



AVS

COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

Attur Main Road, Ramalingapuram, Salem - 106.

(Recognized under section 2(f) & 12(B) of UGC Act 1956 and
Accredited by NAAC with 'A' Grade)

(Co - Educational Institution | Affiliated to Periyar University, Salem
ISO 9001 : 2015 Certified Institution)

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Syllabus for

B. Sc COMPUTER SCIENCE

(Artificial Intelligence and Data Science)

CHOICE BASED CREDIT SYSTEM –LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK

(CBCS – LOCF)

(Applicable to the Candidates admitted from 2023-24 onwards)



VISION

- To attain excellence in the field of education by creating competent scholars with a touch of human values.

MISSION

- To accomplish eminence in the academic domain.
- To provide updated infrastructure.
- To educate value based education.
- To impart skills through efficient training programs.
- To cultivate culture and tradition with discipline and determination.



REGULATIONS

1. Eligibility for Admission:

+2 Pass with mathematics or business mathematics or computer science or statistics (academic or vocational stream) or 10+3 years diploma

2. Duration:

3 YEARS

3. Eligibility for award of degree:

A candidate shall be eligible for the award of the degree only if he / she has undergone the prescribed courses of study in a college affiliated to the university for a period of not less than three academic years comprising six semesters and passed the examinations prescribed and fulfilled such conditions as have been prescribed there for.

4. Course of Study:

Text Book , Reference book and website Resources

5. Scheme of Examination:

The scheme of examinations for the course is given in Annexure. All the practical examinations /Internship work shall be conducted and evaluated internally by the institution themselves with internal and external examiners appointed by the university

6. Passing Rules:

a) A candidate who secures not less than 40% in the University (external) Examination and 40% marks in the external examination and continuous internal assessment put together in any course of Part I, II, III & IV shall be declared to have passed the examination in the Subject (theory or Practical).

b) A candidate who secures not less than 40% of the total marks prescribed for the subject under part IV degree programmed irrespective of whether the performance is assessed at the end Semester examination or by continuous internal assessment shall be declared to have passed in that subject.

c) A candidate who passes the examination in all the courses of Part I, II, III, IV & V shall be declared to have passed, the whole examination

i) Theory

A candidate who passes the examination in all the courses of Part I, II, III, IV & V shall be declared to have passed, the whole examination



A candidate who secures not less than 40% of the total marks prescribed for the subject under part IV degree programme irrespective of whether the performance is assessed at the end Semester examination or by continuous internal assessment shall be declared to have passed in that subject.

Total mark 100 External Max Mark : 75 Internal Mark : 25

ii) Practical

A candidate who passes the examination in all the courses of shall be declared to have passed, the whole examination

Total mark 100 External Max Mark : 75 Internal Mark : 25

Programmed Outcomes (POs)	
On successful completion of the B. Sc. COMPUTER SCIENCE ARTIFICIAL INTELLIGENCE AND DATA SCIENCE	
PO1	Scientific aptitude will be developed in Students
PO2	Students will acquire basic Practical skills & Technical knowledge along with domain knowledge of different subjects in the Computer Science & humanities stream.
PO3	Students will become employable; Students will be eligible for career opportunities in education field, Industry, or will be able to opt for entrepreneurship.
PO4	Students will possess basic subject knowledge required for higher studies, professional and applied courses.
PO5	Students will be aware of and able to develop solution oriented approach towards various Social and Environmental issues.
PO6	Ability to acquire in-depth knowledge of several branches of Computer Science and aligned areas. This Programme helps learners in building a solid foundation for higher studies in Computer Science and applications.
PO7	The skills and knowledge gained leads to proficiency in analytical reasoning, which can be utilized in modeling and solving real life problems.
PO8	Utilize computer programming skills to solve theoretical and applied problems by critical understanding, analysis and synthesis.
PO9	To recognize patterns and to identify essential and relevant aspects of problems.
PO10	Ability to share ideas and insights while seeking and benefitting from knowledge and insight of others.

Program Specific Outcomes (PSOs)	
After the successful completion of B. Sc. COMPUTER SCIENCE ARTIFICIAL INTELLIGENCE AND DATA SCIENCE programme the students are expected to	
PSO1	Knowledge
PSO2	Problem Analysis
PSO3	Design / Development of Solutions
PSO4	Conduct investigations of complex problems
PSO5	Exhibit good domain knowledge and completes the assigned tasks Effectively and efficiently in par with the expected quality standards.
PSO6	Apply analytical and critical thinking to identify, formulate, analyze and solve Complex problems in order to reach authenticated conclusions

**Programmed Educational Objectives (PEOs)**

The B. Sc. COMPUTER SCIENCE ARTIFICIAL INTELLIGENCE AND DATA SCIENCE programme describes accomplishments that graduates are expected to attain within five to seven years after graduation.

PEO1	Graduates should be able to evolve AI based efficient domain specific processes for effective decision making in several domains such as business and governance domains for Artificial Intelligence and Data Science
PEO2	Familiarize the students with suitable software tools of computer science and industrial applications to handle issues and solve. Problems in mathematics or statistics and real-time application related sciences.
PEO3	Demonstrate the ability to create innovative solutions from idea to product, applying Scientific methods and tools
PEO4	Provide innovative ideas to instigate new business ventures in the hospitality industry
PEO5	Acquire good knowledge and understanding to solve specific theoretical and applied problems in advanced areas of Computer Science and Industrial statistics.

CREDIT DISTRIBUTION FOR 3 YEARS B. Sc. COMPUTER SCIENCE ARTIFICIAL INTELLIGENCE AND DATA SCIENCE PROGRAMME

Part	Course Type	Credits per Course	No. of Papers	Total Credits
Part I	Language – I (Tamil/Hindi/French)	3	4	12
Part II	Language – II (English)	3	4	12
Part III	Core Courses- Theory	5	3	15
	Core Courses- Theory	4	6	24
	Core Courses- Practical	3	4	12
	Core Courses- Practical	4	2	8
	Major Elective Courses- Theory	3	4	12
	Major Elective Courses- Practical			
	Generic Discipline Specific/ Allied Courses – Theory	5	2	10
	Generic Discipline Specific/ Allied Courses – Theory	4	2	8
Generic Discipline Specific/ Allied Courses – Practical	3	1	3	
Total				92
Part IV	Non Major Elective Courses	2	2	4
	Skill Enhancement Courses	2	6	12
	Skill Enhancement Courses	1	1	1
	Professional Competency Skill Enhancement Course			
	EVS (Environmental Studies)	1	2	2
	Value Education	2	1	2
	Internship	2	1	2
	Field Project	-	-	-
	Research Project (for PG only)			
	MOOC/ SWAYAM/ NPTEL Courses	1	1	1
Total				24
Part V	Extension Activity (NSS/NCC/Physical Education)	1	1	1
Part VI	Naan Mudhalvan Scheme (Online Examination &Project work)	-	-	-
Total Credits				141

**CONSOLIDATED SEMESTER WISE AND COMPONENT WISE CREDIT
DISTRIBUTION FOR 3 YEARS B. Sc. COMPUTER SCIENCE ARTIFICIAL
INTELLIGENCE AND DATA SCIENCE PROGRAMME**

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	3	7	4	2	24
Part V	-	-			-	1	1
Part VI						-	-
Total	23	23	22	26	26	21	141

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

METHOD OF EVALUATION

Evaluation	Components	Marks
Internal Evaluation	Continuous Internal Assessment Test	15
	Assignments	3
	Class Participation	2
	Distribution of marks for Attendance (in percentage) 96 – 100: 5 Marks 91 – 95: 4 Marks 86 – 90: 3 Marks 81 – 85: 2 Marks	5
External Evaluation	End Semester Examination	75 Marks
Total		100 Marks

Note: 1.UG Programmers- A candidate must score minimum 10 marks in Internal and 30 marks in External Evaluation.

2.PGProgrammes- A candidate must score minimum 13 marks in Internal and 38 marks in External Evaluation.

CONTINUOUS INTERNAL ASSESSMENT

Categorizing Outcome Assessment Levels Using Bloom's Taxonomy

level	Cognitive Domain	Description
K1	Remember	It is the ability to remember the previously learned concepts or ideas.
K2	Understand	The learner explains concepts or ideas.
K3	Apply	The learner uses existing knowledge in new contexts.
K4	Analyze	The learner is expected to draw relations among ideas and to compare and contrast.
K5	Evaluate	The learner makes judgments based on sound analysis.
K6	Create	The learner creates something unique or original.

Question Paper Blue Print for Continuous Internal Assessment- I& II

Duration: 2 Hours		Maximum: 50 marks					
Section	K level						Marks
	K1	K2	K3	K4	K5	K6	
A (no choice)	10						10 X 1 =10
B (no choice)		1	1				2 X 5 =10
C (either or choice)				3			3 x 10 = 30
Total							50 marks

Note: K4 and K5 levels will be assessed in the Model Examination whereas K5 and K6 Levels will be assessed in the End Semester Examinations.

Question Paper Blue Print for Continuous Internal Assessment- I

Time: 2 Hours

Total Marks: 50 Marks

Minimum Pass: 20 Marks

Unit	Section – A	Section - B	Section - C
I	Q.N. 1, 2, 3, 4, 5	Q.N. 11	Q.N. 13 A, 13 B
I or II	-	-	Q.N. 14 A, 14 B
II	Q.N. 6, 7, 8, 9, 10	Q.N. 12	Q.N. 15 A, 15 B

SECTION – A (10 X 1 = 10 Marks)

ANSWER ALL THE QUESTIONS

SECTION – B (2 X 5 = 10 Marks)

ANSWER ALL THE QUESTIONS

SECTION – C (3 X 10 = 30 Marks)

ANSWER ALL THE QUESTIONS (Either or Choice)

Question Paper Blue Print for Continuous Internal Assessment- II

Time: 2 Hours

Total Marks: 50 Marks

Minimum Pass: 20 Marks

Unit	Section – A	Section - B	Section - C
III	Q.N. 1, 2, 3, 4, 5	Q.N. 11	Q.N. 13 A, 13 B
III or IV	-	-	Q.N. 14 A, 14 B
IV	Q.N. 6, 7, 8, 9, 10	Q.N. 12	Q.N. 15 A, 15 B

SECTION – A (10 X 1 = 10 Marks)

ANSWER ALL THE QUESTIONS

SECTION – B (2 X 5 = 10 Marks)

ANSWER ALL THE QUESTIONS

SECTION – C (3 X 10 = 30 Marks)

ANSWER ALL THE QUESTIONS (Either or Choice)

Question Paper Blue Print for Model Examination & End Semester Examination

Duration: 3 Hours		Maximum: 75 marks						
Section		K level						Marks
		K1	K2	K3	K4	K5	K6	
A (no choice, three questions from each unit)		15						15 X 1 =15
B (choice, one question from each unit)			1	1				2 X 5 =10
C (either or choice & two questions from each unit)	Courses with K4 as the highest cognitive level				4	1		5 x 10 = 50
	Course with K5 as the highest cognitive level wherein three K4 questions and two K5 questions are compulsory.				3	2		
	Course with K6 as the highest cognitive level wherein two questions each on K4, K5 and one question on K6 are compulsory.				2	2	1	
Total								75 marks

**Question Paper Blue Print for Model Examination & End Semester Examination**

Time: 2 Hours

Total Marks: 75 Marks

Minimum Pass: 30 Marks

Unit	Section – A	Section - B	Section - C
I	Q.N. 1, 2, 3	Q.N. 16	Q.N. 21 A, 21 B
II	Q.N. 4, 5, 6	Q.N. 17	Q.N. 22 A, 22 B
III	Q.N. 7, 8, 9	Q.N. 18	Q.N. 23 A, 23 B
IV	Q.N. 10, 11, 12	Q.N. 19	Q.N. 24 A, 24 B
V	Q.N. 13, 14, 15	Q.N. 20	Q.N. 25 A, 25 B

SECTION – A (15 X 1 = 15 Marks)

ANSWER ALL THE QUESTIONS

SECTION – B (2 X 5 = 10 Marks)

ANSWER ANY TWO QUESTIONS

SECTION – C (5 X 10 = 50 Marks)

ANSWER ALL THE QUESTIONS (Either or Choice)



Question Paper Blue Print for Model Practical Examination & End Semester Examination
(Practical)

Time: 3 Hours

Total Marks: 60 Marks

Minimum Pass: 24 Marks

Practical Marks	Maximum Mark	Minimum Mark
Internal	25	10
External	75	30
Total	100	40

Evaluation for End Semester Examinations (Practical)

Record	15 marks
Formula with expansion	05 marks
Observation with data	25 marks
Viva-voce	10 marks
Calculation	15 marks
Result with units	05 marks
TOTAL	75 MARKS

*Submission of record with due certification is a must for external practical examinations.

**A student should complete all requires experiments to get 10 marks for the record.



Scheme of Examination for B. Sc. Computer Science (AI & DS)

First Year – Semester - I

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
I	23UFTA01	Podhu Tamil - I	3	3	25	75	100
II	23UFEN01	General English - I	3	3	25	75	100
III	23UADCC01	Core Course 1- Data Structures	5	5	25	75	100
	23UADCCP01	Core Course II – Practical - Computer Programming Lab	4	3	25	75	100
	23UMAEGS05	Elective Course Generic Specific EC I - Introduction to Linear Algebra	5	5	25	75	100
IV	23UADFC01	Foundation Course FC– Fundamentals of Computer Programming	3	2	25	75	100
	23UTANE01	Non Major Elective Course - Pechukalai Thiran	2	2	25	75	100
Total			25	23			

First Year – Semester - II

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
I	23UFTA02	Podhu Tamil - II	3	3	25	75	100
II	23UFEN02	General English - II	3	3	25	75	100
III	23UADCC02	Core Course III – Introduction on python	5	5	25	75	100
	23UADCCP02	Core Course IV – Practical - Python Programming Lab	4	3	25	75	100
	23UMAEGSO4	Elective Course Generic Specific EC II – Optimization Techniques	3	3	25	75	100
	23UMAGSP03	Elective Course Generic Specific – Optimization Techniques Practical	2	2	25	75	100
IV	23UADSE02	Skill Enhancement Course III - Introduction to HTML	3	2	25	75	100
	23UBXNE002	Non Major Elective Course - Managerial Skill Development	2	2	25	75	100
Total			25	23			

Second Year – Semester - III

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
I	23UFTA03	Podhu Tamil - III	3	3	25	75	100
II	23UFEN02	General English - III	3	3	25	75	100
III	23UADCC03	Core Course V- Foundation of Artificial intelligence	5	5	25	75	100
	23UADCCP03	Core Course VI- Practical - Internet Programming Lab	4	3	25	75	100
	23UADGE03	Elective Course Generic Specific EC III – Statistical Methods and its Application-I	5	4	25	75	100
IV	23UADSE15	Skill Enhancement Course IV - Enterprise Resource Planning	2	1	25	75	100
	23UADSE04	Skill Enhancement Course V- PHP Programming	2	2	25	75	100
	23EVS02	Environmental Studies	1				
Total			25	21			

Second Year – Semester - IV

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
I	23UFTA04	Podhu Tamil - IV	3	3	25	75	100
II	23UFEN03	General English - IV	3	3	25	75	100
III	23UADCC04	Core Course VII - Fundamental of Data Science	5	4	25	75	100
	23UADCCP04	Core Course VIII – Practical - Database Programming Lab	4	3	25	75	100
	23UADGE04	Elective Course Generic Specific EC IV- Statistical Methods and its Application-II	3	4	25	75	100
		Allied Statistical Practical	2	3	25	75	100
IV	23UADSE03	Skill Enhancement Course VI - Web Designing	2	2	25	75	100
	23UADSE05	Skill Enhancement Course VII - Software Testing	2	2	25	75	100
	23EVS02	Environmental Studies	1	2	25	75	100
V		Swayam	-	1	25	75	100
Total			25	27			

Third Year – Semester - V

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
III	23UADCC05	Core Course IX – Ethics of Artificial intelligence	4	4	25	75	100
	23UADCC06	Core Course X - Database Design and management	4	4	25	75	100
	23UADCCP05	Core Course XI - Practical: Data Science Lab	4	4	25	75	100
	23UITSE02	Elective Course Generic Specific EC V- Basics of Internet	3	3	25	75	100
	23UITSE09	Elective Course Generic Specific EC VI - Quantitative Aptitude	3	3	25	75	100
	23UADCCPR1	Core Course XII - Project with Viva voce	3	4	25	75	100
IV		Value Education	2	2	25	75	100
		Internship/Industrial Training (Summer Vacation at the end of IV semester activity)	2	2	25	75	100
Total			25	26			

Third Year – Semester - VI

Part	Course Code	Course Title	Ins. Hrs	Credit	CIA	ESE	Total
III	23UADCC07	Core Course XIII - Robotic Process Automation	4	4	25	75	100
	23UADCC08	Core Course XIV- Natural Language Processing	5	4	25	75	100
	23UADCCP06	Core Course XV- Practical - Programming in UI Path Automation Lab	4	4	25	75	100
	23UITSE12	Elective Course Generic Specific EC VII - Biometrics	4	3	25	75	100
	23UITSE10	Elective Course Generic Specific EC VIII - Multimedia Systems	4	3	25	75	100
IV	23UADSE01	Skill Enhancement Course VIII - Fundamentals of Information Technology	4	2	25	75	100
V		Extension Activity	-	1	25	75	100
Total			25	21			

****Ins. Hrs** – Instructional Hours, **CIA**- Continuous Internal Assessment, **ESE**- End Semester Examination

Semester: I	Course Code: 23UADCCO1	Hours/Week: 15	Credit: 5
COURSE TITLE : CORE COURSE 1 - DATA STRUCTURES			

Course Overview:

1. Analyze linear data structures, such as lists, queues, and stacks, according to the needs of different application
2. Demonstrate the concept of trees and its applications.
3. Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules
4. Design, implement and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting.

Learning Objectives:

1. Understand the concept of abstract data types
2. Analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications
3. Demonstrate the concept of trees and its applications
4. Design, implement and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting
5. Enhance the knowledge to solve problems as graph problems and implement efficient graph algorithms to solve them

Unit - I	Abstract Data Types (ADTs)	15 Hours
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ADTs and classes – introduction to OOP – classes in Python – inheritance – namespaces – shallow and deep copying. Introduction to analysis of algorithms – asymptotic notations – recursion – analyzing recursive algorithms.

Unit - II	Linear Structures	15 Hours
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List ADT – array-based implementations – linked list implementations – singly linked lists – circularly linked lists – doubly linked lists – applications of lists – Stack ADT – Queue ADT – double ended queues

Unit - III	Sorting and Searching	15 Hours
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Bubble sort – selection sort – insertion sort – merge sort – quick sort – linear search – binary search

– hashing – hash functions – collision handling – load factors, rehashing, and efficiency

Unit - IV	Tree Structures	15 Hours
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Tree ADT – Binary Tree ADT – tree traversals – binary search trees – AVL trees – heaps – multi-way search trees.

Unit - V	Graph Structures	15 Hours
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Graph ADT – representations of graph – graph traversals – DAG – topological ordering – shortest paths – minimum spanning trees.

Text Book(s):

1. Ellis Horowitz, Sartaj Shani, Data Structures, Galgotia Publication.
2. Ellis Horowitz, Sartaj Shani, Sanguthevar Rajasekaran, Computer Algorithms, Galgotia Publication.
3. Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser, — Data Structures & Algorithms in Python, John Wiley & Sons Inc., 2013
4. Lee, Kent D., Hubbard, Steve, — Data Structures and Algorithms with Python, Springer Edition 2015
5. Aho, Hopcroft, and Ullman, —Data Structures and Algorithms, Pearson Education, 1983

Reference Books:

1. Jean-Paul, Tremblay & Paul G .Sorenson, An Introduction to Data structures with Applications Tata McGraw Hill Company 2008, 2nd Edition.
2. Samanta.D , Classic Data Structure Prentice Hall of India Pvt Ltd 2007, 9th Edition
3. Seymour Lipschutz, Data Structures McGraw Hill Publications, 2014, 1st Edition
4. Rance D. Necaie, —Data Structures and Algorithms Using Python, John Wiley & Sons, 2011
5. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, —Introduction to Algorithms", Second Edition, McGraw Hill, 2002.

Web Resources:

1. <https://www.geeksforgeeks.org/data-structures/>
2. https://www.tutorialspoint.com/data_structures_algorithms/index.htm
3. <https://techdevguide.withgoogle.com/paths/data-structures-and-algorithms/>

4. <https://www.freecodecamp.org/news/learn-data-structures-and-algorithms/>
5. <https://www.worldscientific.com/worldscibooks/10.1142/5256#t=aboutBook>

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications	K1
CO2	Demonstrate the concept of trees and its applications.	K2
CO3	Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules	K3
CO4	Design, implement and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting	K4
CO5	Enhance the knowledge to solve problems as graph problems and implement efficient graph algorithms to solve them	K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping (COs vs POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	2	3	2
CO2	3	3	2	2	3	2
CO3	3	3	2	2	3	2
CO4	3	3	2	3	2	2
CO5	3	3	2	3	2	3

3 - Strong, 2 – Medium, 1 – Low

Semester: I	Course Code: 23UADCCP01	Hours/Week: 15	Credit: 3
COURSE TITLE : CORE COURSE II – PRACTICAL : COMPUTER PROGRAMMING LAB			

Course Overview:

1. Apply the various basic programming constructs like decision making statements. Looping statements ,functions, concepts like overloading, inheritance ,polymorphism ,virtual functions , constructors and destructors
2. Illustrate the concept o f Virtual Classes, inline functions and friend functions
3. Identify suitable programming constructs for problem solving
4. Compare the various file stream classes; file types, usage of templates and exception Handling mechanisms..

Learning Objectives:

1. Apply the various basic programming constructs like decision making statements. Looping statements, functions, concepts like overloading, inheritance, polymorphism ,virtual functions , constructors and destructors.
2. Illustrate the concept of Virtual Classes, inline functions and friend functions
3. Compare the various file stream classes; file types, usage of templates and exception Handling mechanisms..
4. Compare the pros and cons of procedure oriented language with the concepts of object Oriented language.
5. Be able to read and write files in Programming

Sl. No	Contents	No.of Hours
1.	Write a C program to find the sum, average, standard deviation for a given set of numbers	60HRS
2.	Write a C program to generate n prime numbers.	
3.	Write a C program to generate Fibonacci series.	
4.	Write a C program to sort the given set of numbers in ascending order	
5.	Write a C program to count the number of Vowels in the given sentence.	
6.	Write a C++ Program to create class, which consists of EMPLOYEE Detail like E_ Number, E_ Name, Department, Basic, Salary, Grade. Write a member function to get and display them.	
7.	Write C++Program to create class SHAPE which consists of two virtual functions	

8.	Write a C++ Program using function overloading to read two matrices of different Data Types Such as integers and floating point numbers.
9.	Write a C++ Program to create a File and to display the contents of that file with line numbers.
10	Write a C++ Program to merge two files into a single file.

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Apply the various basic programming constructs like decision making statements. Looking statements ,functions, concepts like overloading, inheritance ,polymorphism ,virtual functions , constructors and destructors	K1
CO2	Illustrate the concept of Virtual Classes, in line functions and friend functions	K2
CO3	Identify suitable programming constructs for problem solving.	K3
CO4	Design, implement and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting	K4
CO5	Compare the various file stream classes; file types, usage of templates and exception Handling mechanisms..	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	S	S	S
CO2	S	S	L	S	M	S
CO3	S	S	S	S	M	M
CO4	S	S	S	S	M	S
CO5	S	M	S	S	S	S

S - Strong, M – Medium, L – Low

Semester: I	Course Code: 23UADFC01	Hours/Week: 15	Credit: 2
COURSE TITLE: FOUNDATION COURSE FC – FUNDAMENTALS OF COMPUTER PROGRAMMING			

Course Overview:

1. Learn about the Computer fundamentals and the Problem solving and understand the basic concepts of C and C++ programming
2. Demonstrate the various basic programming constructs like decision making statements. Looking statements and functions
3. Analyze the object oriented concepts like overloading, inheritance ,polymorphism, Virtual functions ,constructors and destructors.
4. Compare the various file stream classes; file types, usage of templates and exception Handling mechanisms, pros and cons of procedure oriented language with the concepts of programming language

Learning Objectives:

1. To impart knowledge about Computer fundamentals
2. To understand the concepts and techniques in C Programming
3. To equip and indulge themselves in problem solving using C
4. To introduce he concepts of Object Oriented Programming Paradigm in C++
5. Understand about operating system and their uses

Unit – I	Introduction to C	6 Hours
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Introduction to C 12 Hours Overview of C - Introduction - Character set - C tokens - keyword & Identifiers - Constants - Variables - Data types - Declaration of variables - Assigning values to variables - Defining Symbolic Constants - Arithmetic, Relational, Logical, Assignment, Conditional, Bitwise, Special, Increment and Decrement operators - Arithmetic Expressions - Evaluation of expression - precedence of arithmetic operators - Type conversion in expression – operator precedence & as sociativity - Mathematical functions - Reading & Writing a character - Formatted input and output

Unit – II	Decision Making , Looping and Arrays	6 Hours
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Decision Making and Branching: Introduction – if, if...else, nesting of if ...else statements else if ladder – The switch statement, The? : Operator – The go to Statement. Decision Making and

Looping: Introduction- The while statement - the do statement – the for statement-jumps in loops.

Arrays – Character Arrays and Strings

Unit – III	C++	6 Hours
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Introduction to C++ - key concepts of Object - oriented Programming – Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Functions in C++ - inline functions – Function Overloading. Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects – friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.

Unit - IV	Inheritance	6 Hours
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Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchical, Hybrid, Multipath inheritance – Virtual base Classes – Abstract Classes

Unit - V	Pointers & Files	6 Hours
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Pointers – Declaration – Pointer to Class, Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes. Files – File stream classes – file modes – Sequential Read/Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling – Miscellaneous functions

Text Book(s):

1. E. Balagurusamy: Computing Fundamentals & C Programming – Tata McGraw-Hill, Second Reprint 2008
2. Ashok N Kamthane , Object-Oriented Programming with Ansi and Turbo C++, Pearson Education,2003.

Web Resources:

1. https://www.tutorialspoint.com/computer_programming/computer_programming_basics.html
2. <https://www.educative.io/answers/what-are-the-basic-fundamental-concepts-of-programming>
3. <https://www.geeksforgeeks.org/basics-of-computer-programming-for-beginners>

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:		
Upon successful completion of this course, the student will be able to		
COs	Statements	Bloom's Level
CO1	Learn about the Computer fundamentals and the Problem solving and understand the basic concepts of C and C++ programming	K1
CO2	Demonstrate the various basic programming constructs like decision making statements. Looping statements and functions.	K2
CO3	Analyze the object oriented concepts like overloading, inheritance, polymorphism, Virtual functions, constructors and destructors.	K3
CO4	Compare the various file stream classes; file types, usage of templates and exception Handling mechanisms, pros and cons of procedure oriented language with the concepts of programming language	K4
CO5	Study about Numeric data and character-based data. Analyze about Arrays.	K2
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	S	S	S
CO2	S	S	L	S	M	S
CO3	S	S	S	S	M	M
CO4	S	S	S	S	M	S
CO5	S	M	S	S	S	S

S - Strong, M – Medium, L – Low

Semester: II	Course Code: 23UADCC02	Hours/Week: 5	Credit: 5
COURSE TITLE : CORE COURSE III – INTRODUCTION ON PYTHON			

Course Overview:

1. Develop algorithmic solutions to simple computational problems
2. Read, write, execute by hand simple Python programs. Structure simple Python programs for solving problems.
3. Decompose a Python program into functions
4. Describe the hash function and concepts of collision and its resolution methods

Learning Objectives:

1. To impart knowledge about Computer fundamentals
2. To understand the concepts and techniques in C Programming
3. To equip and indulge themselves in problem solving using C
4. To introduce the concepts of Object Oriented Programming Paradigm in C++
5. Understand about operating system and their uses

Unit - I	Algorithms	15 Hours
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Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion).

Unit - II	Python interpreter	15 Hours
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Python interpreter and interactive mode, values and types: int, float, boolean, string and list; variables, expressions, statements, tuple assignment, precedence of operators, comments, modules and functions, function definition and use, flow of execution, parameters and arguments.

Unit - III	Conditionals	15 Hours
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Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else). Iteration: state, while, for, break, continue, pass. Fruitful functions: return values, parameters, local and global scope, function composition, recursion. Strings: string slices, immutability, string functions and methods, string module, Lists as arrays.

Unit - IV	Lists	15 Hours
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list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters. Tuples: tuple assignment, tuple as return value, Dictionaries: operations and methods, advanced list processing - list comprehension. Pipeline alert , Numpy Arrays, Packages

Unit - V	Files and exception	15 Hours
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text files, reading and writing files, format operator, command line arguments, errors and exceptions, handling exceptions, modules, packages.

Text Book(s):

1. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist‘‘, 2nd edition, Updated for Python 3, Shroff/O ‘‘Reilly Publishers, 2016.
2. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011

Reference Books:

1. John V Guttag, — Introduction to Computation and Programming Using Python‘‘, Revised and expanded Edition, MIT Press, 2013
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016
3. Kenneth A. Lambert, —Fundamentals of Python: First Programs, CENGAGE Learning, 2012
4. Charles Dierbach, —Introduction to Computer Science using Python: A Computational Problem- Solving Focus, Wiley India Edition, 2013.

Web Resources:

1. <https://www.python.org/about/gettingstarted>
2. <https://www.programiz.com/python-programming>

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning
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**Learning Outcomes:**

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Develop algorithmic solutions to simple computational problems	K1
CO2	Read, write, execute by hand simple Python programs. Structure simple Python programs for solving problems.	K2
CO3	Decompose a Python program into functions	K3
CO4	Describe the hash function and concepts of collision and its resolution methods	K4
CO5	Judge the pros and cons of Python	K2
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	S	S	S
CO2	S	S	L	S	S	S
CO3	S	S	S	M	S	M
CO4	S	S	S	M	S	S
CO5	S	S	S	S	S	S

S - Strong, M – Medium, L – Low

Semester: II	Course Code: 23UADCCP02	Hours/Week: 4	Credit: 3
COURSE TITLE : CORE COURSE IV– PRACTICAL - PYTHON PROGRAMMING LAB			

Course Overview:

1. Implement Python programs with conditionals and loops
2. Develop Python programs step-wise by defining functions and calling them.
3. Describe the hash function and concepts of collision and its resolution methods
4. Use Python lists, tuples, dictionaries for representing compound data

Learning Objectives:

1. To write, test, and debug simple Python programs
2. To implement Python programs with conditionals and loops.
3. Use functions for structuring Python programs.
4. Represent compound data using Python lists, tuples and dictionaries.
5. Read and write data from/to files in Python

Sl. No	Contents	No. of Hours
1.	Compute the GCD of two numbers	60HRS
2.	Find the square root of a number (Newton's method)	
3.	Exponentiation (power of a number)	
4.	Find the maximum of a list of numbers	
5.	Linear search and Binary search..	
6.	Selection sort, Insertion sort	
7.	Merge sort	
8.	First n prime numbers	
9.	Multiply matrices	
10	Programs that take command line arguments (word count)	

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning



Learning Outcomes: Upon successful completion of this course, the student will be able to		
COs	Statements	Bloom's Level
CO1	Implement Python programs with conditionals and loops	K1
CO2	Develop Python programs step-wise by defining functions and calling them	K2
CO3	Describe the hash function and concepts of collision and its resolution methods	K3
CO4	Use Python lists, tuples, dictionaries for representing compound data	K4
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	S	S	S
CO2	S	S	M	S	M	S
CO3	S	S	S	S	M	M
CO4	S	S	S	S	M	S
CO5	S	M	S	S	S	S

S - Strong, M – Medium, L – Low

Semester: II	Course Code: 23UADSE02	Hours/Week: 3	Credit: 2
COURSE TITLE: SKILL ENHANCEMENT COURSE III - INTRODUCTION TO HTML			

Course Overview:

1. Knows the basic concept in HTML Concept of resources in HTML
2. Knows Design concept. Concepts of Meta Data Understand the concept of save the files.
3. Understand the page formatting. Concept of list
4. Creating Links. Know the concept of creating link to email address

Learning Objectives:

1. Insert a graphic within a web page.
2. Create a link within a web page
3. Create a table within a web page.
4. Insert heading levels within a web page
5. Insert ordered and unordered lists within a web page. Create a web page.

Unit – I	Introduction to HTML	15 Hours
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Web Basics: What is Internet – Web browsers – What is Webpage – HTML Basics: Understanding tags.

Unit – II	Tags for Document structure	15 Hours
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Tags for Document structure (HTML, Head, Body Tag).Block level text elements :Headings paragraph(tag) – Font style elements:(bold, italic, font, small, strong, strike, big tags)

Unit - III	Lists	15 Hours
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Types of lists: Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, BR - Using Images – Creating Hyperlinks

Unit – IV	Tables	15 Hours
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Creating basic Table, Table elements, Caption – Table and cell alignment – Row span, Col span – Cell padding.

Unit – V	Frames	15 Hours
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Frames: Frameset – Targeted Links – No frame – Forms: Input, Text area, Select, Option.

**Text Book(s):**

1. Mastering HTML5 and CSS3 Made Easy, Teach U Comp Inc., 2014.
2. Thomas Michaud “Foundations of Web Design: Introduction to HTML & CSS”

Web Resources:

1. <https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf>
2. <https://www.w3schools.com/html/default.asp>

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Knows the basic concept in HTML Concept of resources in HTML	K1
CO2	Knows Design concept. Concepts of Meta Data Understand the concept of save the files.	K2
CO3	Understand the page formatting. Concept of list	K3
CO4	Creating Links. Know the concept of creating link to email address	K4
CO5	Concept of adding images Understand the table creation.	K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping (COs vs POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	S	S	S
CO2	S	S	M	S	S	S
CO3	S	S	S	S	S	M
CO4	S	M	S	S	S	S
CO5	S	S	S	M	S	S

S - Strong, M – Medium, L – Low

Semester: III	Course Code: 23UADCC03	Hours/Week: 5	Credit: 5
COURSE TITLE : CORE COURSE V - FOUNDATION OF ARTIFICIAL INTELLIGENCE			

Course Overview:

1. Understand autonomous agents that make effective decisions in fully informed, partially observable and adversarial settings
2. Choose appropriate algorithms for solving given AI problems
3. Design and implement logical reasoning agents.
4. Demonstrate agents that can reason under uncertainty

Learning Objectives:

1. Understand the basic concepts of intelligent agents
2. Develop general-purpose problem solving agents, logical reasoning agents and agents that reason under uncertainty.
3. Employ AI techniques to solve some of today's real world problems.
4. Analyze the implications of applying AI systems to organizations and future of work.
5. Explain how to develop AI systems to meet business, organizational, and technology Requirements.

Unit – I	Introduction to AI	15 Hours
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Introduction to AI – Agents and Environments – Concept of rationality – Nature of environments – Structure of agents Problem solving agents – Search algorithms – uninformed search strategies

Unit – II	Heuristic search strategies	15 Hours
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Heuristic search strategies – heuristic functions. Local search and optimization problems – local search in continuous space – search with on – deterministic actions – search in partially observable environments – online search agents and unknown environments

Unit - III	Game theory	15 Hours
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Game theory – optimal decisions in games – alpha - beta search – monte - carlo tree search – stochastic games – partially observable games. Constraint satisfaction problems – constraint propagation – backtracking search for CSP – local search for CSP – structure of CSP.

Unit – IV	Knowledge	15 Hours
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Knowledge - based agents – propositional logic – propositional theorem proving – propositional model checking – agents based on propositional logic. First - order logic – syntax and semantics – knowledge representation and engineering – inferences in first - order logic – forward chaining – backward chaining – resolution

Unit – V	Ontological engineering	15 Hours
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Ontological engineering – categories and objects – events – mental objects and modal logic – reasoning systems for categories – reasoning with default information. Classical planning – algorithms for classical planning – heuristics for planning – hierarchical planning – nondeterministic domains – time, schedule, and resources – analysis.

Text Book(s):

1. Stuart Russel and Peter Norvig, — Artificial Intelligence: A Modern Approach, Fourth Edition, Pearson Education, 2020.
2. Dan W. Patterson, —Introduction to AI and ES, Pearson Education, 2007
3. Kevin Night, Elaine Rich, and Nair B., — Artificial Intelligence, McGraw Hill, 2008

Reference Books:

1. Patrick H. Winston, "Artificial Intelligence", Third edition, Pearson Edition, 2006
2. Deepak Khemani, —Artificial Intelligence, Tata McGraw Hill Education, 2013
(<http://nptel.ac.in/>)
3. Artificial Intelligence by Example: Develop machine intelligence from scratch using real artificial intelligence use cases

Web Resources:

1. <https://www.javatpoint.com/artificial-intelligence-ai>
2. https://www.tutorialspoint.com/artificial_intelligence/index.htm

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning
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**Learning Outcomes:**

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Understand autonomous agents that make effective decisions in fully informed, partially observable and adversarial settings	K1
CO2	Choose appropriate algorithms for solving given AI problems	K2
CO3	Design and implement logical reasoning agents	K3
CO4	Demonstrate agents that can reason under uncertainty	K4
CO5	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.	K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping (COs vs POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	M	M
CO2	S	S	S	M	S	M
CO3	S	S	S	M	S	M
CO4	S	S	S	S	S	M
CO5	S	S	S	M	S	M

S - Strong, M – Medium, L – Low

Semester: III	Course Code: 23UADSE04	Hours/Week: 2	Credit: 2
COURSE TITLE: SKILL ENHANCEMENT COURSE - PHP PROGRAMMING			

Course Overview:

1. Write PHP scripts to handle HTML forms
2. Write regular expressions including modifiers, operators, and meta characters.
3. Create PHP Program using the concept of array
4. Create PHP programs that use various PHP library functions X

Learning Objectives:

1. To provide the necessary knowledge on basics of PHP.
2. To design and develop dynamic, database-driven web applications using PHP version.
3. To get an experience on various web application development techniques.
4. To learn the necessary concepts for working with the files using PHP.
5. To get a knowledge on OOPS with PHP.

Unit – I	Introduction to PHP	6 Hours
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Introduction to PHP - Basic Knowledge of websites - Introduction of Dynamic Website
-Introduction to PHP-Scope of PHP - XAMPP and WAMP Installation

Unit – II	PHP Programming Basics	6 Hours
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PHP Programming Basics - Syntax of PHP - Embedding PHP in HTML - Embedding HTML in PHP. Introduction to PHP Variable - Understanding Data Types - Using Operators - Using Conditional Statements - If(), else if() and else if condition Statement.

Unit - III	Switch Statements	6 Hours
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Switch () Statements - Using the while () Loop - Using the for () Loop PHP Functions.
PHP Functions - Creating an Array - Modifying Array Elements - Processing Arrays with Loops
- Grouping Form Selections with Arrays – Using Array Functions.

Unit – IV	PHP Advanced Concepts	6 Hours
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PHP Advanced Concepts - Reading and Writing Files – Reading, Data from a file.

Unit – V	Managing Sessions and Using Session Variables	6 Hours
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Managing Sessions and Using Session Variables - Destroying a Session - Storing Data in Cookies – Data base connectivity - Setting Cookies

Text Book(s):

1. Head First PHP & MySQL: A Brain-Friendly Guide- 2009-Lynn mighley and Michael Morrison.
2. The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL- Alan Forbes

Reference Books:

1. PHP: The Complete Reference-Steven Holzner
2. DT Editorial Services (Author), — HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)ll, Paperback 2016, 2ndEdition.

Web Resources:

1. Open source digital libraries: PHP Programming
2. <https://www.w3schools.com/php/default.asp>

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Write PHP scripts to handle HTML forms	K1
CO2	Write regular expressions including modifiers, operators, and met characters.	K2
CO3	Create PHP Program using the concept of array.	K3
CO4	Create PHP programs that use various PHP library functions	K4
CO5	Manipulate files and directories..	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	2	2	2
CO2	3	3	3	2	3	2
CO3	3	3	3	3	3	2
CO4	3	3	3	3	3	2
CO5	3	3	3	2	3	2

3 - Strong, 2 – Medium, 1 – Low

Semester: III	Course Code: 23UADCCP03	Hours/Week:4	Credit: 3
COURSE TITLE : CORE COURSE VI - PRACTICAL - INTERNET PROGRAMMING LAB			

Course Overview:

1. Apply the various basic programming constructs of JAVA like decision making statements.
2. Looping statements, overloading, inheritance, polymorphism, constructors And destructors
3. Illustrate the concepts of the reading and multi-threading.
4. Design programs using various file stream classes; file types ,and frames

Learning Objectives:

1. To introduce the concepts of Object Oriented Programming Paradigm and the Programming constructs of JAVA
2. Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
3. Read and make elementary modifications to Java programs that solve real-world problems.
4. Validate input in a Java program.
5. Document a Java program using Java doc.

Sl. No	Contents	No. of Hours
1.	Write a Java Applications to extract a portion of a character string and print the extracted string.	60HRS
2.	Write a Java Program to implement the concept of multiple inheritance using Interfaces	
3.	Write a Java Program to create an Exception called payout-of-bound sand throw the exception	
4.	Write a Java Program to implement the concept of multi the reading with the use of any three multiplication tables and assign three different priorities to them.	
5.	Write a Java Program to draw several shapes in the created windows	
6.	Write a Java Program to demonstrate the Multiple Selection List-box.	
7.	Write a Java Program to create a frame with three text fields for name ,age and qualification and a text Field for multiple line for address	
8.	Write a Java Program to create Menu Bars and pull down menus	
9.	Write a Java Program to create frames which respond to the mouse clicks.	
10	Write a Java Program to draw circle ,square ,ellipse and rectangle at the mouse click positions	

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Apply the various basic programming constructs of JAVA like decision making statements.	K1
CO2	Looping statements, overloading, inheritance, polymorphism, constructors And destructors	K2
CO3	Illustrate the concepts of the reading and multi-threading	K3
CO4	Design programs using various file stream classes; file types, and frames.	K4
CO5	An exposure to create real time applications using JAVA	K5
K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create		

Mapping (COs vs POs)						
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	M	M	M	M
CO2	S	S	M	M	S	M
CO3	S	S	S	S	S	M
CO4	S	S	M	S	S	M
CO5	S	S	M	M	S	M

S - Strong, M – Medium, L – Low

Semester: III	Course Code: 23UADSE15	Hours/Week: 2	Credit: 1
COURSE TITLE : SKILL ENHANCEMENT COURSE - ENTERPRISE RESOURCE PLANNING			

Course Overview:

1. To understand the basic concepts, Evolution and Benefits of ERP.
2. To know the need and Role of ERP in logical and Physical Integration
3. Identify the important business functions provided by typical business software such as enterprise resource planning and customer relationship management
4. To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth

Learning Objectives:

1. To aim at preparing the students technological competitive and make them ready to self-upgrade with the higher technical skills
2. Identify the important business functions provided by typical business software
3. Enterprise resource planning and customer relationship management

Unit - I	ERP Introduction, Benefits, Origin, Evolution and Structure	15 Hours
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ERP Introduction, Benefits, Origin, Evolution and Structure: Conceptual Model of ERP, the Evolution of ERP, the Structure of ERP, Components and needs of ERP, ERP Vendors; Benefits & Limitations of ERP Packages

Unit - II	Enterprise Integration/ERP	15 Hours
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Need to focus on Enterprise Integration/ERP; Information mapping; Role of common shared Enterprise database; System Integration, Logical vs. Physical System Integration, Benefits & limitations of System Integration, ERP's Role in Logical and Physical Integration. Business Process Reengineering, Data ware Housing, Data Mining, Online Analytic Processing (OLAP), Product Life Cycle Management (PLM), LAP, Supply chain Management.

Unit - III	ERP Marketplace and Marketplace Dynamics	15 Hours
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ERP Marketplace and Marketplace Dynamics: Market Overview, Marketplace Dynamics, the Changing ERP Market. ERP - Functional Modules: Introduction, Functional Modules of ERP Software, Integration of ERP, Supply chain and Customer Relationship Applications. Cloud and Open Source, Management, Material Management, Financial Module, CRM and Case Study.

Unit - IV	ERP Implementation Basics	15 Hours
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ERP Implementation Basics, ERP implementation Strategy, ERP Implementation Life Cycle, Pre-Implementation task, Role of SDLC/SSAD, Object Oriented Architecture, Consultants, Vendors and Employees.

Unit - V	ERP & E-Commerce, Future Directives	15 Hours
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ERP & E - Commerce, Future Directives - in ERP, ERP and Internet, Critical success and failure factors, Integrating ERP into organizational culture. Using ERP tool: either SAP or ORACLE format to case study

Text Book(s):

1. Enterprise Resource Planning – Alexis Leon, Tata McGraw Hill.

Reference Books:

1. Enterprise Resource Planning – Diversified by Alexis Leon, TMH
2. Enterprise Resource Planning – Ravi Shankar & S. Jaiswal , Galgotia

Web Recourses:

1. https://www.tutorialspoint.com/management_concepts/enterprise_resource_planning.htm
2. <https://www.saponlinetutorials.com/what-is-erp-systems-enterprise-resource-planning/>
3. <https://www.guru99.com/erp-full-form.html>
4. <https://www.oracle.com/in/erp/what-is-erp/>

Teaching Methodology: Videos, Audios, PPT, Role Play, Field Visit, Seminar, Chalk & Talk, Lecturing, Case Study, Demonstration, Problem Solving, Group Discussion, Flipped Learning

Learning Outcomes:

Upon successful completion of this course, the student will be able to

COs	Statements	Bloom's Level
CO1	Understand the basic concepts of ERP.	K1
CO2	Identify different technologies used in ERP.	K2
CO3	Understand and apply the concepts of ERP Manufacturing Perspective and ERP Modules	K3
CO4	Discuss the benefits of ERP	K4
CO5	Apply different tools used in ERP	K5

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5 – Evaluate, K6 – Create

Mapping (COs vs POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2		1			2
CO2	2	3			1	2
CO3		2	2			
CO4				2		1
CO5	2		1		2	

3 - Strong, 2- Medium, 1 - Low