Name of Institute: Institute of Sciences Humanities & Liberal Studies

Name of Faculty: Dr .Ashishkumar Parejiya

Course code: IMCA0708

Course name: Introduction to Python

Pre-requisites: Basic knowledge of Programming and logic creation

Credit points: 06

Offered Semester: 1st

Course coordinator
Full name: Prof(Dr). Ashishkumar M Parejiya
Department with sitting location: Department of Computer Science – Main Building Basement
Telephone: 9428474822
Email: ashishparejiya.mca@indusuni.ac.in
Consultation times: After 3:00 pm / 5 days a week

Course lecturer
Full name: Prof(Dr). Ashishkumar M Parejiya
Department with sitting location: Department of Computer Science – Main Building Basement
Telephone: 9428474822
Email: ashishparejiya.mca@indusuni.ac.in
Consultation times: After 3:00 pm / 5 days a week

Students will be contacted throughout the session via mail with important information relating to this course.

Course Objectives

By participating in and understanding all facets of this course a student will:

1) Create and execute Python programs
2) Understand the concepts of file I/O
3) Be able to read data from a text file using Python
4) Plot data using appropriate Python visualization libraries

Course Outcomes (CO)

After successful completion of this course, student will be able to

1) understand Python programming concepts and create programmes
2) create and execute file I/O related programmes
3) create GUI programmes through Python visualization libraries

Course Outline

UNIT-I

[12 hours]

Introduction: Development tools, Learning programming with python, Values and Variables-Integer Values, Variables and Assignment, Identifiers, Floating-point Types, Control Codes within Strings, User Input, The eval Function, Controlling the print Function, Expressions and Arithmetic- Expression, Operator Precedence and Associatively, Comments, Errors, Arithmetic Examples, Arithmetic Operators, Algorithms

UNIT-II

[12 hours]

Conditional Execution: Boolean Expressions, Boolean Expressions, The Simple if Statement, The if/else Statement, Compound Boolean Expressions, Nested Conditionals, Multi-way Decision Statements, Conditional Expressions, Errors in Conditional Statements. Iteration: The while Statement, Definite Loops vs. Indefinite Loops, the for Statement, Nested Loops, Abnormal Loop Termination, the break statement, the continue Statement, Infinite Loops, Computing Square Root, Drawing a Tree, Printing Prime

UNIT-III

[12 hours]

Functions: Introduction to Using Functions, Standard Mathematical Functions, time Functions, Random Numbers, Function Basics, Using Functions Main Function, Parameter Passing, Function Examples Better Organized Prime Generator, Command Interpreter, Restricted Input Recursion: Making Functions Reusable, Documenting Functions and Modules, Functions as Data, Lists: Using Lists, List Assignment and Equivalence, List Bounds, Slicing, Lists and Functions, Prime Generation with a List, List Processing, Sorting, Searching

UNIT-IV

[12 hours]

Objects: Using Objects, String Objects, List Objects.
Custom Types: Geometric Points, Methods, Custom Type Examples, Stopwatch, Automated Testing
Class Inheritance Handling Exceptions: Exception Examples, Using Exceptions, Custom Exceptions
GUI Programming with Tkinter : Basics Graphics, Labels, grid, Entry boxes, Buttons, Global variables, Tic-tac-toe, GUI Programming II, Frames, Colors, Images, Canvases, Check buttons and Radio buttons, Text widget, Scale widget, GUI Events, Event examples, GUI Programming III, Title bar, Disabling things, Getting the state of a widget, Message boxes, Destroying things, Updating, Dialogs, Menu bars, New windows, pack

Method of delivery

Lectures – Board Work

Power point presentation

Quiz organization

Doubt solving

Programming Demo

Study time

Lectures: 4 hours / week

Lab Sessions: 4 hours / week

Extra at home / self learning: 6 hours / week

CO-PO Mapping (PO: Program Outcomes)

Program Outcomes:

Computer Applications Graduates will be able to:

PO1 **IT knowledge:** Apply the knowledge of mathematics, science, computer fundamentals and specialization to the solution of complex problems.

PO2 **Problem analysis:** Identify, formulate, review research literature, and analyze complex computer science problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and computer sciences.

PO3 **Design/development of solutions:** Design solutions for complex computer science problems and design system components or processes that meet the specified needs with appropriate consideration for cultural, social environment.

PO4 **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern IT tools including prediction and modelling to complex activities with an understanding of the limitations.

PO6 **The digital youth and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional skill-set.

PO7 **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the computer science practice.

PO8 **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO9 **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO10 **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO11 **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Mapping of CO with PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	✓	✓	✓								
CO2	✓	✓	✓		✓						✓
CO3			✓	✓	✓				✓		✓

Blooms Taxonomy and Knowledge retention (For reference)

(Blooms taxonomy has been given for reference)

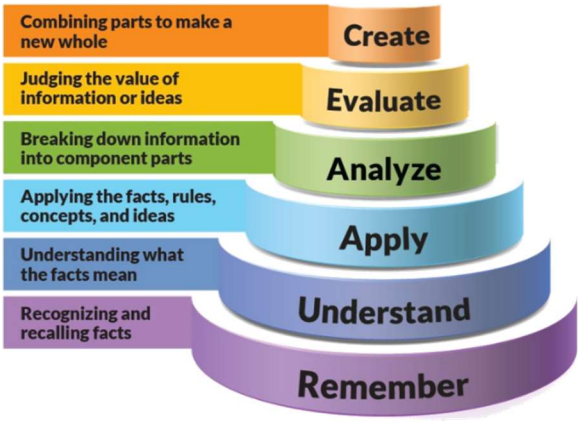

Figure 1: Blooms Taxonomy

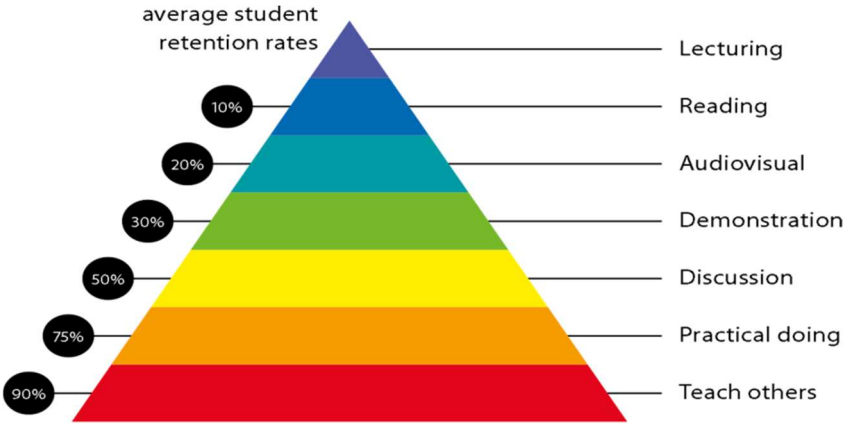

Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of _____Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	**1 Professional knowledge, grounding & awareness**
Independent learners Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	**2 Information literacy, gathering & processing**
Problem solvers Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.	**4 Problem solving skills**
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.	**5 Written communication** **6 Oral communication** **7 Teamwork**
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	**10 Sustainability, societal & environmental impact**

Practical work:

UNIT		TOPICS / SUBTOPICS	TEACHING HOURS
1	**Python Installation, Setup Environment Variable, Test command on console, Introduction**		10
	1	Basic Programs, Decision Making And Loop	
	2	Function, Native Datatype	
	3	File Operations	
	4	Control Structures, Data Structures	
2	1	Functions Scoping, Recursion And List Mutability	14
	2	Exception Handling And Assertions	
	3	Regular Expressions	
	4	Multithreading	
	5	Different Types Of Graphs	
	6	Classical Ciphers	
	7	Graphics Using Turtle	
3	**GUI Programming Using Tkinter**		06
	1	GUI Programs	
	2	Dictionary, Event Handling	

Lecture/tutorial times

Example:

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for semester examinations.

Details of referencing system to be used in written work

Text books

1. Learning to program with Python by Richard L. Halterman.
2. A Practical Introduction to Python Programming Heinold

Additional Materials/ Reference Books:

1. Programming Python by Mark Lutz, O'Reilly.
2. Core Python Programming by R. Nageswara Rao, dreamtech.
3. Core Python Programming, by Wesley J. Chun. Second Edition, Prentice Hall.

Digital Learning Resources:

1. https://www.python.org/doc/

ASSESSMENT GUIDELINES
Your final course mark will be calculated from the following:

Internal Assessment 1	20 Marks (Unit -1 and Unit – 2)	Objectives (1-2)	**60% in Total**
Internal Assessment 2	20 Marks (Unit -3 and Unit – 4)	Objective (3-4)	
CIE – Assignment Evaluation	16 marks (4 marks / unit)	Objectives (1-4)	
CIE – MOOC / Workshop / Seminars/PPT	4 marks	Objectives (1-4)	
Final exam (*closed book*)	40 marks	Objectives (1-5) – **40%**	

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 50% in internal component or less than 50% in the end semester will be considered for supplementary assessment in the respective components (i.e internal component or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (internal component or end semester) and need to obtain the required minimum 50% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

A report on the practical work is due the subsequent week after completion of the class by each group.

Late Work

Late assignments will not be accepted without supporting documentation. Late submission of the reports will result in a deduction of -% of the maximum mark per calendar day

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties. Plagiarism is the use of another person's work, or idea, as if it is his or her own - if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment)

Course schedule

	Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
	Weeks 1	Unit – 1		Board work + PPT
	Weeks 2	Unit – 1		Board work + PPT + Practical Implementation
	Week 3	Unit – 1 *Quiz*		Board work + PPT *Quiz*
	Week 4	Unit – 2		Board work + PPT
	Week 5	Unit – 2		Board work + PPT + Self Learning
	Week 6	Unit – 2 *Chart Preparation*		Board work + PPT *Charts*
	Week 7	Unit – 3		Board work + PPT
	Week 8	Unit – 3		Board work + PPT
	Week 9	Unit – 3		Board work + PPT
	Week 10	Unit – 4 *Debate on Technical topic*		Board work + PPT *Debate*
	Week 11	Unit – 4		Board work + PPT
	Week 12	Unit – 4 *Lecture Book Submission and Group Presentations*		Board work + PPT *Submissions and Presentations*