KAMARAJ COLLEGE

(AUTONOMOUS)
Accredited with A+ Grade by NAAC
Among Top 150 Colleges in India - NIRF Ranking 2024
இந்து நாடார் சங்கங்களால் 1966-ல் தொடங்கப்பட்ட கல்லூரி
(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)
THOOTHUKUDI - 628 003.

B.C.A.,

SYLLABUS

(With effect from the academic year 2024-2025 onwards)

Department Profile

Name of the Programme : B.C.A.,

Programme Code : 04

Year of Establishment : 2014

Vision:

Achieving excellence in Information Technology Enabled Services through Teaching, Extension and Consultancy.

Mission:

To offer accredited under graduate programmes with the state-of-art technology throughout the Nation to maintain high academic standards and teaching quality

To be a centre of excellence for innovation in frontier areas of Computer Science and technology relevant to the country.

COLLEGE MAIL ID kamarajcoll@gmail.com

COLLEGE WEBSITE www.kamarajcollege.ac.in

UNDERGRADUATE DEGREE PROGRAMME

1. Introduction

Programme Outcome, Programme Specific Outcomes and Course Outcomes

Students completing this programme will be able to present their core under-graduate discipline clearly and precisely, make abstract ideas precise by formulating them in the language of the specific discipline, describe related ideas from multiple perspectives and explain fundamental concepts. Completion of this programme will also enable the learners to join teaching profession, enhance their employability for government jobs, jobs in various other public and private enterprises.

Eligibility: Passed the 10 + 2 (Higher Secondary) examination conducted by Government of Tamil Nadu with Mathematics / Computer Science / Business Mathematics as one of the Subject or other equivalent examinations (Minimum Aggregate of 50%)

Learning Outcomes-Based Curriculum Framework Guidelines Based Regulations For Under Graduate Programme	
Programme	B.C.A.,
Programme Code	04
Duration	3 Years (UG)
Programme Outcomes:	
PO1	**Disciplinary knowledge**: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate Programme of study.
PO2	**Communication Skills**: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.
PO3	**Critical thinking:** Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.
PO4	**Problem solving:** Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

PO5	**Analytical reasoning**: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyse and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.
PO6	**Research-related skills:** A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.
PO7	**Cooperation/Team work:** Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
PO8	**Scientific reasoning:** Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.

Methods of Evaluation		Marks	
Internal Evaluation	Continuous Internal Assessment Test	15	25
	Assignment (PPT) and Seminar	5	
	Group Discussion and Viva	5	
External Evaluation	End Semester Examination		75
	Total		100 Marks
Methods of Assessment			
Recall(K1)	Simple definitions , MCQ, Recall steps, Concept definitions		
Understand/ Comprehend(K2)	MCQ, True/False, Short essays, Concept explanations, Short summary or overview		
Application(K3)	Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain		
Analyze(K4)	Problem-solving questions, Finish a procedure in many steps, Differentiate Between various ideas, Map knowledge		
Evaluate(K5)	Longer essay/Evaluation essay, Critique or justify with pros and cons		
Create(K6)	Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations		

Programme Specific Outcomes

On successful completion of Bachelor of (Chemistry) programme, the student should be able to:

PSO1	**Disciplinary Knowledge**
PSO2	**Critical Thinking**
PSO3	**Problem Solving**
PSO4	**Analytical & Scientific Reasoning**:
PSO5	**Research related skills:**

COURSE STRUCTURE FOR SCIENCE STREAM

(With effect from the academic year 2024 to 2025 onwards)

Semester III	Name of the Course	Hours /Week	Credit	Duration of ESE (Hrs.)	Marks Allotted		
					CIA	ESE	Total
Part I	பொதுத்தமிழ்: தமிழக வரலாறும் பண்பாடும்	**6**	**3**	**3**	**25**	**75**	**100**
Part II	General English Part - III	**6**	**3**	**3**	**25**	**75**	**100**
Part III Core III	Data Structures and Algorithms	**5**	**5**	**3**	**25**	**75**	**100**
Core Lab III	Data Structures and Algorithms Lab	**4**	**3**	**3**	**40**	**60**	**100**
EC III (Select any one)	Microprocessor and Microcontroller / Cyber Forensics	**3**	**3**	**3**	**25**	**75**	**100**
Part-IV SEC 4 - Lab	PHP Programming Lab	**2**	**2**	**3**	**40**	**60**	**100**
Part - IV AECC 1	Bootstrap and React	**2**	**2**	**3**	**25**	**75**	**100**
Part - IV	Yoga, Culture & Heritage	**2**	**2**	**1.5**	**25**	**75**	**100**
	Total	**30**	**23**				

Extra Credits

Curricular Activities	Co-Curricular Activities	Extra-Curricular Activities
Paper Presentation	Cultural Competitions	NCC
Paper Publication	Domain Clubs	NSS
Placement Training		SPORTS
Quiz		UBA
Competitions		YRC

Level	Credit			
	Participation	III Prize	II Prize	I Prize
Intra college	1	2	3	4
Intercollegiate	2	3	4	5
District	3	4	5	6
University	4	5	6	7
State	5	6	7	8
National	6	7	8	9
International	7	8	9	10

****Paper Presentation for each paper: 1 credit.**

Total credits Under – Graduate Courses including Lab Hours- 2024 to 2025

Semester	Hours	Credits	Additional Credits	Extra Credits
I	30	22	2	3
II	30	22	2	3
III	30	23	2	3
IV	30	24	2	3
V	30	26	3	3
VI	30	23	3	3
Total		140	14	18

Written Examination: Theory Paper (Bloom's

Taxonomy based) Question paper Model

ASSESSMENT PATTERN

Continuous Internal Assessment (CIA) & End Semester Examination (ESE)

- CIA : 25
- ESE: 75

Theory Course:

For theory courses there shall be two tests conducted by the faculty concerned and the average of the best two can be taken as the Continuous Internal Assessment (CIA).CIA is for 50 marks max and will be converted in to 15 marks. The duration of each test shall be 2 Hrs.

Continuous Internal Assessment (Writing)	15 marks
Assignment (PPT)& Seminar	5 marks
Viva & Group Discussion	5 marks

For theory Papers:

- Part A (10X1)=10Marks-Answerallquestions(Multiple choice)
- Part B (5 X 5)= 25 Marks-Choosing either (a) or (b)
- Part C (5X 8)=40 Marks-Choosing either(a)or (b)
- **Total =75 marks**

<u>Laboratory Courses Assessment</u>

- CIA - 40 marks
- ESE-60 marks
- Mandatory Record submission, attendance and class participation.
- Two CIA for 40 marks max. The average of the best two can be taken as the Continuous Internal Assessment.
- The duration of each test shall be 3 hours

In order to avoid pull the score down of each PO, it is suggested that the usage L-Low (1) to the minimum.

The S, M, L is based on the Course outcomes. The mapping is based on the revised Bloom's

Taxonomy Verbs used to describe your Course outcomes.

- Remember and Understanding – Lower level
- Apply and Analyse – Medium Level
- Evaluate and Create – Strong Level

CORE III – (Data Structures and Algorithms)

<table>
<tr><td colspan="2">Title of the Course</td><td colspan="6">Data Structures and Algorithms</td></tr>
<tr><td colspan="2">Paper Number</td><td colspan="6">CORE III</td></tr>
<tr><td colspan="2">Subject code</td><td colspan="6"></td></tr>
<tr><td rowspan="2">Category</td><td rowspan="2">Core</td><td>Year</td><td>II</td><td rowspan="2">Credits</td><td rowspan="2">4</td><td rowspan="2">Course Code</td><td rowspan="2"></td></tr>
<tr><td>Semester</td><td>III</td></tr>
<tr><td colspan="2" rowspan="2">Instructional Hours per week</td><td>Lecture</td><td colspan="2">Tutorial</td><td>Lab Practice</td><td colspan="2">Total</td></tr>
<tr><td>3</td><td colspan="2">2</td><td>--</td><td colspan="2">5</td></tr>
<tr><td colspan="2">Pre-requisite</td><td colspan="6"></td></tr>
<tr><td colspan="8">Learning Objectives</td></tr>
<tr><td>LO1</td><td colspan="7">To understand the concepts of ADTs</td></tr>
<tr><td>LO2</td><td colspan="7">To learn linear data structures-lists, stacks, queues</td></tr>
<tr><td>LO3</td><td colspan="7">To learn Tree structures and application of trees</td></tr>
<tr><td>LO4</td><td colspan="7">To learn graph structures and application of graphs</td></tr>
<tr><td>LO5</td><td colspan="7">To understand various sorting and searching</td></tr>
</table>

UNIT	CONTENTS
I	Abstract Data Types (ADTs)- List ADT-array-based implementation- linked list implementation singly linked lists-circular linked lists-doubly- linked lists-applications of lists- All operations-Insertion-Deletion-Traversal.
II	Stack ADT-Operations-Applications-Evaluating arithmetic expressions–Conversion of infix to postfix expression- Queue ADT - Operations- Circular Queue- Priority Queue-DE Queue applications of Queues.
III	Tree ADT-tree traversals-Binary Tree ADT-expression trees- applications of trees-binary search tree ADT- AVL Trees – Heap-Applications of heap.
IV	Graph - Definition- Representation of Graph- Types of graph-Breadth first traversal – Depth first traversal- Applications of graphs.
V	Searching- Linear search- Binary search-Sorting-Bubble sort- Selection sort-Insertion sort- Shell sort –Radix sort-Hashing-Hash functions- Separate chaining- Open Addressing-Rehashing.

Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)	Questions related to the above topics, from various competitive examinations UPSC/TRB /NET/UGC –CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Recommended Texts:	
1	Benjamin Baka, "Python Data Structures and Algorithms", Packt Publishing 2017, First Edition.
2	Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran,"Computer Algorithms",Galgotia Publications pvt. Ltd, 2000.
3	Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education 2014, 4th Edition.
4	Reema Thareja, "Data Structures Using C", Oxford Universities Press 2014, 2nd Edition
References Books:	
1	Rance D. Necaise, "Data Structures and Algorithms using Python", John Wiley & Sons, 2011
2	Thomas H.Cormen, Chales E.Leiserson, Ronald L.Rivest, Clifford Stein, "Introduction to Algorithms", McGraw Hill 2009, 3rd Edition.
Web Resources	

1	NPTEL & MOOC courses titled Data Structures
2	https://nptel.ac.in/courses/106106127/

Course outcomes	On completion of this course, students will be able to:	Cognitive Level
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation	K1
CO2	Understand basic data structures such as arrays, linked lists, stacks and queues	K2
CO3	Describe the hash function and concepts of collision and its resolution methods	K3
CO4	Solve problem involving graphs, trees and heaps	K4
CO5	Apply algorithm for solving problems like sorting, searching, insertion and deletion of data	K5

Mapping With Programme Outcomes and Programme Specific Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**3**	**3**	**3**	3	3	3	**3**	3
CO 2	3	3	2	3	2	3	3	2
CO 3	3	2	3	3	3	1	2	3
CO 4	2	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	1

S-Strong (3)M-Medium (2)L-Low (1)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

CORE Lab III - (Data Structures and Algorithms Lab)

<table>
<tr><td>Title of the Course</td><td colspan="7">Data Structures And Algorithms Lab</td></tr>
<tr><td>Paper Number</td><td colspan="7">CORE Lab III</td></tr>
<tr><td>Subject code</td><td colspan="7"></td></tr>
<tr><td rowspan="2">Category</td><td rowspan="2">Core</td><td>Year</td><td>II</td><td rowspan="2">Credits</td><td rowspan="2">3</td><td rowspan="2">Course Code</td><td rowspan="2"></td></tr>
<tr><td>Semester</td><td>III</td></tr>
<tr><td colspan="2" rowspan="2">Instructional Hours Per week</td><td>Lecture</td><td colspan="2">Tutorial</td><td colspan="2">Lab Practice</td><td>Total</td></tr>
<tr><td>1</td><td colspan="2">-</td><td colspan="2">3</td><td>4</td></tr>
<tr><td colspan="2">Pre-requisite</td><td colspan="6"></td></tr>
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<tr><td>LO1</td><td colspan="7">To understand the concepts of ADTs</td></tr>
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<tr><td>LO4</td><td colspan="7">To learn graph structures and application of graphs</td></tr>
<tr><td>LO5</td><td colspan="7">To understand various sorting and searching</td></tr>
</table>

EXPERIMENTS	
1. Write a program to implement Stack ADT. 2. Write a program to implement Queue ADT 3. Write a program to implement linked list. 4. Write a program to convert from infix to postfix expression. 5. Write a program to implement binary search tree. 6. Write a program for the implementation of BFS and DFS for a given graph. 7. Write a program for implementing the linear search. 8. Write a program for implementing the Binary search. 9. Write a program for implementing the Selection sort. 10. Write a program for implementing the Insertion sort.	
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)	Questions related to the above topics, from various competitive examinations UPSC/TRB /NET/UGC –CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Recommended Texts	1. Benjamin Baka, "Python Data Structures and Algorithms", Pack Publishing 2017, First Edition. 2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education 2014, 4th Edition 3. Reema Thareja, "Data Structures Using C", Oxford Universities Press 2014, 2nd Edition
Reference Books:	1. Thomas H. Cormen, Chales E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", McGraw Hill 2009, 3rd Edition
Web Resources	
	NPTEL & MOOC courses titled Data Structures
	https://nptel.ac.in/courses/106106127/

Course outcomes	On completion of this course, students will be able to:	Cognitive Level
CO1	Understand the concept of Dynamic memory management, data types, algorithms	K1
CO2	Understand basic data structures such as arrays, linked lists, stacks and queues	K2
CO3	Describe the hash function and concepts of collision and its resolution methods	K3

CO4	Solve problem involving graphs, trees and heaps	K4
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	K5

Mapping With Programme Outcomes and Programme Specific Outcomes

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	**3**	**3**	**3**	3	3	3	**3**	3
CO 2	3	3	2	3	2	3	3	2
CO 3	3	2	3	3	3	1	2	3
CO 4	2	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	1

S-Strong (3)M-Medium (2)L-Low (1)

CO/PSO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

ELECTIVE III (Microprocessor and Microcontroller)

Title of the Course	**Microprocessor and Microcontroller**						
Paper Number	**Elective III – 3.1**						
Subject code							
Category	**Elective**	**Year**	II	**Credits**	3	**Course Code**	
		Semester	III				

Instructional Hours per week	**Lecture**	**Tutorial**	**Lab Practice**	**Total**
	2	1	-	3
Pre-requisite				

Learning Objectives	
LO1	To introduce the internal organization of Intel 8085 Microprocessor.
LO2	To know about various instruction sets and classifications
LO3	To enable the students to write assembly language programs using 8085.
LO4	To interface the peripheral devices to 8085 using Interrupt controller and DMA interface
LO5	To provide real-life applications using microcontroller.

UNIT	**CONTENTS**
I	Digital Computers - Microcomputer Organization-Computer languages –Microprocessor Architecture and its operations – Microprocessor initiated operations and 8085 Bus organization – Internal Data operations and 8085 registers - Peripheral or External initiated operations.
II	8085 Microprocessor – Pin out and Signals – Functional block diagram - 8085 Instruction Set and Classifications.
III	BCD to Binary and Binary to BCD conversions - ASCII to BCD and BCD to ASCII conversions - Binary to ASCII and ASCII to Binary conversions. BCD Arithmetic - BCD addition and Subtraction – Multi byte Addition and Subtraction - Multiplication and Division.
IV	The 8085 Interrupts – RIM AND SIM instructions-8259 Programmable Interrupt Controller-Direct Memory Access (DMA) and 8257 DMA controller.
V	Introduction to Microcontroller - Microcontroller Vs. Microprocessor - 8051 Microcontroller architecture - 8051 pin description. Timers and Counters – Operating Modes- Control Registers. Interrupts – Interrupts in 8051 - Interrupts Control Register – Execution of interrupt.

Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)	Questionsrelatedtotheabovetopics,fromvariouscompetitiveexaminations UPSC / TRB / NET / UGC – CSIR / GATE / TNPSC /others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill

Recommended Texts	1. R.S. Gaonkar- "Microprocessor Architecture- Programming and Applications with 8085", 5th Edition- Penram International Publications, 2009. [For unit I to unit IV] 2. Soumitra Kumar Mandal -"Microprocessors and Microcontrollers – Architectures, Programming and Interfacing using 8085, 8086, 8051", Tata McGraw Hill Education Private Limited. [For unit V].
Reference books:	Mathur- "Introduction to Microprocessor"- 3rd Edition- Tata McGraw-Hill -1993.
	Raj Kamal - "Microcontrollers: Architecture, Programming, Interfacing and System Design", Pearson Education, 2005.
	Krishna Kant, "Microprocessors and Microcontrollers – Architectures, Programming and System Design 8085, 8086, 8051, 8096", PHI, 2008

Course outcomes: CO	**On completion of this course, the students will Be able to:**	**Cognitive Level**
CO1	Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the Architecture of 8085.	K1
CO2	Understanding the 8085 instruction set and their classifications, enables the students to write the programs easily on their own using different logic.	K2
CO3	Apply different types of instructions to convert binary codes and analyzing the outcome. The instruction set is applied to develop programs on multi byte arithmetic operations.	K3
CO4	Analyze how peripheral devices are connected to 8085 using Interrupts and DMA controller.	K4
CO5	Have an exposure to create real time applications using Micro controller.	K5

Mapping With Programme Outcomes and Programme Specific Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**3**	**3**	**3**	3	3	3	**3**	3
CO 2	3	3	2	3	2	3	3	2
CO 3	3	2	3	3	3	1	2	3
CO 4	2	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	1

S-Strong (3) M-Medium (2) L-Low (1)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

ELECTIVE III (Cyber Forensics)

Title of the Course	**Cyber Forensics**						
Paper Number	**Elective III – 3.2**						
Subject code							
Category	**Elective**	**Year**	II	**Credits**	3	**Course Code**	
		Semester	III				
Instructional Hours per week		**Lecture**		**Tutorial**		**Lab Practice**	**Total**
		2		1		-	3
Pre-requisite							
Learning Objectives							

LO1	Understand the definition of computer forensics fundamentals
LO2	To study about the Types of Computer Forensics Evidence
LO3	Understand and apply the concepts of Duplication and Preservation of Digital Evidence
LO4	Understand the concepts of Electronic Evidence and Identification of Data
LO5	To study about the Digital Detective, Network Forensics Scenario, Damaging Computer Evidence.

UNIT	CONTENTS
I	**Overview of Computer Forensics Technology:** Computer Forensics Fundamentals: What is Computer Forensics Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of professional Forensics Methodology, Steps taken by Computer Forensics Specialist.
II	**Types of Computer Forensics Technology:** Types of Business Computer Forensic, Technology: Computer Forensic Technology-Types of Military Computer Forensic Technology– Types of Business Computer Forensic Technology **Computer Forensics Evidence and capture:** Data Recovery: Data Recovery Defined, Data Back–up and Recovery, The Role of Back –up in Data Recovery, The Data – Recovery Solution.
III	**Duplication and Preservation of Digital Evidence:** Processing steps, Legal Aspects of collecting and Preserving Computer forensic Evidence. Computer image Verification and Authentication.
IV	**Computer Forensics Analysis:** Discovery of Electronic Evidence: Electronic Document Discovery. Identification of Data: Time Travel, Forensic Identification and Analysis of Technical Surveillance Devices.
V	**Reconstructing Past Events:** How to Become a Digital Detective, Useable File Formats, Unusable File Formats, Converting Files. Destruction Of E–Mail, Damaging Computer Evidence, Documenting The Intrusion on Destruction of Data, System Testing.

Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)	Questionsrelatedtotheabovetopics,fromvariouscompetitiveexaminations UPSC / TRB / NET / UGC – CSIR / GATE / TNPSC /others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill

Recommended Texts	John R. Vacca, "Computer Forensics: Computer Crime Investigation", 3/ E, Fire wall Media, New Delhi, 2002.
Reference books:	Nelson, Phillips Enfinger, Steuart, "Computer Forensics and Investigations" Enfinger, Steuart, CENGAGE Learning, 2004.
	Anthony Sammes and Brian Jenkinson,"Forensic Computing: A Practitioner' s Guide", Second Edition, Springer–Verlag London Limited, 2007.
	.Robert M. Slade," Software Forensics Collecting Evidence from the Scene of a Digital Crime", TMH 2005.
Web Resources	https://www.vskills.in
	https://www.hackingarticles.in/best-of-computer-forensics-tutorials/

Course outcomes: CO	**On completion of this course, the students will Be able to:**	**Cognitive Level**
CO1	Understand the definition of computer forensics fundamentals.	K1
CO2	Evaluate the different types of computer forensics technology.	K2
CO3	Analyze various computer forensics systems.	K3
CO4	Apply the methods for data recovery, evidence collection and data seizure.	K4
CO5	Gain the knowledge of duplication and preservation of digital evidence.	K5

Mapping With Programme Outcomes and Programme Specific Outcomes

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	**3**	**3**	**3**	3	3	3	**3**	3
CO 2	3	3	2	3	2	3	3	2
CO 3	3	2	3	3	3	1	2	3
CO 4	2	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	1

S-Strong (3) M-Medium (2) L-Low (1)

CO/PSO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

SEC IV- Lab (Php Programming Lab)

Title of the Course	**Php Programming Lab**						
Paper Number	SEC - IV - Lab						
Subject code							
Category	SEC	**Year**	II	**Credits**	2	**Course Code**	
		Semester	III				
Instructional Hours Per week		**Lecture**	**Tutorial**		**Lab Practice**		**Total**
		-	-		2		2
Pre-requisite							

Learning Objectives	
LO1	To provide the necessary knowledge on basics of PHP.
LO2	To design and develop dynamic, database-driven web applications using PHP.
LO3	To get an experience on various web application development techniques.
LO4	To learn the necessary concepts for working with the files using PHP.
LO5	To get a knowledge on sessions and cookies.

EXPERIMENTS	
1. Get name of a user from a form and show greeting text. 2. Write a PHP program to check whether given string is palindrome or not. 3. Write a PHP program to check whether given number is Armstrong or not. 4. Write a PHP program using function. 5. Create a PHP page for login page without sql connection. 6. Write a PHP program for Array manipulation. 7. Write a PHP program to design personal information 8. Create a PHP page for login page with sql connection. 9 Create a web page to advertise a product of the company using images and audio.	
Extended Professional Component(is a part of internal component only, Not to be included in the External Examination question paper)	Questionsrelatedtotheabovetopics,fromvariouscompetitiveexaminationsUPSC/TRB /NET/UGC –CSIR/GATE/TNPSC/others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill

Recommended Texts	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)", Paperback 2016, 2ndEdition.
Web resources:	1. Refer MOOC Courses like NPTEL and SWAYAM **2.** https://www.w3schools.com/php/default.asp

Course outcomes: CO	**On completion of this course, the students will be able to Cognitive Level**	
CO1	Write PHP scripts to handle HTML forms	K1
CO2	Write regular expressions including modifiers, operators, and meta 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

Mapping With Programme Outcomes and Programme Specific Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**3**	**3**	**3**	3	3	3	**3**	3
CO 2	3	3	2	3	2	3	3	2
CO 3	3	2	3	3	3	1	2	3
CO 4	2	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	1

S-Strong (3) M-Medium (2) L-Low (1)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

AECC 1 - (Bootstrap And React)

Title of the Course	**Bootstrap And React**						
Paper Number	**AECC I**						
Subject code							
Category	**AECC**	**Year**	II	**Credits**	2	**Course Code**	
		Semester	III				

Instructional Hours per week	**Lecture**	**Tutorial**	**Lab Practice**	**Total**
	1	1	-	2

Pre-requisite	
Learning Objectives	
LO1	Understand the Fundamentals of Bootstrap
LO2	Work with Bootstrap CSS
LO3	Work with Bootstrap Components
LO4	Explore the Bootstrap Java script plugins
LO5	To build an app using React

UNIT	**CONTENTS**
I	**Introduction:** What Is Bootstrap? - Bootstrap File Structure - Basic HTML Template -Global Styles - Default Grid System - Basic Grid HTML - Offsetting Columns - Nesting Columns - Fluid Grid System - Container Layouts -Responsive Design - What Is Responsive Design?
II	**Bootstrap CSS:** Typography - Headings – Emphasis – Bold – Italics - Emphasis Classes - Lists – Code – Tables - Forms - Optional Form Layouts - Supported Form Controls - Form Control Sizing - Form Control States – Buttons – Images.
III	**Bootstrap Layout Components:** Dropdown Menus – Options - Button Groups - Button Groups as Radio Buttons and Checkboxes - Buttons with Dropdowns – Drop up Menus - Navigation Elements - Tabular Navigation – Dropdowns - Navigation Lists – Forms -– Labels – Alerts.

IV	**Bootstrap Java Script Plugins:** Overview - Programmatic API – Transitions – Modal – Usage – Options – Methods – Events. Using Bootstrap: GitHub Project - Customizing Bootstrap - Using LESS - Text Snippets - Photoshop Templates – Themes - Built with Bootstrap
V	**Introduction of React:** React without a Build Tool chain - Interactive "Hello, World" with Create React App and JSX. What's in a Name? - UI Layer - Virtual DOM - The Philosophy of React - React Is Declarative. JSX: What Is JSX? - How JSX Works - Syntax Basics of JSX - JSX Is JavaScript XML- Reserved Words - JSX Uses camelCase - JSX Boolean Attributes - Use Curly Braces to Include Literal JavaScript - When to Use JavaScript in JSX - Conditionals in JSX - Expressions in JSX - Using Children in JSX - React Fragments.

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Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill

Recommended Texts	1. Bootstrap, Jake Spurlock, O'REILLY 2. BEGINNING React JS Foundations, Building User Interfaces with React JS, AN APPROACHABLE GUIDE, Chris Minnick
Web Resources	• www.allitebooks.com • https://www.learnvern.com/bootstrap-tutorial • https://www.w3schools.com/REACT/DEFAULT.ASP

Course outcomes: CO	**On completion of this course, the students will Be able to:**	**Cognitive Level**
CO1	Understand the Fundamentals of Bootstrap	K1
CO2	Able to work with Bootstrap CSS	K2
CO3	Able to work with Bootstrap Components	K3
CO4	Implementing Bootstrap Java script plugins	K4
CO5	Building an app using React	K5

Mapping With Programme Outcomes and Programme Specific Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**3**	**3**	**3**	3	3	3	**3**	3
CO 2	3	3	2	3	2	3	3	2
CO 3	3	2	3	3	3	1	2	3
CO 4	2	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	1

S-Strong (3) M-Medium (2) L-Low (1)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Blue Print:

Blue Print – End Semester Examinations – November 2024
Semester -I

Class: U.G. / P.G. Time: 3 Hours Max. Marks: 75

Section A (10 x 1 = 10)

Answer ALL questions.
Choose the correct answer. (With four options)

	Unit I	Unit II	Unit III	Unit IV	Unit V
Question Nos.	1 & 2	3 & 4	5 & 6	7 & 8	9 & 10

Section B (5 x 5 = 25)

Answer ALL questions choosing either (a) or (b).
Answer should not exceed 250 words

	Unit I	Unit II	Unit III	Unit IV	Unit V
Question Nos.	11 (a) & 11 (b)	12 (a) & 12 (b)	13 (a) & 13 (b)	14 (a) & 14 (b)	15 (a) & 15 (b)

Section C (5 x 8 = 40)

Answer ALL questions choosing either (a) or (b).
Answer should not exceed 500 words.

	Unit I	Unit II	Unit III	Unit IV	Unit V
Question No.	16 (a) & 16 (b)	17 (a) & 17 (b)	18 (a) & 18 (b)	19 (a) & 19 (b)	20 (a) & 20 (b)