor- 10 Numbers
12. Connecting Wires

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N - 20 SCHEME

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name   : 1052:Diploma in Computer Engineering

Subject Code :   4052561

Semester   : V

Subject Title   :   Elective Practical I – Component Based Technology Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	End Semester Examinations	Total		
Component Based Technology Practical	4	64	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

OBJECTIVES:

.⬜On completion of the following exercises, the students must be able to

- ⬜ Develop and execute simple programs using C#.NET
- ⬜ Understand the concepts of event handlers.
- ⬜ Know the usage of various C#.NET controls
- ⬜ Create C#.NET applications using menus.
- ⬜ Access SQL database by using ADO.NET
- ⬜ Use Form controls.
- ⬜ Create Window applications using C#.NET form controls
- ⬜ Use web controls.
- ⬜ Create web pages using ASP.NET
- ⬜ Develop XML database handling methodologies

DETAILED SYLLABUS

Exercise

PART- A

1. Accept a character from console and check the case of the character.
2. Write a program to accept any character from keyboard and display whether it is vowel or not.
3. Write a program to implement a calculator with memory and recall operations.
4. Develop a form in to pick a date from Calendar control and display the day, month, and year details in separate text boxes.
5. Develop a application using the File and Directory controls to implement a common dialog box
6. Develop a database application to store the details of students using ADO.NET
7. Create a simple ASP.NET page to Output Text with a form, two HTML text boxes, an HTML button, and an HTML <span> element. Create an event procedure for the button.

PART B

1. Develop a menu based application to implement a text editor with cut, copy, paste, save and close operations with accessing and shortcut keys.
2. Develop an application to perform timer based quiz of 5 questions.
3. Develop a database application using ADO.NET to insert, modify, update and delete operations.
4. Develop a application using Datagrid to add, edit and modify records.
5. Develop a web application to input data through a web form to a database andvalidate the data. Use the Required Field Validator and RangeValidator Controls.
6. Develop a Window application to read an XML document containing subject, mark scored, year of passing into a Dataset
7. Develop a Window application to read students records from Database using ADO.NET and generate XML document containing students records

AUTONOMOUS EXAMINATION

Note:

One from PART-A and one from PART-B

DETAILLED ALLOCATION OF MARKS

Writing answer for any one program from PART - A	20 Marks
Writing answer for any one program from PART - B	25 Marks
Executing program (PART – A)	20 Marks
Executing program (PART – B)	20 Marks
Result (PART – A)	5 Marks
Result (PART – B)	5 Marks
VIVA - VOCE	5 Marks
TOTAL	100 Marks

LIST OF EQUIPMENTS

HARDWARE REQUIREMENT	SOFTWARE REQUIREMENT
1. Desktop Computers – 30 Nos 2. Printer – 1 No	1. Visual Studio 2008/2012/2013/2015 2. Microsoft SQL Server 2005/2008 or above

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N - 20 SCHEME

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name   :   1052:Diploma in Computer Engineering

Subject Code   :   4052562

Semester   :   V

Subject Title   :   Data Analytics Using Python Practical

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	End Semester Examinations	Total	
Data Analytics Using Python Practical	4	64	25	100*	100	3 Hrs.

* **Examinations will be conducted for 100 marks and it will be reduced to 75 marks.**

RATIONALE:

This course provides the students the foundations for data analytics with python. The syllabus is designed to provide exposure to practical systems and software used in data analysis. The course explains data science techniques and the various Python programming   packages required to prepare data for analysis, perform data analytics and create meaningful data visualization.

OBJECTIVES:

➢ To familiarize with the Python NumPy library for array processing.

➢ To utilize the Pandas packages in Python for exploratory data analytics.

➢ To explore some of the real world applications of Machine learning techniques.

➢ To create informative visualizations with matplotlib to identify patterns.

4052562 Data Analytics Using Python Practical

Prerequisite:

- Python : Install Python IDE and important Python Libraries. Install Anaconda and find the features of Jupyter Notebook.
- Data Source:

    https://archive.ics.uci.edu/ml/machine-learning-databases/auto-mpg/

    https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data

    https://www.kaggle.com/arshid/iris-flower-dataset

    https://www.kaggle.com/rohankayan/years-of-experience-and-salary-dataset

PART A

Perform the exercises in PART A using NumPy

1. **Basic data structures in NumPy**

    a. Create a List, set, tuple and dictionary which stores the details of a student (rollno,name , dept, branch, percentage of mark) in Python and print the values.

    b. Convert the list and tuple as NumPy array.

2. **Arrays in NumPy**

    a. Create arrays using different intrinsic methods (ones, zeros, arange, linspace, indice) and print their values.

    b. Check the results of arithmetic operations like add(), subtract(), multiply() and divide() with arrays created using arange and ones intrinsic method.

    c. Check the results of mathematical operations like exp(), sqrt(), sin(), cos(), log(), dot() on an array created using arange intrinsic method.

3. **Built-in functions in NumPy.**

    a. Load your class Marklist data from a csv (comma separated value) file into an array. Perform the following operations to inspect your array. Len(), ndim, size, dtype, shape, info()

    b. Apply the aggregate functions on this data and print the results. (Functions like min(), max(), cumsum(), mean(), median(), corrcoef(), std())

4. **Handling Multiple Arrays**

    a. Create two python NumPy arrays (boys, girls) each with the age of nstudents in the class.

    b. Get the common items between two python NumPy arrays.

    c. Get the positions where elements of two arrays match.

    d. Remove from one array those items that exist in another.

    e. Extract all numbers between a given range from a NumPy array.

5. **Array Slicing in NumPy**

    a. Load your class Marklist data into an array called "**marks"** to store students roll_num, subject marks and result.

    b. Split all rows and all columns except the last column into an array called "features".

    c. Split the marks array into 3 equal-sized sub-arrays each for 3 different subject marks.

    d. Split the last column into an array "label".

    e. Delete the roll_num column from the marks array and insert a new column student name in its place.

6. **Indexing & Sorting in NumPy**

    a. Load your class Marklist data from a csv file into an array.

    b. Access the mark of a student in a particular subject using indexing techniques.

    c. Sort the student details based on Total mark.

    d. Select a subset of 2D array using fancy indexing (indexing using integer arrays)

    e. Print student details whose total marks is greater than 250 using Boolean indexing.

7. **Handing Two dimensional array in NumPy**

    a. Import iris dataset with numbers and texts keeping the text intact into python NumPy.

    b. Convert the 1D iris to 2D array (iris2d) by omitting the species text field.

    c. Find the number and position of missing values in iris2d's sepal_length

    d. Insert np.nan values at 20 random positions in iris 2d dataset

    e. Filter the rows of iris2d that has petal_length > 1.5 and sepal_length < 5.0

PART-B

Perform the exercises in PART B using Pandas

8. Working with a Series

    a. Create a series using list and dictionary.

    b. Create a series using NumPy functions in Pandas.

    c. Print the index and values of series.

    d. Print the first and last few rows from the series.

9. Working with Data Frame Columns

    a. Create and print a DataFrame.

    b. Find the descriptive statistics for each column.

    c. Group the data by the values in a specified column, values in the index.

    d. Set Index and columns in a DataFrame.

    e. Rename columns and drop columns

    f. Select or filter rows based on values in columns.

    g. Select single and multiple columns with specific names

10. Working with DataFrame Rows

    a. Slicing DataFrame using *loc* and *iloc.*

    b. Filter multiple rows using *isin.*

    c. Select first n rows and last n rows

    d. Select rows randomly n rows and fractions of rows (use *df.sample* method)

    e. Count the number of rows with each unique value of variables

    f. Select *nlargest* and *nsmallest* values.

    g. Order/sort the rows

11. Handling missing data and duplicates

    a. Identify rows with missing data (isnull(), notnull()) and replace NA/Null data with a given value.

    b. Drop rows and columns with any missing data (dropna(), dropna(1))

    c. Find duplicate values and drop duplicates.

    d. Fill the missing values using forward filling and backward filling.

    e. Replace the missing value with new value and write the dataframe to a CSV file inthe local directory.

12. **Merge and combine data**
   a. Perform the *append, concat* and *combine_first* operations on DataFrames.
   b. Apply different types of merge on data.
   c. Use a *query* method to filter DataFrame with multiple conditions.

Perform the following exercises using Pandas matplotlib

13. Consider the Salary dataset, which contains 30 observations consisting of years of working experience and the annual wage (in dollars).
   a. Create a linear plot to identify the relationship between years of working experience and the annual wages with suitable title , legend and labels.
   b. Create a scatter plot to identify the relationship between years of working experience and the annual wages with title , legend and labels.
   c. Also distinguish between observations that have more than 5 years of working experience and observations that have less than 5 years of working experience by using different colors in one single plot.

14. Consider the Iris dataset, where observations belong to either one of three iris flower classes.
   a. Visualize the average value for each feature of the Setosa iris class using a barchart.
   b. Format the obtained bar graph by Changing the color of each bar, Change the Edgecolor , Linewidth and Line style.

15. Consider the Iris dataset, where observations belong to either one of three iris flower classes.
   a. Visualize the Histogram for each feature (Sepal Length, Sepal Width,petal Length & petal Width) separately with suitable bin size and color.
   b. Plot the histograms for all features using subplots to visualize all histograms in one single plot. Save the plot as JPEG file.
   c. Plot the boxplots for all features next to each other in one single plot.

AUTONOMOUS EXAMINATION

DETAILED ALLOCATION OF MARKS

SCHEME OF VALUATION	
Write any one program from PART-A	20 Marks
Write any one program from PART-B	25 Marks
Executing program (PART-A)	20 Marks
Executing program (PART-B)	20 Marks
Result with print out(PART-A)	5 Marks
Result with print out(PART-B)	5 Marks
VIVA-VOCE	5 Marks
TOTAL	100 Marks

LIST OF EQUIPMENTS

Hardware Requirements

Desktop Computers – 30 Nos

Printer   - 1 No.

Software Requirement:

Python , Microsoft Excel

Course Name : 1052:Diploma in Computer Engineering

Subject Code : 4052563

Semester : V

Subject title : Elective Practical -I Mobile Computing Practical

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per Semester 16 Weeks

Subject	Instructions		Examination			
Mobile Computing Practical	Hours / Week	Hours/ Semester	Marks			Duration
	4	64	Internal Assessment	**End Semester** Examination	Total	
			25	100 *	100	3 Hrs

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The Mobile Computing Lab studies design principles and evaluation methodologies for understanding and building systems support mechanisms for mobile computing systems including mobile adhoc and sensor networks for achieving the goal of anytime, anywhere computing in wireless mobile environments. The primary research focuses of the Mobile Application development practical are in mobility management, data and service management, security and dependability aspects in mobile computing environments.

OBJECTIVES:

On completion of the following exercises, the students must be able to

1. Provide a solid foundation and skills for programming to create applicationsfor Mobile Devices

2. Install, configure and use Android development environment.

3. To Learn about Basic Mobile Application Development tools

4. To learn How to create interactive applications in android with multiple activities

5. Create Mobile Application using SQLite Database

LIST OF EXPERIMENTS

PART-A

1.	Write a program to demonstrate activity(Application Life Cycle)
2.	Write a program to demonstrate different types of layouts
3.	Write a program to implement simple calculator using text view, edit view, option button and button
4.	Write a program to demonstrate list view
5	Write a program to display Text in Text View using different Font Style
6	Write a program to demonstrate AutoComplete Text View
7	Write a program to demonstrate Image Button View

PART-B

1	Write a program to demonstrate Date picker and time picker
2.	Develop an simple application with context menu and option menu
3.	Develop an application to send SMS
4.	Write a program to view ,edit, contact
5.	Write a program to send e-mail
6.	Write a program to display map of given location/position using map view
7.	Write a program to demonstrate the application of intent class
8.	Write a program to demonstrate SQLite (Create Database , Table , Insert ,Update, Delete and view records)

HARDWARE REQUIREMENTS:

Desktop Computers with minimum 4 GB RAM	30 Nos
Printer	1 No

SOFTWARE REQUIREMENTS:

Android Studio / Netbeans /Eclipse	Android ATD
Android SDK	JDK 6.0 or above

AUTONOMOUS PRACTICAL EXAMINATION

DETAILED ALLOCATION OF MARKS	
Writing program in Part-A	20 Marks
Execution of program Part-A	20 Marks
Writing program in Part-B	20 Marks
Execution of program in Part-B	25 Marks
Printed Output (Part -A)	5 Marks
Printed Output (Part -B)	5 Marks
VIVA – VOCE	5 Marks
TOTAL	**100 Marks**

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N - 20 SCHEME

DIPLOMA IN COMPUTER ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name   : 1052:Diploma in Computer Engineering

Subject Code   : 4052570

Semester   V

Subject Title   : Entrepreneurship and Start ups

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks per Semester: 16 Weeks

Subject	Instruction		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	End Semester Examinations	Total	
Entrepreneurship and Start ups	4 hours	64 hours	25	100*	100	3 Hours

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topics	Hours
1	Entrepreneurship – Introduction and Process	10
2	Business Idea and Banking	10
3	Start ups, E-cell and Success Stories	10
4	Pricing and Cost Analysis	10
5	Business Plan Preparation	10
Revision, Field visit and Preparation of case study report		14
Total		64

RATIONALE:

Development of a diploma curriculum is a dynamic process responsive to the society and reflecting the needs and aspiration of its learners. Fast changing society deserves changes in educational curriculum particularly to establish relevance to emerging socio-economic environments; to ensure equity of opportunity and participation and finally promoting concern for excellence. In this context the course on entrepreneurship and start ups aims at instilling and stimulating human urge for excellence by realizing individual potential for generating and putting to use the inputs, relevant to social prosperity and thereby ensure good means of living for every individual, provides jobs and develop Indian economy.

OBJECTIVES:

At the end of the study of5th semester the students will be able to

- To excite the students about entrepreneurship
- Acquiring Entrepreneurial spirit and resourcefulness
- Understanding the concept and process of entrepreneurship
- Acquiring entrepreneurial quality, competency and motivation
- Learning the process and skills of creation and management of entrepreneurial venture
- Familiarization with various uses of human resource for earning dignified means of living
- Know its contribution in and role in the growth and development of individual and the nation
- Understand the formation of E-cell
- Survey and analyze the market to understand customer needs
- Understand the importance of generation of ideas and product selection
- Learn the preparation of project feasibility report
- Understand the importance of sales and turnover
- Familiarization of various financial and non financial schemes
- Aware the concept of incubation and starts ups

DETAILED SYLLABUS

Unit	Name of the Topics	Hours
1	**ENTREPRENEURSHIP – INTRODUCTION AND PROCESS** ● Concept, Functions and Importance ● Myths about Entrepreneurship ● Pros and Cons of Entrepreneurship ● Process of Entrepreneurship ● Benefits of Entrepreneur ● Competencies and Characteristics ● Ethical Entrepreneurship ● Entrepreneurial Values and Attitudes ● Motivation ● Creativity ● Innovation ● Entrepreneurs - as problem solvers ● Mindset of an employee and an entrepreneur ● Business Failure - causes and remedies ● Role of Networking in entrepreneurship	10
2	**BUSINESS IDEA AND BANKING** ● Types of Business: Manufacturing, Trading and Services ● Stakeholders: Sellers, Vendors and Consumers ● E- Commerce Business Models ● Types of Resources - Human, Capital and Entrepreneurial tools ● Goals of Business and Goal Setting ● Patent, copyright and Intellectual Property Rights ● Negotiations - Importance and methods ● Customer Relations and Vendor Management ● Size and Capital based classification of business enterprises ● Role of Financial Institutions ● Role of Government policy ● Entrepreneurial support systems ● Incentive schemes for State Government ● Incentive schemes for Central Government	10

3	**STARTUPS, E-CELL AND SUCCESS STORIES**	10
	• Concept of Incubation centre's	
	• Activities of DIC, financial institutions and other relevance institutions	
	• Success stories of Indian and global business legends	
	• Field Visit to MSME's	
	• Various sources of Information	
	• Learn to earn	
	• Startup and its stages	
	• Role of Technology – E-commerce and Social Media	
	• Role of E-Cell	
	• E-Cell to Entrepreneurship	
4	**PRICING AND COST ANALYSIS**	10
	• Calculation of Unit of Sale, Unit Price and Unit Cost	
	• Types of Costs - Variable and Fixed, Operational Costs	
	• Break Even Analysis	
	• Understand the meaning and concept of the term Cash Inflow and Cash Outflow	
	• Prepare a Cash Flow Projection	
	• Pricing and Factors affecting pricing	
	• Understand the importance and preparation of Income Statement	
	• Launch Strategies after pricing and proof of concept	
	• Branding - Business name, logo, tag line	
	• Promotion strategy	
5	**BUSINESS PLAN PREPARATION**	10
	• Generation of Ideas,	
	• Business Ideas vs. Business Opportunities	
	• Selecting the Right Opportunity	
	• Product selection	
	• New product development and analysis	
	• Feasibility Study Report – Technical analysis, financial analysis and commercial analysis	
	• Market Research - Concept, Importance and Process	
	• Marketing and Sales strategy	
	• Digital marketing	
	• Social Entrepreneurship	
	• Risk Taking-Concept -Types of business risks	

REFERNCE BOOKS:

1. Dr. G.K. Varshney, Fundamentals of Entrepreneurship, Sahitya Bhawan Publications, Agra - 282002
2. Dr. G.K. Varshney, Business Regulatory Framework , Sahitya Bhawan Publications, Agra - 282002
3. Robert D. Hisrich, Michael P. Peters, Dean A. Shepherd, Entrepreneurship , McGraw Hill (India) Private Limited, Noida - 201301
4. M.Scarborough, R.Cornwell, Essentials of Entrepreneurship and small business management, Pearson Education India, Noida - 201301
5. Charantimath Poornima M. Entrepreneurship Development and Small Business Enterprises, Pearson Education, Noida - 201301
6. Trott, Innovation Management and New Product Development, Pearson Education, Noida - 201301
7. M N Arora, A Textbook of Cost and Management Accounting, Vikas Publishing House Pvt. Ltd., New Delhi-110044
8. Prasanna Chandra, Financial Management, Tata McGraw Hill education private limited, New Delhi
9. I. V. Trivedi, Renu Jatana, Indian Banking System, RBSA Publishers, Rajasthan
10. Simon Daniel, HOW TO START A BUSINESS IN INDIA, BUUKS, Chennai - 600018
11. Ramani Sarada, The Business Plan Write-Up Simplified - A practitioners guide to writing the Business Plan, Notion Press Media Pvt. Ltd., Chennai 600095.

Autonomous Examination – Evaluation

PatternInternal Mark Allocation

Assignment (Theory portion)*	– 10
Seminar Presentation	– 10
Attendance	– 5
Total	**– 25**

Note: * Two assignments should be submitted. The same must be evaluated and converted to 10 marks.

Guidelines for assignment:

First assignment – Unit I

Second assignment – Unit II

Guidelines for Seminar Presentation- Unit III

Each assignment should have five three marks questions and two five marks questions.

AUTONOMOUS EXAMINATION

Note

1. The students should be taught all units and proper exposure and field visit also arranged. All the portions should be completed before examinations.

2. The students should maintain theory assignment and seminar presentation. The assignment and seminar presentation should be submitted during the Autonomous Practical Examinations.

3. The question paper consists of theory and practical portions. All students should write the answers for theory questions (40 Marks) and practical portions (60 Marks) should be completed for Autonomous examinations.

4. All exercises should be given in t he question paper and students are allowed to select by lot. If required the dimensions of the exercises may be varied for every batch. No fixed time allotted for each portion and students have liberty to do the examination for 3Hrs.

5. For Written Examination: theory question and answer: 45 Marks
    Ten questions will be asked for 3 marks each. Five questions from each unit 1 & 2.(10 X 3 = 30).
    Three questions will be asked for 5 marks each. One question from each unit 1, 2 & 3. (3 X 5 =15)

6. For Practical Examination: The business plan/Feasibility report or Report on Unit 4 & 5 should be submitted during the autonomous practical examinations. The same have to be evaluated for the report submission (40 marks).

DETAILED ALLOCATION OF MARKS

Sl.No	Description	Marks
Part A	Written Examination - Theory Question and answer (10 questions x 3 marks:30 marks & (3 questions x 5 marks: 15 marks)	45
Part B	Practical Examination -Submission on Business Plan/Feasibility Report or Report on Unit 4 & 5	40
PartC	Viva voce	15
	Total	100

MODEL QUESTION PAPER

ENTREPRENEURSHIP AND START UPS

Part A

Time: 1 hour   **Max. Marks:45**

I. Answer ten questions in brief   **(10x3=30)**

1. Define entrepreneurship.

2. State the process of entrepreneurship

3. What are the benefits of being an entrepreneur?

4. How do entrepreneurs act as problem solvers?

5. Outline the role of networking in entrepreneurship.

6. List the various types of business

7. Outline the business model.

8. Suggest the various goals of business.

9. How selection of human resources is carried out?

10. Specify the role of government policy on entrepreneurship.

II. Answer three questions in detail   **(3x5=15)**

11. Describe the importance of innovation on entrepreneurship.

12. Enumerate the various incentive schemes for the central government.

13. How technology will play a major role in E- commerce?

Part B

Practical Examination –

Submission on Business Plan/Feasibility Report

or   Report on Unit 4 & 5   **(40) Marks**

PART C

Viva Voce   **(15) Marks**