<u>Certificate/ Diploma Course in Artificial Intelligence and Data</u> <u>Science</u>

Duration of the Course:

1) Certificate course: 6 months

2) Diploma:12 months

Eligibility: Any student enrolled in the degree program of the college and having knowledge about the basics of Computers.

Sr.No.	Topics	
Topics c	overed under Certificate Course are Sr No.1, 2 and 3	in the provide the second bill
1	CCAD-1-01T Problem Solving using Python CCAD-1-01PProblem Solving using Python Lab	Credits: 6(4 Th. 2 Lab)
2	CCAD-1-02T Introduction to AI and Data Science	Credits: 6
3	CCAD-1-03T Statistical Foundation CCAD-1-03P Statistical Foundation Lab	Credits: 6(4Th. 2 Lab)
Topics o	covered under Diploma Course are Sr No. 1, 2, 3, 4, 5	and 6
4	DAD-1-04T Data Mining and Visualization DAD-1-04P Data Mining and Visualization Lab	Credits: 6 (4Th. 2 Lab)
5	DAD-1-05T Machine Learning DAD-1-05P Machine Learning Lab	Credits: 6 (4 Th. 2 Lab)
6	DAD-1-06P e- platforms for machine learning	Credits: 6

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Certificate/ Diploma Course in Artificial Intelligence and Data Science

Semester I

CCAD-1-01T: Problem Solving using Python

Total Marks: 100 External Marks: 70 Internal Marks: 30 Credits: 4 Pass Percentage: 40%

Objective

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Objective of this paper is to explain the basic of Python concepts objects, data structures and concepts related to Methods and Functions in python. Paper explicate Object Oriented Programming with Python and comprehend the concepts related to Python Generators and file handling.

INSTRUCTIONS FOR THE PAPER SETTER/ EXAMINER

- 1. The syllabus prescribed should be strictly adhered to.
- 2. The question paper will consist of three sections: A, B, and C. Sections A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. The candidates will attempt two questions from each section.
- Section C will have fifteen short answer questions covering the entire syllabus. Each question will carry 3 marks. Candidates will attempt any ten questions from this section.
- 4. The examiner shall give a clear instruction to the candidates to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.
- 5. The duration of each paper will be three hours.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt any two questions each from the sections A and B of the question paper and any ten short questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

Section A

Unit I: Introduction: Python installation and setup, Command line Basics; Python Objects and Data Structures Basics: Introduction to Python data types, Variable assignments, Numbers, String, String methods, Lists

Unit II: Python Comparison Operators: Chaining comparison operators with logical operators, Pass Break and continue.

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Unit III: Program Flow control in Python: If Elif and Else statements in python, for loops, While loops

Unit IV: Methods and Functions in python: Introduction to functions, Def keyword, User defined functions, arguments and parameters, Parameter naming in python

Section B

Unit V: Object Oriented Programming: Introduction, Classes and objects, attributes and methods, Inheritance and polymorphism, Special methods; Modules and Packages: Pip install and PyPi.

Unit VI: Errors and Exception Handling: Introduction to errors, Built-in errors, raising errors in python, Pylint overview

Unit VII: Python Generators: Yielding and Generator function, Making an iterable from a generator, Generator expressions and performance.

Unit VIII: File handling in Python: Files in python, importing own files, Read and writing text files, working with CSV, XML and JSON files.

Suggested Readings

1. Timothy Budd, Exploring Python, TMH, 1st Ed, 2011

3. Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist : learning with Python, Green Tea Pr, 2002

4. Paul Barry, Head First Python: A Brain-Friendly Guide, O'Reilly, 2nd ed. 2016

5. Udemy, https://www.udemy.com/course/complete-python-bootcamp/

6. Udemy, https://www.udemy.com/course/python-the-complete-python-developer-course/

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Detailed Contents

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Programming Using C

Total Marks:100 External Marks:70 Internal Marks: 30 Credits: 4 Pass Percentage: 40%

INSTRUCTIONS FOR THE PAPER SETTER/ EXAMINER:

- 1. The syllabus prescribed should be strictly adhered to.
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- 3. Section C will have fifteen short answer questions covering the entire syllabus. Each question will carry 3 marks. Candidates will attempt any ten questions from this sec-
- 4. The examiner shall give a clear instruction to the candidates to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.
- 5. The duration of each paper will be three hours.

INSTRUCTIONS FOR THE CANDIDATES:

Candidates are required to attempt any two questions each from the sections A and B of thequestion paper and any ten short questions from Section C.They have to attempt questionsonly at one place and only once. Second or subsequent attempts, unless the earlier ones havebeencrossed out, shall not be evaluated.

Section A

Unit I: Simple Program logic, Pseudo-code, Problem Identification, Analysis, Flowcharts, and algorithms

Unit II: C Programming: character set, Identifiers and keywords, Data types, Declarations, Statement and symbolic constants, Input-output statements.

Unit III: Operators and Expressions: Arithmetic, relational, logical, unary operators, others

Unit IV: Control statements: Branching, looping using for, while and do-while Statements, Nested control structures, switch, break, continue statements.

Section B

Unit V: Functions: Declaration, Definition, Call, passing arguments, call by value, call by reference, Recursion, Use of library functions; Storage classes: automatic, external and static variables.

Unit VI: Arrays: Defining and processing arrays, Passing array to a function, Using multidimensional arrays, Solving matrices problem using arrays.

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Unit VII: Strings: Declaration, Operations on strings.

Unit VIII: Pointers: Pointer datatype, Structures: Using structures and union

Suggested Reading:

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- 1. Byron S Gottfried, Programming with C| 4th Edition (Schaum's Outlines)
- 2. Yashavant Kanetkar, Let Us C, 17TH EDITION
- 3. E Balagurusamy, Programming in ANSI C

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Object Oriented Analysis and Design Using UML

Total Marks: 100 External Marks: 70 Internal Marks: 30 Credits: 4 Pass Percentage: 40%

INSTRUCTIONS FOR THE PAPER SETTER/ EXAMINER:

- 1. The syllabus prescribed should be strictly adhered to.
- The question paper will consist of three sections: A, B, and C. Sections A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. The candidates will attempt two questions from each section.
- Section C will have fifteen short answer questions covering the entire syllabus. Each question will carry 3 marks. Candidates will attempt any ten questions from this section.
- 4. The examiner shall give a clear instruction to the candidates to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.
- 5. The duration of each paper will be three hours.

INSTRUCTIONS FOR THE CANDIDATES:

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Candidates are required to attempt any two questions each from the sections A and B of thequestion paper and any ten short questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

Section A

Unit I: Introduction to Object: Object Orientation, Development, Modeling, Object Modelingtechnique. Object modeling: Objects and classes, Links and Association, Generalization and inheritance

Unit II: Grouping constructs, Aggregation, Abstract Classes, Generalization as extension and restriction, Multiple inheritance

Unit III: Design Methodology, Analysis: Object modeling, Dynamic modeling, Functional modeling, Adding operations, Iterating Analysis.

Unit IV: Comparison of methodologies: Structured Analysis/ Structured Design, Jackson Structured Development.

Section B

Unit V: Implementation: Using Programming Language, Database System, outside Computer. Programming Style: Object Oriented Style, Reusability, Extensibility, Robustness, Programming in-the-large.

Unit VI: UML: Basics, Emergence of UML, Types of Diagrams. Use Case: Actors, Use Case Diagram, Relationships between Use Cases

Programming Using C Lab

Total Marks: 100 External Marks: 70 Internal Marks: 30 Credits: 2 Pass Percentage: 40%

The programs in lab will be based on the contents covered in the theory syllabus.

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Office Automation Tools

Total Marks: 100 External Marks: 70 Internal Marks: 30 Credits: 4 Pass Percentage: 40%

Section A

Unit I: Word processing: Formatting a Document, Using AutoCorrect, Proofing a Document with Spell and Grammar Check, Finding and Replacing Text, Improving the Look of a Document, Inserting Graphics, Inserting Table

Unit II: Adding comments to a document, Creating a table of contents, Creating indexes and bibliographies, Printing a document, Tracking changes to a document.Mail Merge

Unit III: Select, cut, copy, paste, find and replace, inserting special characters, setting tab stops and indents normal of special characters and indents normal special characters.

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Unit IV: Creating a table of contents, Creating indexes and bibliographies, Printing a document, Tracking changes to a document

Section B

Unit V: Formatting Text: Using RIGHT, LEFT, and MID functions; format text by using UPPER, LOWER, and PROPER functions

Unit VI: SPREADSHEET PACKAGE: Introduction to Spreadsheets, Using Formulas in Excel, Understanding Cell Referencing in Excel, Editing a Worksheet, Formatting and Printing a Worksheet

Unit VII: Use of Simple Statistical Functions, What-if Analysis and Data Tables in Excel, Working with Graphs and Charts.

Unit VIII: PRESENTATION PACKAGE: Introduction to PowerPoint, Different Views of a Presentation, Editing a Presentation, Adding Special Effects in a presentation.

Suggested Reading:

- 1. Archana Kumar, Computer Basics with Office Automation, 2013
- Angeline D Magdalene Delighta, Exploring of Computer fundamentals and office automation I LAP Lambert Academic Publishing
- 3. Dr. P. Rizwan Ahmed, Office Automation I Margham Publications; 2016th edition

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Office Automation Tools Lab

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Total Marks: 100 External Marks: 70 Internal Marks: 30 Credits: 2 Pass Percentage: 40%

The programs in lab will be based on the contents covered in the theory syllabus.

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Office Equipment & Secretarial Tasks

Total Marks: 100 External Marks: 70 Internal Marks: 30 Credits: 6 Pass Percentage: 40%

Section A

Unit I: Office Machines and equipments: Importance, objectives of office machines, Office Safety and Security: Meaning, importance of office Safety, safety hazards and steps to improve office safety, Security hazards and steps to improve office security

Unit II: Characteristics of Computers, Hardware, Software, Machine Language, Assembly Language and Assembler, High Level Language and Compiler v/s Interpreter.

Unit III: Input Devices: Keyboard, Mouse, Joystick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Speech Recognition Devices

Section B

Unit IV: Optical Recognition devices – OMR, OBR, OCR. Output Devices: Monitors, Impact Printers - Dot matrix, Character and Line printer, Non Impact Printers – DeskJet and Laser printing, Plotter.

Unit V: Measurement of Office Work, Importance, purpose, difficulty in measuring office work. Different ways of measurement, setting of work standards, benefits of work standards.

Unit VI: Techniques of setting standards, Office Manuals: Meaning, need, types of office manuals and steps in preparing of office manuals.

Suggested Reading:

3 10

1. Pradeep K., Sinha, Computer Fundamentals : Concepts, Systems & Applications- 8th Edition

2. Rajaraman V, Fundamentals of Computers-6th Edition

3. RS Salaria, Computer Fundamentals 1St Edition 2017

4. Archana Kumar, Computer Basics with Office Automation, 2013

5. Angeline D Magdalene Delighta, Exploring of Computer fundamentals and office automation I LAP Lambert Academic Publishing

6. Dr. P. Rizwan Ahmed, Office Automation I Margham Publications; 2016th edition

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Office Operations & Office Management

Total Marks: 100 **External Marks: 70** Internal Marks: 30 Credits: 4 Pass Percentage: 40%

Section A

Unit I: Office and office Management - meaning of office, function of office, primary and administrative functions, importance of office.

Unit II: Relation of office with other departments of business Organization, Concept of paperless office, virtual office, back and front office, open and private office Unit III: Definition and elements of office management, duties of an Office Manager Unit IV: Office forms: Meaning and types of forms used in business organization, advantages

Section B

Unit V: Forms controls, objectives, form designing, principles of forms designing and specimens of forms used in office. Unit VI: Office Record Management: Meaning, importance of record keeping management

Unit VII: Principles of record management and types of records kept in a business organization.

Suggested Reading:

1. Sudhir Andrews, Front Office Management and Operations 2. Judith Read-Smith, Records Management, Published October 14th 1996 by South Western **Educational Publishing**

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Office Operations & Office Management Lab

Total Marks: 100 External Marks: 70 Internal Marks: 30 Credits: 2 Pass Percentage: 40%

The programs in lab will be based on the contents and applications of word processing, spreadsheet and presentation covered in the theory syllabus

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E-Governance

Total Marks: 100 External Marks: 70 Internal Marks: 30 Credits: 6 Pass Percentage: 40%

Section A

Unit I: Introduction to E-Government and E-Governance, Difference between E-Government and E-Government; E-Government as Information System; Benefits of E-Government; E-Government Life Cycle; Online Service Delivery and Electronic Service Delivery; Evolution, Scope and Content of E-Governance; Present Global Trends of Growth in E-Governance

Unit II: Models of E-Governance, Introduction; Model of Digital Governance: Broadcasting / Wider Dissemination Model, Critical Flow Model, Comparative Analysis Model, Mobilization and Lobbying Model, Interactive – Service Model / Government-to-Citizen-to-Government Model (G2C2G)

Unit III: Evolution in E-Governance and Maturity Models: Five Maturity Levels; Characteristics of Maturity Levels; Towards Good Governance through E-Governance Models

Unit IV: E-Government Infrastructure Development, Network Infrastructure; Computing Infrastructure

Section B

Unit V: Data centers; E-Government Architecture; Interoperability Framework

Unit VI: Cloud Governance; E-readiness; Data System Infrastructure; Legal Infrastructural Preparedness

Unit VII:Institutional Infrastructural Preparedness; Human Infrastructural Preparedness; Technological Infrastructural Preparedness

Unit VIII: Security for e-Government, Challenges and Approach of E-government Security; Security Management Model; E- Government Security Architecture

Suggested Reading:

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1. Dr. R.K. Dubey, E Governance I R.K. Publisher & Distributors

2. Shirin Madon, e-Governance for Development

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