CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (III CYCLE) WITH "A" GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI – 18

DEPARTMENT OF COMPUTER APPLICATIONS

Bachelor of Computer Applications

2023-2024 onwards

SYLLABUS

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

DEPARTMENT OF COMPUTER APPLICATIONS

<u>VISION</u>

- ❖ To produce globally competent computer professionals by providing high qualityeducation and also focus on developing the skills of technical competency.

- ❖ To make an incorporated framework that meets the higher instructive necessities ofthe community.

- ❖ To prepare the students for technical training with revolutionary vision so they cancreate employment opportunities for themselves as well as for others.

<u>MISSION</u>

- ❖ To produce a quality learning environment that helps students to enhance problemsolving skills and practical knowledge.

- ❖ To provide technical education to the students through well-equipped labs.

- ❖ Giving personal attention to slow learners consequently, allowing them to cope upwith other wards.

- ❖ To impart the professional and communication skills training to the students to getbetter placement.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	**LEARNING ENVIRONMENT** To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	**ACADEMIC EXCELLENCE** To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	**EMPLOYABILITY** To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	**PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY** To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	**GREEN SUSTAINABILITY** To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES for B.Sc Computer Science,

B.Sc Computer Science with Cognitive Systems , BCA and

B.Sc Information Technology PROGRAMME

PO NO.	On completion of B. Sc Computer Science / B. Sc Computer Science with Cognitive Systems / BCA/ B. Sc Information Technology Programme, the students will be able to
PO 1	**ACADEMIC SKILLS & SOCIAL RESPONSIBILITY** Apply Computing, Mathematical and Scientific Knowledge in Various disciplines by understanding the concerns of the society.
PO 2	**CRITICAL THINKING AND INNOVATIVE PROGRESS** Design the software applications with varying intricacies using programming languages for innovative learning in techno world to meet the changing demands.
PO 3	**PERSONALITY DEVELOPMENT** Perceive Leadership skills to accomplish a common goal with effective communication and understanding of professional, ethical, and social responsibilities.
PO 4	**LIFELONG LEARNING** Identify resources for professional development and apply the skills and tools necessary for computing practice to gain real life experiences.
PO 5	**CREATIVITY AND HOLISTIC APPROACH** Create a scientific temperament and novelties of ideas to support research and development in Computer Science to uphold scientific integrity and objectivity.

PROGRAMME SPECIFIC OUTCOMES FOR BCA

PSO NO.	The students of Bachelor of Computer Applications will be able to	POs Addressed
PSO 1	Understand the concepts of logical and critical thinking with adequate practical skills.	PO1 PO2 PO4 PO5
PSO 2	Adopt necessary technical, scientific, managerial and financial knowledge to be employable or purse higher education.	PO1 PO2 PO4
PSO 3	Apply neoteric technology in various domains and evaluate the method of implementing it.	PO1 PO2 PO4
PSO 4	Design and create innovative ideas that meet the requirements of an entrepreneur and software industry.	PO1 PO2 PO4 PO5
PSO 5	Explore the ethical values, sustainability and productivity.	PO3 PO4 PO5

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF COMPUTER APPLICATIONS
BCA
LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)
(For the Candidates admitted from the Academic year 2023-2024 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course - I (LC)	Podhu Tamil – 1	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyan aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper I- French I	23ULF1						
	II	English Language Course - I (ELC)	General English -I	23UE1	6	3	3	25	75	100
	III	Core Course – I (CC)	Python Programming	23UCA1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Python Programming Lab (P)	23UCA1CC1P	3	3	3	40	60	100
		First Allied Course - I (AC)	Numerical Methods	23UCA1AC1	4	3	3	25	75	100
		First Allied Course - II (AC)	Statistical Methods and its Application-I	23UCA1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course -I (AECC)	Value Education	23UGVE	2	2	-	100	-	100
Total					**30**	**22**				**700**

The Internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	25	75

For Theory:

The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks).

The passing minimum for End Semester Examinations shall be 40 % out of 75 marks (i.e. 30 marks).

For Practical:

The passing minimum for CIA shall be 40 % out of 25 marks (i.e. 10 marks).

The passing minimum for End Semester Examinations shall be 40 % out of 75 marks (i.e .30 marks).

Internal Component (Theory)

Component	Marks
Attendance	03
Library	03
Seminar/ Quiz/ Assignment	4
CIA –I	7.5
CIA-II	7.5
Total	**25**

Internal Component (Practical)

Component	Marks
Observation	05
Record	05
Continual performance in practical	05
Model	10
Total	**25**

Question Paper Pattern

Answer all the questions

PART A   (20 X 1 = 20)

Answer all the questions

PART B   (5 X 5 = 25)

Answer any three questions

PART C   (3 X 10 = 30)

Semester I	Internal Marks:25			External Marks: 75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**	
23UCA1CC1 / 23UCS1CC1	**PYTHON PROGRAMMING**	**CORE**	**5**	**5**	

Course Objectives

- To make students understand the concepts of Python programming
- To apply the OOPs concept in Python programming
- To make the students learn best practices in Python programming

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the fundamental concepts of Python	K1
CO2	Demonstrate the problem-solving approach using Python statements	K2
CO3	Construct the Python programme using functions and modules	K3
CO4	Analyze the Python programming concepts to develop programs	K4
CO5	Develop a Python program to solve real-time problems	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

"1"-Slight (Low) Correlation "2"-Moderate (Medium) Correlation

"3" –Substantial (High) Correlation "-" - Indicates there Is no Correlation

Syllabus

UNIT	Contents	HOURS	COs	COGNITIVE LEVEL
I	**Basics of Python Programming:** Features of Python -History of Python- Literal Constants-Variables and Identifiers–Data Types- Input Operation- Comments– Reserved Words- Indentation- Operators and Expressions –Other Data Types- Type Conversion.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Decision Control Statements:** Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. **Basic Loop Structures / Iterative Statements:** while loop, for loop- Nested Loops- The break Statement- The continue Statement.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**Functions and Modules:** Function Definition – **Function Call:** Function Parameters – **Variable Scope and Lifetime:** Local and Global Variables- Using the Global Statement-Resolution of Names. The return Statement. **More on Defining Functions:** Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments. **Python Strings**: Strings are Immutable- Built-in String Methods and Functions – Comparing String**s. Modules:** The from…import statement- Name of Module – The dir() function – Modules and Namespace.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**Lists:** Access values in List-Updating values in Lists-Nested lists -Basic list operations-List Methods. **Tuple:** Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples. **Dictionaries:** Creating a dictionary, Accessing values, Modifying an Entry -Deleting items – Built-in Dictionary Functions and Methods - Difference between a List and a Dictionary.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	**File Handling:** Types of files in Python - Opening and Closing files- **Reading and Writing files**: write() and writelines() methods- append() method – read() and readlines() methods – Splitting words –File Positions.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**Self Study for Enrichment** (**Not to be included for End Semester Examination**) Difference between lists and tuples - Defining our own modules- Renaming and deleting files.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. Reema Thareja. (2017), Python Programming using problem solving approach, 1st Edition, Oxford University Press.

References

1. Dr. R. Nageswara Rao. (2017), Core Python Programming, 1st Edition, Dream tech Publishers.

2. VamsiKurama. (2017), Python Programming: A Modern Approach,1st Edition, Pearson Education.

3. Mark Lutz. (2013), Learning Python, Fifth Edition, Orielly.

4. Adam Stewarts. (2017), Python Programming, Online.

5. Fabio Nelli. (2015), Python Data Analytics,1st Edition, APress.

6. Kenneth A. Lambert. (2019), Fundamentals of Python – First Programs,2nd Edition, CENGAGE Publication.

Web References

1. https://www.programiz.com/python-programming

2. https://www.guru99.com/python-tutorials.html

3. https://www.w3schools.com/python/python_intro.asp

4. https://www.geeksforgeeks.org/python-programming-language/

5. https://en.wikipedia.org/wiki/Python_(programming_language)

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

Dr.K.Akila, Associate Professor, Department of Computer Applications

Semester I	Internal Marks:25			External Marks: 75
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
23UCA1CC1P	**Python Programming Lab (P)**	**CORE**	3	3

Course Objectives

- To provide programming knowledge in Python.
- To create loops and decision statements in Python.
- To build and package Python modules for reusability.
- To read and write files in Python.

Course Outcome and Cognitive Level Mapping

CO Number	**CO Statement** On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the syntax and semantics of Python.	K1
CO2	Identify the problem and solve using Python programming techniques.	K2
CO3	Identify suitable programming constructs for problem solving.	K3
CO4	Analyze various concepts of Python language to solve the problem in an efficient way.	K4
CO5	Develop a Python program for a given problem and test for its correctness.	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

"1"-Slight(Low)Correlation   "2"-Moderate(Medium)Correlation

"3" -Substantial(High)Correlation   "-"- Indicates there Is no Correlation

List of Practicals

1. Program using variables, constants, I/O statements in Python.
2. Program using Operators in Python.
3. Program using Conditional Statements.
4. Program using Loops.
5. Program using Jump Statements.
6. Program using Functions.
7. Program using Recursion.
8. Program using Arrays.
9. Program using Strings.
10. Program using Modules.
11. Program using Lists.
12. Program using Tuples.
13. Program using Dictionaries.
14. Program for File Handling.

Web References

1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://www.w3schools.com/python/python_intro.asp
4. https://www.geeksforgeeks.org/python-programming-language/
5. https://en.wikipedia.org/wiki/Python_(programming_language)

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

Dr.K.Akila, Associate Professor, Department of Computer Applications

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
23UCG1AC1/ 23UCS1AC1/ 23UCA1AC1/ 23UIT1AC1	**NUMERICAL METHODS**	**ALLIED**	**4**	**3**

Course Objective

- **Learn** the various topics in Numerical methods.
- **Understand** the fundamentals of algebraic equations, interpolation, numerical differentiation and integration.
- **Develop** skills in solving problems of numerical techniques.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Remember the basic concepts of numerical methods.	K1
CO2	Illustrate the various notions of computational numerical streams.	K2
CO3	Apply the different techniques of numerical problems	K3
CO4	Classify the methods of numerical techniques.	K4
CO5	Examine the solutions of numerical problems.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	3	2	3
CO2	3	2	3	3	3	3	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2	2
CO4	3	2	2	3	3	3	3	3	3	2
CO5	3	2	3	3	3	3	3	3	2	2

"1" – Slight (Low) Correlation ¬ "2" – Moderate (Medium) Correlation ¬

"3" – Substantial (High) Correlation ¬ "-" indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	**Solution of Algebraic and Transcendental Equations**: Introduction – Bisection Method –The Iteration Method – The Method of False Position – Newton Raphson Method. (Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
II	**Interpolation:** Finite differences – Forward differences – Backward differences – Central differences – Newton's Formulae for interpolation–Interpolation with Unevenly Spaced Points – Lagrange's Interpolation Formula. (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
III	**Numerical Differentiation and Integration:** Introduction – Numerical Differentiation – Numerical Integration – Trapezoidal Rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
IV	**Numerical Linear Algebra:** Solution of Linear Systems – Direct Methods – Gauss - Elimination – Gauss -Jordan method. Solution of Linear Systems – Iterative Methods. (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
V	**Numerical Solution of Ordinary Differential Equations:** Introduction – Solution by Taylor's Series – Euler's Method – Modified Euler's Method – Runge-Kutta Method–Predictor-Corrector Methods – Adams-Moulton Method – Milne's Method(Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
VI	**Self-Study for Enrichment** **(Not included for End Semester Examination)** Ramanujan's Method – Bessel's Formula – Newton-Cotes Integration Formulae –The QR Method – Picard's Method of Successive Approximations	-	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4

Text Books

Sastry.S.S (2004), *Introductory Methods of Numerical Analysis* (Third Edition), Prentice Hall of India Private Ltd, New Delhi.

Chapters and Sections

UNIT–I   Chapter 2: Sections: 2.1 – 2.5 (Omit 2.3.1 & 2.5.1)

UNIT II   Chapter 3: Sections: 3.3 : 3.3.1 – 3.3.3, 3.6, 3.9 : 3.9.1

UNIT-III   Chapter 5: Sections: 5.1, 5.2 (only), 5.4 : 5.4.1 – 5.4.3

UNIT-IV   Chapter 6: Sections: 6.3: 6.3.2, 6.4

UNIT-V   Chapter 7: Sections: 7.1,7.2, 7.4: 7.4.2, 7.5,7.6

Reference Books

1. Venkataraman, M.K. (2003). *Numerical Methods in Science and Engineering,* The National Publishing Company.
2. Iyengar S.R.K, Jain R.K, (2009). *Numerical Methods*, New Age International Publishers.
3. Subramanian,N. (2007). *Numerical Methods,* SCM Publisher, Erode.

Web References

1. https://tinyurl.com/4y7knvm9
2. https://tinyurl.com/t29njcy5
3. https://www.youtube.com/watch?v=TIWRyzzFUYQ
4. https://www.youtube.com/watch?v=iviiGB5vxLA
5. https://www.youtube.com/watch?v=j_4MVZ3VADU

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Brain storming, e-content.

Course Designer

1. Dr. V. Geetha
2. Dr. S. Sasikala

ALLIED COURSE-II (AC)
STATISTICAL METHODS AND ITS APPLICATION-I
(For BCA Students)
(2023-2024 Onwards)

Semester I	Internal Marks:25		External Marks:75	
COURSECODE	COURSETITLE	CATEGORY	Hrs/Week	CREDITS
23UCA1AC2	STATISTICAL METHODS AND ITS APPLICATION - I	ALLIED	4	3

Course Objective

- **Enable** the short historical development of Statistics.
- **Provide** the knowledge to interpret and solve the statistical problems.
- **Explore** the ideas of statistical tools.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Remember and recall the basic concepts of statistics.	K1
CO2	Illustrate the various notions in the respective stream.	K2
CO3	Apply the different terminologies of statistics.	K3
CO4	Classify the solution of statistical methods using various techniques.	K4
CO5	Explain the solution of statistical problems.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	2	2	3	2	2	2	3
CO2	2	2	3	2	2	2	2	2	2	3
CO3	3	2	3	2	2	3	2	2	3	3
CO4	3	2	2	2	2	2	2	2	2	2
CO5	2	2	2	2	3	2	3	1	2	2

"1"–Slight(Low)Correlation   "2"–Moderate(Medium) Correlation

"3"–Substantial(High) Correlation   "-" indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	**Measures of Central Tendency:** Averages–Arithmetic Mean – Median – Mode – Geometric Mean.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**Dispersion:** Dispersion – Measures of Dispersion – Coefficients of Dispersion (Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**Correlation:** Introduction – Meaning of Correlation – Scatter Diagram – Karl Pearson's Co-efficient of Correlation. **Rank Correlation:** Spearman's Rank Correlation Coefficient – Tied Ranks (Derivations not needed and Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**Linear Regression:** Introduction–Linear Regression–Regression Coefficients–Properties of Regression Coefficients-Angle between Two Lines of Regression-Correlation Coefficient between Observed and Estimated Values(Derivations not needed and Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**Skewness, Kurtosis, Moments:** Introduction –Meaning-Skewness- Test of Skewness- Dispersion and Skewness- Measures-Objective-Karlpearson's Coefficient of Skewness-Bowley's Coefficient of Skewness – Kelly's Coefficient of Skewness – Moments- Meaning – Kurtosis - Meaning(Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**Self Study for Enrichment:** **(Not included for End Semester Examination)** HarmonicMean–Range– Repeated Ranks(Continued)– Standard Error of Estimate or Residual Variance- Sheppard's Correction for moments.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Gupta.S.C. &V.K.Kapoor. (2014). *Fundamentals of Mathematical Statistics*. Sultan Chand&Sons, New Delhi.

2. Pillai.R.S.N & Bhagavathi (2008).*Statistics Theory and Practice*. S.Chand & Sons, New Delhi.

Chapters and Sections

UNIT-I   Chapter 2: Sections 2.4 – 2.8 [1]
UNIT-II   Chapter 2: Sections 2.12–2.14[1]
UNIT- III   Chapter 10: Sections 10.1 to 10.4 and 10.7(10.7.1, 10.7.2)[1]
UNIT-IV   Chapter 11: Sections 11.1 to 11.2 (11.2.1, 11.2.2, 11.2.3, 11.2.5)[1]
UNIT-V   Chapter 11: Pages : 338–363[2]

Reference Books

1. Gupta. S.C. &Kapoor. V.K.(2004). *Elements of Mathematical Statistics*. Sultan Chand & Sons, New Delhi.
2. Veerarajan.T.(2010). *Probability, Statistics and Random Processes.* Tata Mc Graw Education Private.
3. Bhisma Rao.G.S.S. (2011). *Probability and Statistics.* Scitech Publications (India) Private Limited.

Web References:

1. https://www.youtube.com/watch?v=6DYtC7lrVuY

2. https://youtu.be/64ELhoTvzk0

3. https://www.youtube.com/watch?v=xZ_z8KWkhXE

4. https://www.youtube.com/watch?v=nk2CQITm_eo
5. https://rcub.ac.in/econtent/ug/bcom/sem4/Business%20Statistics%20Unit%204%20Correlation%20and%20Regression.pdf

6. https://youtu.be/Gp6dqDLchbk

Pedagogy

Power Point Presentation, Group Discussion, Seminar, Assignment.

Course Designer

Dr. P. Geethanjali