SOURASHTRA COLLEGE, MADURAI – 625004
(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)
DEPARTMENT OF COMPUTER APPLICATIONS
CERTIFICATE COURSE IN FUNDAMENTALS OF CYBER SECURITY AND SOFTWARE TESTING – SYLLABUS
(Under CBCS based on OBE) (For those admitted during 2024 – 2025 and after)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24CCAC11	FUNDAMENTALS OF CYBER SECURITY	CERTIFICATE COURSE	20 Hrs.	-	-

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	-	-	100	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:

The course deals with security concepts in information, business continuity, access control, threats and attacks of data, system hardness and security awareness training.

COURSE OBJECTIVES:

Security Principles - Business Continuity(BC) Disaster Recovery(DR) & incident Response Concepts- Access Controls Concepts - Types / Threats and attacks / Infrastructure - Data Security / System Hardening / Security awareness training

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 security concepts and principles	Upto K3
CO 2	understand the concept of Business Continuity, Disaster Recovery and Incident Response concepts	Upto K3
CO 3	access control concepts like physical and logical access	Upto K3
CO 4	analyze the types of Network Security, network threats and attacks, network security infrastructure.	Upto K3
CO 5	identify the data security, system hardening, best practice security policies, security awareness training	Upto K3

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

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FUNDAMENTALS OF CYBER SECURITY

UNIT – I: SECURITY PRINCIPLES

1.1. Understand the security concepts of information assurance
- Confidentially
- Integrity
- Availability
- Authentication (e.g. methods of authentication, multi-factor authentication(MFA))
- Non-repudiation
- Privacy

1.2. Understand the risk management process
- Risk Management(e.g. risk priorities, risk tolerance)
- Risk Identification, assessment and treatment

1.3. Understand security controls
- Technical Controls
- Administrative Controls
- Physical Controls

1.4. Understand ISC2 Code of Ethics
- Professional Code of Contact

1.5. Understand governance processes
- Policies
- Procedures
- Standards
- Regulation and laws

UNIT –II: BUSINESS CONTINUITY (BC) DISASTER RECOVERY (DR) & INCIDENT RESPONSE CONCEPTS

2.1. Understand business continuity (BC)

- Purpose
- Importance
- Components

2.2. Understand Disaster recovery (DR)

- Purpose
- Importance
- Components

2.3. Understand incident response

- Purpose
- Importance
- Components

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UNIT – III: ACCESS CONTROLS CONCEPTS

3.1. Understand physical access controls

- Physical Security Controls(e.g. badge system, gate entry, environment design)
- Monitoring (e.g. Security guards, closed circuit television (CCTV) alarm systems logs)
- Authorized versus unauthorized personnel.

3.2. Understand logical access controls

- Principles of latest privilege
- Segregation of duties
- Discretionary access control(DAC)
- Mandatory access control(MAC)
- Role based access control(RBAC)

UNIT – IV: TYPES / THREATS AND ATTACKS / INFRASTRUCTURE

4.1 Understand Types of Network Security.

- Types of network security.
- Email Security, Network Segmentation, Access Control, Sandboxing.
- Firewall, Data Loss Prevention, Intrusion Prevention System.
- Cloud Network Security, Web Security.
- Benefits of Network Security.

4.2 Understand network threats and attacks

- Types of threats (e.g. distributed denial of services(DDoS0 virus, worm Trojan, man-in-the middle(MITM), side channel)
- Identification (e.g. intrusion detection system(IDS) host based intrusion detection system (HIDS), network intrusion detection system(NIDS))
- Prevention(e.g. antivirus, scans, firewalls, intrusion prevention system(IPS))

4.3 Understand network security infrastructure

- On-premises (e.g. poser data

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UNIT –V: DATA SECURITY / SYSTEM HARDENING / SECURITY

AWARENESS TRAINING

5.1. Understand data security

- Encryption(e.g. symmetric, asymmetric, haping)
- Data handling (e.g. destruction, retraction, classification, labeling
- Logging and monitoring security events

5.2. Understand system hardening

- Configuration management(e.g. baseliness, updates, patches)

5.3 Understand best practice security policies

- Data handling policy
- Password policy
- Acceptable use policy (AUP)
- Bring your own devices(BYOD)policy
- Changes management policy(e.g. documention, approval, rollback)
- Privacy policy

5.4 Understand security awareness training

- Purpose concepts(e.g. social engineering password protection)
- Importance

TEXT BOOK: Course Material Provided

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. S.E. HEMAPRIYA

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24CCAC12	FUNDAMENTALS OF SOFTWARE TESTING	CERTIFICATE COURSE	20 Hrs.	-	-

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	-	-	100	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:

This course deals with fundamental of testing, developing test cases, test techniques, test management and control defects.

COURSE OBJECTIVES:

- Fundamentals of software testing—key concepts, context, risk, goals, process, and people issues
- Lifecycle testing—relationship of testing to development, including different models, verification and validation, and types of testing
- Test levels—system, acceptance, unit, and integration testing
- Test design techniques—black-box test methods, white-box testing, and exploratory testing
- Static testing—reviews, inspections, and static analysis tools
- Test management—team organization, key roles and responsibilities, test approach and planning, configuration management, defect classification and tracking, test reporting
- Testing tools—selection, benefits, risks, and classifications

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 Testing Fundamentals of Importance, Seven Fundamentals, SDLC Vs STLC	Upto K3
CO 2	analyze the various types of testing	Upto K3
CO 3	understand the concepts of Test Case Developments	Upto K3
CO 4	analyse the various testing technique concepts	Upto K3
CO 5	understand the concept of Test Management & Control and Defects	Upto K3

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

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FUNDAMENTALS OF SOFTWARE TESTING

UNIT – I: TESTING FUNDAMENTALS
- Software Testing - Introduction - Importance
- Seven Fundamental Principles of Testing
- SDLC Vs STLC
- Software Testing Life Cycle - STLC explained

UNIT – II: TYPES OF TESTING
- Manual Testing Tutorials for Beginners
- Automation Testing
- Unit Testing
- Integration Testing
- System Testing
- Smoke and Sanity Testing
- What is Regression Testing?
- Non - Functional Testing

UNIT – III: TEST CASE DEVELOPMENTS
- First Steps Test Case Development
- Test Scenario
- Test Case Specifications
- Test Basis
- Traceability Matrix

UNIT – IV: TESTING TECHNIQUES
- Equivalence Partitioning & Boundary Value Analysis
- Decision Table Testing
- State Transition Diagram
- Use Case Testing
- Testing Review

UNIT –V: TEST MANAGEMENT & CONTROL AND DEFECTS
- Estimation
- Test Plan
- Defects
- Defect Life Cycle
- Testing Tool

TEXT BOOK: Course Material Provided

Mapping of CO with PSO

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

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

COURSE DESIGNER: Prof. O.K. HARIHARAN

Passed in the BoS Meeting held on 09/03/2024   **Signature of the Chairman**