Theory Paper

Part A Introduction			
Program: Degree		**Class :UG**	**Year: III** Session:
Subject: BCA			
1	**Course Code**		**UPYTHCA501**
2	**Course Title**		**Python Programming (Theory) (Group A - Paper-II)**
3	**Course Type (Core Course/ Discipline Specific Elective/ Elective/ Generic Elective /Vocational/ .....)**		**Discipline Specific Elective (DSE)**
4	**Pre-requisite (if any)**		
5	**Course Learning outcomes (CLO)**		**On successful completion of this course, the students will be able to:** 1.Develop and execute simple Python programs. 2. Structure a Python program into functions. 3. Using Python lists, tuples to represent compound data 4. Develop Python Programs for file processing
6	**Credit Value**		**4**
7	**Total Marks**		Max. Marks: 40 + 60 Min. Passing Marks:16+24

Part B Content of the Course

No. of Lectures (in hours per week): 3 **Hrs. per week**
Total No. of Lectures: **60 Hrs.**

Module	Topics	No. of Lectures (1 Hour Each)
Unit I	What is Python? WHY PYTHON? History, Features - Dynamic, Interpreted, Object oriented, Embeddable, Extensible, Large standard libraries, Free and Open source. Download &Python Installation Process in Windows, Unix, Linux and Mac, Online Python IDLE, Python Realtime IDEs like Spyder, Jupyter Note Book, PyCharm. Rodeo, Visual Studio Code, ATOM, PyDevetc, Data Types and Variables, Numbers, Operators Comments in Python. Input output operation in python.	**No. of Lectures 14**
Unit II	Control Statements: Conditional control statements - if, If-else, lf-elif-else, Loop control statements- for, while, Data Structure & Collection:-String, List, Tuple, Set, Dictionary, Comparison of List, Tuple and Set, Function in python, types of function in python, map, reduce, filter function. Lamda Function	**10**

Unit - **III**	Importance of modular programming. What is module? Types of Modules - Pre defined, User defined. User defines module creation, OS, Date-time, math modules, organizing python project into packages, Types of packages - pre defined, user defined. Package v/s Folder, File and Directory handling in Python.	
Unit - **IV**	Procedural v/s Object oriented programming, Principles of OOP - Encapsulation, Abstraction (Data Hiding), Polymorphism, Inheritance. Inner Classes. Exception handling and types of errors, try, except, finally, raise, and Need to Custom exceptions, Case studies, regular expression.	
Unit - V	Multithreading and multiprocessing in python, Threading module, Creating thread - inheriting Thread class , Using callable object, Life cycle of thread. Single threaded application, Multithreaded application, Can we call run() directly? Need to start() method , Sleep() & Join(), Synchronization - Lock class - acquire(), release() functions. Garbage collection. Python Data Base Communications (PDBC), Introduction of Numpy, Pandas & MatPlotLib, Drawing plots.	

Part C Suggested Study Material

Suggested Readings:

1.Mark Lutz, Learning Python
2. Tony Gaddis, Starting Out With Python
3. Kenneth A. Lambert, Fundamentals of Python
JamesPayne,BeginningPythonusingPython2.6andPython32.

Reference Books:

1. Python Crash Course: A Hands-On, Project-Based Introduction to Programming Edition) Author: Eric Matthes.
2. The Python Language Reference Manual (version 3.2), Guido van Rossum, Drake, Jr. (Editor),ISBN: 1906966141,Network Theory Ltd, 120 pages (Revised

Suggestive digital platforms/ web links:

1. www.w3school.com
2. www.pvthon.org
3. https://www.tutorialspoint.com/Python/index.htm

S.No.	Online Course	Duration	Plateform
01	Joy of Computing using Python https://nptel.ac.in/courses/106106182	12 Weeks	NPTEL
02	Complete Python course https://www.udemy.com/topic/python/	12 Weeks	Udemy

<table>
<tr><th colspan="4">PART D: Assessment and Evaluation</th></tr>
<tr><td colspan="2">Internal Assessment : Continuous Comprehensive Evaluation (CCE) : 40 Marks
Shall be based on allotted assignments and Class Tests. The marks shall be as follows:</td><td colspan="2">External Assessment: University Exam (UE) : 60 Marks
Time : 03.00 Hours</td></tr>
<tr><td>Assessment and presentation of assignment</td><td>10 Marks</td><td rowspan="2">Section (A) : Five Very Short Questions (50 Words Each)
OR
MCQ Questions</td><td rowspan="2">05 x 02 = 10 Marks
OR
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<tr><td colspan="4">Any remarks/suggestions:</td></tr>
</table>

Part A Introduction		
Program: Degree	**Class : UG**	**Year: III** **Session:**
Subject: BCA		
1	**Course Code**	**UCOMPCA502**
2	**Course Title**	**Computer Graphics (Theory) (Group A - Paper-I)**
3	**Course Type (Core Course/ Discipline Specific Elective/ Elective/ Generic Elective /Vocational/ .....)**	**Discipline Specific Elective (DSE)**
4	**Pre-requisite (if any)**	None
5	**Course Learning outcomes (CLO)**	**On successful completion of this course, the students will be able to:** 1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics. 2. Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis. 3. Use of geometric transformations on graphics objects and their application in composite form. 4. Extract scene with different clipping methods and its transformation to graphics display device. 5. Explore projections and visible surface detection techniques for display of 3D scene on 2D screen. 6. Render projected objects to naturalize the scene in 2D view and use of illumination models for this.
6	**Credit Value**	**4**
7	**Total Marks**	Max. Marks: 40 + 60 Min. Passing Marks: 16+24

Part B Content of the Course

No. of Lectures (in hours per week): 3 **Hrs. per week**
Total No. of Lectures: **60 Hrs.**

Module	Topics	No. of Lectures (1 Hour Each)
Unit 1	**Introduction to Computer Graphics:** Application of Computer Graphics. Interactive and Passive Graphics. **Graphic Systems:** Display Processor, Cathode Ray Tube (CRT), Random Scan vs Raster Scan, Color CRT Monitors, Direct View Storage Tubes, Flat Panel Display. **Input Output Devices:** Input Devices, Trackball, Light Pen, Image Scanner, Output Devices, Plotters.	12

Unit -II	**Scan Conversion a line: Scan Conversion Definition, Scan Converting a** Point. Scan Converting **a Straight Line. DDA Algorithm.** **Scan Conversion Circle: Defining a Circle, Defining a Circle using** Polynomial Method, Defining **a Circle using Polar Coordinates Method,** Bresenham's Circle Algorithm, **Midpoint Circle Algorithm.** **Scan Converting Ellipse: Scan converting a Ellipse,** **Polynomial** Method, Trignometric Method, Midpoint **Ellipse Algorithm**	**12**
Unit - III	**Filled Area Primitives: Boundary Fill Algorithm, Flood Fill Algorithm,** Scan Line Polygon **Fill Algorithm.** **2D Transformations: Introduction of** Transformation, **Translation,** Scal Mg. Rotation, Reflection, Shearing, Matrix Representation, Homogeneous Coordinates, Composite Transformation, **Pivot** Point **Rotation.** **2D-Viewing: Window, Window to Viewport** Co-ordinate Transformation, Zooming, Panning.	**12**
Unit -IV	**Clipping Techniques: Clipping, Point Clipping, Line Clipping,** Midpoint Subdivision Algorithm, Text Clipping, **Polygon, Sutherland-**Hodgeman Polygon Clipping, Weiler-Atherton **Polygon Clipping.** **Pointing & Positioning:** Pointing & Positioning Techniques, Elastic or Rubber Band Techniques, Dragging. **Shading:** Introduction of Shading, Constant Intensity Shading, Gouraud shading, Phong Shading.	**12**
Unit V:	**Animation:** Animation, Application Areas of Animation, Animation Functions. **3D Computer Graphics:** Three Dimensional Graphics, Three Dimensional Transformations, Scaling, Rotation, Rotation about Arbitrary Axis, Inverse Transformations, Reflection, Shearing **Hidden Surfaces:** Hidden Surface Removal, Back Face Removal Algorithm, Z-Buffer Algorithm, Painter's Algorithm, Scan Line Algorithm, Subdivision Algorithm.	12

Keywords/Tags: Graphic Systems, Input-Output Devices, Scan Conversion, 2D Transformations, 2D-Viewing, Clipping Techniques, **Shading,** Animation, 3D Computer Graphics, **Hidden** Surfaces.

Part C-Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

Textbooks:

1. Hearn: Computer Graphics C Version, Pearson Education India; 2nd edition, 2002.
2. John Hughes, Andries van Darn, Morgan McGuire, David Sklar, James Foley: Computer Graphics: Principles and Practice, Addison-Wesley Professional, 3rd edition, 2013.
3. Zhigang Xiang, Roy Plastock: Computer Graphics, McGraw **Hill Education, 2nd** edition,

Reference Book:

1. James D. Foley, Andries van Darn, Steven K. Feiner, John F. Hughes: Introduction to Computer Graphics, Addison Wesley, 1993.
2. Chopra Dr. Rajiv: Computer Graphics, S Chand & Co Ltd.
3. Desai: Computer Graphics, **PHI,** 2008.
4. Asthana, R.G.S.: Computer Graphics for Scientists and Engineers, New Age International Pvt Ltd.

Suggested Digital Platforms Web links:

https://www.eshiksha.mp.gov.in/mpdhe https://epgp. i nfl ibnet.ac. in

Suggested equivalent online courses:

https://nptel.ac.in/courses/106103224

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

PART D: Assessment and Evaluation			
Internal Assessment : Continuous Comprehensive Evaluation (CCE) : 40 Marks Shall be based on allotted assignments and Class Tests. The marks shall be as follows:		External Assessment: University Exam (UE) : 60 Marks Time : 03.00 Hours	
Assessment and presentation of assignment	10 Marks	Section (A) : Five Very Short Questions (50 Words Each) OR MCQ Questions	05 x 02 = 10 Marks OR 10 x 01 = 10 Marks
Class Test I (Objective Questions)	10 Marks		
Class Test II (Descriptive Questions)	10 Marks	Section (B) : Five Short Questions (200 Words Each)	05 x 06 = 30 Marks
Class Test III	10 Marks	Section (C): Two Long Questions (500 Words Each)	02 x 10 = 20 Marks
Total	40 Marks	Total	60 Marks
Any remarks/suggestions:			

Part A- Introduction

Program: Degree	Class: B.C.A.	Year - III	Session:

Subject- Foundation Course

1	**Course Code**	**UPERSAR503**
2	**Course Title**	**Personality Development and Character Building**
3	**Course Type**	**SEC/ Ability Enhancement Compulsory Course**
4	**Pre-requisite (if any)**	**Compulsory for all Students**
5	**Course Learning outcomes (CLO)**	1. Students will acquire the conceptual knowledge of Personality Development. 2. Students will develop insight into character building. 3. Students will be able to become global visionary citizens. 4. Students will be able to understand Indian knowledge tradition. 5. Students will be able to understand the difference between nature, culture and distortion. 6. This course will help in character building and overall development of personality of the students.
6	**Credit Value**	4

Part B- Content of the Course

Total No. of Lectures + Practical (in hours per week): **L-1 Hr / P-1 Lab Hr (=2 Hrs)**

Total No. of Lectures/ Practical: **L-30 /P-0 (30 Hrs)**

Unit	Topics	No. of lectures (Total 30)
1	• Personality development (Physical, mental, intellectual and spiritual development) meaning, concept, factors of personality development. • Character building (personal and national character): Meaning, concept, factors of character and means of character building. • Panchkosha, Annamaya Kosha, Pranamaya Kosha, Manomaya Kosha, Vigyanmaya Kosha and Anandamaya Kosha general introduction meaning purpose and importance.	06 Theoretical 04 Experiential
2	• Physical and mental development • Meaning, concept of physical and mental development • Ideal daily routine, balanced diet, routine, subtle exercise • Ashtanga Yoga-Yama Niyam, Ishwar Pranidhan, self-study, contentment, patience, virtue, practice of discipline. • Past glory, social and citizenship awareness, equal respect to all sects and scientific outlook • Nation, Nationality, Democracy, Independence, Suraj, Vasudhaiva Kutumbakam, Coexistence.	06 Theoretical 04 Experiential

3	• Moral and mental development • Difference among happiness, joy and pleasure. • Ashtanga Yoga, Pranayama, Pratyahara, Dharana, Dhyana, Samadhi. • Continuity of Karmayoga, Bhaktiyoga, Jnanayoga in life according to one's own will • Indian time calculation. • Self-respect and contemplation of mother tongue and Indian knowledge tradition. • Biographies of Legends. • Practice of service, tolerance, charity, dedication and self-examination. Self reliance	06 Theoretical 04 Experimental
	PART C	
	Suggested Readings:- 1- उच्च शिक्षा भारतीय दृष्टि -श्री अतुल कोठारी 2- अदम्य साहस - डॉ० ए.पी.जे. अब्दुल कलम 3- व्यक्तित्व विकास - स्वामी विवेकानंद रामक्रष्ण 4- आत्मतत्व का विस्तार-श्रुतम प्रकाशन जोधपुर 5-भारतीय मनोविज्ञान श्री लज्जा राम तौमर 6- उपनिषद विशेषांक - गीता प्रेस गोरखपुर 7- भारतीय ज्ञान परम्परा वोध हिंदी ग्रन्थ अकादमी म०प्र०	

PART D: Assessment and Evaluation			
Internal Assessment : Continuous Comprehensive Evaluation (CCE) : 40 Marks Shall be based on allotted assignments and Class Tests. The marks shall be as follows:		External Assessment: University Exam (UE) : 60 Marks Time : 03.00 Hours	
Assessment and presentation of assignment	10 Marks	Section (A) : Five Very Short Questions (50 Words Each) OR MCQ Questions	05 x 02 = 10 Marks OR 10 x 01 = 10 Marks
Class Test I (Objective Questions)	10 Marks		
Class Test II (Descriptive Questions)	10 Marks	Section (B) : Five Short Questions (200 Words Each)	05 x 06 = 30 Marks
Class Test III	10 Marks	Section (C): Two Long Questions (500 Words Each)	02 x 10 = 20 Marks
Total	40 Marks	Total	60 Marks
Any remarks/suggestions:			

Part A Introduction			
	Program: Degree	**Class :UG**	**Year: III** **Session:**
	Subject: BCA		
1	**Course Code**	**UPROJCA504**	
2	**Course Title**	**Project (Minor) /Internship**	
3	**Course Type (Core Course/ Discipline Specific Elective/ Elective/ Generic Elective /Vocational/ .....)**	Project	
4	**Pre-requisite (if any)**		
5	**Course Learning outcomes (CLO)**		
6	**Credit Value**	**6**	
7	**Total**	**Max Marks 100**	**Min Marks 40**

Practical Paper

Part A Introduction		
Program: Degree	**Class : UG**	**Year: III** **Session:**
Subject: Computer Application		
1	**Course Code**	**UPYTHCA505**
2	**Course Title**	**Python Programming (Practical)** **(Group A - Paper-II)**
3	**Course Type (Core Course/ Discipline Specific Elective/ Elective/ Generic Elective /Vocational/.....)**	**Discipline Specific Elective (DSE)**
4	**Prerequisite (if any)**	**To** study this course, a student must have basic Logical, and analytical skills.
5	**Course Learning outcomes (CLO)**	**On successful completion of this course, the students will be able to:** 1. Develop Simple programs in Python 2. Knowledge of conditional and loop statements. 3. Learning of Tuple, List, Directory in Python 4. Knowledge of Files and Ooops Concepts in Pyhton. 5. Introductory Knowledge of Pandas, PDBC and **Numpy.**
6	**Credit Value**	**2**
7	**Total Marks**	Max. Marks: 40+60 Min. Passing Marks:16+24
Part B- Content of the Course		
Number of Lab Practical's (in hours per week): 2 Hours Per Week		

Total No. of Lab : 30 (Each Lab of 2 Hours)		
	Suggestive List of Practical **Students are required to write program(Code) in Python, execute and test it**	**No. of Labs: 30 (** Hours **Each)**
	1. Write a program to demonstrate different number data types in Python. **2.** Write a program to perform different Arithmetic Operations on numbers in Python. **3.** Write a program to create, concatenate and print a string and accessing sub-string from a given string. **4.** Write a python script to print the current date in the following format a."Fri Oct 11 02:26:23 15T2019" **5.** Write a program to create, append, and remove lists in python. **6.** Write a program to demonstrate working with tuples in python. **7.** Write a program to demonstrate working with dictionaries in python. **8.** Write a python program to find largest of three numbers. **9.** Write a Python program to construct the following pattern, using a nested for loop * * * * * * * * * * **** * * **10.** Write a Python script that prints prime numbers less than20. **11.** Write a python program to define a module to find Fibonacci Numbers and import the module to another program. **12.** Write a python program to define a module and import a specific function in that module to another program. **13.** Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order. **14.** Write a Python class to convert an integer to a roman numeral. **15.** Write a Python class to reverse a string word by word.	
	Keywords/Tags: Open Source, Data Type, Module, List, Tuples, Directory, Loops, Array	

Part C-Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

1.Mark Lutz, Learning Python
2. Tony Gaddis, Starting Out With Python
3. Kenneth A. Lambert, Fundamentals of Python
4. JamesPayne.BeginningPythonusingPython2.6andPython32.

Suggestive digital platforms/ web links:
www.lavatpoint.com

www.w3school.com

www.python.org

https://www.tutorialspoint.com/python/index.htm

Suggested equivalent online courses:

S.No.	Online Course	Duration	Plate-form
01	Joy of Computing using Python https://nptel.ac. in/courses/106106182	**12** Weeks	NPTEL
02	Complete Python course https://www.udemy.com/topic/python/	12 Weeks	Udemy

Any remarks/ suggestions:

PART D: Assessment and Evaluation			
Internal Assessment : Continuous Comprehensive Evaluation (CCE) : 40 Marks		External Assessment: University Exam (UE) : 60 Marks Time **03.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	10 Marks	Practical record file	10 Marks
Viva	10 Marks	Viva voce practical	10 Marks
Lab Test from practical list	10 Marks	Table works/ Exercise Assigned (02) in practical exam	30 Marks
Assignments (Charts/ Model)/ Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	10 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	10 Marks
Total *Excursion/ Lab visits/ Industrial* *Training is compulsory*	40 Marks	Total	60 Marks

Part A Introduction		
Program: Degree	**Class :UG**	**Year: III Year** **Session:**
Subject: BCA		
	Course Code	**UCOMPCA506**
2	**Course Title**	**Computer Graphics (Practical)** **(Group A Paper-I)**
3	**Course Type (Core Course/ Discipline Specific Elective/ Elective/ Generic Elective /Vocational/.....)**	**Discipline Specific Elective (DSE)**
4	**Pre-requisite (if any)**	**None**
5	**Course Learning outcomes (CLO)**	**On successful completion of this course, the students will be able to:** 1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics. 2. Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis. 3. Use of geometric transformations on graphics objects and their application in composite form. 4. Extract scene with different clipping methods and its transformation to graphics display device. 5. Explore projections and visible surface detection techniques for display of 3D scene on 2D screen. 6. Render projected objects to naturalize the scene in 2D view and use of illumination models for this.
6	**Credit Value**	**2**
7	**Total Marks**	Max. Marks: 40+60 Min. Passing Marks:16+24
Part B- Content of the Course		

Total No. of Lectures-Tutorials-Practical (in hours per week): **L-T-P: 0-0-1**		
Unit	**Topics**	**No. of Lectures (2 Hours Each)**
	1. Write a Program to draw basic graphics construction like line, circle, arc, ellipse and rectangle. 2. Write a program of Translation, Rotation, and Scaling using Composite Transformation. 3. Write a program to draw a Circle using midpoint implementation Method. 4. Write a program to draw Bezier curve. 5. Program to rotate a rectangle about its midpoint. 6. Program to clip a line using Liang Barsky Method. 7. Program to implement Standard Perspective Projection in 3-Dimensions. 8. Program to implement Parallel Projection in 3-Dimensions. 9. Write a Program to implement Digital Clock. 10. Write a Program to draw animation using increasing circles filled with different colors and patterns. 11. Write a Program control a ball using arrow keys. 12. Write a Program to implement Bouncing Ball in vertical direction.	
Part C-Learning Resources **Text Books, Reference Books, Other resources Suggested Readings: Textbooks:**		
	• Learn: Computer Graphics C Version, Pearson Education India; 2nd edition, 2002. • John Hughes, Andries van Dam, Morgan McGuire, David Sklar, James Foley: Computer Graphics: Principles and Practice, Addison-Wesley Professional, 3rd edition. 2013. • Zhigang Xiang, Roy Plastock: Computer Graphics, McGraw Hill Education, 2nd edition, 2006. 4. Reference Book:	

PART D: Assessment and Evaluation			
Internal Assessment : Continuous Comprehensive Evaluation (CCE) : 40 Marks		External Assessment: University Exam (UE) : 60 Marks Time **03.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	10 Marks	Practical record file	10 Marks
Viva	10 Marks	Viva voce practical	10 Marks
Lab Test from practical list	10 Marks	Table works/ Exercise Assigned (02) in practical exam	30 Marks
Assignments (Charts/ Model)/ Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	10 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	10 Marks
Total *Excursion/ Lab visits/ Industrial* *Training is compulsory*	40 Marks	Total	60 Marks