SOURASHTRA COLLEGE, MADURAI – 625004

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

B.Sc. COMPUTER SCIENCE – SYLLABUS
(Under CBCS based on OBE) (with effect from 2021 – 2022)

UNDERGRADUATE (UG) PROGRAMME OUTCOMES (POs)

B.Sc. Computer Science is an Undergraduate degree Programme with a duration of Three years 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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PROGRAMME SPECIFIC OUTCOMES (PSOs)

On completion of **B.Sc. Computer Science 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 an 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	acquire holistic development to ignite 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
PSO6	receive 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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B.Sc. COMPUTER SCIENCE – 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.	21UCSC11	**Part – III: Core – 1:** Programming in C	5	3	25	75	100	5
4.	21UCSCP1	**Part – III: Core – 2:** **Practical – I:** C Programming	5	3	40	60	100	3
5.	21UCSA11	**Part – III: Allied – 1:** Discrete Structures	4	3	25	75	100	4
6.	21UCSS11	**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.	21UCSC21	**Part – III: Core – 3:** Data Structures And Algorithms	5	3	25	75	100	5
4.	21UCSCP2	**Part – III: Core – 4:** **Practical – II:** Data Structures Using C	5	3	40	60	100	3
5.	21UCSA21	**Part – III: Allied – 2:** Probability and Statistics	4	3	25	75	100	4
6.	21UCSS21	**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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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.	21UCSC31	**Part – III: Core – 5:** Object Oriented Programming Using C++	5	3	25	75	100	5
4.	21UCSCP3	**Part – III: Core – 6:** **Lab – III:** Object Oriented Programming Using C++	5	3	40	60	100	3
5.	21UCSA31	**Part – III: Allied – 3:** Operations Research - I	4	3	25	75	100	4
6.	21UCSSP1	**Part – IV:SBS – 3:Lab– IV:** Linux And Shell Programming	2	3	40	60	100	2
7.	21UCSN31	**Part – IV:NME – 1:** Office Automation	2	3	25	75	100	2
		TOTAL	**30**				**700**	**22**

SEMESTER – IV

S. No.	Subject 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.	21UCSC41	**Part – III: Core – 7:** Programming In Java	5	3	25	75	100	5
4.	21UCSCP4	**Part – III: Core – 8:** Lab – V:Java Programming	5	3	40	60	100	3
5.	21UCSA41	**Part – III: Allied – 4:** Operations Research - II	4	3	25	75	100	4
6.	21UCSSP2	**Part – IV:SBS – 4:** Lab –VI: Visual Programming	2	3	40	60	100	2
7.	21UCSN41	**Part – IV:NME – 2:** Introduction to Internet	2	3	25	75	100	2
8.		**Part – V:** Extension Activities	–	–	–	–	100	1
		TOTAL	**30**				**800**	**23**

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SEMESTER - V

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UCSC51	**Part – III: Core – 9:** Relational Database Management Systems	5	3	25	75	100	4
2.	21UCSC52	**Part – III: Core – 10:** Operating System Concepts	5	3	25	75	100	4
3.	21UCSC53	**Part – III: Core – 11:** Software Engineering	5	3	25	75	100	4
4.	21UCSCP5	**Part – III: Core – 12: Lab – VII:** Open Source Programming using PHP & MYSQL	6	3	40	60	100	4
5.		**Part – III: Elective – 1:**	5	3	25	75	100	5
	21UCSE51	Data Communication and Computer Networks						
	21UCSE52	PHP Programming						
	21UCSE53	Python Programming						
	21UCSE54	Artificial Intelligence						
6.	21UCSS51	**Part – IV: SBS – 5:** Quantitative Aptitude	2	3	25	75	100	2
7.	21UCSSP3	**Part – IV: SBS – 6: Lab – VIII:** SQL and PLSQL	2	3	40	60	100	2
8.	21USSY51	Soft Skills (Self–Study)	–	–	–	–	100	–
		TOTAL	**30**				**800**	**25**

*One elective course to be chosen from FOUR courses

SEMESTER – VI

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UCSC61	**Part – III: Core – 13:** Data Mining and Warehousing	5	3	25	75	100	5
2.	21UCSC62	**Part – III: Core – 14:** Computer Graphics	5	3	25	75	100	5
3.	21UCSCP6	**Part – III: Core – 15: Lab – IX:** Python Programming	5	3	40	60	100	3
4.	21UCSCP7	**Part – III: Core – 16: Lab – X:** Web Design	5	3	40	60	100	3
5.		**Part – III: Elective – 2:**	5	3	25	75	100	5
	21UCSE61	Web Technology						
	21UCSE62	Cloud Computing						
	21UCSE63	Machine Learning using Python						
	21UCSE64	Cyber security						
6.	21UCSEV1	**Part – III: Elective – 3:** Project & 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 FOUR courses

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COURSE STRUCTURE – V SEMESTER

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UCSC51	**Part – III: Core – 9:** Relational Database Management Systems	5	3	25	75	100	4
2.	21UCSC52	**Part – III: Core – 10:** Operating System Concepts	5	3	25	75	100	4
3.	21UCSC53	**Part – III: Core – 11:** Software Engineering	5	3	25	75	100	4
4.	21UCSCP5	**Part – III: Core – 12: Lab – VII:** Open Source Programming using PHP & MYSQL	6	3	40	60	100	4
5.		**Part – III: Elective – 1:**	5	3	25	75	100	5
	21UCSE51	Data Communication and Computer Networks						
	21UCSE52	PHP Programming						
	21UCSE53	Python Programming						
	21UCSE54	Artificial Intelligence						
6.	21UCSS51	**Part – IV: SBS – 5:** Quantitative Aptitude	2	3	25	75	100	2
7.	21UCSSP3	**Part – IV: SBS – 6: Lab – VIII:** SQL and PLSQL	2	3	40	60	100	2
8.	21USSY51	Soft Skills (Self–Study)	–	–	–	–	100	–
		TOTAL	**30**				**800**	**25**

*One elective course to be chosen from FOUR courses

CA – **Class Assessment (Internal)**

SE – **Summative Examination**

SBS – **Skill Based Subject**

T – **Theory**

P – **Practical**

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSC51	RELATIONAL DATABASE MANAGEMENT SYSTEMS	CORE – 9	5	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:
This course helps the students to understand the need for database management systems, their architecture, data models and a detailed explanation of database schema. This course also facilitates the students to acquire the skill of using SQL as a tool to access database information.

COURSE OBJECTIVE:
- To give knowledge about the basic concepts of Database management systems
- To inculcate knowledge about E–R model and E–R diagram
- To give knowledge about SQL and on–line Transaction processing
- To make the students understand the need of normalization using various normal forms and to improve database design

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	describe the purpose of Database System, Different database models and Database Architecture	Upto K3
CO 2	explain the basic concepts of relational data model, entity–relationship model, relational database design, relational algebra, relational calculus	Upto K3
CO 3	design ER–models to represent simple database application scenarios	Upto K3
CO 4	improve the ER–model to relational tables, populate relational database and understand and formulate SQL queries on data	Upto K3
CO 5	implement ACID properties on database transactions and improve the database design by normalization	Upto K3

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

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RELATIONAL DATABASE MANAGEMENT SYSTEM

UNIT – I:
Introduction to Database Systems: Purpose of a Database System, Database Systems versus File Systems – View of Data – Data Models – Database Languages – Database Users and Administrators, Transaction Management, Database System Structure, Application Architectures.

Entity – Relationship Model: Basic Concepts – Mapping Constraints – Keys – Design Issues – Entity Relationship Diagram – Weak Entity Sets – Design of an E–R Database Schema – Reduction of an E–R Schema to Tables.

UNIT – II:
Relational Model: Structure of Relational Databases – The Relational Algebra – Extended. Relational Algebra Operations – Modification of the Database – Views – The Tuple Relational Calculus, The Domain Relational Calculus.

UNIT – III:
SQL: Basic Structure – Set Operations – Aggregate functions – Nested Queries – Derived Relations – Views – Modification of the database – Data Definition Language – Embedded SQL – Other SQL Features.

UNIT – IV:
Relational Database Design: First Normal Form – Pitfalls in Relational Database Design – Normalization Using Functional Dependencies – Decomposition – Desirable properties of decomposition Normalization using Multivalued Dependencies.

UNIT – V:
Transaction concept – Transaction State – Implementation of Atomicity and Durability – Concurrent Executions – Recoverability– Concurrency control – Lock –Based Protocols – Timestamp based Protocols – Validation based Protocols.

TEXT BOOK:
A. Silberschatz, H.Korth and S.Sudarsan, *Database System Concepts*, TATA McGraw Hill Inc., 2002, Fourth Edition.

UNIT I	: Chapter 1.1 to 1.9 and Chapter 2.1, 2.3 to 2.9, 2.9.1
UNIT II	: Chapter 3.1 to 3.4
UNIT III	: Chapter 4.2, 4.3, 4.4, 4.6, 4.9
UNIT IV	: Chapter 7.1 to 7.4
UNIT V	: Chapter 13.1to 13.4, 13.6, 14.1 to 14.3

REFERENCE BOOKS:
1. Bipin. C. Desai, *An Introduction to Database System,* West Publishing Company, 2004.
2. C. J. Date, *An Introduction to Database Systems, Addition – Wesley*, 2007, Eighth Edition.

Mapping of CO with PSO

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

3. Advanced Application   2. Intermediate Development   1. Introductory Level
COURSE DESIGNER: Prof. K. P.GNANESH

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSC52	**OPERATING SYSTEM CONCEPTS**	**CORE – 10**	**5**	**–**	**4**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**V**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course enables the students to get knowledge on the Operating system Concepts. This course also facilitates the students to understand the basic concepts of Android Operating system.

COURSE OBJECTIVES:

- To give knowledge on the various concepts of Operating systems
- To impart knowledge on Deadlock, Processor scheduling, Memory management and disk scheduling
- To introduce the basic concepts of Android operating system

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 fundamentals of Operating systems and process and processor scheduling concepts	**Upto K3**
CO 2	understand the fundamentals and problems of Asynchronous concurrent execution processes	**Upto K3**
CO 3	understand the problem of Deadlock and deadlock recovery	**Upto K3**
CO 4	understand the fundamentals of real and virtual memory concepts	**Upto K3**
CO 5	understand the fundamentals disk organization and file managements	**Upto K3**

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

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OPERATING SYSTEM CONCEPTS

UNIT – I:
Introduction to Operating Systems: Introduction, What is an Operating systems, Operating system components and goals, Operating systems architecture. Process Concepts: Introduction, Process States, Process Management, Interrupts, Interprocess Communication. Processor Scheduling: Introduction, Scheduling levels, Preemptive Vs Non–Preemptive Scheduling Priorities, Scheduling objective, Scheduling criteria, Scheduling algorithms.

UNIT – II:
Asynchronous Concurrent Execution: Introduction, Mutual Exclusion, Implementing Mutual Exclusion Primitives, Software solutions to the Mutual Exclusion Problem, Hardware solution to the Mutual Exclusion Problem, Semaphores. Concurrent Programming: Introduction Monitors.

UNIT – III:
Deadlock and Indefinite Postponement: Introduction, Examples of Deadlock, Related Problem Indefinite Postponement, Resource concepts, Four Necessary conditions for Deadlock, Deadlock solution, Deadlock Prevention, Deadlock Avoidance with Dijkstra's Banker's algorithm, Deadlock Detection, Deadlock Recovery.

UNIT – IV:
Real Memory Organization and Management: Introduction, Memory organization, Memory Management, Memory Hierarchy, Memory Management Strategies, Contiguous Vs Non – Contiguous Memory allocation, Fixed Partition Multiprogramming, Variable Partition multiprogramming.
Virtual Memory Management: Introduction, Page Replacement, Page Replacement Strategies, Page Fault Frequency (PFF) Page replacement, Page Release, Page Size.

UNIT – V:
Disk Performance Optimization: Introduction, Why Disk Scheduling is necessary, Disk Scheduling strategies, Rotational optimization.
File and Database Systems: Introduction, Data Hierarchy, Files, File Systems, File Organization.
Basics of Android: Introduction to Android – What is Android– Android Platform – Components – Applications – Components life cycle – Life cycle states – Life cycle events – Application life time – Life cycle method

TEXT BOOK:
Operating Systems, by Deitel Deitel Choffnes – Pearson education Third edition
UNIT – I   :   Chapter 1: 1.1,1.2,1.12,1.13,Chapter 3: 3.1,3.2,3.3,3.4,3.5
UNIT – II   **:**   Chapter 5: 5.1, 5.2, 5.3, 5.4 (upto 5.4.2), 5.5, 5.6,
                 Chapter 6: 6.1, 6.2
UNIT – III   :   Chapter 7: 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.10
                 Chapter 8: 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7
UNIT – IV   :   Chapter 9: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.8, 9.9,
                 Chapter 11: 11.1, 11.5, 11.6, 11.8, 11.9, 11.10
UNIT – V   **:**   Chapter 12: 12.1, 12.4, 12.5, 12.6
                 Chapter 13: 13.1, 13.2, 13.3, 13.4, 13.5

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REFERENCE BOOK:
An Introduction to Operating Systems Concepts and Practice, by Pramod Chandra P. Bhatt – PHI 2nd Edition

DIGITAL TOOLS:
1. **https://data–notes.co/the–10–operating–system–concepts–software–developers–need–to–remember–480d0734d710**
2. **https://www.tutorialspoint.com/operating_system/index.htm**

Mapping of CO with PSO

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

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

COURSE DESIGNER: Dr. T. D.VENKATESWARAN

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSC53	**SOFTWARE ENGINEERING**	**CORE – 11**	**5**	**–**	**4**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**V**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:
It deals with the technological and Managerial aspects of systematic way of software development and Maintenance.

COURSE OBJECTIVES:
- To impart knowledge on systematic way of software development and Maintenance
- To give knowledge about the important activities of the various phases of Software life cycle
- To introduce the basic concepts of Software project Management

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 Introduction about Software Engineering and phase–I of software life cycle: Planning a software Project	**Upto K3**
CO 2	gain knowledge about the software cost factors and Cost estimation techniques	**Upto K3**
CO 3	know about the Software Requirements Specification (SRS) and various Relational, State oriented notations	**Upto K3**
CO 4	understand about the various Design Notations and Design Techniques. Also gain knowledge about Unit testing and Debugging techniques	**Upto K3**
CO 5	know about Software Maintenance activities and also gain knowledge about Software Project Management	**Upto K3**

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

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SOFTWARE ENGINEERING

UNIT– I: Introduction to Software Engineering
Some Definitions – Some Size factors – Quality and Productivity Factors – Managerial Issues.
Planning a Software Project: Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure – Other Planning Activities.

UNIT– II: Software Cost Estimation
Software Cost Factors – Software Cost Estimation Techniques – Staffing Level Estimation – Estimating Software Maintenance Costs.

UNIT– III: Software Requirements Definitions
The Software Requirements Specification – Formal Specification Techniques – Relational Notations – State–Oriented notations – Languages and Processors for Requirements Specification – PSL/PSA – SSA – GIST.

UNIT– IV: Software Design
Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real – Time and Distributed System Design – Test Plans – Milestones, Walkthroughs, and Inspections – Design Guidelines.
Verification and Validation Techniques: Quality Assurance – Unit Testing and Debugging – System Testing.

UNIT– V: Software Maintenance
Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management – Source – Code Metrics
Introduction to Software Project Management (SPM): Introduction – What is a project – Software projects Vs Other types of project – Activities covered by SPM – Some ways of categorizing software projects – The project as a system – What is Management? – Problems with software projects – Management control – Stakeholders

TEXT BOOKS:
1. *Software Engineering Concepts* – Richard E. Fairley – Tata McGraw – Hill Publishing Company Limited, New Delhi 1997.
2. *Software Project Management* – Mike Cotterell and BOB Hughes, International Thomson Publishing

REFERENCE BOOKS:
1. *Software Engineering* – K.L. James, Prentice Hall of India Pvt. Ltd., New Delhi – 2009.
2. *Software Engineering* by PRESSMAN.
3. Rajib Mall, *Fundamentals of Software Engineering*, 3rd Edition, Prentice Hall of India Private Limited, 2008

DIGITAL TOOLS:
1. **https://acecollege.in/CITS_Upload/Downloads/Books/1035_File.pdf**
2. **https://gacbe.ac.in/pdf/ematerial/18BIT41C–U1.pdf**
3. **https://ddegjust.ac.in/studymaterial/mca–3/ms–12.pdf**

Mapping of CO with PSO

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

3. Advanced Application   2. Intermediate Development   1. Introductory Level
COURSE DESIGNER: Dr. V. K. VIJAYAKUMAR

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSCP5	OPEN SOURCE PROGRAMMING USING PHP & MYSQL	CORE – 12 LAB – VII	–	6	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	40	60	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course is intended to provide knowledge necessary to design and develop dynamic web pages using open source technology PHP and MySQL and also enhance the skill to connect and develop programs and applications using Database in XAMPP

COURSE OBJECTIVES:
- To develop an ability to design and code server side scripting
- To create dynamic and interactive web pages connecting with server
- To get knowledge about various objects , features and apply it
- To develop skill for state management of a web page using cookies and session
- To manage dynamic content and databases

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, code and debug in PHP using basic features	Upto K3
CO 2	design and develop codes using GET and POST request	Upto K3
CO 3	design and develop programs for state management using session and cookies	Upto K3
CO 4	design and implement programs that uses various objects, features in PHP	Upto K3
CO 5	design and develop applications that connects with the database	Upto K3

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

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OPEN SOURCE PROGRAMMING USING PHP & MYSQL

1) Write a PHP program to check given number is Armstrong number
2) Write a PHP program to find Factorial of a number using function
3) Write a PHP program to generate Prime numbers
4) Write a PHP program to reverse the given number
5) Write a PHP program to generate Fibonacci Series
6) Write a PHP program to Display Star Triangle
7) Write a PHP program to Generate Password
8) Write a PHP program to Split sentence into Words
9) Write a PHP program to check the given data is Palindrome or not
10) Write a PHP program to accessing indexed, associative multidimensional array
11) Write a PHP program to calculate EB Bill calculation
12) Write a PHP program to Handle Exception
13) Write a PHP program to convert Decimal number to Binary, Octal and HexaDecimal
14) Write a PHP program to find common elements of two arrays
15) Write a PHP program to sort given array
16) Write a PHP program to create and display Cookies.
17) Write a PHP program to create and display Session Variables
18) Write a PHP program to perform simple arithmetic calculations
19) Write a PHP program to create and access objects
20) Write a PHP program to implement basic banking transactions
21) Write a PHP program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.
22) Write a PHP program to insert a new record (bookinfo)in a table in MySQL
23) Write a PHP program to retrieve records (student)from table in MySQL (student)
24) Write a PHP program to update a record (customer contact) in a table in MySQL
25) Write a PHP program to delete a record (patient) in a table in MySQL (patient)

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. D. V. JEYANTHI

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSE51	**DATA COMMUNICATION AND COMPUTER NETWORKS**	**ELECTIVE-1**	**5**	**–**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**V**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:
This course enables the students to get introductory knowledge on Data Communications and Networking. It familiarizes the students with the basics of data communications, OSI model, TCP/IP model and techniques. It also focuses on topologies, coding schemes, error control, flow control and the services of various layer and its protocols.

COURSE OBJECTIVES:
- To teach various types of networking technology, network model
- To impart knowledge on various issues of the different layers of OSI , TCP/IP model
- To understand the working of physical layer, data link layer, network layer, transport layer and its services
- To introduce the basic concepts of network security , security services

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 network communication using the layered concept, Open System Interconnect (OSI) and the Internet Model and understand various types of transmission media, network devices; and parameters of evaluation of performance for each media and device	**Upto K3**
CO 2	understand the concept of flow control, error control and LAN protocols; to explain the design of, and algorithms used in, the physical, data link layers.	**Upto K3**
CO 3	understand the concept of Network Layer function, routing algorithms and datagram service	**Upto K3**
CO 4	understand the functioning of transport layer, TCP protocol, connection establishment, congestion control and transport layer protocols	**Upto K3**
CO 5	understand the fundamental concept of network security, model of network security, security services and cryptography	**Upto K3**

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

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DATA COMMUNICATION AND COMPUTER NETWORKS

UNIT – I:

Introduction – A Brief History – Applications – Computer Networks – Topology – Categories of Networks – Standards and Standards Organisations – Network Architecture– OSI Model – TCP/IP Architecture

Communication Media and Data Transmission – Analog and Digital Data Transmission – Modulation and DeModulation – Transmission Media –Twisted Pair– Baseband , Broadband Co–axial Cable – Optical Fibre – Wireless Communication – Radio waves – Microwaves – Infrared

UNIT – II:

Error Detection and Correction – Types of Errors – Error Detection – Parity Check – Redundancy Check – Check Sum – Error Corrections

Data Link Control And Protocol Concepts – Flow Control – Stop and Wait Flow Control – Sliding Window Flow Control – Error Control – Synchronous Protocols

Local Area Network – LAN Transmission Equipment – NIC – Bridge – Router – Brouter – Switches – Gateways – Ethernet IEE 802.3 – Pure Aloha – Slotted Aloha – CSMA – CSMA/CD

UNIT – III:

Internetworking – Principles of internetworking – routing Principles – Centralized Routing – Distributed Routing – Dijikstra Algorithm – Internetwork Protocol – IP Services – Datagram Protocol Function – Internet Control Message Protocol

UNIT – IV:

TCP Reliable Transport Service – Transport Protocols – Services TCP provides to Applications – End to End Services and Datagram – Transmission Control Protocol – User Datagram Protocol

Network Applications – Client–Server Model – Domain Naming Systems – TELNET – File Transfer and Remote File Access – FTP – TFTP – Electronic Mail – World Wide Web – URL

UNIT – V:

Network Security – Fundamental Concepts – Identification and Authentication – A Model for Network Security – Malicious Software – Security Services and Cryptography – Crypto Systems – Symmetric Cryptosystems – Asymmetric Crypto Systems – Security Services – Hash function, Message Digest , Digital Signatures, digital Certificates – Securing Network using Firewall – Types of Firewalls – Web Security – Intrusion Detection System

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TEXT BOOK:
Data Communication and Computer Networks, by Brijendra Singh, PHI Learning Private Limited, New Delhi, 2009, II Edition
UNIT 1: Chapter 1, Chapter 2.2–2.7
UNIT 2: Chapter 3. Chapter 5.1, 5.2, 5.3, Chapter 6.2, 6.4
UNIT 3: 10.1, 10.2, 10.3
UNIT 4: Chapter 11, 12
UNIT 5: Chapter 14

REFERENCE BOOKS:
1. Forouzan, Behrouz, *Data Communications and Networking,* McGraw–Hill, third edition
2. *Computer Networks,* Fifth Edition Andrew S. Tanenbaum

DIGITAL TOOLS (including moocs, swayam, nptel):
1. **https://www.youtube.com/watch?v=iSS0uOSPv8Y&list=PL5B4lsKp6FVzTrpjBbKcv2AgOVzqtHJnp**
2. **https://csc–knu.github.io/sys–prog/books/Andrew%20S.%20Tanenbaum%20–%20Computer%20Networks.pdf**
3. **https://www.digimat.in/nptel/courses/video/106105183/L01.html**
4. **https://www.youtube.com/watch?v=sG6WGvzmVaw&list=PL8BF3052396E05930**
5. **https://www.youtube.com/watch?v=pVl1L1jrbFE**

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. D. V. JEYANTHI

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSE52	PHP PROGRAMMING	ELECTIVE – 1	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	V	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course is intended to provide knowledge necessary to design and develop dynamic web pages using open source technology PHP and MySQL. Also enhances the skill to connect and develop programs and applications using Database in XAMPP.

COURSE OBJECTIVE:
- To develop an ability to design and code server side scripting
- To create dynamic and interactive web pages connecting with server
- To get knowledge about various objects , features and apply it
- To develop skill for state management of a web page using cookies and session
- To manage dynamic content and databases

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 PHP and using variables, operators, data types and creating scripts	Upto K3
CO 2	identify the conditional control statements in PHP Working with String and Numeric Functions	Upto K3
CO 3	understand the concepts of Data in Arrays and Processing Arrays with Loops and Iterations Working with Dates and Times	Upto K3
CO 4	describe the procedures for Working with Files and Directories in PHP	Upto K3
CO 5	understand the basics of using MySQL ,Simple XML and DOM Extension	Upto K3

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

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PHP PROGRAMMING

UNIT – I:

Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

UNIT – II:

Writing Simple Conditional Statements – Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

UNIT – III:

Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms – Working with Array Functions – Working with Dates and Times.

UNIT – IV:

Creating User–Defined Functions – Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files– Writing Files Processing Directories.

UNIT – V:

Introducing Database and SQL– Using MySQL–Adding and modifying Data– Handling Errors – Using SQLite Extension and PDO Extension. Introduction – XML – Simple XML and DOM Extension.

TEXT BOOK:

Vikram Vaswani – *PHP A Beginner's Guide*, Tata McGraw–Hill

REFERENCE BOOK:

The PHP Complete Reference – Steven Holzner – Tata McGraw–Hill Edition.

DIGITAL TOOLS:
1. https://www.w3schools.com/php/
2. https://www.tutorialspoint.com/php/index.htm

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. K. P. GNANESH

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSE53	**PYTHON PROGRAMMING**	**ELECTIVE – 1**	**5**	**–**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**V**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course enables the students to understand and use the basic, history and features of python.

COURSE OBJECTIVES:
1. Interpret the use of procedural statements like assignments, conditional statements, loops and function calls.
2. Infer the supported data structures like lists, dictionaries and tuples in Python.
3. Illustrate the application of matrices and regular expressions in building the Python programs.
4. Discover the use of external modules in creating excel files and navigating the file systems.
5. Describe the need for Object–oriented programming concepts 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	learn the syntax and semantics of Python Programming Language.	**Upto K3**
CO 2	write Python functions to facilitate code reuse and manipulate strings.	**Upto K3**
CO 3	illustrate the process of structuring the data using lists, tuples and dictionaries.	**Upto K3**
CO 4	demonstrate the use of built–in functions to navigate the file system.	**Upto K3**
CO 5	appraise the need for working on web scraping.	**Upto K3**

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

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PYTHON PROGRAMMING

UNIT – I:

Introduction, Python Basics: Entering Expressions into the Interactive Shell, The Integer, Floating–Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program. Flow control: Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with sys. exit().

UNIT – II:

Functions: def Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling. Lists: The List Data Type, Working with Lists, Augmented Assignment Operators, Methods.

UNIT – III:

Dictionaries and Structuring Data: The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real–World Things.

Manipulating Strings – Working with Strings, Useful String Methods.

UNIT – IV:

Pattern Matching with Regular Expressions: Finding Patterns of Text without Regular Expressions, Finding Patterns of Text with Regular Expressions, More Pattern Matching with Regular Expressions, Greedy and Nongreedy Matching, The findall() Method, Character Classes, Making Your

Own Character Classes, The Caret and Dollar Sign Characters, The Wildcard

Character, Review of Regex Symbols, Case–Insensitive Matching, Substituting Strings with the sub() Method, Managing Complex Regexes, Combining re.IGNORECASE, re .DOTALL, and re .VERBOSE.

Reading and Writing Files: Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module, Saving Variables with the pprint. pformat() Function.

Organizing Files: The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module.

UNIT – V:

Web Scraping: Project: MAPIT.PY with the web browser Module, Downloading Files from the Web with the requests Module, Saving Downloaded Files to the Hard Drive, HTML.

Working with Excel Spreadsheets: Excel Documents, Installing the openpyxl Module, Reading Excel Documents, Project: Reading Data from a Spreadsheet, Writing Excel Documents, Project: Updating a Spreadsheet, Setting the Font Style of Cells, Font Objects, Formulas, Adjusting Rows and Columns, Charts.

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TEXT BOOK:
Al Sweigart, *Automate the Boring Stuff with Python*, William Pollock, 2015, ISBN: 978–1593275990.

REFERENCE BOOKS:
1. Allen B. Downey, *Think Python: How to Think Like a Computer Scientist*, 2nd Edition, Green Tea Press, 2015, ISBN: 978–9352134755.
2. Charles Dierbach, *Introduction to Computer Science Using Python,* 1st Edition, Wiley India Pvt Ltd. ISBN–13: 978–8126556014.
3. Wesley J Chun, *Core Python Applications Programming*, 3rd Edition, Pearson Education India, 2015. ISBN–13: 978–9332555365.

DIGITAL TOOL:
https://infytq.infosys.com/

Mapping of CO with PSO

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

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

COURSE DESIGNER: Dr. T. D.VENKATESWARAN

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSE54	**ARTIFICIAL INTELLIGENCE**	**ELECTIVE – 1**	**5**	**–**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**V**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision.

COURSE OBJECTIVES:

The objective is to educate students about the concepts, techniques and applications of Artificial Intelligence.

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 what an AI technique is and define AI problems as state space search problem	**Upto K3**
CO 2	learn Heuristic search techniques: Generate – and – test – Hill climbing – Best–first search – Problem reduction – Constraint satisfaction – Means–ends analysis	**Upto K3**
CO 3	learn to represent knowledge using predicate logic	**Upto K3**
CO 4	learn to solve AI problems using Resolution. Also learn to represent knowledge using rules	**Upto K3**
CO 5	learn to solve Gaming problems using minimax procedure and learn to identify the characteristics of an expert system	**Upto K3**

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

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ARTIFICIAL INTELLIGENCE

UNIT – I:

What is Artificial Intelligence?: The AI problems – The underlying assumptions – What is an AI technique?– The Level of the model – Criteria for Success Problems, Problem spaces and search: Defining the problem as a state space search – Production systems

UNIT – II:

Problem characteristics– Production system characteristics – Issues in the design of search programs – Additional problems, Heuristic search techniques: Generate – and – test – Hill climbing – Best–first search – Problem reduction – Constraint satisfaction – Means– ends analysis

UNIT – III:

Knowledge representation issues: Representations and mappings – Approaches to knowledge representations – Issues in knowledge representations – The frame problem
Using predicate logic: Representing simple facts in logic – representing Instance and Isa relationships – Computable functions and predicates

UNIT – IV:

Resolution – Natural deduction – Representing knowledge using rules: Procedural Versus Declarative knowledge – Logic programming – Forward versus Backward reasoning – Matching – Control knowledge

UNIT – V:

Game playing: Overview – The Minimax search procedure – Adding Alpha–Beta cutoffs – Additional refinements – Iterative deepening – References on specific games
Expert systems: Representing and using domain knowledge – expert system shells – Explanation – Knowledge acquisition

TEXT BOOK:

Artificial Intelligence, By Elaine Rich, Kevin Knight, Shivashankar B Nair,
Third Edition, Tata Mc Graw Hill Education Pvt.Ltd.,
UNIT – I	:	(Chapter–1: 1.1 to 1.5, Chapter–2: 2.1, 2.2),
UNIT – II	:	(Chapter–2: 2.3 to 2.6, Chapter–3: 3.1 to 3.6)
UNIT – III	:	(Chapter– 4: 4.1 to 4.4, Chapter –5: 5.1 to 5.3)
UNIT – IV	:	(Chapter–5: 5.4, 5.5, Chapter –6: – 6.1 to 6.5)
UNIT – V	:	(Chapter –12: 12.1 to 12.5, 20.1 to 20.4)

Passed in the BOS Meeting held on 04/03/2023   Signature of the Chairman

REFERENCE BOOKS:

1. Stuart J Russell and Peter Norvig, *Artificial Intelligence – A Modern Approach*, 3rd Edition, Prentice Hall of India/ Pearson Education, New Delhi, 2018.
2. George F Luger, *Artificial Intelligence: Structures and Strategies for Complex Problem Solving,* 5th Edition, Pearson Education, New Delhi, 2017.
3. Nils J Nilsson, *Principles of Artificial Intelligence,* Narosa Publishing House, New Delhi, 2002.
4. Patrick Henry Winston, *Artificial Intelligence,* 3rd Edition, Pearson Education, New Delhi, 2013.

DIGITAL TOOLS:

1. **https://www.javatpoint.com/artificial–intelligence–tutorial**
2. **https://www.tutorialspoint.com/artificial_intelligence/index.htm**
3. **https://www.w3schools.com/ai/**

Mapping of CO with PSO

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

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

COURSE DESIGNER: Dr. V. K.VIJAYAKUMAR

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSS51	**QUANTITATIVE APTITUDE**	**SBS – 5**	**2**	**–**	**2**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**V**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

Quantitative aptitude is an inseparable and an integral part of aptitude exams in India. It **tests the quantitative skills along with logical and analytical skills**. One can test their own number of handling techniques and problem–solving skills by solving these problems.

COURSE OBJECTIVES:

- To give numerical aptitude and to prepare students for competitive examinations
- To impart knowledge on solving various types of numerical problems
- To give practice to students by giving variety of problems and enrich their analytical skills

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	solve problems on Numbers, HCF & LCM of numbers and Decimal Fractions.	**Upto K3**
CO 2	solve problems on Square roots & Cube roots, Average, Problems on Numbers, Problems on Ages.	**Upto K3**
CO 3	solve problems on Percentage, Profit & Loss , Ratio & Proportion.	**Upto K3**
CO 4	solve problems on Time & Work, Time & Distance	**Upto K3**
CO 5	solve problems on Simple Interest, Compound Interest, Area , Volume & Surface areas.	**Upto K3**

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

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QUANTITATIVE APTITUDE

UNIT – I:
Numbers – HCF & LCM of numbers – Decimal Fractions.

UNIT – II:
Square roots & Cube roots – Average – Problems on Numbers – Problems on Ages.

UNIT – III:
Percentage – Profit & Loss – Ratio & Proportion.

UNIT – IV:
Time & Work – Time & Distance.

UNIT – V:
Simple Interest – Compound Interest – Area –Volume & Surface areas.

TEXT BOOK:
Quantitative Aptitude, **R.S. Aggarwal, Reprint 2007, S. Chand & Company Ltd,**
Unit I   : Chapters: 1, 2, 3
Unit II   : Chapters: 5, 6, 7, 8
Unit III : Chapters: 10, 11, 12
Unit IV : Chapters: 15, 17
Unit V   : Chapters: 21, 22, 24, 25

REFERENCE BOOKS:
1. *Quantitative Aptitude For Competitive Examination,* by Abhijit Guha, 5th Edition, Mc Graw Hill
2. *Quantitative Aptitude and Reasoning,* by Praveen R. V, January 2012

DIGITAL TOOLS:
1. **https://www.tutorialspoint.com/quantitative_aptitude/aptitude_profit_loss_examples.htm**
2. **https://www.youtube.com/playlist?list=PLpyc33gOcbVA4qXMoQ5vmhefTruk5t9lt**
3. **https://www.javatpoint.com/aptitude/quantitative**

Mapping of CO with PSO

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

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

COURSE DESIGNER: Dr. V. K. VIJAYAKUMAR

Passed in the BOS Meeting held on 04/03/2023   Signature of the Chairman

SOURASHTRA COLLEGE, MADURAI – 625004
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B.Sc. COMPUTER SCIENCE – SYLLABUS
(Under CBCS based on OBE) (with effect from 2021 – 2022)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSSP3	**LAB : SQL AND PLSQL**	**SBS – 6 Lab – VIII:**	–	**2**	**2**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**V**	**40**	**60**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course aims at facilitating the students to understand the skill of using SQL as a tool to access database information.

COURSE OBJECTIVES:
- To introduce and implement Data base manipulation operations in Oracle SQL.
- To enhance the students to develop programs in PL/SQL.

No.	Course Outcome	Knowledge Level(According to Bloom's Taxonomy)
CO 1	demonstrate DDL,DML and DCL operations in Oracle–SQL. Managing Databases and Tables, Inserting, Updating, and Deleting Data, Querying with SQL SELECT commands.	**Upto K3**
CO 2	implement SQL queries using Aggregate functions, set operations and time, date and string functions by multiple tables.	**Upto K3**
CO 3	utilize the basic data types, Functions, Arrays, Strings, Date and Times, and Design to write PL/SQL programs using decision making and looping, functions, arrays and strings.	**Upto K3**
CO 4	design to write programs using triggers and procedures.	**Upto K3**
CO 5	write a PL/SQL Coding for packages.	**Upto K3**

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

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SQL AND PLSQL

Table creation with primary key, not null, unique, foreign key and check constraints

1. Inserting record (values to selective fields), Updation and deletion of records.

2. Queries using simple select statements

3. Queries using multiple tables

4. Nested queries

5. Working with Time & Date, string functions

6. Working with Aggregate functions

7. Queries using GROUP BY.. HAVING

8. Queries using set operations (union, intersection and minus)

9. PL/SQL program using decision making with branching

10. PL/SQL program using decision making with looping

11. PL/SQL program using cursor

12. PL/SQL program using functions and procedures

13. PL/SQL program using package

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. K. P.GNANESH

SOURASHTRA COLLEGE, MADURAI – 625004

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COURSE STRUCTURE – VI SEMESTER

S. No.	Sub. Code	Subject Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UCSC61	**Part – III: Core – 13:** Data Mining and Warehousing	5	3	25	75	100	5
2.	21UCSC62	**Part – III: Core – 14:** Computer Graphics	5	3	25	75	100	5
3.	21UCSCP6	**Part – III: Core – 15: Lab – IX:** Python Programming	5	3	40	60	100	3
4.	21UCSCP7	**Part – III: Core – 16: Lab – X:** Web Design	5	3	40	60	100	3
5.		**Part – III: Elective – 2:**	5	3	25	75	100	5
	21UCSE61	Web Technology						
	21UCSE62	Cloud Computing						
	21UCSE63	Machine Learning using Python						
	21UCSE64	Cyber security						
6.	21UCSEV1	**Part – III: Elective – 3:** Project & 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 FOUR courses

CA – **Class Assessment (Internal)**

SE – **Summative Examination**

SBS – **Skill Based Subject**

T – **Theory**

P – **Practical**

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSC61	**DATA MINING AND WAREHOUSING**	**CORE-13**	**5**	**–**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**VI**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:
It deals with data mining techniques and data warehousing techniques to extract knowledge from large data bases

COURSE OBJECTIVES:
- To give knowledge in Data Mining and Data Warehousing
- To inculcate knowledge on Association Rule mining, Clustering and Classification techniques
- To make the students learn various applications of data mining 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 data mining concepts regarding types of data, knowledge, techniques and applications	**Upto K3**
CO 2	understand the data warehousing concepts, data cube, OLAP & OLTP and Attribute–Oriented Induction	**Upto K3**
CO 3	gain knowledge about Association rule mining algorithms such as Apriori, FP–Growth for extracting knowledge from large data bases	**Upto K3**
CO 4	learn the classification techniques using various classification algorithms such as decision tree induction, Bayesian for extracting knowledge from large data bases	**Upto K3**
CO 5	learn the clustering techniques using various clustering algorithms such as k–means, k–medoids, etc., for extracting knowledge from large data bases. Also learn about various data mining applications	**Upto K3**

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

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DATA MINING AND WAREHOUSING

UNIT – I: Introduction

Why Data Mining? – What Is Data Mining? – What Kinds of Data Can Be Mined? – What Kinds of Patterns Can Be Mined? – Which Technologies Are Used? – Which Kinds of Applications Are Targeted? – Major Issues in Data Mining

UNIT – II: Data Warehousing and Online Analytical Processing

Data Warehouse: Basic Concepts – Data Warehouse Modeling: Data Cube and OLAP – Data Warehouse Design and Usage – Data Generalization by Attribute–Oriented Induction

UNIT – III: Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods

Basic Concepts: Market Basket Analysis: A Motivating Example – Frequent Itemsets, Closed Itemsets, and Association Rules

Frequent Itemset Mining Methods: Apriori Algorithm: Finding Frequent Itemsets by Confined Candidate Generation – Generating Association Rules from Frequent Itemsets – Improving the Efficiency of Apriori – A Pattern–Growth Approach for Mining Frequent Itemsets – Mining Frequent Itemsets Using Vertical Data Format – Mining Closed and Max Patterns

Which Patterns Are Interesting?— Pattern Evaluation Methods: Strong Rules Are Not Necessarily Interesting – From Association Analysis to Correlation Analysis – A Comparison of Pattern Evaluation Measures

UNIT – IV: Classification: Basic Concepts

Basic Concepts: What Is Classification? – General Approach to Classification –
Decision Tree Induction: Decision Tree Induction – Attribute Selection Measures – Tree Pruning – Scalability and Decision Tree Induction – Visual Mining for Decision Tree Induction
Bayes Classification Methods: Bayes' Theorem – Na¨ıve Bayesian Classification
Rule–Based Classification: Using IF–THEN Rules for Classification – Rule Extraction from a Decision Tree – Rule Induction Using a Sequential Covering Algorithm

UNIT – V: Cluster Analysis: Basic Concepts and Methods

Cluster Analysis: What Is Cluster Analysis? – Requirements for Cluster Analysis – Overview of Basic Clustering Methods
Partitioning Methods: k–Means: A Centroid–Based Technique – k–Medoids: A Representative Object–Based Technique
Hierarchical Methods: Agglomerative versus Divisive Hierarchical Clustering – Distance Measures in Algorithmic Methods
Data Mining Applications: Data Mining for Financial Data Analysis – Data Mining for Retail and Telecommunication Industries – Data Mining in Science and Engineering – Data Mining for Intrusion Detection and Prevention – Data Mining and Recommender Systems

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TEXT BOOK:

Data Mining: Concepts and Techniques, by Jiawei Han, Micheline Kamber , Jian Pei – Third Edition, Morgan Kaufmann Publishers is an imprint of Elsevier.

UNIT – I   : (Chapter 1 – 1.1 to 1.7)
UNIT – II   : (Chapter 4 – 4.1, 4.2, 4.3, 4.5)
UNIT – III : (Chapter 6 – 6.1, 6.2, 6.3)
UNIT – IV   : (Chapter 8 – 8.1, 8.2, 8.3, 8.4)
UNIT – V   : (Chapter 10 – 10.1, 10.2. 10.3.1, 10.3.2, Chapter 13.3)

REFERENCE BOOKS:

1. K.P. Soman , Shyam Diwakar, V.Ajay *Insight into Data Mining Theory and Practice*, Prentice Hall of India Pvt. Ltd, New Delhi
2. *Data Mining and Data Warehousing: Principles and Practical Techniques* by Parteek Bhatia, Cambridge University Press, 2019
3. *Data Mining and Data Warehousing* by B.S. Charulatha January 2018, Charulatha Publications Private Limited
4. *Principles of Data Mining*, by D.Hand, H.Mannila and P.Smyth, Second Edition, PHI Pvt.Ltd., New Delhi, 2006
5. *Data Mining: Introduction and Advanced Topics* **by** M.H.Dunham, Second Edition, Pearson Education Pvt. Ltd., New Delhi, 2004

DIGITAL TOOLS:

1. https://www.vssut.ac.in/lecture_notes/lecture1428550844.pdf
2. https://www.lpude.in/SLMs/Master%20of%20Computer%20Applications/Sem_1/DECAP446_DATA_WAREHOUSING_AND_DATA_MINING.pdf
3. https://mrcet.com/pdf/Lab%20Manuals/IT/DATA%20WAREHOUSING%20AND%20DATA%20MINING%20(R18A0524).pdf

Mapping of CO with PSO

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

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

COURSE DESIGNER: Dr. V. K. VIJAYAKUMAR

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSC62	COMPUTER GRAPHICS	CORE – 14	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:
This course enables the students to get knowledge on the Computer Graphics Concepts and know the algorithm of basic primitive graphics commands. This course also facilitates the students to understand the working principles of input and output devices.

COURSE OBJECTIVES:
- To give knowledge about various display devices, input devices on Graphic systems
- To impart knowledge on various algorithms for line drawing, circle generating, ellipse generating, polygon filling, and clipping
- To make the students understand two–dimensional transformations like scaling, rotation, translation, etc., and Window–to–Viewport coordinate transformation.

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 fundamentals of computer graphics, display devices, input and output devices	Upto K3
CO 2	understand the line, circle and ellipse generations	Upto K3
CO 3	understand the attributes of line, circle and ellipse commands	Upto K3
CO 4	understand the fundamentals of two dimensional geometric transformations	Upto K3
CO 5	understand the fundamentals of two dimensional viewing transformations	Upto K3

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

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COMPUTER GRAPHICS

UNIT – I: A Survey of Computer Graphics

Computer–Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical User Interfaces.
Overview of Graphics Systems: Video Display Devices – Raster Scan Systems – Random Scan Systems – Input Devices – Hard Copy Devices.

UNIT – II: Output Primitives

Points and Lines – Line Drawing Algorithms – Circle Generating Algorithms – Ellipse Generating Algorithms – Filled Area primitives.

UNIT – III: Attributes of Output Primitives

Line Attributes – Curve Attributes – Color and Gray Scale Levels – Area Fill Attributes – Character Attributes – Bundled Attributes – Inquiry Functions – Antialiasing.

UNIT – IV: Two –Dimensional Geometric Transformations

Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations – Transformations between Coordinate Systems.

UNIT – V: Two –Dimensional Viewing

The Viewing Pipeline – Viewing Coordinate Reference Frame – Window –to– Viewport Coordinate Transformation – Two–Dimensional Viewing Functions – Clipping Operations – Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

TEXT BOOK:

Computer Graphics – Donald Hearn , M. Pauline Baker Prentice Hall Of India Pvt. Ltd., New Delhi, Second Edition, 1994

Chapters

Unit – I	: 1.1 – 1.8, 2.1–2.3, 2.5, 2.6	**Unit – II**	: 3.1, 3.2, 3.5–3.7, 3.11
Unit – III	: 4.1 – 4.8	**Unit – IV**	: 5.1 – 5.5
Unit – V	: 6.1 – 6.11		

REFERENCE BOOKS:

1. *Computer Graphics, Multimedia and Animation* – Malay K. Pakhira, Prentice Hall of India Pvt. Ltd., New Delhi – 2008.
2. *Fundamentals of Computer Graphics and Multimedia* – D.P. Mukherjee, Prentice Hall of India Pvt. Ltd., New Delhi – 1999.

DIGITAL TOOLS:

1. **https://cs.lmu.edu/~ray/notes/graphicsintro/**
2. **https://www.tutorialspoint.com/computer_graphics/computer_graphics_basics.htm**

Mapping of CO with PSO

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

3. Advanced Application   2. Intermediate Development   1. Introductory Level
COURSE DESIGNER: Dr. T. D.VENKATESWARAN

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSCP6	LAB: PYTHON PROGRAMMING	CORE – 15 LAB – IX	-	5	3

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	40	60	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:
Python is highly versatile. You can use it for both small and complex tasks, and it is used across many different industries — from its more common applications in **data science and software engineering to environments like mobile app development, artificial intelligence, and machine learning**.

COURSE OBJECTIVES:
It deals with Programming using PYTHON in the following areas
- Data science.
- Scientific and mathematical computing.
- Web development.
- Finance and trading.
- System automation
- Computer graphics.
- Basic game development.

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	learn simple programs using formulas	Upto K3
CO 2	learn simple programs to solve mathematical problems	Upto K3
CO 3	learn python programs to play simple games	Upto K3
CO 4	learn python programs to solve simple problems related to Computer graphics	Upto K3
CO 5	learn python programs to solve simple problems related to Data Science	Upto K3

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

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PYTHON PROGRAMMING

LIST OF EXPERIMENTS

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"
21. Python Programs to play Simple games
22. Python Programs to solve simple problems using Graphics
23. Python Programs to solve simple problems in Data Science

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REFERENCE BOOKS:
1. Allen B. Downey, *Think Python: How to Think Like a Computer Scientist*,1st Edition 2012, O'Reilly
2. Jeff McNeil , *Python 2.6 Text Processing: Beginners Guide,* 2010 ,Packet Publications

DIGITAL TOOLS:
1. **https://www.w3schools.com/python/**
2. **https://docs.python.org/3/tutorial/**
3. **https://www.tutorialspoint.com/python/index.htm**
4. **https://www.geeksforgeeks.org/python–programming–language/learn–python–tutorial/**

Mapping of CO with PSO

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

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

COURSE DESIGNER: Dr. V. K. VIJAYAKUMAR

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSCP7	**LAB: WEB DESIGN**	**CORE – 16 LAB – X**	**–**	**5**	**3**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**VI**	**40**	**60**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:
This course is intended to teach the basic involved in creating static, interactive web pages using HTML, analyzing a web page and identify its elements and its attributes It also demonstrates about creating, validating dynamic web pages using JavaScript programming.

COURSE OBJECTIVES:
- To develop an ability to design static web page using HTML
- To enrich the skill of creating interactive web page using HTML Forms
- To analyze and develop web page by identifying its elements and attributes
- To implement client side validation in browser side using JavaScript
- To help the students understand and demonstrate JavaScript objects by developing dynamic web pages
-

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	develop static web page with various text formatting elements, list, tables ,image, marquee using HTML	**Upto K3**
CO 2	develop web site with multiple web pages using Frames, links using HTML, CSS	**Upto K3**
CO 3	develop interactive web page using Form Elements using HTML	**Upto K3**
CO 4	develop dynamic web pages to implement basic logics using Java Script	**Upto K3**
CO 5	develop dynamic web pages with client side validation using Java Script	**Upto K3**

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

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WEB DESIGN

1. Write a html program to display your resume using various text formatting
2. Write a html program to display registration form using various form elements
3. Write a html program to display railway registration form using various form elements
4. Write a html program to display an advertisement using images
5. Write a html program to display time table using table
6. Write a html program to display college web site using frames
7. Write a html program to display restaurant menu page using external link
8. Write a html program to display syllabus using internal link
9. Write a HTML program to display Sourashtra College using CSS
10. Write a JavaScript program to perform Arithmetic Operations
11. Write a JavaScript program to reverse a given number
12. Write a JavaScript program to check palindrome
13. Write a JavaScript program to merge two arrays
14. Write a JavaScript program to search an element in an array
15. Write a JavaScript program to change the background colour of the screen
16. Write a JavaScript program to display digital clock
17. Write a JavaScript program to do Form Validation
18. Write a JavaScript program to do Student MarkSheet Processing
19. Write a JavaScript program to do String Manipulation
20. Write a JavaScript program to create WishList
21. Write a JavaScript program to create and display Cookie
22. Write a JavaScript program to do cinema ticket booking
23. Write a JavaScript program to do EB Bill Calculation

DIGITAL TOOLS:

1. **https://www.youtube.com/watch?v=uUhOEj4z8Fo**(swayam / nptel tutorial – IIT Kharagpur)
2. **https://www.youtube.com/watch?v=QEtWL4lWlL4**(swayam / nptel tutorial – IIT Kharagpur)
3. **https://www.w3schools.com/js/**
4. **https://www.tutorialspoint.com/servlets/index.htm**
5. **https://www.javatpoint.com/jsp–tutorial**
6. **https://www.youtube.com/watch?v=OuBUUkQfBYM**(Full Stack)

Mapping of CO with PSO

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

3. Advanced Application   2. Intermediate Development   1. Introductory Level
COURSE DESIGNER: Prof. D. V. JEYANTHI

Passed in the BOS Meeting held on 04/03/2023   Signature of the Chairman

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSE61	**WEB TECHNOLOGY**	**ELECTIVE – 2**	**5**	**–**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**VI**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course enables the students to get knowledge on the Internet and Web Concepts, SGML and HTML Mark language coding along with Java Script Client Scripting. This course also facilitates the students to understand web server programming using Servlets and JSP.

COURSE OBJECTIVES:

- To provide a comprehensible introduction about the basic concepts of Internet, Protocols, Web Concepts and the fundamentals needed to create web pages
- To inculcate knowledge about SGML and understand the programming techniques of markup language using HTML to create static web pages
- To give knowledge about Client side scripting , validation and understand using Java Script
- To understand the concepts of web server programming using Servlets and JSP to develop dynamic web pages and web 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	define and describe about internet and various internet terminologies, protocols and web concepts	Upto K3
CO 2	explain SGML, understands HTML and able to write programs using HTML	Upto K3
CO 3	define and explain Client Side Scripting, to write programs using Java Script	Upto K3
CO 4	understand the fundamentals of Server Side Scripting, Web Server programming and implementation using Servlets	Upto K3
CO 5	understand the technology of developing dynamic web pages using JSP and explores the programming features of JSP	Upto K3

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

Passed in the BOS Meeting held on 04/03/2023   Signature of the Chairman

SOURASHTRA COLLEGE, MADURAI – 625004
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WEB TECHNOLOGY

UNIT – I: Introduction

History of the Internet – Services and Accessibility – Uses of the Internet – Protocols – Web Concepts – Client/Server Model of the Web – Retrieving Data from the Web – How – the web works – Web Browsers – Searching Information on the Web – Internet Standards.

UNIT – II: SGML – DTD

Elements, Attributes – Head Section Tags – Body Section Tags – Text Formatting – Internal and External Links – Embedding Images – Lists – Tables – Frames – HTML Forms – Form Elements

UNIT – III: JAVASCRIPT

Introduction – Language Elements–Identifiers– Expressions – keywords – operators – statements – conditional statements – looping statements – break– continue – functions – Objects of JavaScript – window object – document object – forms object – textbox and text are a object– buttons , radio button and checkbox object – select object – Other Objects –Date object – String Object – Math Object – Arrays – Client Side Cookies

UNIT – IV: SERVLETS

Introduction – Advantages of Servlets over CGI – Installing Servlets – The Servlet Life Cycle – Servlet API servlet package, Http package, Servlet Interface, Http Servlet Request Interface , Http Servlet Response Interface, Http Servlet class– A Simple Servlet – Handling HTTP GET Requests – Handling HTTP POST Requests – Cookies – Session Tracking – Multi–tier Applications Using Database Connectivity – Servlet Chaining.

UNIT – V: JAVA SERVER PAGES (JSP)

Introduction – Advantages of JSP – Developing First JSP – Components of JSP – Reading Request Information – Retrieving the Data Posted from a HTML File to a JSP File – JSP Sessions – Cookies – Disabling Sessions.
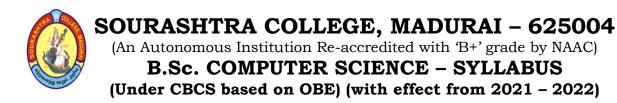
TEXT BOOK:
Web Technology – A Developer's Perspective, N.P. Gopalan and J. Akilandeswari, Prentice–Hall of India Pvt. Ltd, New Delhi, 2008.
UNIT – I: Chapters 1 and 4   **UNIT – II**: Chapter 5   **UNIT – III**: Chapter 6
UNIT – IV: Chapter 10   **UNIT – V**: Chapter 11

REFERENCE BOOKS:
1. J. Jaworkski, *Mastering Javascript*, BPB Publications.
2. Marty Hall and Larry Brown Pearson, *Core SERVLETS AND JAVA SERVER PAGES VOLUME 1: CORE TECHNOLOGIES*, Pearson Education India.
3. Jason Hunter, *Java Servlet Programming*, 2nd Edition, 2001, Shroff Publishers, New Delhi
4. Ivan Bayross, *Web Enabled Commercial Application Development Using HTML, DHTML, Javascript*, Perl, CGI –, BPB Publications, 2000.

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DIGITAL TOOLS:

1. **https://www.youtube.com/watch?v=uUhOEj4z8Fo** (swayam/nptel tutorial–TKharagpur)
2. **https://www.youtube.com/watch?v=QEtWL4lWlL4** (swayam/nptel tutorial – IIT Kharagpur)
3. **https://www.w3schools.com/js/**
4. **https://www.tutorialspoint.com/servlets/index.htm**
5. **https://www.javatpoint.com/jsp–tutorial**
6. **https://www.youtube.com/watch?v=OuBUUkQfBYM**(Full Stack)

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. D. V. JEYANTHI

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSE62	CLOUD COMPUTING	ELECTIVE – 2	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course is intended to provide knowledge necessary to classify and design various architectures of cloud computing and also enhances the practical applications of cloud computing.

COURSE OBJECTIVES:
- Classify the various Cloud computing applications
- Understand the architectures of cloud computing
- Understand the basic knowledge of cloud security

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 history and Basic knowledge of Cloud computing.	Upto K3
CO 2	understand different architectures of cloud computing such as Software as a Service (SaaS) – Infrastructure as a Service (IaaS) – Platform as a Service (PaaS)	Upto K3
CO 3	describe about applications of cloud computing by using case studies	Upto K3
CO 4	understand about cloud data centers and CRM management	Upto K3
CO 5	understand security threats and solution in clouds	Upto K3

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

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CLOUD COMPUTING

UNIT – I:

History of Cloud computing – Cloud Computing Architectural Framework – Types of Clouds – pros and cons of cloud computing – difference between web 2.0 and cloud – key challenges in cloud computing – Major Cloud players – Cloud Deployment Models – Virtualization in Cloud Computing – types of virtualization – Parallelization in Cloud Computing – cloud resource management – dynamic resource allocation – Optimal allocation of cloud models

UNIT – II:

Software as a Service (SaaS) – Infrastructure as a Service (IaaS) – Platform as a Service (PaaS) – Service Oriented Architecture (SoA) – Elastic Computing – On Demand Computing

UNIT – III:

Deployment of applications on the cloud – Hypervisor – Case studies – Xen, VMware, Eucalyptus – Amazon EC2, KVM, Virtual Box, Hyper–V

UNIT – IV:

Cloud data centres – Energy efficiency in data centre – Mobile cloud computing service models – Collaboration with services and applications: CRM management – Project management – Email – on line database – calendar – schedules – Word Processing – Presentation – Spreadsheet – Databases – Desktop – Social Networks and Groupware

UNIT – V:

Cloud security – Security threats and solutions in clouds – Auditing protocols – dynamic auditing – storage security – Privacy preserving – Fully Homo–morphic Encryption – big data security – Cloud availability – DoS attacks – Fault tolerance management in cloud computing – Cloud computing in India

TEXT BOOK:

Anthony T. Velte, Toby J. Velte Robert Elsenpeter, ***Cloud Computing a Practical Approach***, TATA Mc–Graw – Hill, New Delhi, 2010

REFERENCE BOOKS:

1. Judith Hurwitz, Bloor.R, Kanfman. M, Halper.F, (2010), ***Cloud Computing for Dummies***, Wiley India Edition.
2. Gautam Shroff, (2010), ***Enterprise Cloud Computing***, Cambridge University press.
3. Ronald Krutz and Russell Dean Vines, (2010), ***Cloud Security,*** Wiley–India pvt. Ltd.

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. K. P. GNANESH

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSE63	**MACHINE LEARNING USING PYTHON**	**ELECTIVE – 2**	**5**	**–**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**VI**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course enables the students to understand and use the basic, history and features of python.

COURSE OBJECTIVES:

- Interpret the use of procedural statements like assignments, conditional statements, loops and function calls.
- Infer the supported data structures like lists, dictionaries and tuples in Python.
- Illustrate the application of matrices and regular expressions in building the Python programs.
- Discover the use of external modules in creating excel files and navigating the file systems.
- Describe the need for Object–oriented programming concepts 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	learn the Python libraries and tools	**Upto K3**
CO 2	learn Supervised Machine Learning Algorithms	**Upto K3**
CO 3	understand Unsupervised Learning and preprocessing	**Upto K3**
CO 4	get knowledge on Data and Engineering Features	**Upto K3**
CO 5	understand Model Evaluation and Improvement - Cross-Validation - Grid Search - Evaluation Metrics and Scoring	**Upto K3**

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

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MACHINE LEARNING USING PYTHON

UNIT I
Introduction - Knowing Your Task and Knowing Your Data - Python - scikit-learn - Installing scikit-learn - Essential Libraries and Tools - Supervised Learning - Classification and Regression - Generalization, Over fitting, and Under fitting.

UNIT II
Supervised Machine Learning Algorithms - k-Nearest Neighbors - Linear Models - Naive Bayes Classifiers - Decision Trees - Ensembles of Decision Trees - Kernelized Support Vector Machines - Neural Networks.

UNIT III
Unsupervised Learning and Preprocessing - Types of Unsupervised Learning - Challenges in Unsupervised Learning - Dimensionality Reduction, Feature Extraction, and Manifold Learning – Clustering.

UNIT IV
Representing Data and Engineering Features - Categorical Variables - Binning, Discretization, Linear Models, and Trees - Interactions and Polynomials - Univariate Nonlinear Transformations - Automatic Feature Selection – Utilizing Expert Knowledge.

UNIT V
Model Evaluation and Improvement - Cross-Validation - Grid Search - Evaluation Metrics and Scoring.

TEXT BOOK
Andreas C. Müller, Sarah Guido, Introduction to Machine Learning with Python, O'Reilly Media, Inc, October 2016

Unit I – Chapters 1,2	Unit II – Chapter - 2	Unit III – Chapter 3
Unit IV – Chapter 4	Unit V – Chapter 5	

REFERENCE BOOKS
1. Jeremy Watt , Reza Borhani, Aggelos K. Katsaggelos, *Machine Learning Refined - Foundations, Algorithms, and Applications* , Second edition, Cambridge University Press , 2020.
2. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar**,** *Foundations of Machine Learning,* Second Edition, The MIT Press, 2018
3. John Paul Mueller and Luca Massaron, *Machine Learning (in Python and R) For Dummies,* John Wiley & Sons, 2016

DIGITAL TOOL:
1. https://www.w3schools.com/python/python_ml_getting_started.asp
2. https://www.geeksforgeeks.org/machine-learning-with-python/
3. https://www.tutorialspoint.com/machine_learning_with_python/index.htm
4. https://in.coursera.org/learn/machine-learning-with-python

Mapping of CO with PSO

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

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

COURSE DESIGNER: Dr. V. K.VIJAYAKUMAR

Passed in the BOS Meeting held on 04/03/2023   Signature of the Chairman

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSE64	CYBER SECURITY	ELECTIVE – 2	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	VI	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course enables the students to learn the fundamentals of cyber security and equip students to protect and defend against cyber threats and expose students to governance, regulatory, legal, economic, environmental, social and ethical contexts of cyber security. Expose students to responsible use of online social media networks

COURSE OBJECTIVES:

- To provide a comprehensible introduction about the basic concepts of Internet, world wide web, cyber security
- To inculcate knowledge about cyber crime, offenses and laws
- To give knowledge about social media, privacy and security
- To expose with Ecommerce, digital payments and RBI guidelines
- To exposed with basic security tools available to secure computer and mobile devices

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 Cyber security and issues and challenges associated with it.	Upto K3
CO 2	understand the cyber crimes, their nature, legal remedies and as to how report the crimes through available platforms and procedures	Upto K3
CO 3	appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms	Upto K3
CO 4	understand the basic concepts related to E–Commerce and digital payments. They will become familiar with various digital payment modes and related cyber security aspects, RBI guidelines and preventive measures against digital payment frauds.	Upto K3
CO 5	understand the basic security aspects related to Computer and Mobiles. They will be able to use basic tools and technologies to protect their devices	Upto K3

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

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CYBER SECURITY

UNIT – I: **Introduction to Cyber security**

Defining Cyberspace and Overview of Computer and Web–technology, Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security

UNIT – II: **Cyber Crime and Cyber Law**

Classification of cyber crimes, Common cyber crimes– cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus–operandi , Reporting of cyber crimes, Remedial and mitigation measures, Legal perspective of cyber crime, IT Act 2000 and its amendments, Cyber crime and offences, Organisations dealing with Cyber crime and Cyber security in India, Case studies

UNIT – III: **Social Media Overview and Security**

Introduction to Social networks. Types of Social media, Social media platforms, Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media, Case studies

UNIT – IV: **E – Commerce and Digital Payments**

Definition of E– Commerce, Main components of E–Commerce, Elements of E– Commerce security, E–Commerce threats, E–Commerce security best practices, Introduction to digital payments, Components of digital payment and stake holders, Modes of digital payments– Banking Cards, Unified Payment Interface (UPI), e–Wallets, Unstructured Supplementary Service Data (USSD), Aadhar enabled payments, Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in unauthorised banking transactions. Relevant provisions of Payament Settlement Act, 2007.

UNIT – V: **Digital Devices Security, Tools and Technologies for Cyber Security**

End Point device and Mobile phone security, Password policy, Security patch management, Data backup, Downloading and management of third party software, Device security policy, Cyber Security best practices, Significance of host firewall and Ant–virus, Management of host firewall and Anti–virus, Wi–Fi security, Configuration of basic security policy

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TEXT BOOKS:
1. *Cyber Crime Impact in the New Millennium*, by R. C Mishra ,Auther Press. Edition 2010. 2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by SumitBelapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
2. *Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives* by SumitBelapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
3. *Security in the Digital Age: Social Media Security Threats and Vulnerabilities* by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001)

REFERENCE BOOKS:
1. *Electronic Commerce* by Elias M. Awad, Prentice Hall of India Pvt Ltd.
2. *Cyber Laws: Intellectual Property & E–Commerce Security* by Kumar K, Dominant Publishers
3. *Network Security Bible*, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
4. *Fundamentals of Network Security* by E. Maiwald, McGraw Hill.

DIGITAL TOOLS(including moocs, swayam, nptel):
1. **https://www.tutorialspoint.com/data_communication_computer_network/index.htm**
2. **https://www.javatpoint.com/computer–network–tutorial**

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. D. V. JEYANTHI

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UCSEV1	**PROJECT & VIVA-VOCE**	**ELECTIVE – 3**	**-**	**5**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
III	**VI**	**40**	**60**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:

The Project & Viva-Voce gives an exposure about software development and documentation.

COURSE OBJECTIVES:
- To give exposure on software development and maintenance
- To train students, a systematic way of Report writing
- To practice students for project presentation

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	learn to do Planning and write software requirements specifications of a software project	**Upto K3**
CO 2	learn to do architectural & detailed design of a software project	**Upto K3**
CO 3	learn to write the source code of the software project	**Upto K3**
CO 4	learn to do unit testing, debugging, Integration & Acceptance testing of the software project	**Upto K3**
CO 5	learn to write the report of a software project	**Upto K3**

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

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PROJECT & VIVA-VOCE

UNIT- I: Analysis Phase

To formulate and formalize the system's requirements. This is accomplished by establishing what the system is to do, according to the requirements and expectations of the system's end users.

UNIT- II: Design Phase

To transform the requirements into complete and detailed system design specifications

UNIT- III: Implementation Phase

It is concerned with translating software design specification into the source code

UNIT- IV: Testing Phase

Four main stages of testing can be performed on any build. They are the; **Unit Tests, Integration Tests, System Tests, and Acceptance Tests**

UNIT- V: Report Writing Phase

Project Report writing deals with reports about Analysis, Design, Coding and testing phases

TEXT BOOKS:

1. *Software Engineering Concepts* – Richard E.Fairley – Tata McGraw - Hill Publishing Company Limited, New Delhi 1997.
2. *Software Project Management* – Mike Cotterell Andbob Hughes, International Thomson Publishing
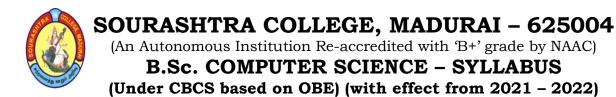
REFERENCE BOOKS:

1. *Software Engineering* – K.L.James, Prentice Hall of India Pvt. Ltd., New Delhi – 2009.
2. *Software Engineering* – Pressman.
3. Rajib Mall, *Fundamentals of Software Engineering*,3rd Edition, Prentice Hall of India Private Limited, 2008

DIGITAL TOOLS:

1. **https://acecollege.in/CITS_Upload/Downloads/Books/1035_File.pdf**
2. **https://gacbe.ac.in/pdf/ematerial/18BIT41C-U1.pdf**
3. **https://ddegjust.ac.in/studymaterial/mca-3/ms-12.pdf**

Mapping of CO with PSO

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

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

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RULES & REGULATIONS:

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 students must submit 3 copies (2 copies for 2 students + 1 copy for the Dept.) of their Project Report two weeks before the external examination.
7. The maximum marks for the external examination 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**

COURSE DESIGNER: Dr. V. K. VIJAYAKUMAR