



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

706

UNDERGRADUATE (UG) PROGRAMME OUTCOMES (POs)

Undergraduate (B.A., B.Sc., B.Com., B.C.A., B.B.A., etc.) is 3–year degree programme with 6 semesters consisting the following Programme Outcomes (POs) under various criteria including critical thinking, problem solving, effective communication, societal/ citizenship/ ethical credibility, sustainable growth and employable abilities.

PO 1	Critical Thinking: Intellectual exploration of knowledge towards actions in clear and rational manner by understanding the logical connections between ideas and decisions.
PO 2	Problem Solving: Understanding the task/ problem followed by planning and narrow execution strategy that effectively provides the solution.
PO 3	Effective Communication: Knowledge dissemination by oral and verbal mechanisms to the various components of our society.
PO 4	Societal/ Citizenship/ Ethical Credibility: Realization of various value systems/ moral dimensions and demonstrate the empathetic social concern as well as equity in all the decisions, executions and actions.
PO 5	Environmental Concern and Sustainable Growth: Understanding the emerging environmental challenges and provide the possible contribution in sustainable development that integrates environment, economy and employment.
PO 6	Skill Development and Employable Abilities: Adequate training in relevant skill sector and creating employable abilities among the under graduates.



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707

PROGRAMME SPECIFIC OUTCOMES (PSOs)

On completion of **Bachelor of Computer Applications (BCA)** Programme, the students are expected to

PSO 1	develop as professionally competent citizens by applying the scientific knowledge of Computer Science with the ability to think clearly, rationally and creatively to support in evolving solutions to the social/public/scientific issues with responsible democratic participation
PSO 2	have enterprising resourcefulness to identify, plan, formulate, design and evaluate solutions for complex computing problems that address the specific needs with appropriate consideration for Societal, Cultural, Environmental and Industrial domains.
PSO 3	develop holistically having been ignited the lateral thinking ability in problem solving, acquisition of new skills, open-minded and organized way of facing problems with self-awareness and evolving analytical solutions
PSO 4	create and initiate innovations effectively and communicate efficiently with the computing community and society at large to bridge the gap between computing industry and academia
PSO 5	understand, assess and commit to professional and ethical principles, norms and responsibilities of the cyber world and the ability for work efficacy as a part of a team and engage effectively with diverse stakeholders through Digital Literacy
PSO 6	acquire the ability and willingness to embark on new ventures and initiatives with critical thinking and desire for more continuous learning focusing on life skills.



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708

BACHELOR OF COMPUTER APPLICATIONS – COURSE STRUCTURE

SEMESTER – I

S. No.	Sub. Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT11	Part – I: Tamil – கவிதையும் சிறுகதையும்	6	3	25	75	100	3
	21UACH11	Hindi – Hindi – I						
	21UACS11	Sanskrit – Sanskrit – I						
2.	21UACE11	Part – II: English – English For Enrichment – I	6	3	25	75	100	3
3.	21UCAC11	Part – III: Core – 1: Programming in C	5	3	25	75	100	4
4.	21UCACP1	Part – III: Core – 2: Lab I: C Programming	5	3	40	60	100	4
5.	21UCAA11	Part – III: Allied – 1: Discrete Mathematics	4	3	25	75	100	4
6.	21UCAS11	Part – IV: SBS – 1: Digital Computer Fundamentals	2	3	25	75	100	2
7.	21UACVE1	Part – IV: Value Education	2	3	25	75	100	2
		TOTAL	30				700	22

SEMESTER – II

S. No.	Sub. Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT21	Part – I: Tamil – செய்யுளும் புதினமும்	6	3	25	75	100	3
	21UACH21	Hindi – Hindi – II						
	21UACS21	Sanskrit – Sanskrit – II						
2.	21UACE21	Part – II: English – English For Enrichment – II	6	3	25	75	100	3
3.	21UCAC21	Part – III: Core – 3: Data Structures & Algorithms	5	3	25	75	100	4
4.	21UCACP2	Part – III: Core – 4: Lab – II: Data Structure using C	5	3	40	60	100	4
5.	21UCAA21	Part – III: Allied – 2: Computer Based Financial Accounting	4	3	25	75	100	4
6.	21UCAS21	Part – IV: SBS - 2 : Computer Organization & Architecture	2	3	25	75	100	2
7.	21UACES1	Part – IV: Environmental Studies	2	3	25	75	100	2
		TOTAL	30				700	22



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709

SEMESTER – III

S. No.	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT31	Part – I: Tamil – காப்பியமும் நாடகமும்	6	3	25	75	100	3
	21UACH31	Hindi – Hindi – III						
	21UACS31	Sanskrit – Sanskrit – III						
2.	21UACE31	Part – II: English – English For Enrichment – III	6	3	25	75	100	3
3.	21UCAC31	Part – III: Core – 5: Object Oriented Programming using C++	5	3	25	75	100	4
4.	21UCACP3	Part – III: Core – 6: Lab – III: Object Oriented Programming using C++	5	3	40	60	100	4
5.	21UCAA31	Part – III: Allied – 3: Operations Research	4	3	25	75	100	4
6.	21UCASP1	Part – IV: SBS – 3: Lab: Office Automation	2	3	40	60	100	2
7.	21UCAN31	Part – IV: NME – 1 : Introduction to Information Technology	2	3	25	75	100	2
TOTAL			30				700	22

SEMESTER – IV

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT41	Part – I: Tamil – சங்க இலக்கியமும் அற இலக்கியமும்	6	3	25	75	100	3
	21UACH41	Hindi – Hindi – IV						
	21UACS41	Sanskrit – Sanskrit – IV						
2.	21UACE41	Part – II: English – English For Enrichment – IV	6	3	25	75	100	3
3.	21UCAC41	Part – III: Core – 7: Programming in Java	5	3	25	75	100	4
4.	21UCACP4	Part – III: Core – 8: Lab – IV: Java Programming	5	3	40	60	100	4
5.	21UCAA41	Part – III: Allied – 4: Numerical Methods	4	3	25	75	100	4
6.	21UCASP2	Part – IV: SBS – 4: Lab: Multimedia	2	3	40	60	100	2
7.	21UCAN41	Part – IV: NME – 2: Web Programming	2	3	25	75	100	2
8.		Part – V: Extension Activities	–	–	–	–	100	1
TOTAL			30				800	23



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710

SEMESTER – V

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UCAC51	Part–III–Core–9: Software Engineering	6	3	25	75	100	4
2.	21UCAC52	Part–III–Core–10: Relational Database Management System	6	3	25	75	100	4
3.	21UCACP5	Part–III–Core–11: Lab – V: Web Technology	5	3	40	60	100	4
4.	21UCAC53	Part–III–Core–12: Computer Networks	5	3	25	75	100	4
5.	Part–III : Elective – 1:		4	3	25	75	100	5
	21UCAE51	Web Technology						
	21UCAE52	Multimedia and its Applications						
	21UCAE53	Mobile Computing						
6.	21UCAS51	Part – IV: SBS – 5: Quantitative Aptitude	2	3	25	75	100	2
7.	21UCASP3	Part – IV: SBS – 6: Lab: PL/SQL	2	3	40	60	100	2
8.	21USSY51	Soft Skills (Self–Study)	–	–	–	–	100	–
		TOTAL	30				800	25

*One elective course to be chosen from THREE courses

SEMESTER – VI

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UCAC61	Part – III: Core – 13: Programming in Python	5	3	25	75	100	4
2.	21UCACP6	Part – III: Core – 14: Lab – VI: Python Programming	5	3	40	60	100	4
3.	21UCAC62	Part – III: Core – 15: Operating System	5	3	25	75	100	4
4.	21UCACP7	Part – III: Core – 16: Lab – VII: Open Source Technology(PHP)	5	3	40	60	100	4
5.	Part – III: Elective – 2:		5	3	25	75	100	5
	21UCAE61	Principles of Information Security						
	21UCAE62	Data Mining						
	21UCAE63	Unix and Shell Programming						
6.	21UCAEV1	Part – III: Elective – 3: Project Work & Viva Voce	5	3	40	60	100	5
7.	21UGKY61	General Knowledge (Self–Study)	–	–	–	–	100	–
		TOTAL	30				700	26

*One elective course to be chosen from THREE courses



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711

COURSE STRUCTURE – V SEMESTER

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UCAC51	Part–III: Core – 9: Software Engineering	6	3	25	75	100	4
2.	21UCAC52	Part–III: Core – 10: Relational Database Management System	6	3	25	75	100	4
3.	21UCACP5	Part–III: Core – 11: Lab – V: Web Technology	5	3	40	60	100	4
4.	21UCAC53	Part–III: Core – 12: Computer Networks	5	3	25	75	100	4
5.	Part–III : Elective – 1:		4	3	25	75	100	5
	21UCAE51	Web Technology						
	21UCAE52	Multimedia and its Applications						
	21UCAE53	Mobile Computing						
6.	21UCAS51	Part – IV: SBS – 5: Quantitative Aptitude	2	3	25	75	100	2
7.	21UCASP3	Part – IV: SBS – 6: Lab: PL/SQL	2	3	40	60	100	2
8.	21USSY51	Soft Skills (Self–Study)	–	–	–	–	100	–
TOTAL			30				800	25

*One elective course to be chosen from **THREE** courses

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

T – Theory

P – Practical



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(with effect from 2021 – 2022)

712

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAC51	SOFTWARE ENGINEERING	CORE – 9	6	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

COURSE DESCRIPTION:

This course helps the students to learn the basic knowledge of Software Engineering which they can apply in project.

COURSE OBJECTIVES:

To make the students

- understand the concepts of Software Engineering.
- understand the concepts of Cost estimation.
- understand the concepts of Verification and Validation Techniques.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the Planning and development process	Upto K3
CO 2	learn about the Software cost Estimation techniques	Upto K3
CO 3	understand how to prepare SRS and requirement specifications	Upto K3
CO 4	acquire the concepts of software designing and notations and	Upto K3
CO 5	apply the verification and validation techniques in software testing	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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713

SOFTWARE ENGINEERING

UNIT-I: Introduction

Introduction to Software Engineering Some definitions – Quality and productivity factors – Managerial issue. Planning a software project: Definition the problem – Developing a solution strategy– planning the development process – planning an organization structure – other planning activities.

UNIT-II: Software Cost Estimation

Software – Cost factors – software cost estimation techniques – Specification techniques – staffing –level estimation – estimating software maintenance costs.

UNIT-III: Software Requirements Definition

The software requirements specification – format languages and processors for requirements specification. (Except RSL/REVS)

UNIT-IV: Software Design

Fundamentals Design concepts – Modules and modularizing Criteria Design Notations – Design Techniques – Detailed Design Consideration – Test plan – Mile stones walk through and inspection – Design guide lines.

UNIT-V: Verification and Validation Techniques

Quality Assurance – static analysis – symbolic exception – Unit testing and Debugging – System Testing – formal verification.

Software maintenance: Enhancing maintainability during development – managerial aspects of software maintenance–configuration management–source code metrics–other maintenance tools and techniques.

TEXT BOOK:

Richard E.Fairly, *Software Engineering Concepts*, McGraw Hill Book Company.

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

- Unit – I – Chapter 1 (1.1, 1.3, 1.4), Chapter 2(2.1 to 2.5)
- Unit – II – Chapter 3(3.1 to 3.4)
- Unit – III – Chapter 4(4.1 to 4.3)
- Unit – IV – Chapter 5(5.1 to 5.5, 5.7 to 5.9)
- Unit – V – Chapter 8 & 9

REFERENCE BOOK:

Roger S. Pressman, *Software Engineering: A Practitioner's Approach* McGraw Hill International Book Company.

DIGITAL TOOLS:

1. www.tutorialspoint.com/software_engineering/
2. www.ecomputernotes.com/software-engineering
3. <https://www.udemy.com/course/software-engineering-for-beginners/>
4. <http://www.tutorialride.com/software-engineering/software-engineering-tutorial.htm>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2		1		
CO2		2	3			2
CO3	2			2	3	2
CO4	2		2	1		2
CO5	2	2	2	1	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. O. K. HARIHARAN



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714

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAC52	RELATIONAL DATABASE MANAGEMENT SYSTEM	CORE-10	6	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input type="checkbox"/>	Entrepreneurship <input type="checkbox"/>

COURSE DESCRIPTION:

This course provides fundamental concepts of Database Management System for the database architecture which enhances the user to analyze data normalization, Integrity Constraints and PL/SQL.

COURSE OBJECTIVE:

To learn various concepts of Database Architecture, Data Modeling, Analysis of Data Normalization, Integrity constraints, Queries and its Aggregate Functions and PL/SQL.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember the Quality of Information, Introduction of DBMS, RDBMS Characteristics, Types of DBMS	Upto K3
CO 2	know about Integrity Constraints and apply the basic concepts of Database Architecture	Upto K3
CO 3	know about Data Modeling and analyze the Data Normalization	Upto K3
CO 4	apply the Basic concept of SQL– Tables, Views and Indexes and discuss Queries , Sub Queries	Upto K3
CO 5	explain the application of Aggregate functions and discuss Integrity Constraints and PL/SQL	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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(with effect from 2021 – 2022)

715

RELATIONAL DATABASE MANAGEMENT SYSTEM

UNIT-I:

Data, Information and Information processing: Introduction – Definition of Information – Quality of Information – Information Processing. Introduction to DBMS: Introduction – why a Database ? – characteristic of data in database – DBMS – why DBMS – Types of DBMS – DDL.

UNIT – II:

Introduction – RDBMS Technology – The relational data structure – Relational Data Integrity – Relational data manipulation – Codd's rules – Database Architecture and Data Modeling: Introduction, Conceptual, Physical and Logical Database Model – Database design – Design Constraints.

UNIT – III:

E-R Modeling: Introduction – ER- Model – Components of an ER Model – ER Modeling Symbol – Data Normalization : Introduction – Keys – Relationship – 1NF – 2NF–3NF –4NF – 5NF – DKNF – Denormalization .

UNIT – IV:

SQL Data types and Literals – Types of SQL Commands – SQL Operators – Arithmetic – Comparison operators – Logical operators – Set operators – operator precedence. Tables: Create a Table – Modify a Table – Deleting a Table. Queries and sub queries

UNIT – V:

Aggregate function – insert, update and delete operation – data integrity – PL/SQL Blocks – Control Structure – Iterative Control statement – Cursors – Triggers

TEXT BOOK:

Alexis Leon and Mathews Leon, *Data base Management System* ,Leon Vikas Publishing Chennai,2002

CHAPTERS and SECTIONS (For UNIT-I, II, III,IV and V)

Unit – I:	Chapter 1: Pg.No: 1– 6,Chapter 5: Pg.No:99–117, Chapter 6: Pg.No. 138 to 143
Unit – II:	Chapter 7: Pg.No:159–168, Chapter 8: Pg.No: 177–186
Unit – III:	Chapter 9: Pg.No:195–211,Chapter 11:Pg.No:241–254
Unit – IV:	Chapter 14: Pg.No:296–310,Chapter 15: Pg.No:319–322, Chapter 17: Pg.No: 355–376
Unit – V:	Chapter 18: Pg.No:385–390,Chapter 19:Pg.No:395–398,Chapter 28:Pg.No:567–575Chapter 46:D:Pg.No:933–949,952–953.Chapter 20: Pg.No: 401–407,Chapter 25: Pg.No. 485 to 491



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716

REFERENCE BOOKS:

1. Raghu Ramakrishnan & Johannes Gehrke, *Database Management Systems*, 2nd edition, McGraw Hill international Edition, 2003
2. C.J.Date, *An Introduction to Database Systems*, Pearson education 8th edition

DIGITAL TOOLS:

1. <http://www.studytonight.com/dbms/rdbms-concept.php>
2. <https://www.tutorialspoint.com/sql>
3. <https://beginnersbook.com/2015/04/rdbms-concepts/>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					
CO2		2	1			
CO3	1	2	2			3
CO4	1	2	2		1	3
CO5	1	2	2		1	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. S.E.HEMAPRIYA



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717

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCACP5	WEB TECHNOLOGY LAB	CORE – 11 LAB – V	–	5	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course provides fundamental concepts of Web Technology using HTML, JAVA Script and VB Script.

COURSE OBJECTIVE:

To learn various concepts of designing a web page using different tags using HTML, JAVA Script and VB Script.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	design a web page using different tags using HTML	Upto K3
CO 2	design for a web page using tables, links, frames etc.	Upto K3
CO 3	analyze the web page using different validation techniques using JAVA Scripts	Upto K3
CO 4	apply the web page validation techniques using JAVA Script Event Handling	Upto K3
CO 5	apply the web page validation techniques using VB Script Event Handling using simple form entry and ticket booking	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



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718

WEB TECHNOLOGY LAB

HTML:

1. Design student ID card using image tag.
2. Display various Subjects using Lists.
3. Design class Timetable using Tables.
4. Display various Text styles and Colors using Frames.
5. Design Student Admission Form.

JAVASCRIPT:

6. Login ID Validation
7. Handling Mouse Events
8. Creating Cookies
9. Background Color Changing
10. Evaluate an Expression.
11. Performing Arithmetic Operation.
12. Performing String Operation.
13. EB Bill Calculation.
14. Cinema Ticket Booking
15. Create a sample Bank Entry form.

COURSE DESIGNER: Prof. S. E. HEMAPRIYA



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719

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAC53	COMPUTER NETWORKS	CORE -12	5	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

COURSE DESCRIPTION:

This course provides different network models and teaches about different network layer and for each layer they can analyze and apply different Protocols and Algorithms.

COURSE OBJECTIVE:

To learn different layers of Computer Network and learn about different Algorithms and Protocols for each layer and their application.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember the Fundamental concepts of Network Hardware and Software, Reference Models	Upto K3
CO 2	analyze the concept of Wireless Transmission, Communication Satellites by applying Physical Layer	Upto K3
CO 3	apply Data link Layer Error Detection and Correction and analyze different Protocols with Data link Layer	Upto K3
CO 4	analyze Network layer with different Algorithms . Discuss Transport Layer with Protocols	Upto K3
CO 5	discuss Application Layer, DNS, World Wide web and Multimedia	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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720

COMPUTER NETWORKS

UNIT – I:

Introduction: Uses of computer Networks –Network Hardware –Network Software – Reference Models –Example Networks.

UNIT – II:

The Physical Layer: Guided Transmission Media –Wireless Transmission– Communication Satellites –Mobile telephone System.

UNIT – III:

The Data Link Layer : Data Link Layer Design Issue –Error Detection and Correction – Elementary Data Link Protocols –Sliding Window Protocols–The Channel Allocation Problem –Multiple Access Protocols –ALOHA, CSMA, Collision free protocols.

UNIT – IV:

The Network Layer: Network Layer Design Issues–Routing Algorithms –Shortest path, Flooding , Hierarchical and Broadcast. The Transport Layer: The Transport Service Elements of Transport Protocols.

UNIT – V:

The Application Layer: DNS– The Domain Name System –Electronic Mail –The World Wide Web – Multimedia.

TEXT BOOK:

Computer Networks by Andrew S. Tanenbhum 4th Edition, Prentice Hall of India ,2006.

REFERENCE BOOKS:

1. *Data Communications and Networking*, Forouzan, Tata McGraw Hill,2003.
2. *Data and Computer Communications*, William Stallings, Pearson education,7th edition, 2003

DIGITAL TOOLS:

1. <https://www.studytonight.com/computer-networks/>
2. <https://www.javatpoint.com/computer-network-tutorial>
3. <https://www.guru99.com/data-communication-computer-network-tutorial.html>
4. <https://www.geeksforgeeks.org/computer-network-tutorials/>
5. https://www.tutorialspoint.com/data_communication_computer_network/index.htm
6. <https://hackr.io/tutorials/learn-computer-networks>
7. <https://www.computernetworkingnotes.com/networking-tutorials/>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					
CO2	1	2				3
CO3	1	2	2			
CO4	1	2	1		1	3
CO5	1	2	2	1	1	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. O. K. HARIHARAN



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

721

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAE51	WEB TECHNOLOGY	ELECTIVE-1	4	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

The Course helps to learn about basic web page creation using HTML along with different tags and their attributes and create a web page of their own

COURSE OBJECTIVE:

To learn about the structure of HTML with different types of tags and to learn web page creation

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember the Overview of HTML with its structure and basic formatting tags.	Upto K3
CO 2	apply different types of List and Marquee tag with attributes.	Upto K3
CO 3	apply different table building tags with attributes	Upto K3
CO 4	discuss Linking Pages, Image tag and Frame tag attributes	Upto K3
CO 5	discuss Form tag , input tag and webpage creation	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

722

WEB TECHNOLOGY

UNIT-I:

Overview of HTML–structure of a html program–HEAD tag–BODY tag–paragraph tag–formatting tag– (Bold–underline–italic–strike thru–superscript–subscript)

UNIT-II:

LISTS–Ordered list and unordered list–marquee tag–break tag–ruler tag–foot tag–data definition tag. TABLES–TABLE building tags and attributes of table–table tag–table header tag–table row tag–table data tag–row span–column span.

UNIT-III:

LINKS–linking pages using anchor tag–attributes of anchor tag–image tag and its attributes–frame tag.

UNIT-IV:

FORMS–Form tag–input tag–types–text, radio, button, check, password–sample webpage creation.

UNIT-V:

Java Script : Introduction – Language elements– Objects of Javascript– other objects

TEXT BOOK:

1. *HTML COMPLETE*–BPB publications–2nd edition (Unit – I to IV)
2. *Web Technology* by N.P.Gopalan Akilandeshwari (Unit – V)

CHAPTERS and SECTIONS:

Unit – I:	Chapter – 3
Unit – II:	Page No. 817 to 821,718,719,735,736, 746 to 748, 757,837 to 839 and 915 to 917,Chapter 7.
Unit – III:	Chapter – 5, Chapter– 8 (Page No. 266 to 277) Chapter – 4 (P. No. 129 to 140)
Unit – IV:	Chapter – 11
Unit – V:	Chapter 5.1 to 5.4 Page.No. 95– 114

REFERENCE BOOKS:

1. *HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and j Query*, 2 nd Paperback – 1 January 2016
2. *Mastering Html, Css & Javascript Web Publishing Paperback* – 15 July 2016 by Laura Lemay (Author), Rafe Colburn (Author), Jennifer Kyrnin (Author)
3. *Web Technology: Theory and Practice* by M. Srinivasan Released June 2012 Publisher(s): Pearson India, ISBN: 9788131774199

DIGITAL TOOLS:

1. <https://www.geeksforgeeks.org/web-technology/>
2. <https://builtwith.com/>
3. <https://www.intechinc.com/blog/which-technology-is-right-for-my-website/>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					
CO2	1	2	2			
CO3	1		2			3
CO4	1		1			3
CO5	1	2	3	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. S. E. HEMAPRIYA



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

723

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAE52	MULTIMEDIA AND ITS APPLICATIONS	ELECTIVE-1	4	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability	Skill Oriented	Entrepreneurship
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

COURSE DESCRIPTION:

The Course explains Multimedia hardware and Software with their applications. Their real time uses matches with current booming technology.

COURSE OBJECTIVE:

To make the students access the knowledge of various Multimedia technologies and applications and the different data compression techniques, Communication systems and recent trends in Multimedia.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember the Fundamental concepts of Multimedia Streams, Literature, Global Structure and Medium	Upto K3
CO 2	analyze the basic concepts of Sound , Video and Animation, Apply it in Computer Image Processing and Computer Based Animation	Upto K3
CO 3	analyze the storage space in Data Compression, discuss about different storage Media and Multimedia Operating system	Upto K3
CO 4	learn about different Networking Systems, Layers and Services Multimedia Communication Systems.	Upto K3
CO 5	discuss user Interface Synchronization, Abstraction levels and analyze about higher programming languages and apply in recent trends.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

724

MULTIMEDIA AND ITS APPLICATIONS

UNIT-I:

Introduction–Branch overlapping Aspects of Multimedia Content –Global Structure – Multimedia Literature. Multimedia–Media and Data Streams– Medium.

UNIT-II:

Sound/Audio: Basic Sound Concepts–Music– Speech, Images and Graphics: Basic Concepts:–Computer Image Processing– Video and Animation: Basic Concepts – Television –Computer Based Animation.

UNIT-III:

Data Compression: Storage Space –Coding Requirements –JPEG– MPEG–DVI, Optical Storage Media; Computer Technology –Multimedia Operating System.

UNIT-IV:

Networking System: Layers, Protocols and Services, Networks, Metropolitan Area Networks, WAN, Multimedia Communication System.

UNIT-V:

User Interfaces, Synchronization, Abstraction for Programming: Abstraction Levels– Libraries–System Software–Toolkit–Higher Programming Languages. Multimedia Application: Introduction – Media Population – Media Communication –Trends.

TEXT BOOK:

Ralf Steinmetz & Klara Nahrstedt – *Multimedia Computing, Communication & Applications*, Pearson Education.

CHAPTERS and SECTIONS:

Unit – I:	Chap 1.1 to 1.4, 2.1	Unit – II:	Chap. 3.1 to 3.3, 4.1 to 4.2 and 5.1 to 5.3
Unit – III:	Chap 6.1 to 6.2, 6.5,6.7,6.8 and Chap 9.	Unit – IV:	Chap. 10.1 to 10.2, 10.4 to 10.5 and Chap 11.
Unit – V:	Chap. 14,15, 16.1 to 16.5, 17.1,17.2,17.5 and 17.8		

REFERENCE BOOK:

Fred t, Hofstetter – *Multimedia Literacy* – 3rd edition TMH.

DIGITAL TOOLS:

- https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm
- <https://www.lisedunetwork.com/multimedia-its-components-and-applications/>
- <https://www.linkedin.com/pulse/multimedia-its-applications-muhammad-ikhmal>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					
CO2	1	2	2			3
CO3	1	2	1		1	3
CO4	1	2	2	2	1	3
CO5	1	2	2	2	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. R. SIVA SANKARI



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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

725

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAE53	MOBILE COMPUTING	ELECTIVE-1	4	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

It provides the fundamentals of various handheld devices in Mobile computing and the applications in various mobile networking architecture and analyze them in short range connectivity

COURSE OBJECTIVE:

To help the students learn hand held devices in Mobile Computing in different operating systems and to apply them in various home networking with different internet protocols and formats and analyze about connectivity in wireless communication in short range.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember various hand held devices in Mobile Computing in different operating systems.	Upto K3
CO 2	identify various smart devices and their appliances. Apply them in home networking and Automotive computing.	Upto K3
CO 3	acquire the knowledge of various internet protocols and formats. Apply in various WAP architecture.	Upto K3
CO 4	know Voice technology Trends and standardization.	Upto K3
CO 5	analyze about connectivity in wireless communication in short range.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

726

MOBILE COMPUTING

UNIT-I:

Information Access Devices –Handheld Computers –Palm OS –Based Devices–Windows CE –Based Handheld Computers –EPOC Based Handheld Computers –Sub notebooks – Phones –Cellular Phones –Data transmission capabilities –Smart Phones –Screen phones

UNIT-II:

Smart Identification–Smart cards –smart labels –smart Tokens –Embedded Controls– Smart sensors and Actuators –Smart Appliances–Appliances and home networking – Automotive computing

UNIT-III:

Internet Protocols and Formats –HTTP– HTML–XML–Xforms–Mobile Internet–WAP 1.1 Architecture –Wireless Application Environment 1.1 –WAP 2.0 Architecture –i-node

UNIT-IV:

Voice –Voice Technology Trends –Voice on the web –Standardization.

UNIT-V:

Connectivity–Wireless Wide Area Networks –Short Range Wireless Communication

TEXT BOOK:

Principles of Mobile Computing –UweHansmann, LotharMerk, Martin S.Nicklous, Thomas Stober –Springer –Second Edition –2003

CHAPTERS and SECTIONS:

Unit – I:	Chap. 2.1 to 2.10	Unit – IV:	Chap 12.1 to 12.3,
Unit – II:	Chap 3.1 to 3.3 and 4.1 to 4	Unit – V:	Chap 14.1 to 14.2
Unit – III:	Chap 10.1 to 10.4, 11.1 to 11.4,		

REFERENCE BOOK:

Mobile Computing – RajkamalPublished by Oxford Higher Education/Oxford University Press, 2011

DIGITAL TOOLS:

- <https://minigranth.in/mobile-computing-tutorial>
- <https://www.analyticssteps.com/blogs/introduction-mobile-computing>
- <https://www.geeksforgeeks.org/wireless-mobile-computing-technologies/>
- <https://www.wisdomjobs.com/e-university/mobile-computing-tutorial>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					
CO2	1	2	2			3
CO3	1	2	2			3
CO4	1	2	1	1	1	3
CO5	1	2	2	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. R. SIVA SANKARI



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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

727

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAS51	QUANTITATIVE APTITUDE	SBS-5	2	-	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability <input type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course provides basic mathematical concepts helpful in various competitive exams.

COURSE OBJECTIVES:

- To enrich the students' knowledge in basic mathematical concepts.
- To make the students acquire higher success ratio in various aptitude tests using simple and easy time management techniques.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember Numbers and to calculate HCF and LCM	Upto K3
CO 2	refresh Problem on Numbers and Ages	Upto K3
CO 3	calculate problems on Percentages and Profit and Loss	Upto K3
CO 4	find the Simple Interest and Compound Interest and discuss the Odd Man Out reasonability	Upto K3
CO 5	discuss Areas, Surface areas and Volumes of different shapes.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

728

QUANTITATIVE APTITUDE

UNIT – I:

Numbers – HCF & LCM of numbers

UNIT-II:

Problems on Numbers – Problems on Ages.

UNIT-III:

Percentage – Profit & Loss

UNIT-IV:

Simple Interest – Compound Interest – ODDMan out

UNIT –V:

Area – Volume & Surface areas, time & distance (Solved examples only)

TEXT BOOK:

Quantitative Aptitude – R.S. Aggarwal – S.Chand Publishers, 2007

REFERENCE BOOKS:

1. SURA'S *Quantitative Aptitude and Arithmetic Competitive Exam Book*– Latest Edition 2022eller: Sura Books. Publisher: Sura College of Competition, 2021
2. *Quantitative Aptitude for Competitive Examinations Paperback* – 21 February 2017 by R S Aggarwal (Author)

DIGITAL TOOLS:

1. <https://www.indiabix.com/>
2. https://www.tutorialspoint.com/quantitative_apititude/index.htm
3. <https://www.javatpoint.com/apititude/quantitative>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	2	1		2
CO2	1	2	2	1	1	3
CO3	1	2	2	1	2	3
CO4	1	2	2	2	1	3
CO5	1	2	2	2	1	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. V. B. SHAKILA



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

729

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCASP3	LAB: PL/SQL	SBS-6 LAB	-	2	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

The Course talks about creation of Tables and usage the DDL queries, DML queries, Mathematical calculation, Process Queries and Sub-queries, and apply in PL/SQL programs.

COURSE OBJECTIVE:

To make the students create tables, apply, DDL, DML queries in them and also to analyze them using Queries and Sub queries and practise them using PL/SQL programs in any back end environment

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand creation of Tables and usage of the Data Definition Language queries, Data Manipulation Language queries	Upto K3
CO 2	know the Data Manipulation Language queries with Set operation , Mathematical calculation	Upto K3
CO 3	respond to queries using various Aggregate functions, sub- queries	Upto K3
CO 4	write basic PL/SQL programs	Upto K3
CO 5	understand simple PL/SQL Programs using Tables	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

730

PL/SQL LAB CYCLE

1. Data definition language programs.
2. Data manipulation language programs.
3. Data manipulation with arithmetic operations.
4. Data manipulation with logical operation.
5. Data manipulation with conditional or comparison operations
6. Data manipulation with Aggregate functions of number functions.
7. Data manipulation with group by operations.
8. Data manipulation with set operations.
9. Data manipulation with sub-queries operations.
10. Data manipulation with join query for two or more table.
11. Data manipulation with mathematical functions.
12. Data manipulation with character functions.
13. Data manipulation with date functions.
14. Data manipulation with special operations.
15. Data manipulation with STRING OPERATORS
16. PL/SQL program for calculating Area of circle.
17. PL/SQL program for generate Even Number.
18. PL/SQL program for generate Prime Number.
19. PL/SQL program for checking an Adam Number.
20. PL/SQL program for checking a Number palindrome or Not.

COURSE DESIGNER: Prof. S. E. HEMAPRIYA



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

731

COURSE STRUCTURE – VI SEMESTER

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UCAC61	Part – III: Core – 13: Programming in Python	5	3	25	75	100	4
2.	21UCACP6	Part – III: Core – 14: Lab – VI: Python Programming	5	3	40	60	100	4
3.	21UCAC62	Part – III: Core – 15: Operating System	5	3	25	75	100	4
4.	21UCACP7	Part – III: Core-16: Lab – VII: Open Source Technology (PHP)	5	3	40	60	100	4
5.	Part – III: Elective – 2:		5	3	25	75	100	5
	21UCAE61	Principles of Information Security						
	21UCAE62	Data Mining						
	21UCAE63	Unix and Shell Programming						
6.	21UCAEV1	Part – III: Elective – 3: Project Work & Viva Voce	5	3	40	60	100	5
7.	21UGKY61	General Knowledge (Self-Study)	–	–	–	–	100	–
		TOTAL	30				700	26

*One elective course to be chosen from THREE courses

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

T – Theory

P – Practical



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

732

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAC61	PROGRAMMING IN PYTHON	CORE-13	5	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course describes how to develop the Website and Application in AI.

COURSE OBJECTIVE:

To make the students

- understand the basic of Python.
- understand the List, tuples and Slicing.
- understand Function, string, and File, Exception Handling

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	know about the basic of PYTHON and its operators	Upto K3
CO 2	understand the PYTHON Operators, List and Tuples.	Upto K3
CO 3	learn about the Decision making and Loop control statements and apply them in PYTHON	Upto K3
CO 4	acquire knowledge on various Functions and Strings in PYTHON	Upto K3
CO 5	apply the Concept File Handling and Exception Handling in PYTHON	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

733

PROGRAMMING IN PYTHON

UNIT – I: Basics and Operators

Introduction to Python – Values and Types –Python Keywords–Identifier/Variable – I/O statements – (The printf () Function – The input () Function –The eval () Function) – Commenting in Python. Operators and Expressions – Arithmetic Operators – Operator Precedence and Associativity – Changing Precedence and Associativity of Arithmetic Operators – Translating Mathematical Formulae into Equivalent Python Expressions – Bitwise Operator –The Compound Assignment Operator

UNIT –II: Operators, Lists and Tuples

Boolean Type – Boolean Operators – Using Numbers with Boolean Operators – Using String with Boolean Operators – Boolean Expressions and Relational Operators. Lists – Creating Lists –Accessing Elements of a List –Negative List Indices –List Slicing [Start : End] –List Slicing with Step Size –Python Built–In Functions for Lists –The List Operator –Tuple – Introduction to Tuples – Creating Tuples – Inbuilt functions for Tuples – Indexing and Slicing – Operations on Tuples – Lists and Tuples – Sort the tuples.

UNIT –III: Decision Making Statements & Loop Control Statements

Decision Making Statements – Conditional Expressions – Loop Control Statements – The while Loop – The range () Function – The for Loop – Nested Loops – The break Statement – The continue Statement.

UNIT –IV: Functions and Strings

Functions – Syntax and Basics of a Function –Use of a Function – Parameters and Arguments in a Function – The Local and Global Scope of a Variable – The return Statement –Recursive Functions –The Lambda Function –The String Operators –String Operations.

UNIT –V: File Handling and Exception Handling

File Handling – Need of file Handling –Text Input and Output – Exception Handling – Errors and Exception –Python Exception and its Hierarchy –Handling Exception –Raising Exception –Modules –Packages on Python.



SOURASHTRA COLLEGE, MADURAI – 625004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

734

TEXT BOOK:

Problem Solving and Python Programming – Ashok Namdev Kamthane and Amit Ashok Kamthane–McGrawHall Education 2018

REFERENCE BOOKS:

1. *Problem Solving and Python Programming* – P.Radha Ganesan– Chess Educational Publishers
2. *Python Programming: A Modular Approach* – SheetalTaneja and Naveen Kumar Pearson Publication
3. Tony Gaddis, *Starting out with Python (3C)*, Pearson, 2015.
4. Kenneth A.Lambert, *Fundamentals of Python*.
5. James Payne, *Beginning Python using Python 2.6 and Python 3*.
6. Charles Dierach, *Introduction to Computer Science using Python*.
7. Paul Gries, *Practical Programming: An Introduction to Computer Science using Python 3*.
8. Balagurusamy, *Introduction to Computer & Problem Solving using Python*, McGraw Hill Education, 2016.

DIGITAL TOOLS:

1. <https://www.guru99.com/python-tutorials.html>
2. <https://www.javatpoint.com/python-tutorial>
3. <https://www.studytonight.com/python/>
4. <https://www.programiz.com/python-programming>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2				
CO2		2	1			2
CO3	2			2	1	
CO4	2		2	1		2
CO5	2	2	2	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. R. P. UMADEVI



SOURASHTRA COLLEGE, MADURAI – 625004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

735

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCACP6	LAB – VI: PYTHON PROGRAMMING	CORE –14 LAB – VI	—	5	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course describes how to develop Website and Artificial Intelligence applications using Python programs

COURSE OBJECTIVES:

- To improve the creativity of the students during website creation.
- To make the students understand the concepts of python.
- To develop students' programming skills in python.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	know the basic concepts of python program and their execution.	Upto K3
CO 2	understand python structure and execute its application	Upto K3
CO 3	understand about Operators and slicing technique	Upto K3
CO 4	execute the programs using Decision making and looping statements.	Upto K3
CO 5	develop application using File Handling and Exception Handling	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

736

PYTHON PROGRAMMING – LAB

Ex. No. Name of the Programs

1. Write a Python program to compute addition of two numbers.
2. Write a Python program to finding Total, Average and grade system of Student Marks.
3. Write a Python program to calculate Area and Circumference of a Circle.
4. Write a Python program to compute Temperature Conversion.
5. Write a Python program to calculate of Simple Interest (SI).
6. Write a Python program to check whether the number is Positive Number or Negative Nos.
7. Write a Python program to check whether the year is Leap Year or Not.
8. Write a Python program to calculate greatest of three numbers.
9. Write a Python program to check whether the number is Prime Number or Not.
10. Write a Python program to check whether the number is ODD or EVEN Number.
11. Write a Python program to Swapping of two numbers without using temporary variable.
12. Write a Python program to print the Fibonacci series using recursion.
13. Write a Python program to calculate Factorial of a given number using recursion function.
14. Write a Python program to calculate sum of digits of a given number using function.
15. Write a Python program to reverse the given input number using function.
16. Write a Python program to check whether the number is Palindrome Number or Not.
17. Write a Python program to check whether the number is Armstrong Number or Not.
18. Write a Python program to find the minimum and maximum of a list of numbers.
19. Write a Python program: “tuple1 = (10,50,20,40,30)”
 - i. To display the elements 10 and 50 from tuple1
 - ii. To display length of a tuple1.
 - iii. To find the minimum element from tuple1.
 - iv. To add all elements in the tuple1.
 - v. To display same tuple1 multiple times.
20. Write a Python program.
 - i. To calculate the length of a string.
 - ii. To reverse words in a string.
 - iii. To display same string multiple times.
 - iv. To concatenate two strings.
 - v. Str1=”South India” , using string slicing to display “India”

COURSE DESIGNER: Prof. R. P.UMADEVI



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

737

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAC62	OPERATING SYSTEM	CORE- 15	5	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course provides fundamental concepts of operating system for the system which enhances the user to access the computer and software installation.

COURSE OBJECTIVE:

To learn various interface function between hardware and system and to know various system like files and memory system in computer.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	remember the Fundamental concepts of Operating System	Upto K3
CO 2	apply the basic concepts of process management, scheduling algorithm and multithreading models.	Upto K3
CO 3	analyze the synchronization and Deadlock process.	Upto K3
CO 4	explain the purpose of storage management with page segmentation, allocation of frames and Thrashing	Upto K3
CO 5	discuss the I/O system and Case study.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

738

OPERATING SYSTEM

UNIT – I:

Introduction – Definition – Mainframe Multiprocessor – Distributed, Clustered, Real-time, Handheld systems – I/O and storage structure – Hardware protected – Network structure – System Components – System Services. Calls, Programs, structure– System Design, Implementation and generation.

UNIT – II:

Process Management: Process concepts ,Scheduling, operations – operating processes – Inter – process communication in Client – Server systems – Multithreading models and issues –Windows 2000 and Java threads – CPU scheduling criteria and algorithms – Multi – processor and Real – time scheduling – Algorithm Evaluation – Process scheduling in Windows 2000.

UNIT – III:

Process Synchronization – Critical – section problem – Synchronization Hardware – Semaphores – Classic problems – Critical Regions – monitor – synchronization in windows 2000 – Deadlock characterization, Prevention, Avoidance and Detection – Recovery from Deadlock.

UNIT – IV:

Storage management: Swapping – Contiguous memory allocation – Paging –Segmentation– Segmentation with paging – Demand paging – Process creation – Page replacement – Allocation of Frames – Thrashing – Implementation of Virtual memory in Windows NT – File Concepts and Access methods – directory Structure & implementation – Allocation methods – Free space management.

UNIT – V:

I/O Systems and Case Study: Disk structure, Scheduling and Management – Swap Space Management – Case Study: Windows 2000.

TEXT BOOK:

Operating System Concepts – Silbertschartz A.Galvin P.B., Gagne G–Sixth Edition, 2002, John Wiley & sons.

CHAPTERS and SECTIONS (For UNIT–I, II, III, IV and V)

Unit – I– Chap 1,2,3 (Except 1.3,2.1,3.6) Unit– II – Chap 4,5,6

Unit – III – Chap 7,8 (Except 7.1,7.9, 8.1,8.3) Unit – IV – Chap 9,10

Unit – V– Chap 14 (14.1 to 14.4)

REFERENCE BOOK:

Operating system Concepts and Design, Milan Milankovic, Tata McGraw Hill, 1997.

DIGITAL TOOLS:

- <http://www.ics.uci.edu/~ics143/lectures.html>, 2.
- <http://www.studytonight.com/operating-system>
- <https://www.geeksforgeeks.org/operating-systems/?ref=lbp>
- <https://www.guru99.com/os-tutorial.html>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1					
CO2		2	1			3
CO3	3					2
CO4		2	2	1	2	
CO5		2	1		1	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof: O. K. HARIHARAN



SOURASHTRA COLLEGE, MADURAI – 625004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

739

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCACP7	LAB – VII: OPEN SOURCE TECHNOLOGY (PHP)	CORE-16 LAB – VII	-	5	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
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COURSE DESCRIPTION:

This course helps the students to acquire the basic knowledge in designing a Web Page and also acquire the knowledge to learn programming in PHP to develop online applications.

COURSE OBJECTIVES:

To enable the students

- get the knowledge in various tags in HTML
- know the basics of PHP
- learn about the scripting in PHP for the development of applications.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the basic concepts of HTML	Upto K3
CO 2	learn about the basic concepts of PHP	Upto K3
CO 3	understand about the Looping statements and User Defined functions	Upto K3
CO 4	know about the PHP server side scripting	Upto K3
CO 5	acquire the knowledge in developing webpage	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

740

OPEN SOURCE TECHNOLOGY (PHP)

PHP:

1. Arithmetic operations.
2. If, Else, Else-If statements.
3. For each statement and is function statements.
4. Continue Break statements.
5. Arrays.
6. String functions.
7. Personal information using Post method.
8. Bus Ticket Reservation using Post method.
9. Employee Details using Get method.
10. Student Details using Get method.
11. Calendar function.
12. Multiplication Table.
13. Inheritance.
14. Validation.
15. Session.

COURSE DESIGNER: Prof. S. E. HEMAPRIYA



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

741

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAE61	PRINCIPLES OF INFORMATION SECURITY	ELECTIVE- 2	5	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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COURSE DESCRIPTION:

This course helps the students learn about need for Security, types of attacks, threats and also to acquire knowledge about security planning and implementation of firewall and access tools.

COURSE OBJECTIVES:

To enable the students

- understand about the basic of security
- understand about various Threats
- understand about Security Technologies.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	receive the Basic knowledge of Information Security in Professionals.	Upto K3
CO 2	understand the Security Purpose to access the data.	Upto K3
CO 3	learn about Managing the Risk control and its Strategies.	Upto K3
CO 4	know about the Plan, security policy, Security Technology	Upto K3
CO 5	implement the security using Firewalls and Biometric Access Tools.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

742

PRINCIPLES OF INFORMATION SECURITY

UNIT-I: Information Security

History of Information Security – What is Security – Components of Information System
– Security System Development Life Cycle – Security Professionals and the Organization
– Communities of Interest – Information Security Is it an Art or Science.

UNIT-II: Why Security is Needed

Business Needs First – **Threats:** Deliberate Software Attacks : Virus, Worms, Trojan Horses – Deviations in Quality of Services – Forces of Natures – Human Error or Failure
– Thefts – Technical Hardware Failure or Errors – Technical Software Failure or Errors.
Attacks: Malicious Code, Hoaxes, Backdoors, Password Check, Denial of Service, Spoofing, Spam, Mail bombing, Timing Attack.

UNIT-III: Managing IT Risk

Overview of Risk Management – **Risk Identification:** Plan and Organize the Process , Asset Identification and Inventory, Information Asset Valuation – **Risk Control Strategies:** Defend, Transfer, Mitigate, Accept, Terminate – **Selecting Risk Control Strategy:** Feasibility Studies, Cost Benefit Analysis (CBA), Evaluation, Assessment and Maintenance of Risk Control.

UNIT-IV: Plan for Security

Information Security, Planning and Governance – Information Security Policy, Standards and Practices: Definition, EISP, ISSP – **Security Education , Training and Awareness Program – Continuity Strategies :** Business Impact Analysis , Incident Response Planning. **Security Technology: Access Control –** Identification, Authentication, Authorization , Accountability.

UNIT-V: Security Technology

Firewalls – Firewall Processing Modes, Firewall Categorized by Generation, Firewall Categorized by Structure, Remote Access, VPN **Scanning And Analysis Tools: Port Scanner, Firewall Analysis Tools, Operating System Detection Tools, Vulnerability Scanners, Packet Sniffers – Biometric Access Tools.**



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

743

TEXT BOOK:

Principles of Information Security – Michael E. Whitman and Herbert J. Mattord 4th Edition

CHAPTERS and SECTIONS (For UNIT-I, II, III, IV and V)

Unit – I	Chapter 1: Page No. 3–11, 16–19, 26–32
Unit – II	Chapter 2 : Page No. 39–48, 54–57, 61–62, 63–68, 72 (Timing attack only)
Unit – III	Chapter 4: Page No. 117–132, 144–153
Unit – IV	Chapter 5: Page No. 168–178, 203–221 Chapter 6: Page No. 238–242
Unit – V	Chapter 6: Page No. 242–255, 270–277 Chapter 7: Page No. 318–326, 331–333

REFERENCE BOOKS:

1. *Computer Security Art and Science*, Matt Bishop, Pearson/PHI, 2002
2. *Information Security–Principles and Practices*–By Mark S. Merkow, Jim Breithaupt · 2014–Pearson Education
3. *Information Security Management Principles*–By Andy Taylor– 2013–BCS Learning & Development Limited

DIGITAL TOOLS:

1. <https://www.geeksforgeeks.org/principle-of-information-system-security/>
2. <https://www.tutorialspoint.com/principles-of-information-system-security>
3. <https://www.vskills.in/certification/tutorial/information-security-principles/>
4. <https://study.com/academy/lesson/information-security-basic-principles.html>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2		1		3
CO2		2	1			3
CO3	1			3	3	2
CO4	1		2	1		2
CO5	1	2	2	1	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. R. SIVA SANKARI



SOURASHTRA COLLEGE, MADURAI – 625004

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BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

744

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAE62	DATA MINING	ELECTIVE – 2	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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COURSE DESCRIPTION:

To make the students learn about the concept of ware house model, scheme, concept of data mining and various algorithm and also to make them understand the concept of web mining

COURSE OBJECTIVES:

To enable the students

- understand about the basic of ware housing, architecture and data model.
- understand about various data mining techniques
- understand about clustering techniques Technologies.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the concept of ware housing, scheme, architecture of data model.	Upto K3
CO 2	understand the concept of data mining and various algorithm.	Upto K3
CO 3	analyse the concept of clustering and its techniques, decision trees etc.	Upto K3
CO 4	comprehend the concept of other techniques, neural network and genetic algorithm	Upto K3
CO 5	acquire knowledge on the concept of web mining and hierarchy of categories of clustering	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

745

DATA MINING

UNIT-I:

Data Warehousing –Introduction –Definition –Multidimensional Data Model –OLAP operations–Warehouse Schema –Architecture–Metadata–OLAP Engine– Backend Process.

UNIT-II:

Data Mining –Definition –Comparison with other fields–Techniques –Issues– Application Areas Association Rules–Methods–A Priori algorithm –Partition Algorithm –Pincer Search Algorithm–Border Algorithm –Generalized association rule –Item constraints.

UNIT-III:

Clustering Techniques –Paradigms –Algorithms –CLARA–CLARANS–Hierarchical clustering –DBSCAN–Categorical Clustering Algorithms–STIRR Decision Trees –Tree construction principle –Best split–Splitting indices –criteria – algorithms –CART –ID3.

UNIT-IV:

Other Techniques – Neural Network – Genetic Algorithm – Rough Sets –Support vector machines.

UNIT-V:

Web Mining –Introduction –Web content mining –web structure mining –web usage mining – text mining –hierarchy of categories– text clustering.

TEXT BOOK:

Data Mining Techniques– Arun K Pujari –Universities Press –2001

CHAPTERS and SECTIONS:

Unit – I	Chap 2 (Except 2.8,2.1)
Unit – II	Chap 3 (Except 3.11), Chap. 4 4.1 to 4.6 4.13,4.14,4.15
Unit – III	Chap 5. (Except 5.9,5.10,5.13 to 5.15) Chap 6 – 6.1 to 6.9.
Unit – IV	Chap 8 (8.2,8.6,8.7,7.1 to 7.3)
Unit – V	Chap 9(Except 9.7 and 9.8)

REFERENCE BOOKS:

1. R. Delmaster, and M. Hancock (2001). *Data Mining Explained*. Boston: Digital Press.
2. J. Han, and M. Kamber (2001). *Data Mining: Concepts and Techniques*. San Diego, CA: Academic.
3. D. Hand, H. Mannila and P. Smyth (2001). *Principles of Data Mining*. Cambridge, MA: MIT Press.
4. M. J. A. Berry, and G. S. Linoff (1997). *Data Mining Techniques*. New York: Wiley.
5. M. J. A. Berry, and G. S. Linoff (2000). *Mastering Data Mining*. New York: Wiley.

DIGITAL TOOLS:

- <https://www.javatpoint.com/data-mining>
- <https://data-flair.training/blogs/data-mining-tutorial/>
- <https://www.mygreatlearning.com/blog/data-mining-tutorial/>
- <https://www.guru99.com/data-mining-tutorial.html>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	2			3
CO2	1	2	2		1	
CO3	1	2			1	2
CO4	1	2	1		2	2
CO5	1	2	2	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. R. SIVA SANKARI



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

746

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAE63	UNIX AND SHELL PROGRAMMING	ELECTIVE- 2	5	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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COURSE DESCRIPTION:

To make the students learn about Unix operating System, Shell commands, understanding System calls and able to do program development.

COURSE OBJECTIVE:

To enable the students learn basic Unix commands, file permissions, shell programming basics, process signals and to help them develop programs at a beginner level.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	receive knowledge on the introduction of UNIX, basics of shell, files, directories and permission of files	Upto K3
CO 2	explain about shell command and shell filters	Upto K3
CO 3	acquire knowledge on the basics of shell programming, various looping	Upto K3
CO 4	understand about system calls, low level , processes and signals	Upto K3
CO 5	understand the concept of program development, control flow, functions and procedures	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

747

UNIX AND SHELL PROGRAMMING

UNIT-I:

Introduction –UNIX for beginners: Getting started–Day-to-day use: files and common commands–More about files: directories–The shell–The rest of the UNIX system–The file system: The basics of files–What's in a file?–Directories and filenames–Permissions–Inodes–The Directory hierarchy–Devices.

UNIT-II:

Using the shell: Command line structure–Meta characters–creating new commands–command arguments and parameters–Program output as arguments–Shell variables–More on I/O redirection–Looping in shell programs–bundle: putting it all together–Why a programmable shell?–Filters: Thegrep family–Other filters–The stream editor sed–The awk pattern scanning and processing language–Good files and good filters.

UNIT-III:

Shell Programming : Customizing the cal command–which command is which?–while and until loops: watching for things–Traps: catching interrupts–Replacing a file: overwrite–zap:killing processes by name–The pick command: blanks vs. arguments–The news command: community service messages–get and put: tracking file changes–A look back–Programming with standard I/O: Standard input and output: vis–Program arguments: vis version 2–File access: vis version 3–A screen–at–a–time printer: p–Anexample: pick–On bugs and debugging–An example: zap–An interactive file comparison program: idiff–Accessing the environment.

UNIT-IV:

UNIX System Calls–Low-level I/O–File system: directories–File system: inodes–Processes–Signals and interrupts

UNIT-V:

Program Development –A four-function calculator–Variables and error recovery–Arbitrary variable names; built-in functions–Compilation into a machine–Control flow and relational operators–Functions and procedures; input/output–Performance evaluation–A look back–Document Preparation–The ms macro package–The troff level–The tbl and eqn preprocessors–The manual page–Other document preparation tools.



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

748

TEXT BOOK:

The UNIX Programming Environment –Brian Kernighan, Rob Pike –Pearson Education –2003.

CHAPTERS and SECTIONS:

Unit – I:	Chap-1 and 2	Unit – IV:	Chap-7.
Unit – II:	Chap-3 and 4	Unit – V:	Chap-8 and 9
Unit – III:	Chap-5 and Chap-6		

REFERENCE BOOK:

Introducing UNIX System V– Rachel Morgan, Henry McGilton–McGrawHill International Editions.

DIGITAL TOOLS:

1. <https://www.udemy.com/course/unix-for-beginners/>
2. <https://www.geeksforgeeks.org/introduction-to-unix-system/>
3. <https://www.geeksforgeeks.org/introduction-linux-shell-shell-scripting/>
4. <https://www.softwaretestinghelp.com/unix-shell-scripting-tutorial/>
5. <https://www.udemy.com/course/shellprogramming/>
6. <https://www.javatpoint.com/shell-scripting-tutorial>
7. https://ijirt.org/master/publishedpaper/IJIRT101640_PAPER.pdf

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	2			3
CO2		2	1			2
CO3	1	2	2			3
CO4	1		1	2		2
CO5	1	2	2	1	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. T. S. B. ARUN PRASANTH



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

SYLLABUS (Under CBCS based on OBE)

(with effect from 2021 – 2022)

749

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCAEV1	PROJECT WORK & VIVA VOCE	ELECTIVE – 3	–	5	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input checked="" type="checkbox"/>
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PROJECT VIVA – VOCE

1. A Maximum of two students can join to do the project work.
2. Students must undertake the project work under the guidance of a faculty member
3. Progressive reports have to be submitted to the guide periodically
4. The internal test marks is 40 and is divided into the following components
 - (i) Two Presentations – 2 x 10 = 20 Marks
 - (ii) Progressive Reports – 10 Marks
 - (iii) Internal Viva–voce – 10 Marks
5. The external examination will be jointly conducted by both the Internal and External Examiners
6. The Student must submit 3 copies (2 copies for students + 1 copy for the Dept.) of their project Report two week before the external examination.
7. The maximum marks for the external examinations is 60 and it may be divided into the following components
 - (i) Project Report – 20 marks
 - (ii) Project Presentation – 20 marks
 - (iii) Project viva–voce – 20 marks