K.M.G. COLLEGE OF ARTS AND SCIENCE

(AUTONOMOUS)

Approved by the Government of Tamil Nadu
Permanently Affiliated to Thiruvalluvar University, Vellore
Recognized under Section 2(f) and 12(B) of the UGC Act 1956
Accredited by NAAC (2nd Cycle) with (CGPA of 3.24/4) 'A' Grade

DEPARTMENT OF COMPUTER APPLICATIONS

B.C.A.,

SYLLABUS

(CHOICE BASED CREDIT SYSTEM)

Under

LEARNING OUTCOMES-BASED CURRICULUM

FRAMEWORK (LOCF)

(Effective for the Batch of Students Admitted from 2024-2025)

PREFACE

The curriculum of undergraduate Computer Applications has been designed to explain the concepts in various branches of Computer Applications such as Information Technology, Computer Networking, Software Engineering, Databases etc. The purpose of the outcome-based education is meant to provide an exposure to the fundamental aspects in different branches of Computer Science and its applications, keeping in mind the growing needs for higher education, employability, entrepreneurship and social responsibility. The periodical restructuring of the syllabi is carried out to fulfill the requirements of graduate attributes, qualification descriptors, programme learning outcomes and course outcomes. The programme also includes training to students for seminar presentation, preparation of internship reports, hands-on training in lab courses, skills to handle instruments, synthesis and its analysis, developing leadership qualities, organization and participation in the interdepartmental academic competitions. The allied papers provide a platform to strengthen the understanding of the core subjects. The non-major elective courses offer chances to learn and augment interest in other related fields. The outcome-based curriculum is intended to enrich the learning pedagogy to global standards. ICT enabled teaching-learning platforms are provided to students along with the interaction of international scientists. The seminars periodically delivered by industrialists, subject experts and former professors would certainly help the students to update with latest technology/trends in different fields of Computer Applications. The exposure to the industrial internship and MoUs with industries can open an avenue for a start-up and its progress would be followed regularly. The OBE based evaluation methods will reflect the true cognitive levels of the students as the curriculum is designed with course outcomes and cognitive level correlations as per BLOOM's Taxonomy.

ABOUT THE COLLEGE

The College was founded in the new millennium 2000 by the vision of late Shri.K.M.Govindarajan fondly known as Iyah, with a mission to offer higher education in the fields of Arts and Science to the needy and the poor middle class students of this area and make them fully employable and economically self reliant. With a humble beginning of launching an elementary school named Thiruvalluvar Elementary School in the year 1952, Iyah groomed it into a Higher Secondary School and later into a college. Education was his soul & breath. The college has grown into a full fledged educational hub offering 12 graduate programmes, 8 post graduate programmes, 5 M.Phil research programmes and 4 Ph.D programme. The college has been accredited with A grade by NAAC in 2nd cycle and recognized under section 2(f) & 12(B) of the UGC act 1956. The College is permanently affiliated to Thiruvalluvar University. The College is an associate member of ICT Academy and registered member of NPTEL and Spoken Tutorials of IIT Bombay. The college is also a member of INFLIBNET and NDL.

VISION OF THE COLLEGE

Empower young men and women by educating them in the pursuit of excellence, character building and responsible citizen.

MISSION OF THE COLLEGE

Offer higher education in the fields of Arts, Science & Management to the needy and make them fully self-dependent.

QUALITY POLICY OF THE COLLEGE

KMG Students achieve the best learning results and personal growth with modern education that equip them for working life and a changing society to become deserving citizens.

ABOUT THE DEPARTMENT

The Department of Computer Applications was established in the year 2000 with a view to fulfill the dynamic needs of IT sector all over the world. The department is well equipped with all basic and latest resources. The department comprises of well qualified and dedicated faculty members. The Department aims to make the students use their intellectual calibre for effective and quick acquisition.

VISION OF THE DEPARTMENT

To create a teaching, learning environment that will provide best opportunity for the students specifically from the rural area of Gudiyatham to meet the current challenges of the modern computing industry, to develop as competent professionals, to serve the computing industry and contribute to our nation's socio-economic progress.

MISSION OF THE DEPARTMENT

- To educate students at under graduate level (BCA) in the fundamental and advanced concepts of computing discipline.
- To promote practical skills in our students with an emphasis on ethics, interpersonal development and professional competency.
- To prepare them to pursue exemplary careers in industries, academia and research.
- To impart the ability to use the expertise in computing to meet the ever growing demands of the society.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

1. Professional Excellence: Graduates will demonstrate competency and excellence in their chosen fields of study, applying theoretical knowledge to practical situations effectively.

2. Character Development: Graduates will exhibit strong moral and ethical character, upholding values of integrity, honesty, and respect for others in both personal and professional endeavors.

3. Leadership and Citizenship: Graduates will emerge as responsible leaders and active citizens, contributing positively to their communities and society at large through their actions and initiatives.

4. Continuous Learning: Graduates will engage in lifelong learning and professional development activities, adapting to evolving technologies, methodologies, and societal needs.

5. Self-Dependency and Entrepreneurship: Graduates will possess the skills and mindset necessary to be self-reliant and entrepreneurial, capable of creating opportunities for themselves and others through innovation and initiative.

6. Effective Communication and Collaboration: Graduates will demonstrate proficiency in communication skills, both verbal and written, and exhibit the ability to collaborate effectively with diverse teams and stakeholders.

7. Global Perspective: Graduates will have a broad understanding of global issues and perspectives, demonstrating cultural sensitivity and adaptability in multicultural environments.

PROGRAM OUTCOMES (POs)

On successful completion of the programme, the students will be able to:

POs	Graduate Attributes	Statements
PO1	Disciplinary Knowledge	Acquire detailed knowledge and expertise in all the disciplines of the subject.
PO2	Communication Skills	Ability to express thoughts and ideas effectively in writing, listening and confidently Communicate with others using appropriate media
PO3	Critical Thinking	Students will develop aptitude Integrate skills of analysis, critiquing, application and creativity.
PO4	Analytical Reasoning	Familiarize to evaluate the reliability and relevance of evidence, collect, analyze and interpret data.
PO5	Problem Solving	Capacity to extrapolate the learned competencies to solve different kinds of non-familiar problems.
PO6	Employability and Entrepreneurial Skill	Equip the skills in current trends and future expectations for placements and be efficient entrepreneurs by accelerating qualities to facilitate startups in the competitive environment.
PO7	Individual and Team Leadership Skill	Capability to lead themselves and the team to achieve organizational goals and contribute significantly to society.
PO8	Multicultural Competence	Possess knowledge of the values and beliefs of multiple cultures and a global perspective.
PO 9	Moral and Ethical awareness/reasoning	Ability to embrace moral/ethical values in conducting one's life.
PO10	Lifelong Learning	Identify the need for skills necessary to be successful in future at personal development and demands of work place.

PROGRAM SPECIFIC OUTCOMES (PSOs)

On successful completion of the B.C.A., the students will be able to:

PSOs	Statements
PSO1	Apply fundamental programming concepts and technologies.
PSO2	Demonstrate proficiency in utilizing various programming languages and development tools.
PSO3	Exhibit complex problems through algorithmic thinking, and collaborative skills for working effectively in multidisciplinary teams on software projects, knowledge in emerging trends and technologies in Computer Applications.

Correlation Rubrics:

High	Moderate	Low	No Correlation
3	2	1	-

Mapping of PSOs with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	3	2	3	3	3	3	2	-	-	2
PSO2	3	2	3	3	3	3	2	1	-	2
PSO3	3	3	3	3	3	3	2	3	2	3

K.M.G. COLLEGE OF ARTS AND SCIENCE

(AUTONOMOUS)

Subject and Credit System- B.C.A.,

(Effective for the Batch of Students Admitted from 2024-2025)

Semester	Part	Category	Course Code	Course Title	Ins.Hrs / Week	Credit	Maximum Marks		
							Internal	External	Total
SEMESTER - I	I	Language	AULT10/ AULU10	General Tamil – I / Urdu - I	6	3	25	75	100
	II	English	AULE10	English – I	6	3	25	75	100
	III	Core – 1	AUCCA11	Python Programming	5	5	25	75	100
	III	Core – 2	AUCPCA15	Practical: Python Programming lab	5	5	25	75	100
	III	Elective -1 (Choose any one)	AUEMA12A	Statistical Methods & its Applications-I	4	3	25	75	100
			AUEMA12B	Numerical Methods					
	IV	SEC – 1	AUSCA13	Fundamentals of Information Technology	2	2	25	75	100
	IV	FC - 1	AUFCA14	Foundation Course – Structured Programming Language in C	2	2	25	75	100
				Semester Total	**30**	**23**			

Semester	Part	Category	Course Code	Course Title	Ins.Hrs / Week	Credit	Maximum Marks		
							Internal	External	Total
SEMESTER - II	I	Language	AULT20/ AULU20	General Tamil – II / Urdu -II	6	3	25	75	100
	II	English	AULE20	English – II	6	3	25	75	100
	III	Core - 3	AUCCA21	OOPS Concept Using C++	5	5	25	75	100
	III	Core – 4	AUCPCA25	Practical: C++ Programming Lab	5	5	25	75	100
	III	Elective – 2 (Choose any one)	AUEMA 22A	Statistical Methods & its Applications- II	4	3	25	75	100
			AUEMA22C	Resource Management Techniques					
	IV	SEC 2	AUSCA23	Introduction to HTML	2	2	25	75	100
	IV	SEC 3	AUSCA24	Understanding Internet	2	2	25	75	100
				Semester Total	**30**	**23**			
SEMESTER - III	I	Language	AULT30 / AULU30	General Tamil – III / Urdu - III	6	3	25	75	100
	II	English	AULE30	English – III	6	3	25	75	100
	III	Core - 5	AUCCA31	Data Structure and Algorithms	5	5	25	75	100
	III	Core – 6	AUCPCA35	Practical: Data Structure and Algorithms Lab	5	5	25	75	100
	III	Elective – 3 (Choose any one)	AUECA32A	Introduction to Data Science	3	3	25	75	100
			AUECA32B	Office Automation					
	IV	SEC - 4	AUSCA33	Problem Solving Techniques	1	1	25	75	100
	IV	SEC - 5	AUSCA34	PHP Programming	2	2	25	75	100
	IV	Compulsory	AUES30	Environmental Science	2	2	25	75	100
				Semester Total	**30**	**24**			

Semester	Part	Category	Course Code	Course Title	Ins.Hrs / Week	Credit	Maximum Marks		
							Internal	External	Total
SEMESTER - IV	I	Language	AULT40 / AULU 40	General Tamil – IV / Urdu - IV	6	3	25	75	100
	II	English	AULE40	English – IV	6	3	25	75	100
	III	Core - 5	AUCCA41	Programming in JAVA	5	5	25	75	100
	III	Core – 6	AUCPCA45	Practical: Programming in JAVA Lab	5	5	25	75	100
	III	Elective – 4 (Choose any one)	AUECA42A	Network Security	4	3	25	75	100
			AUECA42B	Multimedia System					
	IV	SEC - 6	AUSCA43	Web Designing	2	2	25	75	100
	IV	SEC - 7	AUSCA44	Cyber Forensics	2	2	25	75	100
				Semester Total	**30**	**23**			

Semester	Part	Category	Course Code	Course Title	Ins.Hrs / Week	Credit	Maximum Marks		
							Internal	External	Total
SEMESTER - V	III	Core – 9	AUCCA51	Operating systems	4	3	25	75	100
	III	Core – 10	AUCPCA55	Practical: Operating systems Lab	4	3	25	75	100
	III	Core – 11	AUCCA52	Data Base Management System	4	3	25	75	100
	III	Core - 12	AUCPCA56	Practical: Data Base Management System Lab	3	3	25	75	100
	III	Elective – 5 (Choose any one)	AUECA53A	Mobile Computing	4	3	25	75	100
			AUECA53B	Artificial Intelligence					
			AUECA53C	Big Data Analytics					
	III	Elective – 6 (Choose any one)	AUECA54A	Computer Networks	4	3	25	75	100
			AUECA54B	Software Testing					
			AUECA54C	Cryptography					
	III	Core – 13	AUCPCA57	Core/Project with Viva-voce	5	4	25	75	100
	IV	Compulsory	AUVE50	Value Education	2	2	25	75	100
	IV	Compulsory	AUICA58	Internship/Industrial Training (Summer vacation at the end of IV semester activity)	-	2	100	-	100
				Semester Total	**30**	**26**			

Semester	Part	Category	Course Code	Course Title	Ins.Hrs / Week	Credit	Maximum Marks		
							Internal	External	Total
SEMESTER - VI	III	Core – 14	AUCCA61	Machine Learning	4	3	25	75	100
	III	Core – 15	AUCPCA66	Practical: Machine Learning Lab	4	3	25	75	100
	III	Core – 16	AUCCA62	Data Analytics using R Programming	5	3	25	75	100
	III	Core – 17	AUCPCA67	Practical: Data Analytics using R Programming Lab	5	3	25	75	100
	III	Elective – 7 (Choose any one)	AUECA63A	IOT and its Applications	5	3	25	75	100
			AUECA63B	Software Project Management					
			AUECA63C	Enterprise Resource Planning					
	III	Elective – 8 (Choose any one)	AUECA64A	Natural Language Processing	5	3	25	75	100
			AUECA64B	Cloud Computing					
			AUECA64C	Robotics and its Applications					
	IV	SEC - 8	AUSCA65	Open Source Technology	2	2	25	75	100
	IV	Compulsory	AUEA60	Extension Activity	-	1	100	-	100
				Semester Total	**30**	**21**			

Consolidated Semester wise and Component wise Credit distribution

Parts	Semester-I	Semester-II	Semester-III	Semester-IV	Semester-V	Semester-VI	Total Credits
Part-I	3	3	3	3	-	-	12
Part-II	3	3	3	3	-	-	12
Part-III	13	13	13	13	22	18	92
Part-IV	4	4	5	4	4	3	24
Part-V	-	-	-	-	-	-	-
Total	23	23	24	23	26	21	**140**

*****Part I, II, and Part III components will be separately taken into account for CGPA calculation and classification for the under graduate programme and the other components. IV, V has to be completed during the duration of the programme as per the norms, to be eligible for obtaining the UG degree.

COURSE DESCRIPTORS

Title of the Course	PYTHON PROGRAMMING	**Hours/Week**	05
Course Code	AUCCA11	**Credits**	05
Category	Core - 1	**Year & Semester**	I & I
Prerequisites	Higher secondary Computer Science / Maths / Accountancy	**Regulation**	2024

Objectives of the course:

- To make students understand the concepts of Python programming.
- To apply the OOPs concept in PYTHON programming.
- To impart knowledge on demand and supply concepts.
- To make the students learn best practices in PYTHON programming.
- To know the costs and profit maximization.

UNITS	Contents	COs	Cognitive Levels
UNIT-I	**Basics of Python Programming:** History of Python-Features of Python – Literal –Constants – Variables – Identifiers – Key words- Built – in Data Types –Output Statements – Input Statements - Comments – Indentation - Operators - Expressions - Type conversions. **Python Arrays:** Defining and Processing Arrays–Array methods.	CO1	K1 K2 K3
UNIT-II	**Control Statements:** Selection/Conditional Branching statements: if, if-else, nested if and if - elif- else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. **Jump Statements: break**, continue and pass statements**.**	CO1 CO2	K1 K2 K3 K4

UNIT-III	**Functions:** Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. **Function Arguments**: Required Arguments, Key ordered Arguments, Default Arguments and Variable Length Arguments-Recursion. **Python Strings:** String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. **Modules**: import statement- The Python module – dir() function – Modules and Name space–Defining our on modules.	CO1 CO2 CO3	K1 K2 K3 K4
UNIT-IV	**Lists:** Creating a list – Access values in List - Updating values in Lists-Nested lists-Basic list operations - List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples – Difference between lists and tuples. **Dictionaries:** Creating, Accessing, Updating and Deleting Elements in a Dictionary–Dictionary Functions and Methods – Difference between Lists and Dictionaries.	CO1 CO2 CO3 CO4	K1 K2 K3 K4 K5
UNIT-V	**Python File Handling:** Types of files in Python -Opening and Closing files-Reading and writing files: write() and write lines() methods- append() method–read() and read lines() methods – with keyword –Splitting words - File methods - File Positions – Renaming and deleting files.	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Recommended Text Books

1. Reema Thareja,–Python Programming using problem solving approach, First Edition, 2017, Oxford University Press.
2. Dr.R.Nageswara Rao,– Core Python Programming, First Edition, 2017, Dreamtech Publishers.

Reference Books

1. VamsiKurama,–Python Programming: A Modern Approach, Pearson Education.
2. Mark Lutz, ”Learning Python”, Orielly.
3. Adam Stewarts, “Python Programming”, Online.
4. Fabio Nelli, “Python Data Analytics”, APress.
5. KennethA. Lambert,–Fundamentals of Python–First Programs,CENGAGE Publication.

Website and E-Learning source

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)

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

COs	CO Description	Cognitive Level
CO1	Learn the basics of python, Do simple programs on python, Learn how to use an array.	K1,K2,K3
CO2	Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.	K1,K2,K3,K4
CO3	Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.	K1,K2,K3,K4
CO4	Work with List, tuples and dictionary, Write program using list, Tuples and dictionary.	K1,K2,K3,K4,K5
CO5	Usage of File handlings in python, Concept to reading and writing files, Do programs using files.	K1,K2,K3,K4,K5

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	-	3	1	3	-	1	-	-	3	3	3	2
CO2	3	2	3	2	3	1	2	-	-	3	3	3	2
CO3	3	-	3	2	3	-	2	-	-	3	3	2	2
CO4	3	1	3	2	3	-	2	-	-	3	3	3	2
CO5	3	1	3	3	3	1	3	-	-	3	3	3	2

COURSE DESCRIPTORS

Title of the Course	PYTHON PROGRAMMING LAB	**Hours/Week**	05
Course Code	AUCPCA15	**Credits**	05
Category	Core - 2	**Year & Semester**	I & I
Prerequisites	Higher secondary Computer Science / Maths / Accountancy	**Regulation**	2024

Objectives of the course:

- Be able to design and program Python applications.
- Be able to create loops and decision statements in Python.
- Be able to work with functions and pass arguments in Python.
- Be able to build and package Python modules for reusability.
- Be able to read and write files in Python.

Lab Exercises	COs	Cognitive Levels
1. Program using variables, constants, I/O statements in Python. 2. Program using Operators in Python. 3. Program using Arrays. 4. Program using Conditional Statements. 5. Program using Loops. 6. Program using Jump Statements. 7. Program using Functions. 8. Program using Recursion. 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.	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

COs	CO Description	Cognitive Level
CO1	Demonstrate the understanding of syntax and semantics of PYTHON programming.	K1, K2,K3
CO2	Identify the problem and solve using PYTHON programming techniques.	K1,K2,K3,K4
CO3	Identify suitable programming constructs for problem solving.	K1,K2,K3,K4
CO4	Analyze various concepts of PYTHON language to solve the problem in an efficient way.	K1,K2,K3,K4,K5,
CO5	Develop a PYTHON program for a given problem and test for its correctness.	K1,K2,K3,K4,K5,K6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	-	1	1	3	-	1	-	-	3	3	3	2
CO2	3	1	2	2	3	1	1	1	-	3	3	3	2
CO3	3	1	3	2	3	2	2	2	-	3	3	3	3
CO4	3	1	3	3	3	2	2	-	-	3	3	3	3
CO5	3	1	3	3	3	2	2	2	-	3	3	3	3

COURSE DESCRIPTORS

Title of the Course	FUNDAMENTALS OF INFORMATION TECHNOLOGY	**Hours/Week**	02
Course Code	AUSCA13	**Credits**	02
Category	SEC -1	**Year & Semester**	I & I
Prerequisites	Higher secondary Computer Science / Maths / Accountancy	**Regulation**	2024

Objectives of the course:

- Understand basic concepts and terminology of information technology.
- Have a basic understanding of personal computers and their operation.
- Be able to identify data storage and its usage.
- Get great knowledge of software and its functionalities.
- Understand about operating system and their uses.

UNITS	Contents	COs	Cognitive Levels
UNIT-I	**Introduction to Computers** - Generations of Computer – Data and Information – Components of Computer – Software – Hardware – InputDevices - Output Devices — Types of Operating System.	CO1 CO2 CO3 CO4 CO5	K1 K2
UNIT-II	**MS Word**: Introduction – Elements of Window – Files, Folders an Directories – Text Manipulating: Cut, Copy, Paste, Drag and Drop – Tex Formatting: Font – Style, Size, Face and Colors (Both foreground an background) – Alignment - Bullets and Numbering - Header and footer watermark – inserting objects (images, other application document) – Table creation – Mail merge.	CO1 CO2 CO4	K1 K2

UNIT-III	**Ms Excel**: Introduction – Inserting rows and columns – Sizing rows and columns – Implementing formulas – Generating series - Functions in excel –Creation of Chart – Inserting objects – Filter – Sorting – Inserting worksheet.	CO1 CO2 CO4	K1 K2 K3 K4
UNIT-IV	**MS PowerPoint**: Introduction – Slides Manipulation (Inserting new, Copy, paste, delete and duplicate slides) – Slide show– Types of Views – Types of Animations – Inserting Objects – Implementing multimedia (Video and Audio) – Templates (Built-in and User-Defined).	CO1 CO2 CO4	K1 K2 K3 K4
UNIT-V	**Internet**: Introduction to Internet and Intranet – Services of Internet - Domain Name – URL – Browser – Types of Browsers – Search Engine - E- Mail – Basic Components of E-Mail –.How to send group mail. **E- Commerce**: Digital Signature – Digital Currency – Online shopping and transaction	CO1 CO2 CO3 CO4	K1 K2

Recommended Text Books

1. Anoop Mathew, S. Kavitha Murugeshan (2009), " Fundamental of Information Technology", Majestic Books.
2. Alexis Leon, Mathews Leon," Fundamental of Information Technology", 2nd Edition.
3. S. K Bansal, "Fundamental of Information Technology".

Reference Books

1. Bhardwaj Sushil Puneet Kumar, "Fundamental of Information Technology".
2. GG WILKINSON, "Fundamentals of Information Technology", Wiley-Blackwell.
3. Ravichandran , "Fundamentals of Information Technology", Khanna Book Publishing.

Website and E-Learning source

1. https://testbook.com/learn/computer-fundamentals
2. https://www.tutorialsmate.com/2020/04/computer-fundamentals-tutorial.html
3. https://www.javatpoint.com/computer-fundamentals-tutorial
4. https://www.tutorialspoint.com/computer_fundamentals/index.htm
5. https://www.nios.ac.in/media/documents/sec229new/Lesson1.pdf

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

COs	CO Description	Cognitive Level
CO1	Learn the basics of computer, Construct the structure of the required things in computer, learn how to use it.	K1,K2
CO2	Gain knowledge on Creating Documents, spreadsheet and presentation.	K1,K2
CO3	Demonstrate the understanding of different tools in word, excel and PowerPoint.	K1,K2, K3,K4
CO4	Utilize the automation tools for documentation, calculation and presentation purpose.	K1,K2,K3,K4
CO5	Gain knowledge in internet technology and identify the component parts of E-Commerce.	K1,K2

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	2	-	1	-	-	-	-	3	3	2	2
CO2	3	2	2	1	-	1	2	1	1	2	3	2	2
CO3	3	2	2	2	2	2	3	2	1	3	3	3	3
CO4	3	2	3	2	3	2	2	1	1	3	3	3	3
CO5	2	2	1	1	-	3	2	1	-	3	2	2	3

COURSE DESCRIPTORS

Title of the Course	STRUCTURED PROGRAMMING LANGUAGE IN C	**Hours/Week**	02
Course Code	AUFCA14	**Credits**	02
Category	FC - 1	**Year & Semester**	I & I
Prerequisites	Higher secondary Computer Science / Maths / Accountancy	**Regulation**	2024

Objectives of the course:

- To familiarize the students with the Programming basics and the fundamentals of C,
- Data types in C, Mathematical and logical operations.
- To understand the concept using if statements and loops.
- This unit covers the concept of Arrays.
- This unit covers the concept of Functions.
- To understand the concept of implementing pointers.

UNITS	Contents	COs	Cognitive Levels
UNIT-I	Overview of C: Importance of C, sample C program, C program structure, executing C program. Constants, Variables, and Data Types: Character set, C tokens, keywords and identifiers, constants, variables, data types, declaration of variables, Assigning values to variables—Assignment statement, declaring a variable and constant, as volatile .Operators and Expression.	CO1 CO2	K1 K2 K3
UNIT-II	Decision Making and Branching: Decision making with If, simple IF, IF ELSE, nested IF ELSE, ELSE IF ladder, switch, GOTO statement. Decision Making and Looping: While, Do While, For, Jumps in loops.	CO1 CO2 CO3	K1 K2 K3 K4

UNIT-III	Arrays: Declaration and accessing of one & two dimensional arrays, initializing two dimensional arrays, multi dimensional arrays.	CO1 CO2 CO3	K1 K2 K3 K4
UNIT-IV	Functions: The form of C functions, Return values and types, calling a function, categories of functions, Nested functions, Recursion, functions with arrays ,call by value, call by reference, storage classes-character arrays and string functions.	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
UNIT-V	Pointers: definition, declaring and initializing pointers, accessing a variable through address and through pointer, pointer expressions, pointer increments and scale factor, pointers and arrays, pointers and functions, pointers and structures.	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Recommended Text Books

E.Balagurusamy,ProgramminginANSIC,FifthEdition,TataMcGraw-Hill,2010.

Reference Books

1. Byron Gottfried, Schaum‘s Outline Programming with C, Fourth Edition, Tata McGraw -Hill, 2018.
2. Kernighan and Ritchie, The C Programming Language, Second Edition, Prentice Hall, 1998
3. Yashavant Kanetkar, Let Us C, Eighteenth Edition, BPB Publications, 2021.

Website and E-Learning source

1. https://codeforwin.org/
2. https://www.geeksforgeeks.org/c-programming-language/
3. http://en.cppreference.com/w/c
4. http://learn-c.org/
5. https://www.cprogramming.com/

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

COs	CO Description	Cognitive Level
CO1	Remember the program structure of C with its syntax and semantics.	K1,K2, K3
CO2	Understand the programming principles in C (datatypes, operators, branching and looping, arrays, functions, structures, pointers and files)	K1,K2,K3,K4
CO3	Apply the programming principles learnt in real-time problems.	K1,K2,K3,K4
CO4	Analyze the various methods of solving problem and choose the best method.	K1,K2,K3,K4
CO5	To write code, debug and test the programs with appropriate test cases.	K1,K2,K3,K4,K5

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	-	2	-	1	1	2	-	-	2	3	3	2
CO2	3	1	2	2	3	2	1	-	1	2	2	2	3
CO3	3	1	3	2	3	3	1	-	1	1	3	3	3
CO4	3	1	3	3	2	1	-	-	1	3	3	2	3
CO5	3	-	3	2	3	2	1	1	-	3	3	3	3