| Course Code | Title |
|---|---|
| **21U3DFE612** | **Discipline Specific Elective Paper III: Cyber Crime** |
| **Semester: VI** | **Credits: 4**    **CIA:50 Marks**    **ESE: 50 Marks** |

**Course Objective:**
- To explain the concept of cybercrime and various types of attacks
- To explain the impact of cybercrime on society

**Course Outcome:**

| | |
|---|---|
| **CO1** | Understand the concept of cybercrime and emerging crime threats and attacks in cyberspace |
| **CO2** | Classify the main typologies, characteristics, activities, actors and forms of cybercrime, including the definitional, technical and social aspects. |
| **CO3** | Evaluate behavioral aspects of the various type of attacks in cyberspace. |
| **CO4** | Analyze the impact of cybercrime crime on businesses and individuals and discuss the impact of cybercrime on society |
| **CO5** | Analysis the cyber crime with technology |

**Offered by: DCFS**

**Course Content**                                  **Instructional Hours / Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Cyber Crime - Overview** Cyber Crime- Overview, Internal and External Attacks, Attack Vectors. Cybercrimes against Individuals – E-mail spoofing and online frauds, Phishing and its forms, Spamming, Cyber-defamation, Cyber stalking, Cyber Bullying and harassment, Computer Sabotage, Pornographic offenses, Password Sniffing. Key loggers and Screen loggers. Cyber Crimes against Women and Children. | 1,2 | 1,3 |
| | **Instructional Hours** | | **18** |
| II | **Cybercrime against organization:** Cybercrime against organization – Unauthorized access of computer, Password Sniffing, Denial-of-service (DOS) attack, Backdoors and Malwares and its types, E-mail Bombing, Salami Attack, Software Piracy, Industrial Espionage, Intruder attacks. | 2 | 4,5 |
| | **Instructional Hours** | | **18** |
| III | **Security policies violations:** Security policies violations, Crimes related to Social Media, ATM, Online and Banking Frauds. Intellectual Property Frauds. Cyber Crimes against Women and Children. | 2 | 6,7 |
| | **Instructional Hours** | | **18** |
| IV | **Global perspective on cybercrimes:** A global perspective on cybercrimes, Phases of cyber-attack – Reconnaissance, Passive Attacks, Active Attacks, Scanning, Gaining Access, Maintaining Access, Lateral movement and Covering Tracks. Detection Avoidance, Types of Attack vectors, Zero-day attack, Overview of Network based attacks. | 2 | 8 |

| | | Instructional Hours | 18 |
|---|---|---|---|
| V | **Cybercrime and cloud computing:** Cybercrime and cloud computing, Different types of tools used in cybercrime, Password Cracking – Online attacks, Offline attacks, Remote attacks, Random Passwords, Strong and weak passwords. Viruses and its types. Ransomware and Crypto currencies. DoS and DDoS attacks and their types. Cybercriminal syndicates and nation state groups. | 2 | 20 |
| | | Instructional Hours | 18 |
| | | Total Hours | 90 |

**Text Book(s)**
1. Nina Godbole and SunitBelapore; "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley Publications, 2011.
2. Shon Harris, "All in One CISSP, Exam Guide Sixth Edition", McGraw Hill, 2013.
3. Bill Nelson, Amelia Phillips and Christopher Steuart; "Guide to Computer Forensics and Investigations" – 3rd Edition, Cengage, 2010 BBS.

**Reference Book(s)**
1. William Stallings; "Cryptography and Network Security: Principles and Practices", Fifth Edition, Prentice Hall Publication Inc., 2007.
2. Atul Jain; "Cyber Crime: Issues, Threats and Management", 2004.
3. Majid Yar; "Cybercrime and Society", Sage Publications, 2006.
4. Michael E Whiteman and Herbert J Mattord; "Principles of Information Security", Vikas Publishing House, New Delhi, 2003. 8. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002
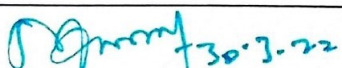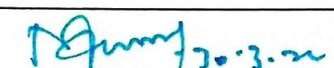
## Tools for Assessment (25 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| P.K.mang Kumar | P.K.mang Kumar | Dr.K.Selvavinayaki | |

Convenor
CDC

30 MAR 2022

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFP101 | Core Paper III Practical in Python Programming | | |
| Semester I | Credits: 4 | CIA : 50Marks | ESE: 50 Marks |

**Course Objective:**

To introduce the concepts of python programming constructs.

**Course Outcomes (CO):**

| CO1 | To develop proficiency in creating based applications using the Python programming Language. |
|---|---|
| CO2 | To be able to understand the various data structures available in Python programming language and apply them in solving problems. |
| CO3 | To be able to do testing and debugging of code written in Python. |
| CO4 | Analyze the different types of logics in python |
| CO5 | Able to create a software by using python |

**Offered by: DCFS**

**Course Content**                                    **Instructional Hours / Week:4**

| S. No. | List of Practical |
|---|---|
| 1 | Write a python program to find the square root |
| 2 | Write a python program to find the largest among three numbers. |
| 3 | Write a user-defined function in a python to check whether the given number is prime or not. |
| 4 | Write a python program to check Armstrong number. |
| 5 | Write a python program to find the sum of elements in an array using functions |
| 6 | Write a python program to print the list of numbers using range and for loop |
| 7. | Write a python program to find the factorial of a number. |
| 8 | Write a python program to find the frequency of characters occurring in a string |
| 9 | Write a python program to let user enter some data in string and then verify data and print |
| 10. | Write a python program in which a function is defined and calling that function to print *Python Programming* |
| 11 | Write a python program in which a function (with single string parameter) is defined and calling that function to print the string parameters given to function. |
| 12 | Write a python program in which a class is define, then create object of that class and call simple print function define in class. |
| | **Total Hours : 60** |

**Tools for Assessment (50 Marks)**

| Application of Logic | e-Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

**Mapping**

| CO/PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | H | H | H | H | M | L | M | L | H |
| CO2 | M | M | M | M | H | M | M | M | M | M | H | M | H |
| CO3 | H | H | M | H | M | M | L | H | H | L | L | H | L |
| CO4 | M | H | L | M | H | H | H | M | H | L | M | M | H |
| CO5 | M | M | H | H | M | H | M | H | H | L | L | M | M |

H-High, M-Medium, L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| Dama 30/3/22 | | | |
| Dr J. RAMAPRABHA | P.K.manojKumar | Dr. K Selvavinayaki | |
| | | Convenor CDC | 30 MA 2022 |

| Course Code | Title | | |
|---|---|---|---|
| **21U3DFP202** | **Core Paper VI - Operating Systems and Security Lab** | | |
| **Semester : II** | **Credits : 4** | **CIA : 50 Marks** | **ESE : 50 Marks** |

**Course Objective:**

To understand the importance of Operating Systems, its functionalities to manage resources of Computer and Peripherals.

**Course Outcomes:**

| CO1 | Understand the fundamentals of Operating system |
|---|---|
| CO2 | Understand and implement different types of Operating System |
| CO3 | Experimenting virtual box |
| CO4 | Examining the security tools |
| CO5 | Understand and implement different types of security tools |

**Offered by: DCFS**

**Course Content**        **Instructional Hours / Week : 4**

| S. No. | List of Practical |
|---|---|
| | **Implementation of Installation** |
| 1 | Installation of Windows Operating system |
| 2 | Installation of Linux Operating system |
| 3 | Installation of Multiple OS on a single machine |
| 4 | Installation of VM Virtual Box |
| | **Implementation of Security Tools** |
| 5 | Hex analysis using Hex Editors |
| 6 | Registry Editing and Viewing using native tools of OS |
| 7 | Hash code generation, comparison of files using tools like HashCal |
| 8 | File analysis using Sleuthkit |
| 9 | Graphical File analysis and Image Analysis |
| 10 | Email Analysis involving Header check, tracing route, performing a check on Spammail and Non-Spam mail. |
| | **Total Hours : 60** |

**Reference Book:**

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 9th Edition, John Wiley and Sons Inc., 2012.

**Recommended Tools to be used:** Windows and Linux Operating Systems and Open source Tools

**Tools for Assessment (50Marks)**

| Application of Logic | e-Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H – High; M- Medium; L - Low

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| Dama 30/3/22 | 30.3.22 | | |
| Dr J. RAMAPRABHA | P.K.manojKumar | Dr. K Selvavinayaki | |
| | | Convenor CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFP303 | **Core Paper IX Practical in Computer Networks** | | |
| **Semester: III** | **Credits: 4** | **CIA : 50    Marks** | **ESE: 50    Marks** |

**Course Objective:**

To enable the students to develop problem solving skills and programming ability in Computer Neworks

**Course Outcomes (CO):**

| CO1 | To understand about port scanning |
|---|---|
| CO2 | To apply the enumeration |
| CO3 | To apply the vulnerability scanning |
| CO4 | To know about wireless network attacks |
| CO5 | To know about website mirroring |

**Offered by: DCFS**

Course Content                                    Instructional Hours / Week: 6

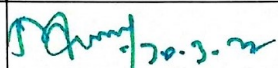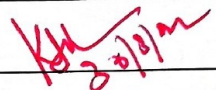| S. No. | List of Practical |
|---|---|
| 1 | Port Scanning using NMap, Superscan |
| 2 | Enumeration-SNMP, SMTP, Unix/Linux, LDAP, NTP |
| 3 | Monitoring Live Network capturing packets and analyzing over the live network using Wireshark |
| 4 | Vulnerability Scanning |
| 5 | Firewall, Intrusion detection and Honey pots |
| 6 | Password Guessing and Password cracking |
| 7. | Buffer overflow attacks |
| 8 | Monitoring Network Communication: Working with Trojans, Backdoors and sniffer |
| 9 | Client side script injection to a web application using XSS |
| 10. | Wireless Network attacks, Bluetooth attacks |
| 11 | Website mirroring using HTTrack and hosting on a Local Network |
| 12 | Penetration testing and justification of penetration testing through risk analysis, SQL injection Attacks |
| | **Total Hours : 90** |

**Tools for Assessment (50 Marks)**
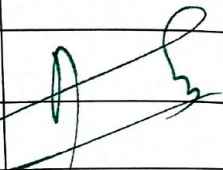
| Application of Logic | E- Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

**Mapping CO and PO**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| B.KARTHIKEYAN   30/3/22 | P.K.mangkmm | Dr.K.Selvavinayaki   Convenor) CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFP304 | Core Paper X -  Practical in Java Programming | | |
| Semester: III | Credits: 4 | CIA: 50 Marks | ESE: 50 Marks |

To enable the students to develop problem solving skills and programming ability in Java Language

**Course Outcomes (CO):**

| CO1 | Apply the concepts of string, array and multiple inheritance. |
|---|---|
| CO2 | Implement multithreading, exception handling concepts. |
| CO3 | Apply the concept of package. |
| CO4 | Develop the programs for the concepts of Applets and AWT. |
| CO5 | Implement the concept of file operations. |

**Offered by: DCFS**

**Course Content**            **Instructional Hours / Week: 5**

| S. No. | List of Practical |
|---|---|
| 1. | Write a Java Applications to extract a portion of a character string and print the extracted string |
| 2. | Write a Java program to insert an element (specific position) into an array. |
| 3. | Write a Java Program to implement the concept of multiple inheritance using Interfaces |
| 4. | Write a program to implement the concept of Exception Handling using predefined exception. |
| 5. | Write a Java Program to create an Exception called payout-of-bounds and throw the exception. |
| 6. | Write a Java Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them. |
| 7. | Write a Java Program to draw several shapes in the created windows. |
| 8. | Write a Java program to import classes from user defined package and creating package. |
| 9. | Write a Java Program to create a frame with four text field's name, street, city and pin code with suitable tables. Also add a button called my details. When the button is clicked its corresponding values are to be appeared in the text fields. |
| 10. | Write a Java Program to create a frame to implement checkbox group. |
| 11. | Write a Java Program to read the data from the file using DataInputStream. |
| 12. | Write a Java Program to write the data to the existing file using BufferedOutputStream. |
| | **Total Hours : 75** |

**Tools for Assessment (50 Marks)**

| Application of Logic | E- Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

**Mapping CO and PO**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *Jama 30/3/22* | *JObm 30.3.22* | *YW 30/3* | |
| Dr J. RAMAPRABHA | P.K.ManojKumar | Dr. K Selvavinayaki<br>Convenor<br>CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFP405 | Core Paper XIII - Cyber Forensic Lab | | |
| **Semester: IV** | **Credits: 3** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

1. Understand the cyber forensic issues
2. Apply various Intrusion detection and Testing
3. Processing and Analyze Crime and Incident Scenes

**Course Outcomes (CO):**

| CO1 | To identify network packet capturing issues over live network. |
|---|---|
| CO2 | Understand Software Firewall and Hardware Firewall Intrusion detection. |
| CO3 | Implement incident response methodologies. |
| CO4 | Analyze data collection and investigation methodologies |
| CO5 | Apply Crime and Incident Scenes Process. |

**Offered by: DCFS**

**Course Content**                    **Instructional Hours / Week: 6**

| S.NO | List of Practical |
|---|---|
| 1. | Live Network capturing packets and analyzing over the live network |
| 2. | Vulnerability Scanning |
| 3. | Software Firewall and Hardware Firewall Intrusion detection and Testing |
| 4. | Incident Response |
| 5. | Computer Investigation and Data collection |
| 6. | Processing Crime and Incident Scenes |
| 7. | Email Investigation |
| 8. | Mobile device investigation. |
| | **Total Hours          90** |

## Tools for Assessment (50 Marks)

| Application of Logic | E- Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

## Mapping CO and PO

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *Llama* 30/3/22 | *signature* 30.3.22 | *signature* | *signature* |
| Dr J. RAMAPRABHA | P.K.manojKumar | Dr.K.Selvavinayaki<br>Convenor<br>CDC | 30 MA 2022 |

| Course Code | Title |
|---|---|
| 21U3DFP506 | **Core Paper XVII - Penetration and Vulnerability Testing Lab** |
| **Semester: V** | **Credits: 3**     **CIA: 20 Marks**     **ESE: 30 Marks** |

**Course Objective:**

1. Understand the Vulnerability Scanning and accessesment
2. Apply various Password Guessing and Password cracking Techniques.
3. Processing with Trojans, Backdoors and sniffer

**Course Outcomes (CO):**

| CO1 | Understand the Vulnerability Scanning and accessesment |
|---|---|
| CO2 | Understand network monitoring and attacks. |
| CO3 | Apply various Password Guessing and Password cracking Techniques. |
| CO4 | Analyze Penetration testing. |
| CO5 | Evaluate Website mirroring. |

**Offered by: DCFS**

**Course Content**           **Instructional Hours / Week:4**

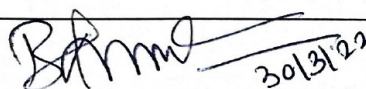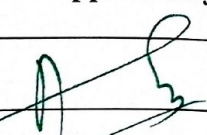| S.NO | List of Practical |
|---|---|
| 1. | Vulnerability Scanning |
| 2. | Vulnerability assessment |
| 3. | Honey pots detection |
| 4. | Password Guessing and Password cracking |
| 5. | Buffer overflow attacks |
| 6. | Monitoring Network Communication: Working with Trojans, Backdoors and sniffer |
| 7. | Client side script injection to a web application using XSS |
| 8. | Wireless Network attacks, Bluetooth attacks |
| 9. | Website mirroring using HTTrack and hosting on a Local Network |
| 10. | Penetration testing and justification of penetration testing through risk analysis, SQL injection Attacks |
| | **Total Hours  60** |

## Tools for Assessment (40 Marks)

| Application of Logic | e-Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 8 | 10 | 10 | 6 | 50 |

## Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *signature* 30/3/22 | *signature* 70.3.22 | *signature* | *signature* |
| B. KARTHIKEYAN | P. K. mangkun | Dr. K. Selvavinayaki<br>Convenor<br>CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U4DFS402 | Skill Based Paper – I - Social Media Forensics | | |
| Semester: IV | Credits: 3 | CIA: 30Marks | ESE: 45 Marks |

**Course Objective:**

1. Understand the need of secure system.
2. Study about various attacks and threads.
3. Apply secure coding Techniques.

**Course Outcomes (CO):**

| CO1 | Understand the network concepts |
|---|---|
| CO2 | Understand network centrality. |
| CO3 | Understand and Apply various network community. |
| CO4 | Analysis various contagion and threshold models |
| CO5 | Analysis of various social network functionality. |

**Offered by: DCFS**

**Course Content**          **Instructional Hours / Week:4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | Networks- Concepts: nodes, edges, adjacency matrix, one and two-mode networks, node degree random network models. Erdos-Renyi and Barabasi-Albert- Concepts: connected components, giant component, average shortest path, diameter, breadth- and Diffusion. first search, preferential attachment | 1 | 1 |
| | **Instructional Hours** | | **12** |
| II | Network centrality- Concepts: Betweenness, closeness, eigenvector centrality (+ Page Rank), network centralization | 1 | 2 |
| | **Instructional Hours** | | **12** |
| III | Community- Concepts: clustering, community structure, modularity, overlapping , communities Small world network models, optimization, strategic network formation and search Concepts: small worlds, geographic networks, decentralized search | 1 | 1 |
| | **Instructional Hours** | | **12** |
| IV | Contagion, opinion formation, coordination and cooperation Concepts: simple contagion, threshold models, opinion formation, unusual applications of SNA | 1 | 3 |
| | **Instructional Hours** | | **12** |
| V | SNA and online social networks- Concepts: how services such as Facebook, LinkedIn, Twitter, Couch Surfing, etc. are using SNA to understand their users and improve their functionality | 1 | 5,6 |
| | **Instructional Hours** | | **12** |
| | **Total Hours** | | **60** |

**Text Book(s):**

1. John Scott, Social Network Analysis, 3rd Edition, SAGE, 2012.
2. Wouter de Nooy, Andrej Mrvar, Vladimir Batagelj, Exploratory Social Network Analysis with Pajek, 2nd Revised Edition, Cambridge University Press, 2011.

**Reference book(s):**

1. Patrick Doreian, Frans Stokman, Evolution of Social Networks, Routledge, 2013.
2. David Easley and Jon Kleinberg, Networks, Crowds, and Markets: Reasoning About a Highly Connected World, Cambridge University Press, 2010.

**Tools for Assessment (30 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|-------|--------|---------|------------|---------|------|-------|
| 4 | 4 | 7 | 5 | 5 | 5 | 30 |

Mapping

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
| 30.3.22 P. K. mang Kumar | 30.3.22 P. K. mang Kumar | Dr. K. Selvavinayaki | |

Convenor
CDC

3 0 MAR 2022

| Course Code | Title |
|---|---|
| 21U3DFP614 | **Skill Based Paper – IV  - Web Application Security Lab** |
| **Semester: VI** | **Credits: 3** | **CIA: 30 Marks** | **ESE: 45 Marks** |

**Course Objective:**

**To Understand and apply securities in web application**

**Course Outcomes (CO):**

| CO1 | To know about the different types of network components |
|---|---|
| CO2 | To know about the different types of firewalls |
| CO3 | To know about the different types of vulnerabilities for hacking a websites |
| CO4 | To analyze the issues in social websites |
| CO5 | To apply the security in websites |

**Offered by: DCFS**

**Course Content**                                   **Instructional Hours / Week:6**

| S.NO | List of Practical |
|---|---|
| 1. | Study of different wireless network components and features of any one of the Mobile Security Apps. |
| 2. | Study of the features of firewall in providing network security and to set Firewall Security in windows. |
| 3. | Steps to ensure Security of any one web browser (Mozilla Firefox/Google Chrome) |
| 4. | Study of different types of vulnerabilities for hacking a websites / Web Applications. |
| 5. | Analysis the Security Vulnerabilities of E-commerce services. |
| 6. | Analysis the security vulnerabilities of E-Mail Application |
| 7. | Analyze the security issues for your college website. |
| 8. | Analyze the security issue in facebook |
| 9. | Analyze the security issues in social web applications |
| 10. | Ensure the security in search engines |
| | **Total Hours         90** |

## Tools for Assessment (50 Marks)

| Application of Logic | E- Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|---|---|---|---|---|---|---|
| 5 | 5 | 5 | 6 | 6 | 3 | 30 |

## Mapping CO and PO

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| P. Jeya 30/3/22 P. JEYANTHI | P.K. Manojkumar 30.3.22 | Dr. K. Selvavinayaki Convenor CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| **21U3MIA101** | **Allied Paper I : Mathematics for Computer Science** | | |
| **Semester: I** | **Credits : 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**Common to B. Sc CS / IT / DCFS and BCA**

**Course Objective:**
   To enable the students to learn concepts of Statistical and Numerical Methods used in Computer applications.

**Course Outcome:** The Students should be able to

| CO1 | Implement the concepts of Matrices in Computer Science |
|---|---|
| CO2 | Solve simultaneous Linear Algebraic Equations |
| CO3 | Relate various formulae in Numerical Differentiation and Integration |
| CO4 | Evaluate the Measures of Central tendency and dispersion. |
| CO5 | Analyse Correlation and Regression |

**Offered by:** Mathematics

**Course Content**          **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Matrices:** Introduction – Types of Matrices –Matrix Operations - Determination – Inverse of a matrix – Rank of a Matrix. | 3 | 4 |
| | Eigen value Problems. | 1 | 4 |
| | **Instructional Hours** | | 15 |
| **II** | **System Of Simultaneous Linear Algebraic Equations:** Gauss elimination, Gauss Jordon, Gauss Jacobi Method, Gauss Seidal method. | 2 | 4 |
| | **Instructional Hours** | | 15 |
| **III** | **Numerical Differentiations:** Newton's forward Difference - Backward Difference – Stirling's formula. | 2 | 9 |
| | **Numerical Integration:** Trapezoidal Rule & Simpson's rule. | 2 | 9 |
| | **Instructional Hours** | | 15 |
| **IV** | **Measures of Central Tendency:** Mean Median and Mode – Empirical Relationship between mean, median and mode. | 3 | 7 |
| | **Measures of Dispersion:** Range, Quartile deviation and Standard deviation. | 3 | 8 |
| | **Instructional Hours** | | 15 |
| **V** | **Correlation:** Introduction, Scatter Diagram - Karl pearson's Correlation and Spearman's Rank Correlation. | 3 | 13 |
| | **Regression:** Regression equation of variables – Linear regression. | 3 | 13 |
| | **Instructional Hours** | | 15 |
| | **Total Hours** | | 75 |

| Course Code | Title |
|---|---|
| 21U4DFS502 | Skill Based Paper -III -FOSS LAB |
| **Semester: V** | **Credits: 3** | **CIA: 30 Marks** | **ESE: 45 Marks** |

**Course Objective:**

**To Understand and apply about the Free Open Source Software lab**

**Course Outcomes (CO):**

| CO1 | To learn about Linux administration |
|---|---|
| CO2 | To apply libre office |
| CO3 | To apply through SAMBA |
| CO4 | To know about bug tracking system |
| CO5 | To know about the terminal commands in Linux |

**Offered by: DCFS**

**Course Content**                                   **Instructional Hours / Week: 5**

| S.NO | List of Practical |
|---|---|
| 1. | Linux installation |
| 2. | Version control system |
| 3. | Bug tracking System |
| 4. | Package management System |
| 5. | Using Libre office |
| 6. | Using Samba |
| 7. | Simple program execution using Perl or Ruby |
| 8. | Linux Administration |
| 9. | Back up and restore procedures |
| 10. | Update packages in Linux using terminal commands |
| | **Total Hours**    **75** |

**Tools for Assessment (40 Marks)**

| Application of Logic | e-Program Creativity | Program Debugging | Test 1 | Test 2 | Observation Note Book | Total |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| 5 | 5 | 10 | 10 | 7 | 3 | 40 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| 8 30/3/22<br>(Dr. V. Kavitha) | 30.3.22<br>P. K. Manoj Kumar | 20/3/22<br>Dr. K Selvavinayaki<br>**Convenor**<br>**CDC** | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3CKC101 | Core Paper – I Python Programming | | |
| Semester: I | Credits: 4 | CIA : 50 Marks | ESE: 50 Marks |

**(Common to B. Sc. CS / A I M L / DS / IT / DCFS AND BCA)**

**Course Objective:**
To develop algorithmic solutions to Simple Computational problems using Python

**Course Outcomes:**

| | |
|---|---|
| CO1 | Understand the basics of Python and write simple Python program. |
| CO2 | Develop Python programs using control statement and list method. |
| CO3 | Apply tuples, Functions, Set iterators to develop simple applications. |
| CO4 | Apply Python Strings, multithreading and exceptions for problem solving |
| CO5 | Manipulate Files and perform Event Handling. |

**Offered by: DCFS**

**Course Content**　　　　　　　　　　　　　　**Instructional Hours / Week : 4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | Fundamentals of Python Programming: Introduction – Features – Applications – Installation-Sample Program-Python Virtual Machine- Memory management in Python-Comparison between C, Java and Python- Keywords, Identifiers, Statements, Indentation.<br><br>Syntax and Styles: Data Types – Literals – Variables-Operators and Expressions-Evaluation of Expression-Sample Programs. | 1 | 1,2 |
| | **Instructional Hours** | | **12** |
| II | Control Flow: If – While – For – Break – Continue-Pass-Entry Controlled Loop - Exit Controlled Loop – Counter Controlled Loop - Condition Controlled Loop - Nested Loop - Sample Programs.<br><br>Arrays-Sequences - Python Lists: Read a List type from a Keyboard-Accessing Elements of a List- Modifying Elements of a List - Basic Operations-Built-in Functions – Python List Methods. | 1<br>2 | 3,4,5<br>9 |
| | **Instructional Hours** | | **12** |
| III | Tuples-Need of a Tuple-Sequence of Unpacking – Methods –Sample programs. Dictionaries: Making a Dictionary-Basic Operations-Dictionary Operations – Sets-Iterators and Generators- Sample Programs<br><br>Functions: Defining Functions-Calling Functions-Passing Arguments-Keyword Arguments-Default Arguments-Required Arguments-Variable Length Arguments-Return Statements-Nesting of Passing Arguments-Anonymous Functions-Recursive Functions-Scope of Local and Global Variables. | 1 | 6,7,8 |
| | **Instructional Hours** | | **12** |

| | | | |
|---|---|---|---|
| **IV** | Strings in Python: Reading – Accessing – Modifying – Finding-Iterating through a String-Build-in String Functions. | 2 | 8 |
| | Errors and Exceptions-Multithreading | 1 | 14,15 |
| | **Instructional Hours** | **12** | |
| **V** | Files and Directory Access: Files and Streams-Opening a File-Reading/Writing Operations in a File-Other operations in a File-Iterating through a File-Splitting Words-Serialization and Deserialization. | 1 | 13,17 |
| | Events:Event Objects-Binding callbacks to events-Event names-Keyboard events-Mouse Events-Sample Programs | | |
| | **Instructional Hours** | **12** | |
| | **Total Hours** | **60** | |

**Text Books:**
1. Ch.Satyanaryana, M.Radhika Mani, B.N. Jagadesh, Python Programming, University Press Pvt. Ltd.2018.
2. Dr.S.A.Kulkarni, Problem Solving and Python Programming, 2nd Edition, Yesdee Publishing,2018

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

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Quiz | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| **8** | **8** | **10** | **8** | **8** | **8** | **50** |

**Mapping**

| CO \ PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | M | H | M | L | M | M | L | M | M | H | H | M | M |
| **CO2** | M | M | M | M | H | M | M | M | H | M | H | H | H |
| **CO3** | H | L | H | H | M | M | L | H | L | L | H | L | L |
| **CO4** | H | H | L | M | L | L | H | M | M | L | H | M | M |
| **CO5** | M | M | H | H | H | H | M | H | H | H | M | H | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *Hama* 30/3/22 | | | |
| Dr T. RAMAPRABHA | P.K.manojkumar | Dr. K.Selvavinayaki | |
| | | **Convenor** CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3CKC306 | **Core Paper VIII - Computer Networks** | | |
| **Semester: III** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

To make the students understand the concepts of Computer Networks.

**Course Outcomes:**

| CO1 | Describe the uses of networks. |
|---|---|
| CO2 | Illustrate the transmission technologies of networks |
| CO3 | Analyze the services and the features of the various layers of data networks |
| CO4 | Determine the network layer and understand how to control the congestion in the network. |
| CO5 | Apply the concept of presentation and network security. |

**Offered by: DCFS**

**Course Content**                                           **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction:** The Uses of Computer Networks - Network Hardware - Network Software - Reference Model | 1 | 1 |
| | **Instructional Hours  15** | | |
| **II** | **The Physical Layer:** Guided Transmission Media - Communication Satellites - The Public Switched Telephone Network - Structure of the telephone system - The Local Loops - S Modems - Wireless Local loops | 1 | 3 |
| | **Instructional Hours** | | 15 |
| **III** | **The Data Link Layer:** Data Link Layer Design Issues- Error Detection & Correction. The medium access control sub layer - The channel allocation problem. <br> **Bluetooth:** Bluetooth architecture - Applications. Data Link Layer **Switching:** Repeaters, Hubs, Bridges, Switches, routers, and gateways | 1 | 5 |
| | **Instructional Hours** | | 15 |
| **IV** | **The Network Layer:** Network Layer Design issues - Routing algorithms - The Optimality principle shortest path routing – flooding - distance vector routing - routing for mobile hosts. <br> **The Transport layer:** The transport services - service provided to the upper layers, transport service primitives. | 1 | 7 |
| | **Instructional Hours** | | 15 |
| **V** | **The Presentation Layer:** DNS - The Domain Name System - Electronic Mail. Architecture and service the user agent. <br> **Network Security:** Cryptography-Symmetric Key algorithms, DES - Public-key algorithms - Digital signature - symmetric key signature - public key signatures | 1 | 10 |
| | **Instructional Hours** | | 15 |

| | Total Hours | 75 |
|---|---|---|

**Text Book(s):**

1. Andrew S. Tanenbaum; Computer Networks, 4th Edition, PHI

**Reference Books:**

1. Achyut Godbole,Data Communication and Networks, 2007, TMH.
2. Uyless Black, Computer Networks: Protocols, Standards, and Interfaces, 2nd ed., PHI
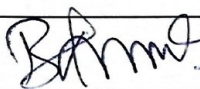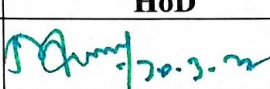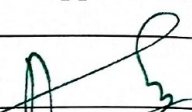
## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Group Discussion | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping PO and CO

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | M | M | H | M | M | H | H | M | M | H | H |
| CO2 | M | M | H | M | H | M | M | M | H | M | M | H | H |
| CO3 | H | H | M | H | M | L | H | L | M | L | H | L | M |
| CO4 | H | H | L | M | H | H | M | H | H | H | M | H | H |
| CO5 | H | M | M | H | M | M | H | M | M | M | H | M | M |

**H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| B.KARTHIKEYAN 30/3/'22 | P.K.mangkmm 7.0.3.22 | Dr.K.Selvavinayaki 30/3/22<br>Convenor<br>CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3CKE501 | Discipline Specific Elective Paper I: Blockchain Technology | | |
| Semester: V | Credits: 4 | CIA: 50 Marks | ESE:50 Marks |

**(Common to B. Sc CS / B. Sc IT / DCFS and BCA)**

**Course Objective:**

To understand the Block chain technology and explain about the Block chain technologyTechniques.

**Course Outcomes:**

| | |
|---|---|
| CO1 | Understand emerging abstract models for Block chain Technology. |
| CO2 | Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain. |
| CO3 | Understanding of the function of Block chain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable. |
| CO4 | Apply hyper ledger Fabric and Etheric platform to implement the Block chain Application. |
| CO5 | Understand the role of Block chain technology |

**Department offered: Computer Science**

**Course Content**                     **Instructional Hours/Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **INTRODUCTION TO BLOCKCHAIN** <br> Block chain- Public Ledgers, Blockchain as Public Ledgers -Bitcoin, Block Chain 2.0, Smart Contracts, Block in a Block Chain, Transactions-Distributed Consensus, The Chain and the Longest Chain -Cryptocurrency to Blockchain 2.0 - Permissioned Model of Block chain, Cryptographic -Hash Function, Properties of a hash function-Hash pointer and Merkle tree | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | **BITCOIN AND CRYPTO CURRENCY** <br> A basic crypto currency, Creation of coins, Payments and double spending, FORTH - the precursor for Bitcoin scripting, Bitcoin Scripts , Bitcoin P2P Network, Transaction in Bitcoin Network, Block Mining, Block propagation and block relay, Consensus introduction, Distributed consensus in open environments-Consensus in a Bitcoin network | 1 | 2 |
| | **Instructional Hours** | | **18** |
| III | **BITCOIN CONSENSUS** <br> Bitcoin Consensus, Proof of Work (PoW)- Hashcash PoW , Bitcoin PoW, Attacks on PoW ,monopoly problem- Proof of Stake- Proof of Burn - Proof of Elapsed Time - Bitcoin Miner, Mining Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Blockchains, Execute contracts- Consensus models for permissioned block chain-Distributed consensus in closed environment Paxos | 1 | 3 |
| | **Instructional Hours** | | **18** |

| IV | **DISTRIBUTED CONSENSUS**<br>RAFT Consensus-Byzantine general problem, Byzantine fault tolerant system-Agreement Protocol, Lamport- Shostak-Pease BFT Algorithm-BFT over Asynchronous systems, Practical Byzantine Fault Tolerance | 1 | 5 |
|---|---|---|---|
| | **Instructional Hours** | | **18** |
| V | **BLOCK CHAIN APPLICATIONS**<br>Internet of Things - Medical Record Management System - Blockchain in Government and Blockchain Security - Blockchain Use Cases – Finance | 1 | 7 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Book:**

1. Mastering Blockchain: Deeper insights into Decentralization, Cryptography, Bitcoin, and popular Blockchain frameworks by Bashir, Imran, 2017.

  **Unit I:** Sections: 1.1 to 1.6 (Chapter 1)
  **Unit II:** Sections: 2.1 to 2.5 (Chapter 2)
  **Unit III:** Sections: 3.1 to 3.8 (Chapter 3)
  **Unit IV:** Sections: 5.1 to 5.4, 5.8 (Chapter 5)
  **Unit V:** Sections: 7.1 to 7.5 (Chapter 7)

**Reference Book(s):**

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. "Bitcoin and cryptocurrency technologies: A Comprehensive Introduction". Princeton University Press, 2016.
2. Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015.
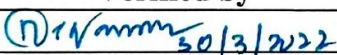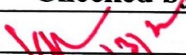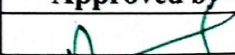
**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| **8** | **8** | **10** | **8** | **8** | **8** | **50** |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

  H-High; M-Medium; L-Low.

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| *(signature)*<br>D&. N. KAVINM. | *(signature)* 30/3/2022<br>Dr. N. KAVINM | *(signature)*<br>Dr. K. Selvavinayaki<br>**Convenor**<br>CDC | *(signature)*<br>3 0 MAR 2022 |

| Course Code | Title |
|---|---|
| **21U3CKE502** | **Discipline Specific Elective Paper I: Next Generation Networks** |
| **Semester: V** | **Credit: 4** | **CIA : 50 Marks** | **ESE : 50 Marks** |

**(Common to B. Sc CS / B. Sc IT / DCFS and BCA)**

**Course Objective:**

To learn the technical, economic and service advantages of next generation networks, analyse the evolution of technologies of 4G and beyond to explore the NGN framework catering services of end user with QoS provisioning.

**Course Outcome:**

| CO1 | Describe the issues and challenges of wireless domain in future generation network design |
|---|---|
| **CO2** | Explain the evolution of technologies of 4G and beyond |
| **CO3** | Explore the LTE concepts and technologies |
| **CO4** | Outline the process of integrating SDN with LTE |
| **CO5** | Explain the NGN architectures, management and standardizations |

**Offered by: Computer Applications**

**Course Content**                          **Instructional Hours/Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **INTRODUCTION:** Evolution of public mobile services - motivations for IP based services, Wireless IP network architecture –3GPP packet data network architecture. Introduction to next generation networks - Changes, Opportunities and Challenges, Technologies, Next Generation Society, future Trends. | 2 | 1,2 |
| | **Instructional Hours** | | **18** |
| **II** | **4G AND BEYOND**: Introduction to LTE-A –Requirements and Challenges, network architectures -mobility management, resource management, services, channel -logical and transport channel mapping, downlink/uplink data transfer, MAC control element, PDU packet formats, scheduling services, random access procedure. | 1 2 | 3 3,4 |
| | **Instructional Hours** | | **18** |
| **III** | **SDMN-LTE INTEGRATION:**SDN paradigm and applications, SDN for wireless-challenges, Leveraging SDN for 5G network Ubiquitous connectivity-mobile cloud-cooperative cellular network-restructuring mobile networks to SDN-SDN/LTE integration benefits. | 1 | 4,5 |
| | **Instructional Hours** | | **18** |

| | | | |
|---|---|---|---|
| **IV** | **NGN ARCHITECTURE**: Evolution towards NGN-Technology requirements, NGN functional architecture- Transport stratum, service stratum, service/ content layer and customer terminal equipment function. NGN entities, Network and Service evolution - fixed, mobile, cable and internet evolution towards NGN. | 1 2 | 4 6 |
| | | **Instructional Hours** | **18** |
| **V** | **NGN MANAGEMENT AND STANDARDIZATION**: NGN requirements on Management-Customer, third party, Configuration, Accounting, performance, device and information management. Service and control management- End-to-End QoS and security. ITU and GSI-NGN releases, ETSI-NGN concept and releases, NGMN alliance and NGMN. | 1 | 7,8,9 |
| | | **Instructional Hours** | **18** |
| | | **Total Hours** | **90** |

**Text Books:**
   1. Jingming Li Salina, Pascal Salina "Next Generation Networks-perspectives and potentials" Wiley, January 2008.
   2. Thomas Plavyk, ―Next generation Telecommunication Networks, Services and Management, Wiley & IEEE Press Publications, 2010

**Reference Book:**
1. Madhusanga Liyanage, Andrei Gurtov, Mika Ylianttila, "Software Defined Mobile Networks   beyond LTE Network Architecture", Wiley, June 2015.

**Tools for Assessment (25 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

S- Strong; H-High; M-Medium; L-Low.

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| | | | |

Convenor
CDC

3 0 MAR 2022

100

| Course Code | Title | | |
|---|---|---|---|
| 21U3CKE503 | Discipline Specific Elective Paper I: Internet of Things | | |
| Semester: V | Credits: 4 | CIA:50 Marks | ESE: 50 Marks |

**Common to B. Sc CS / IT / DCFS and BCA**

**Course Objective:**

To understand the Data and Knowledge Management and use of Devices in IoT Technology, Understand State of the Art – IoT Architecture and Real World IoT Design.

**Course Outcome:**

| CO1 | Understand the vision of IoT from a global context. |
|---|---|
| CO2 | Determine the Market perspective of IoT. |
| CO3 | Use of Devices, Gateways and Data Management in IoT. |
| CO4 | Building state of the art architecture in IoT. |
| CO5 | Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints. |

**Offered by: Information Technology**

**Course Content**                                    **Instructional Hours / Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **M2M to IoT** - The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics. | 1 | 2 |
| | **Instructional Hours** | | **18** |
| II | **M2M to IoT – A Market Perspective**– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. **M2M to IoT-An Architectural Overview**– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. | 1 | 3, 4 |
| | **Instructional Hours** | | **18** |
| III | **M2M and IoT Technology Fundamentals-** Devices and gateways, Local and wide area networking, Data management. | 1 | 5 |
| | **Instructional Hours** | | **18** |
| IV | Business processes in IoT, Everything as a Service (XaaS), M2M and IoT Analytics, Knowledge Management | 1 | 5 |
| | **Instructional Hours** | | **18** |
| V | **IoT Architecture-State of the Art –** Introduction, State of theart. **Architecture Reference Model-**Introduction, Reference Model and architecture, IoT reference Model | 1 | 6,7 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Book:**

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, **From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence**, Academic Press,2014.

2. https://www.tutorialspoint.com/internet_of_things/index.htm

**Reference Books:**

1. Vijay Madisetti and Arshdeep Bahga, **Internet of Things (A Hands-on-Approach)**, VPT, 2014.

2. Francis daCosta, **Rethinking the Internet of Things: A Scalable Approach to Connecting Everything**, Apress Publications,2013
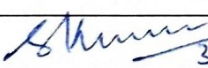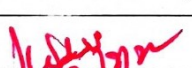
**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|-------|--------|---------|------------|---------|------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

S-Strong; H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
| *(signature)* 30/3/22 | *(signature)* 30/3/22 | *(signature)* | *(signature)* |
| Dr-S. KANNAN | Dr. M. Sambasivam | Dr. K. Selvavinayaki Convenor CDC | 3 0 MAR 2022 |

| Course Code | Title |
|---|---|
| **21U3CKE504** | **Discipline Specific Elective Paper I: Big Data Analytics** |
| **Semester: V** | **Credits: 4** | **CIA:50 Marks** | **ESE: 50 Marks** |

**(Common to B. Sc CS / IT / DCFS and BCA)**

**Course Objective:**

To provide an overview of an exciting growing field of big data analytics, analyse big data like Hadoop, NoSql Map-Reduce and learn fundamental techniques and principles in achieving big data analytics

**Course Outcome:**

| CO1 | Know about the big data analytics |
|---|---|
| CO2 | Tools in big data analytics using Hadoop |
| CO3 | Data model in big data analytics using NoSql |
| CO4 | Understanding about Map Reduce Programming |
| CO5 | Gain more knowledge about Hadoop streaming with R |

**Offered by: DCFS**

**Course Content**          **Instructional Hours/Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **BIG DATA**: Introduction, Big Data characteristics, types of Big Data, Traditional Vs. Big Data business approach, Bigdata Challenges, Case Study of Big Data Solutions. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | **HADOOP:** Introduction – Why Hadoop – Why not RDBMS – RDBMS Vs Hadoop – History of Hadoop – Hadoop Overview – Hadoop Distributed File System(HDFS) – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN – Interacting with Hadoop Ecosystem | 2 | 2 |
| | **Instructional Hours** | | **18** |
| III | **NoSQL DATA MODEL:** Introduction to NoSQL – NoSQL Business Drivers – NoSQL Data Architectural Patterns – Variations of NoSQL Architectural Patterns – Using NoSQL to Manage Big data – Case study of NoSQL | 1 | 3 |
| | **Instructional Hours** | | **18** |
| IV | **MAP-REDUCE Programming:** Introduction – Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression. | 2 | 4 |
| | **Instructional Hours** | | **18** |

| | | | |
|---|---|---|---|
| **V** | **Hadoop streaming with R:** Understanding the basics of Hadoop streaming – How to run Hadoop streaming with R – Understanding a MapReduce application – Understanding how to code and run a Map-Reduce application – how to explore the output of Map Reduce application. | 3 | 4 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**TextBooks:**
1. Radha Shankarmani, M Vijayalakshmi, **Big Data Analytics**, Wiley Publications,first Edition2016.
2. Seema Acharya, Subhashini Chellappan, **Big Data and Analytics**, Wiley Publication, first edition. Reprint in2016.
3. Vignesh Prajapati, **Data analytics with R and Hadoop**, Copyright © 2013, Packt Publishing.

**Reference Books:**
1. Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, **Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses**, Wiley,2013
2. Bill Franks, Taming,**The Big Data Tidal Wave: Finding Opportunities In Huge Data Streams With Advanced Analytics**,Wiley

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| **8** | **8** | **10** | **8** | **8** | **8** | **50** |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

S - Strong; H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *Nama* 30/3/22 | | | |
| Dr T. RAMAPRABHA | P.K.mangKumar | Dr.K.Selvasingayi Convenor CDC | 30 MAR 2022 |

| Course Code | Title |
|---|---|
| **21U3CKE605** | **Discipline Specific Elective Paper II: Software Quality Assurance** |
| **Semester: VI** | **Credits:4**    **CIA:50Marks**    **ESE:50Marks** |

**Common to B. Sc CS / IT/ DCFS and BCA**

**Course Objective:**

To describe Quality Assurance, understand quality components and apply the quality models.

**Course Outcome:**

| CO1 | Knowledge about the concept, factors of Quality Assurance |
|---|---|
| **CO2** | Understand various components of Quality Assurance |
| **CO3** | Analyze Testing process in Quality Assurance |
| **CO4** | Analyze various Software Quality metrics |
| **CO5** | Interpret the various on Standards for Software Quality. |

**Offered by: Computer Science**

**Course Content**          **Instructional Hours/Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Software Quality?:** Introduction - Software error, faults and failures - Classification of the causes of software errors - Software Quality Definition and objectives – software quality assurance and software engineering. <br> **Software Quality factors:** Need for comprehensive software quality requirements – classification of software requirements into software quality factors – product operation software quality factors – product revision software quality factors – product transition software quality factors. | 1 | 2,3 |
| | **Instructional Hours** | **18** | |
| **II** | **Components of SQA system:** SQA system and architecture – Pre-project components – software project life cycle components – Infrastructure components for error prevention and improvement – Management SQA components – SQA standards, system certification and assessment components – Organizing for SQA– the human components. | 1 | 4 |
| | **Instructional Hours** | **18** | |
| **III** | **Software testing strategies:** Definition and objectives - software testing strategies – software test classifications – Whitebox testing– Black box testing. <br> **Software testing – implementation:** Testing process – Test-case Design–Automated testing–Alpha–beta site testing programs. | 1 | 9,10 |
| | **Instructional Hours** | **18** | |
| **IV** | **Software Quality metrics:** Objectives of quality measurement – Classification of software quality metrics – Process metrics – Product metrics – Implementation of Software Quality metrics – Cost of Software Quality metrics - Classical model of Software Quality. | 1 | 21,22 |
| | **Instructional Hours** | **18** | |

| V | **Quality management standards:** scope –Main standards of software quality management - ISO9000-3 – certification according to ISO 9000-3 standard – Capability Maturity model principles, structure and processes area–Bootstrap methodology. | 12 | 234 |
|---|---|---|---|

| | | **Instructional Hours** | **18** |
|---|---|---|---|
| | | **Total Hours** | **90** |

**Text Book(s):**
1. Daniel Galin, **Software Quality Assurance From Theory to Implementation**, Pearson Education Ltd., 2004.
2. ClaudeY. Laporte and Alain April, Software Quality Assurance, IEEE Press Wiley, 2018.

**Reference Books**
1. Stephen H. Kan, **Metrics and Models in Software Quality Engineering**, 2nd Edition, Pearson, 2003.
2.  Kshirasagar Naikand Priyadarshini Tripathy (Eds),**Software Testing and Quality Assurance: Theory and Practice**, John Wiley, 2008
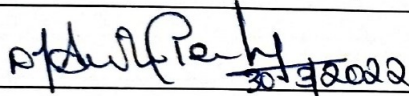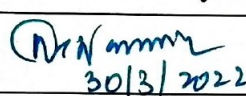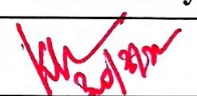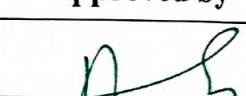
## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Class Participation | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *[signature]* 30/3/2022 D.J. ANITHA MERLIN | *[signature]* 30/3/2022 DR.N. KAVITHA | *[signature]* 30/ Dr.K.Selvavinayagi | *[signature]* Convenor CDC  3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CKE606** | **Discipline Specific Elective Paper II: Information Security** | | |
| **Semester: VI** | **Credits: 4** | **CIA : 50 Marks** | **ESE:50 Marks** |

**Common to B. Sc CS / IT / DCFA and BCA**

**Course Objective:**

To enable the students to understand the various aspects of Information Security in the local and global scenarios.

**Course Outcomes:**

| CO1 | To understand the basics of Information Security |
|---|---|
| CO2 | To identify the legal, ethical and professional issues in Information Security |
| CO3 | To survey the standards available |
| CO4 | To assess the technologies essential to provide Information Security |
| CO5 | Analyze hacking threats and attacks and determine appropriate methods to combat them |

**Offered by: Computer Applications**

**Course Content**                                          **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | Introduction to Information security<br>History-What is Information Security-Critical Characteristics of Information, NSTISSC Security Model-Components of an Information System, Securing the Components-Balancing Security and Access-The SDLC-The Security SDLC | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | Need for Security<br>Introduction- Business Needs-Threats-Attacks<br>Legal, Ethical and Professional Issues<br>Introduction-Laws and ethics-types of law-international laws and legal bodies-Ethics and information security | 1 | 2,3 |
| | **Instructional Hours** | | **18** |
| III | Risk Management:<br>Introduction-overview-Identifying and Assessing Risk-Assessing- Control strategies- selecting strategy | 1 | 4 |
| | **Instructional Hours** | | **18** |
| IV | Planning for Security<br> Introduction-Information Security Policy-Blueprint for Security-Security education-training and awareness- | 1 | 5 |

| | Continuity strategies, Risk appetite, Management discussion points, documenting results | | |
|---|---|---|---|
| | **Instructional Hours** | | **18** |
| **V** | Implementing Information security<br>Introduction - Project management for information security<br>- Technical and non-technical aspects of implementation<br>Information security maintenance<br>Introduction - Security management models - Maintenance model | 1 | 10,12 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Book(s):**

1. Michael E. Whitman and Herbert J. Mattord, "Principles of Information Security" Second Edition, Thomson Publishers.
   Unit I: Chapter 1
   Unit II: Chapter 2,3
   Unit III: Chapter 4
   Unit IV: Chapter 5
   Unit V: Chapter 10,12

**Reference Books:**

1. Surya Prakash Tripathi and Ritendra Goel *"*Introduction to Information Security and Cyber Laws*",* 2014, Dreamtech Press
2. V.K. Pachghare, "Cryptography and Information Security", 2nd Revised edition, Prentice-Hall of India Pvt.Ltd
3. Mark S. Merkow, "Information Security: Principles and. Practices", Second Edition, Pearson Education

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Class Participation | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

**S- Strong; H-High; M-Medium; L-Low**

| Course Designed by | Verified by | Checked by | Approved by |
|---|---|---|---|
| P.K.manoj Kumar | | | |
| | | Convenor<br>CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| **21U3CKE607** | **Discipline Specific Elective Paper II: Intellectual Property Rights and Privacy Laws** | | |
| **Semester: VI** | **Credits: 4** | **CIA : 50 Marks** | **ESE:50 Marks** |

**Course Objectives**

To introduce the concepts of Intellectual Property rights and privacy laws

**Course Outcomes (CO)**

| CO1 | Define that various laws associated with intellectual property rights |
|---|---|
| CO2 | Explain the concept of commercialization of IPR be licensing |
| CO3 | Outline the concepts of copyrights and international protection of copyrights |
| CO4 | Recall the history and perspective of privacy laws. |
| CO5 | Classify the compare the various types of privacy laws |

**Offered by: DCFS**

**Course Content**            **Instructional Hours / Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Intellectual Property Overview -** Concept of Property vis-à-vis Intellectual Property. Types of Intellectual Property- Origin and Development- An Overview. Intellectual Property Rights as Human Right. Role of International Institutions. | 1 | 1,2 |
| | **Instructional Hours** | | **18** |
| II | **Intellectual Property Rights -** Commercialization of Intellectual Property Rights by Licensing. Determining Financial Value of Intellectual Property Rights. Negotiating Payments Terms in Intellectual Property Transaction. Intellectual Property Rights in the Cyber World | 1 | 3,4 |
| | **Instructional Hours** | | **18** |
| III | **Copyright -** Introduction to Copyright- International Protection of Copyright and Related rights- An Overview (International Convention/Treaties on Copyright). | 1 | 5,7 |
| | **Instructional Hours** | | **18** |
| IV | **Indian Copyright Law -** Indian Copyright Law- The Copyright Act, 1957 with its amendments, Copyright works, Ownership, transfer and duration of Copyright, Renewal and Termination of Copyright, Infringement of copyrights and remedies. | 1 | 8 |
| | **Instructional Hours** | | **18** |

| V | Privacy Laws - History and Perspective of Privacy Laws- Global Privacy Issue- Legal Tools – The Constitution. Statutes & State Protection. | 1 | 10,12 |
|---|---|---|---|
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Book (s):**
1. VikasVashishth.; "Law and practice of intellectual property in India"
2. Sreenivasulu N.S; "Law Relating to Intellectual Property", Patridge Publishing, 2013
3. Vakul Sharma; "Information Technology: Law and Practice", Universal Law Publishing Co., India, 2011.

**Reference Book(s):**
1. The Copyright Act, 1957
2. The Patent Act, 1970
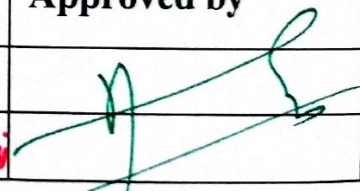
### Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

### Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

**S - Strong; H-High; M-Medium; L-Low**

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| P.JEYANTHI | P.K.ManojKumar | Dr.K.Selvavinayaki<br>Convenor<br>CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| **21U3DFE608** | **Discipline Specific Elective Paper II: Cryptography and Network Security** | | |
| **Semester: VI** | **Credits: 4** | **CIA : 50 Marks** | **ESE:50 Marks** |

**Course Objectives**
- To explain about the security aspects and types of attacks
- To introduce and explain various cryptographic algorithms

**Course Outcomes (CO):**

| CO1 | Explain the various security aspects and its importance |
|---|---|
| CO2 | Outline the several types of security attacks and various cryptographic algorithms |
| CO3 | Summarize about message authentication and security practices. |
| CO4 | Apply symmetric key and public key cryptographic algorithms to perform the process of cryptography. |
| CO5 | Analyze the various cryptographic algorithms and apply them accordingly |

**Offered by: DCFS**

**Course Content**          **Instructional Hours / Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Introduction -** Security trends - Legal, Ethical and Professional Aspects of Security, Need for Security atMultiple levels, Security Policies - Model of network security – Security attacks, services andmechanisms – OSI security architecture – Classical encryption techniques: substitution techniques, transposition techniques, steganography- Foundations of modern cryptography:perfect security – information theory – product cryptosystem – cryptanalysis. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | **Symmetric Key Cryptography -** MATHEMATICS OF SYMMETRIC KEY CRYPTOGRAPHY: Algebraic structures – Modular arithmetic-Euclid"s algorithm- Congruence and matrices - Groups, Rings, Fields-Finite fields- SYMMETRIC KEY CIPHERS: SDES – Block cipher Principles of DES – Strength of DES – Differential and linear cryptanalysis - Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – Advanced Encryption Standard - RC4 –Key distribution. | 1 | 2 |
| | **Instructional Hours** | | **18** |
| III | **Public Key Cryptography -** MATHEMATICS OF ASYMMETRIC KEY CRYPTOGRAPHY: Primes – Primality Testing –Factorization – Euler"s totient function, Fermat"s and Euler"s Theorem - Chinese Remainder Theorem – Exponentiation and logarithm - ASYMMETRIC KEY CIPHERS: RSA cryptosystem – Key distribution – Key management – Diffie Hellman key exchange -ElGamal cryptosystem – Elliptic curve arithmetic-Elliptic curve cryptography. | 1 | 3 |

| | | Instructional Hours | 18 |
|---|---|---|---|
| IV | **Message Authentication and Integrity -** Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA –Digital signature and authentication protocols – DSS- Entity - Authentication: Biometrics, Passwords, Challenge Response protocols- Authentication applications - Kerberos, X.509 | 1 | 5 & 6 |
| | | Instructional Hours | 18 |
| V | **Security Practice and System Security -** Electronic Mail security – PGP, S/MIME – IP security – Web Security – SYSTEMSECURITY: Intruders – Malicious software – viruses – Firewalls. | 1 | 8 & 9 |
| | | Instructional Hours | 18 |
| | | **Total Hours** | **90** |

**Text Book(s):**
1. William Stallings, Cryptography and Network Security: Principles and Practice, PHI3rd Edition, 2006.
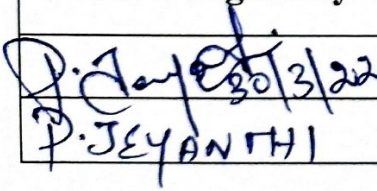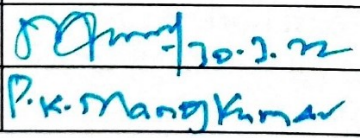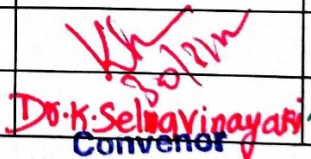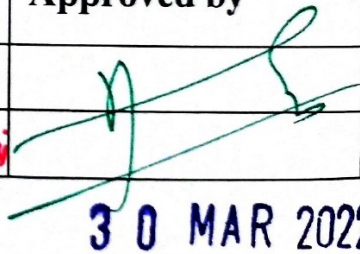
**Reference Books:**
1. C K Shyamala, N Harini and Dr. T R Padmanabhan: Cryptography and NetworkSecurity, Wiley India Pvt.Ltd
2. BehrouzA.Foruzan, Cryptography and Network Security, Tata McGraw Hill 2007.
3. Charlie Kaufman, Radia Perlman, and Mike Speciner, Network Security: PRIVATECommunication in a PUBLIC World, Prentice Hall, ISBN 0-13-046019-2

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| P. Jay 30/3/22 P. JEYANTHI | 30.3.22 P.K. ManojKumar | Dr.K.Selvavinayaki Convenor CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFA303 | Core Paper XI - Principles of Secure Coding | | |
| Semester: IV | Credits: 3 | CIA: 30 Marks | ESE: 45 Marks |

**Course Objective:**

After the successful completion of the course basic knowledge on principles of secure coding will be gained

**Course Outcomes (CO):**

| CO1 | To know how to secure systems |
|---|---|
| CO2 | To Understand about threat modelling |
| CO3 | To identify the secure coding technique |
| CO4 | To apply more about database and web-specific issues |
| CO5 | To implement the testing secure applications |

**Offered by: DCFS**

**Course Content**                                    **Instructional Hours / Week: 4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | Need for secure systems: Proactive Security development process, Secure Software Development Cycle (S-SDLC) , Security issues while writing SRS, Design phase security, Development Phase, Test Phase, Maintenance Phase, Writing Secure Code – Best Practices SD3 (Secure by design, default and deployment), Security principles and Secure Product Development Timeline | 1 | 1 |
| | **Instructional Hours 12** | | |
| II | Threat modelling process and its benefits: Identifying the Threats by Using Attack Trees and rating threats using DREAD, Risk Mitigation Techniques and Security Best Practices. Security techniques, authentication, authorization. Defense in Depth and Principle of Least Privilege. | 1 | 2 |
| | **Instructional Hours** | **12** | |
| III | Secure Coding Techniques: Protection against DoS attacks, Application Failure Attacks, CPU Starvation Attacks, Insecure Coding Practices In Java Technology. ARP Spoofing and its countermeasures. Buffer Overrun- Stack overrun, Heap Overrun, Array Indexing Errors, Format String Bugs. Security Issues in C Language: String Handling, Avoiding Integer Overflows and Underflows and Type Conversion Issues- Memory Management Issues, Code Injection Attacks, Canary based countermeasures using StackGuard and Propolice. Socket Security, Avoiding Server Hijacking, Securing RPC. | 1 | 1 |
| | **Instructional Hours** | **12** | |

| | | | |
|---|---|---|---|
| **IV** | Database and Web-specific issues: SQL Injection Techniques and Remedies, Race conditions, Time of Check Versus Time of Use and its protection mechanisms. Validating Input and Interprocess Communication, Securing Signal Handlers and File Operations. XSS scripting attack and its types – Persistent and Non persistent attack XSS Countermeasures and Bypassing the XSS Filters. | 1 | 3 |
| | **Instructional Hours 12** | | |
| **V** | Testing Secure Applications: Security code overview, secure software installation. The Role of the Security Tester, Building the Security Test Plan. Testing HTTP- Based Applications, Testing File-Based Applications, Testing Clients with Rogue Servers | 1 | 5,6 |
| | **Instructional Hours 12** | | |
| | **Total Hours 60** | | |

**Text Book(s):**

1. Writing Secure Code, Michael Howard and David LeBlanc,Microsoft Press, 2nd Edition, 2004

**Reference Books:**

1. Buffer Overflow Attacks: Detect, Exploit, Prevent by Jason Deckar,Syngress,1st Edition, 2005
2. Threat Modeling, Frank Swiderski and Window Snyder,Microsoft Professional, 1st Edition,2004

## Tools for Assessment (30 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 4 | 4 | 7 | 5 | 5 | 5 | 30 |

## Mapping

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| P.Jey 30/3/22 P.JEYANTHI | P.K.Manoj Kumar 70.3.22 | Dr.K.Selvavinayaki Convenor CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFA404 | **Allied Paper IV - M-Commerce** | | |
| **Semester: IV** | **Credits: 4** | **CIA: 50Marks** | **ESE: 50 Marks** |

**Course Objective:**

Understand the basics of e-Commerce, m-Commerce its technology and applications.

**Course Outcomes (CO):**

| CO1 | Understand the basics of electronic commerce |
|---|---|
| CO2 | Understand the basics of mobile commerce |
| CO3 | Understand the mobile commerce technology |
| CO4 | Analysis about its applications |
| CO5 | Analysis about its business – business mobile commerce |

**Offered by: DCFS**

**Course Content**                                       **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Electronic Commerce -** Traditional commerce and E-commerce – Internet and WWW – Role of WWW – Value Chains – Strategic Business And Industry Value Chains – Role of E-commerce. Packet Switched Networks – TCP/IP Protocol Script – Internet Utility Programmes – SGML, HTML And XML – Web Client And Servers – Web Client/Server Architecture – Intranet And Extranets – Web Based Tools For E-commerce – Security. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | **Mobile Commerce -** Introduction – Infrastructure of M–Commerce – Types Of Mobile Commerce Services – Technologies Of Wireless Business – Benefits And Limitations, Support, Mobile Marketing & Advertisement, Non– Internet Applications In M–Commerce – Wireless/Wired Commerce Comparisons. | 1 | 2 |
| | **Instructional Hours** | | **18** |
| III | **Mobile Commerce: Technology -** A Framework For The Study Of Mobile Commerce – NTT Docomo's I-Mode – Wireless Devices For Mobile Commerce – Towards A Classification Framework For Mobile Location Based Services – Wireless Personal And Local Area Networks –The Impact Of Technology Advances On Strategy Formulation In Mobile Communications Networks. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| IV | **Mobile Commerce: Theory and Applications:** The Ecology Of Mobile Commerce – The Wireless Application Protocol – Mobile Business Services – Mobile Portal – Factors Influencing The Adoption of Mobile Gaming Services – Mobile Data Technologies And Small Business Adoption And Diffusion – E–commerce in The Automotive Industry – Location– Based Services: Criteria For Adoption And Solution | 1 | 3 |

| | | | |
|---|---|---|---|
| | Deployment – The Role of Mobile Advertising In Building A Brand – M–commerce Business Models | | |
| | **Instructional Hours** | | **18** |
| V | **Business– To– Business Mobile E– Commerce:** Enterprise Enablement – Email and Messaging – Field Force Automation (Insurance, Real Estate, Maintenance, Healthcare) – Field Sales Support (Content Access, Inventory) – Asset Tracking and Maintenance/Management – Remote IT Support – Customer Retention (B2C Services, Financial, Special Deals) – Warehouse Automation – Security. | **1** | **5,6** |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Books**

1. E.Brian Mennecke, J.Troy Strader, "Mobile Commerce: Technology, Theory and Applications", Idea Group Inc., IRM press, 2003.

2. Ravi Kalakota, B.Andrew Whinston, "Frontiers of Electronic Commerce", Pearson Education, 2003.

**References**

1. P. J. Louis, "M-Commerce Crash Course", McGraw- Hill Companies February 2001.

2. Paul May, "Mobile Commerce: Opportunities, Applications, and Technologies Of Wireless Business" Cambridge University Press March 2001.

**Tools for Assessment (30 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 4 | 4 | 7 | 5 | 5 | 5 | 30 |

Mapping

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| S.A. Maleo 30/3/22  S. A. Panimalar | SQ 30.3.22  P.K.ManojKumar | Dr.K.Selvavinayaki  **Convenor**  CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC102 | Core Paper II  Basics of Cyber Law | | |
| Semester: I | Credits: 4 | CIA : 50 Marks | ESE: 50 Marks |

**Course Objective:**

To know about the various types of Cyber Crimes, Cyber Laws and its applicability.

**Course Outcomes:**

| CO1 | Learn the various types of cybercrimes |
|---|---|
| CO2 | Demonstrate the various types of cyber laws and their applicability |
| CO3 | Classification of civil, criminal cases and Essential elements of criminal law |
| CO4 | Determine the sections of Indian Evidence act |
| CO5 | Know about the Indian Evidence Act |

**Offered by:  Department of  DCFS**

**Course Content**                                                    **Instructional Hours / Week: 4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | Introduction to Cyberspace, Cybercrime and Cyber Law:The World Wide Web, Web Centric Business, e-Business Architecture, Models of e-Business, e-Commerce, Threats to virtual world. IT Act 2000 - Objectives, Applicability, Non-applicability, Definitions, Amendments and Limitations. Cyber Crimes- Cyber Squatting, Cyber Espionage, Cyber Warfare, Cyber Terrorism, Cyber Defamation. Social Media-Online Safety for women and children, Misuse of Private information. | 1 | 1,2 |
| | **Instructional Hours** | | **12** |
| II | Regulatory Framework of Information and Technology Act 2000 - Information Technology Act 2000, Digital Signature, E-Signature, Electronic Records, Electronic Evidence and Electronic Governance. Controller, CertifyingAuthority and Cyber Appellate Tribunal. (Rules announced under the Act), Network and Network Security, Access and Unauthorized Access, Data Security, E Contracts and E Forms. | 1 | 3,4,5, 9 |
| | **Instructional Hours** | | **12** |
| III | Offences and Penalties Information Technology (Amendment) Act 2008 – Objective, Applicability and Jurisdiction; Various cyber-crimes under Sections 43 (a) to (j), 43A, 65, 66, 66A to 66F, 67, 67A, 67B, 70, 70A, 70B, 80 etc. along with respective penalties, punishment and fines, Penal Provisions for Phishing, Spam, Virus, Worms, Malware, Hacking, Trespass and Stalking; Human rights in cyberspace, International Co-operation in investigating cybercrimes. | 1 | 6,7,8 |
| | **Instructional Hours** | | **12** |
| IV | Classification – civil, criminal cases-Essential elements of criminal law- Constitution and hierarchy of criminal courts. Criminal Procedure Code. Cognizable and non-cognizable offences. Bailable and non-bailable offences. Sentences which the court of Chief Judicial Magistrate may pass. | 1 | 8 14,15 |
| | **Instructional Hours** | | **12** |

| | Indian Evidence Act – Evidence and rules of relevancy in brief. Expert witness. Cross examination and re-examination of witnesses. Sections 32, 45, 46, 47, 57, 58, 60, 73, 135, 136,137, 138, 141. Section 293 in the code of criminal procedure. Secondary Evidence Section 65-B. | 1 | 13,17 |
|---|---|---|---|
| V | | | |

| | **Instructional Hours** | **12** |
|---|---|---|
| | **Total Hours** | **60** |

### Text Books

1. Karnika Seth; "Computers, Internet and New Technology Laws", Lexis Nexis Butters worth Wadhwa, 2012.
2. VikasVashishth.; "Law and practice of intellectual property in India"3. Jonathan Rosenoer; "Cyber Law: The Law of Internet", Springer- Verlag, New York, 1997.
3. Sreenivasulu N.S; "Law Relating to Intellectual Property", PatridgePublishing, 2013
4. Pavan Duggal; "Cyber Law – The Indian Perspective", Saakshar LawPublications.

### Reference Books

1. Harish Chander; "Cyber Laws and IT Protection", PHI Learning Pvt. Ltd,2012.
2. Nina Godbole and SunitBelapore; "Cyber Security: Understanding CyberCrimes, Computer Forensics and Legal Perspectives", Wiley Publications,2011.
3. Vakul Sharma; "Information Technology: Law and Practice", UniversalLaw Publishing Co., India, 2011.
4. The Patent Act, 1970
5. The Indian Evidence Act, 1872.

### Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

### Mapping

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| (Dr. V. Kavilla) 30/3/22 | P.K.Manoj Kumar 30.3.22 | Dr. K.Selvavinayaki Convenor CDC | 30 MAR 2022 |

14

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC203 | Core Paper IV - Operating Systems | | |
| Semester : II | Credits : 4 | CIA : 50 Marks | ESE: 50 Marks |

**Course Objective:**

To understand the importance of Operating Systems, its functionalities to manage resources of Computer and Peripherals.

**Course Outcomes:**

| CO1 | Understand the fundamentals of Operating system |
|---|---|
| CO2 | Apply the scheduling mechanism for process and memory |
| CO3 | Remember the techniques to manage the deadlock and memory |
| CO4 | Understand the various types of operating System, Memory Allocation and IO |
| CO5 | Apply the policies for Memory management and File systems. |

**Offered by: DCFS**

| Course Content | | Instructional Hours / Week : 4 | |
|---|---|---|---|
| **Unit** | **Description** | **Text Book** | **Chapter** |
| I | Introduction: Abstract views of an OS – Goals of an OS – OS and the Computer System – Classes of Operating System: Batch Processing systems – Multiprogramming systems – Time sharing systems – Real Time Operating System – Distributed Operating System – Modern Operating systems | 1 | 1,2 |
| | **Instructional Hours** | | **12** |
| II | Processes and Programs – Programmer View of Process – OS view of Process – Controlling Processes – Process State Transitions – Process Control Block – Process Scheduling: Scheduling Concepts and Terminology – Fundamental Techniques of scheduling – Non Preemptive scheduling policies - Preemptive scheduling policies. | 1 | 3,4 |
| | **Instructional Hours** | | **12** |
| III | Deadlock: Definition – Deadlocks in Resource Allocation – Handling deadlocks – Deadlock Detection and Resolution - Deadlock Prevention – Deadlock Avoidance. Memory Management: Static and dynamic Memory Allocation – The Memory Allocation Model – reuse of Memory – Contiguous Memory allocation – Non Contiguous Memory Allocation. | 1 | 11 |
| | **Instructional Hours** | | **12** |
| IV | Paging – Segmentation – Segmentation with Paging. Virtual Memory: Basics – Demand Paging – Overview of Paging – Demand Paging preliminaries – Page replacement policies – Virtual Memory using segmentation | 1 | |
| | **Instructional Hours** | | **12** |

| | | | |
|---|---|---|---|
| **V** | Layers of the Input Output Control System (IOCS) – Overview of I/O Organization – Disk Scheduling. File systems: File System and IOCS – Files and File Operations – Fundamental File organizations – directory Structures – Case study on LINUX OS ,UNIX OS, Android OS (SelfStudy) | 1 | 7 |
| | | **Instructional Hours** | **12** |
| | | **Total Hours** | **60** |

**Text Books**
1. D. M. Dhamdhere, Operating Systems – AconceptBasedApproach,2$^{nd}$ Edition,2006

**Reference Books**
1. William Stallings,**Operating Systems Internals and Design Principles**, Seventh Edition, Pearson Education Inc. 2012.
2. Abraham Silberchatz, Peter Baer Galvin, Greg Gagne, **Operating System Concepts**, Seventh Edition, Pearson Education 2009.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Case Study Analysis | Assignment | Seminar | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| Dr T. RAMAPRABHA  30/3/22 | P.K.manojKumar | Dr. K Selvavinayaki Convenor CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| **21U3DFC204** | **Core Paper V - Information Security** | | |
| **Semester : II** | **Credits : 4** | **CIA : 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

To inculcate about information security, risk management and Intrusion detection and prevention methods.

**Course Outcomes:**

| CO1 | Know more about information security |
|---|---|
| CO2 | Understand about the need for the information security |
| CO3 | Analyze about the risk management |
| CO4 | Identifying about the information security and governance |
| CO5 | Know more about Intrusion detection and prevention systems |

**Offered by:** DCFS

**Course Content**                                    **Instructional Hours / Week : 4**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | Introduction to Information Security, The history of Information security, What issecurity, CNSS security model, Component s of an Information system,Balancing Information security and access, Approaches to Information securityimplementation, The systems development life cycle, The security systemsdevelopment life cycle, Security professionals and the organization, Communities of Interest. Information Security :is it an Art or a Science | 1 | 1,2 |
| | **Instructional Hours** | | **12** |
| **II** | The need for security: Introduction, Business needs first, Threats-Compromises to individual property, Deliberate software attacks, Deviations in quality of service, Espionage, Sabotage, Theft, Attacks :Malicious code, Hoaxes, Back doors, Password crack, Brute force, Dictionary, Denial of service and Distributed denial of service, Spoofing, Man-in-the-middle, Spam, Mail bombing, Sniffers, Social Engineering, Pharming, Timing attack, Secure software development. | 1 | 3,4,5 |
| | **Instructional Hours** | | **12** |
| **III** | Risk Management: Introduction, An overview of Risk Management, RiskIdentification : Lan and Organize, Asset Identification and Inventory Classifyingand Prioritizing Information assets, Information Asset Valuation, Identifying and Prioritizing Threats, Vulnerability identificationRisk Assessment : Introduction, Likelihood, Risk Determination, Identify PossibleControls, Documenting the Results of Risk Assessment Risk Control Strategies:Defend, Transfer, Mitigate, Accept, Terminate | 1 | 6,7,8 |
| | **Instructional Hours** | | **12** |
| **IV** | Information security planning and governance- Planning levels, Planning and theCISO, Information security governance, Information security policy, standardsand practices- Definitions, EISP, ISSP, SysSP, Policy management, The Information security | 2 | 14,15 |

| | blueprint, Designing of security architecture, Securityeducation training and awareness program, Continuity strategies, Securitytechnology Firewalls and VPNs, Access control- Identification, Authentication,Authorization , Accountability, Firewall processing modes, Firewalls categorizedby generation, Firewalls categorized by structure, Firewall architectures,Selecting the right firewall, Configuring and managing firewalls, Content filters,Protecting remote connections- Remote access, VPNs. | | |
|---|---|---|---|
| | **Instructional Hours** | | **12** |
| V | Intrusion detection and prevention systems- Why IDPS?, types, detectionmodels, response behavior ,strengths and limitations, deployment andimplementation, measuring the effectiveness. Honeypots, Honey nets andpadded cell systems- Trap-and-trace systems, Active intrusion prevention | 2 | 13,17 |
| | **Instructional Hours** | | **12** |
| | **Total Hours** | | **60** |

**Text Books**
1. Michael E. Whitman, herbert J. Mattord, **Principals of Information Security –** cengage Learning, Fourth Edition, 2011.

**Reference Books**
1. Andy Taylor David Alexander, Amanda Finch DavidSutton, **Information Security Management Principles –** BCS Publishers, 2008
2. B. Nelson , A. Phillips, F. Enfiger, C. Steuart, **Guide to Computer Forensics and Investigations** – Cengage Learning, 4th Edition 2010.
3. R. Boyle **Applied Information Security: A Hands - On Guide to Information Security,** Prentice Hall, 2010.
4. E. Maiwald, Fundamentals of Network Security, McGraw – Hill, 2004.

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| 8 30/3/22 (Dr. V. Kavitha) | 30.3.22 P.K.Manoj Kumar | Dr. K Selvavinayaki Convenor CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC305 | **Core Paper VII - Java Programming** | | |
| **Semester: III** | **Credits: 4** | **CIA:50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

To gain knowledge about basic Java language syntax and semantics to write java programs and understand the principles of classes, methods, inheritance, polymorphism and packages.

**Course Outcomes (CO):**

| CO1 | Remember the fundamental concepts of Object-oriented Programming |
|---|---|
| CO2 | Gains the knowledge about different data types, statements, concepts and Dbase Connectivity |
| CO3 | Able to develop programs for the different concepts |
| CO4 | Analyze the Concepts of Exception Handling and Multithreading. |
| CO5 | Skill to Develop application using Applet and AWT |

**Offered by: DCFS**

**Course Content**            **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. **Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www – Web Browsers. **Overview of Java:** simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine | 1 | 1,2,3 |
| | **Instructional Hours** | | **15** |
| II | Constants, Variables, Data Types, Operators and Expressions, **Decision Making and Branching:** if, if...else, nested if, switch, ? : Operator, **Decision Making and Looping:** while, do, for – Jumps in Loops - Labelled Loops, Classes, Objects and Methods. | 1 | 4,5,6,7 & 8 |
| | **Instructional Hours** | | **15** |
| III | **Interfaces: Multiple Interface-**Introduction-Defining Interface-Extending Interface-Implementing Interface-Accessing Interface Variables. **Packages:** Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-Accessing a Package-Using a Package-Adding a Class to a Package. | 1 | 10,11 & 12 |
| | **Instructional Hours** | | **15** |
| IV | **Exception Handling:** Fundamentals-Hierarchy of the Exception Classes- Types of Exception –Exception Class-Uncaught Exceptions-Handling Exception-User Defined Exception. **Multithreaded Programming:** The Java Thread Model-Concept of Thread-Runnable Interface-Thread Class-Thread Creation- Thread's Life Cycle-Thread Scheduling-Synchronization and Deadlock-Inter Thread Communication-Joining Threads- | 2 | 10 & 11 |

| | | | |
|---|---|---|---|
| | Suspending, Resuming and Stopping Threads. | | |
| | **Instructional Hours** | | **15** |
| **V** | **Input/Output Classes:** Input and Output Operations-Hierarchy of Classes in java.io Package-File Class-InputStream and OutputStream Classes-FileInputStream and FileOutputStream Classes-Reader and Writer Classes-RandomAccessFile Class-Stream Tokenizer. **Applets:** Applet Basics-Applet Life Cycle-Running Applets-Methods of the Applet Class-Graphics Class-Color Class-Font Class-Limitations of Applets. **Abstract Window Toolkit:** AWT-AWT Classes-Hierarchy of Classes in Java.awt Package-Control Fundamentals-Component Class-Basic Component Classes-Container Class.-Various Continer Class. | 2 | 16,18& 19 |
| | **Instructional Hours** | | **15** |
| | **Total Hours** | | **75** |

**Text Book(s):**

1. E. Balagurusamy, **Programming with Java – A Primer**, Tata McGraw Hill Publication, 3rd Edition, 2007
2. ISRD Group, **Introduction To Object Oriented Programming Through Java**, Tata McGraw Hill Publication, Forth Reprint 2008.

**Reference Book(s):**

1. Patrick Naughton & Hebert Schildt, **The Complete Reference Java 2,** Tata McGraw Hill Publication**,** 3rd Edition , 2002
2. John R. Hubbard, **Programming with Java**, Tata McGraw Hill Publication, 2nd Edition, 2009

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *Rama* 30/3/22 | | | |
| Dr J. RAMAPRABHA | P.K.Manojkumar | Dr·K·Selvavingaki | |
| | | Convenor CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC406 | **Core Paper XI - Forensic audio-video analysis and Speaker Identification** | | |
| **Semester: IV** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

1. **To understand the need of secure system.**

2. **Study about various attacks and threads.**

3. **Apply secure coding Techniques.**

**Course Outcomes (CO):**

| CO1 | Understand the need for basic circuits |
|---|---|
| CO2 | To know about the video technology |
| CO3 | Understand the forensic audio and video analysis |
| CO4 | Analysis Database and Web-specific issues |
| CO5 | Apply testing to Secure Applications |

**Offered by: DCFS**

**Course Content**                    **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | Basic Circuits: Basic Electric Circuits LR,CR,LCR circuits, Conventional Filters Noise, Acoustic Characteristics of Environments Diffraction, Reverberation and Noise, Acoustic Characteristics of Environments-Diffraction, Reverberation and Diffusion. Recording Formats- Analog and Digital, Audio and Video file formats. Linear and Non–linear Editing. Digital Filters(high pass filters, Low pass filters Noise Characteristics) | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | Introduction to video technology: Concept of Video film production-Introduction to video technology component of Digital Image Processing. Concept of Digital Water Marking. Visual examination technique on video frame image- Facial Image Recognition from video frame image. | 1 | 2 |
| | **Instructional Hours** | | **18** |
| III | Forensic audio and video analysis: Introduction to Forensic Audio& Video Analysis: A basic understanding of forensic audio and video technology-Audio and Video Evidence handling procedures. Authentication of recorded audio and video. Scientific Methodology of forensic audio-video analysis. Recovery of digital audio-video/ Deleted in court. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| IV | Basics of speaker identification: Introduction: Forensic Speaker Identification. Forensic Phonetics – Forensic challenges in Voice recognition. Forensic Phonetic Parameters: Acoustic vs Auditory Parameters, Linguistic Speech parameters: Vocal tract structures. Forensic Significance–Vocal cord activity, Nasals and Nasalization.-Phonetic Aspects of Speech: Articulators Active/Passive, Phonemes– | 1 | 3 |

| | | | |
|---|---|---|---|
| | Segmental and Supra segmental, Prosodic  features- Stress, Intonation, Duration, Syllables, Nasalization, and Accent  features. | | |
| | **Instructional Hours** | | 18 |
| V | **Basics of speaker identification**: Introducti Voice recognition. **Forensic Phonetic Parameters**: Acoustic vs  Auditory Parameters, **Linguistic  Speech parameters**: Vocal tract structures. Forensic Significance–Vocal cord activity, Nasals and Nas Speaker Recognition– Likelihood Ratio, Objective/Subjective Methods. Concept of Test and Error in Speaker Identification.- Admissibility of  Voice evidence in Court. | 1 | 5,6 |
| | **Instructional Hours** | | 18 |
| | **Total Hours** | | 90 |

**Text Book(s):**
1. Forensic Speaker Identification,  Philip Rose: CRC Press Book,(2002)

**Reference book(s):**
1) A Simplified Guide to Forensic Audio and Video Analysis(PDF Notes).
2) The Physics of Speech, D.B.Fry: Cambridge University Press, (1979).
3) The Complete Book of Video Techniques Subjects Equipment, David Cheshire: Dorling Kindersley Publication London,(1992).
4) Audio video analysis by B.R.Sharma, Universal Publishers, Lucknow.
5) Audio and video systems by R.G.Gupta,Tata McGraw-Hill (1995).

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| P.JEYANTHI | P.K.ManojKumar | Dr.K.Selvavinayaki Convenor CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC407 | **Core Paper XII - Cyber Forensic** | | |
| Semester: IV | Credits: 4 | CIA: 50 Marks | ESE: 50 Marks |

**Course Objective:**

1. To understand the layers security by installing firewalls
2. Study about various computer forensic methods
3. Apply evidence collection tools and analysis various forensics.

**Course Outcomes (CO):**

| CO1 | Understand the need of layers security. |
|---|---|
| CO2 | Apply firewalls for network |
| CO3 | Understand computer forensic Techniques |
| CO4 | Apply evidence collection methods |
| CO5 | Analysis various forensics Issues |

**Offered by: DCFS**

**Course Content**                              **Instructional Hours / Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | NETWORK LAYER SECURITY &TRANSPORT LAYER SECURITY: IPSec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPSec. Transport layer Security: SSL protocol, Cryptographic Computations – TLS Protocol. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | E-MAIL SECURITY & FIREWALLS : PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls– Firewall related Terminology-Types of Firewalls- Firewall designs- SET for E-Commerce Transactions. | 1 | 2 |
| | **Instructional Hours** | | **18** |
| III | INTRODUCTION TO COMPUTER FORENSICS: Introduction to TraditionalComputer Crime, Traditional problems associated with Computer Crime Introduction to Identity Theft & Identity Fraud. Types of CF techniques-Incident and Incident response methodology-Forensic duplication and investigation. Preparation For IR:Creating response toolkit and IR team.-Forensics Technology and Systems – Understanding Computer Investigation– Data Acquisition | 1 | 1 |
| | **Instructional Hours** | | **18** |
| IV | EVIDENCE COLLECTION AND FORENSICS Incident Scenes– Working with Windows and DOS Systems. Current Computer TOOLS: Processing Crime and Forensics Tools: Software/Hardware Tools. | 2 | 6 |
| | **Instructional Hours** | | **18** |
| V | ANALYSIS AND VALIDATION: Validating Forensics Data–Data Hiding Techniques – –Performing Remote Acquisition –Network | 2 | 8 |

| | | |
|---|---|---|
| Forensics – Email Investigations–Cell Phone and Mobile Devices Forensics | | |
| **Instructional Hours** | | **18** |
| **Total Hours** | | 90 |

**Text Book(s):**
1. Computer Forensics and Investigations-BillNelson, Amelia Phillips, Frank Enfinger, Christofer Steuart, Second Indian Reprint 2009, Cengage Learning India Private Limited.
2. Digital Evidence and Computer Crime–Eoghan Casey, Edition3, Academic Press, 2011

**Reference book(s):**
1. Computer Forensics and Cyber Crime: An Introduction– Marjie Britz, Edition2 ,PrenticeHall,2008

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

2.

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *Nama* 30/3/22 | *[signature]* 30.3.22 | *[signature]* | *[signature]* |
| Dr. T. RAMAPRABHA | P.K.manojkumar | Dr.K.Selvavinayaki | |
| | | Convenor CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC508 | **Core Paper XIV - Cloud Security** | | |
| **Semester: V** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

   **Understand the need of secure system in Cloud environment**

**Course Outcomes (CO):**

| CO1 | Understand the Cloud fundamentals |
|---|---|
| **CO2** | Understand the applications of cloud. |
| **CO3** | Understand and Apply various securities in cloud. |
| **CO4** | Analysis various contagion and threshold models |
| **CO5** | Analysis of various virtualization securities. |

**Offered by: DCFS**

**Course Content**                                    **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | CLOUD COMPUTING FUNDAMENTALS: Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. | 1 | 1 |
| | **Instructional Hours** | | **15** |
| II | CLOUD APPLICATIONS: Technologies and the processes required when deploying web services-Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages-Development environments for service development; Amazon, Azure, Google App. | 1 | 2 |
| | **Instructional Hours** | | **15** |
| III | SECURING THE CLOUD: Security Concepts - Confidentiality, privacy, integrity, authentication, non-repudiation, availability, access control, defense in depth, least privilege- how these concepts apply in the cloud and their importance in PaaS, IaaS and SaaS. e.g. User authentication in the cloud. | 1 | 1 |
| | **Instructional Hours** | | **15** |
| IV | Contagion, opinion formation, coordination and cooperation Concepts: simple contagion, threshold models, opinion formation, unusual applications of SNA | 2 | 3 |
| | **Instructional Hours** | | **15** |
| V | VIRTUALIZATION SECURITY: Multi-tenancy Issues: Isolation of users/VMs from each other- How the cloud provider can provide this-Virtualization System Security Issues: e.g. ESX and ESXi Security, ESX file system security- storage considerations, backup and recovery- Virtualization System Vulnerabilities. | 2 | 5,6 |
| | **Instructional Hours** | | **15** |

| | Total Hours | | 90 |
|---|---|---|---|

**Text Book(s):**

1. Gautam Shroff, "Enterprise Cloud Computing Technology Architecture Applications", Cambridge University Press; 1 edition [ISBN: 978- 0521137355], 2010.
2. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", Tata McGraw- Hill Osborne Media; 1 edition 22, [ISBN: 0071626948], 2009.

**Reference book(s):**

1. Tim Mather, Subra Kumaraswamy, Shahed Latif, "Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance", O'Reilly Media; 1 edition, [ISBN: 0596802765], 2009.
2. Ronald L. Krutz, Russell Dean Vines, "Cloud Security", Wiley [ISBN: 0470589876], , 2010.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

3.

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| S.A. Maleo 30/3/22 | 30.3.22 | | |
| S.A. Panimalar | P.K.Manojkumar | Dr.K.Selvavinayaki Convenor CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC509 | Core Paper XV- **Penetration and Vulnerability Testing** | | |
| **Semester: V** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

1. **Understand Ethical Hacking terminologies.**
2. **Study about Network and Vulnerability Scanning**
3. **Apply Information gathering methodologies.**

**Course Outcomes (CO):**

| CO1 | Understand the fundamentals of Ethical Hacking |
|---|---|
| CO2 | Understand and apply Network and Vulnerability Scanning. |
| CO3 | Apply Information gathering methodologies |
| CO4 | Analysis various Password cracking techniques. |
| CO5 | Analysis and evaluate Session Hijacking Techniques |

**Offered by: DCFS**

**Course Content**                    **Instructional Hours / Week: 5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Introduction** : Ethical Hacking terminology- Five stages of hacking- Vulnerability Research- Legal implication of hacking- Impact of hacking. | 1 | 1 |
| | **Instructional Hours** | | 15 |
| II | **Foot Printing & Social Engineering**: Information gathering methodologies- Competitive Intelligence- DNS Enumerations- Social Engineering attacks. | 1 | 2 |
| | **Instructional Hours** | | 15 |
| III | **Scanning & Enumeration**: Port Scanning-Network Scanning- Vulnerability Scanning- NMAP scanning tool OS Fingerprinting- Enumeration. | | |
| | **Instructional Hours** | | 15 |
| IV | SYSTEM HACKING :Password cracking techniques- Key loggers- Escalating privileges- Hiding Files Steganography technologies- Countermeasures. | **1** | **5.6** |
| | **Instructional Hours** | | 15 |
| V | SNIFFERS & SQL INJECTION :Active and passive sniffing- ARP Poisoning- Session Hijacking- DNS Spoofing Conduct SQL Injection attack - Countermeasures. | **1** | **7,8** |
| | **Instructional Hours** | | 15 |
| | **Total Hours** | | 75 |

**Text Book(s):**
1. Kimberly Graves, "CEH: Official Certified Ethical Hacker Review Guide", WileyPublishing Inc.,
2. Shakeel Ali &TediHeriyanto, "Backtrack -4: Assuring security by penetration testing", PACKT Publishing.

**Reference book(s):**
1. Sagar Rahalkar, Network Vulnerability Assessment Packet Publishing
2. Metasploit, The Penetration Tester's Guide (1st Edition)

## Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|-------|--------|---------|------------|---------|------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

## Mapping

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
| P.K.mang Kumar 30.3.22 | P.K.mang Kumar 7.3.22 | Dsl.K.Selvavinayaki Convenor CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC510 | Core Paper XVI - Free and Open Source Softwares | | |
| Semester: V | Credits: 4 | CIA: 50 Marks | ESE: 50 Marks |

**Course Objective:**

**To Understand and apply the knowledge about the free and open source software**

**Course Outcomes (CO):**

| CO1 | To understand about the philosophy |
|---|---|
| CO2 | To remember the Linux installation |
| CO3 | To learn about open source programming language |
| CO4 | To learn about the programming tools and techniques |
| CO5 | To apply in the  real world through case studies |

**Offered by: DCFS**

**Course Content**                                    **Instructional Hours / Week:5**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | PHILOSOPHY :<br>Notion of Community--Guidelines for effectively working with FOSS community--, Benefits of Community based Software Development -- Requirements for being open, free software, open source software –Four degrees of freedom – FOSS Licensing Models - FOSS Licenses – GPL- AGPL- LGPL - FDL - Implications – FOSS examples. | 1 | 1 |
| | **Instructional Hours** | | **15** |
| II | LINUX : Linux Installation and Hardware Configuration – Boot Process- The Linux Loader (LILO) - The Grand Unified Bootloader (GRUB) - Dual-Booting Linux and other Operating System - Boot-Time Kernel Options- X Windows System Configuration- System Administration – Backup and Restore Procedures- Strategies for keeping a Secure Server. | 1 | 2 |
| | **Instructional Hours** | | **15** |
| III | PROGRAMMING LANGUAGES<br>Programming using languages like Perl or Ruby | | |
| | **Instructional Hours** | | **15** |
| IV | PROGRAMMING TOOLS AND TECHNIQUES Usage of design Tools like Argo UML or equivalent, Version Control Systems like Git or equivalent, – Bug Tracking Systems- Package Management Systems | 1 | 5,6 |
| | **Instructional Hours** | | **15** |
| V | FOSS CASE STUDIES<br>Open Source Software Development - Case Study – Libreoffice –Samba | 1 | 7,8 |
| | **Instructional Hours** | | **15** |
| | **Total Hours** | | **75** |

**Text Book(s):**
1. Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, "Linux in a Nutshell", Sixth Edition, OReilly Media, 2009.

**Reference book(s):**
1. Philosophy of GNU URL: http://www.gnu.org/philosophy/.
2. Linux Administration URL: http://www.tldp.org/LDP/lame/LAME/linux-admin-made-easy/.
3. The Python Tutorial available at http://docs.python.org/2/tutorial/.
4. Perl Programming book at http://www.perl.org/books/beginning-perl/.
5. Ruby programming book at http://ruby-doc.com/docs/ProgrammingRuby/.
6. Version control system URL: http://git-scm.com/.
7. Samba: URL : http://www.samba.org/.
8. Libre office: http://www.libreoffice.org/.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|-------|--------|---------|------------|---------|------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

**H-High; M-Medium; L-Low**
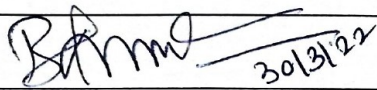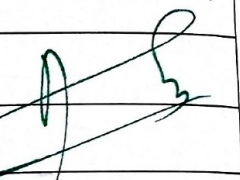
| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
| 30/3/22<br>B. KARTHIKEYAN | 30.3.22<br>P.K.mangkumar | Dr.K.Selvavinayaki<br>Convenor<br>CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFC611 | Core Paper XVIII - Malware Analysis and Cyber threat | | |
| Semester: VI | Credits: 4 | CIA: 50 Marks | ESE: 50 Marks |

**Course Objective:**

**To gain knowledge in malware analysis and cyber threat**

**Course Outcomes (CO):**

| CO1 | To Know about the computer virology |
|---|---|
| CO2 | To understand about the working culture of malwares |
| CO3 | To understand about the virus design |
| CO4 | To understand about the malware design |
| CO5 | To understand about the virus and worm analysis |

**Offered by: DCFS**

**Course Content**                                   **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | INTRODUCTION: Computer Infection Program- Life cycle of malware- Virus nomenclature- Worm nomenclature- Tools used in computer virology. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | IMPLEMENTATION OF COVERT CHANNEL :Non self-reproducing Malware- Working principle of Trojan Horse- Implementation of Remote access and file transfer- Working principle of Logical Bomb- CaseStudy: Conflicker C worm. | 1 | 2 |
| | **Instructional Hours** | | **18** |
| III | VIRUS DESIGN AND ITS IMPLICATIONS :Virus components- Function of replicator, concealer and dispatcher- Trigger -Mechanisms- Testing virus codes- Case Study: Brute force logical bomb. | | |
| | **Instructional Hours** | | **18** |
| IV | MALWARE DESIGN USING OPEN SOURCE :Computer Virus in Interpreted programming language- Designing Shell bash virus - under Linux- Fighting over infection- Anti –antiviral fighting – Polymorphism- Case study: Companion virus. | 2 | 5.6 |
| | **Instructional Hours** | | **18** |
| V | VIRUS AND WORM ANALYSYS :Klez Virus- Clone Virus- Doom Virus- Black wolf worm- Sassar worm- Happyworm 99. | 2 | 7,8 |
| | **Instructional Hours** | | **18** |
| | **Total Hours** | | **90** |

**Text Book(s):**

1. ErciFiliol, "Computer Viruses: from theory to applications", Springer, 1st edition, ISBN 10: 2-287-23939-1, 2005.
2. Mark.A .Ludwig, "The Giant black book of computer viruses, Create

SpaceIndependent Publishing Platform, 2 nd edition, ISBN 10: 144140712X, 2009.

**Reference book(s):**
1. Monnappa K A by Learning Malware Analysis: Explore the concepts, tools, and techniques to analyze and investigate Windows malware.
2. Jessey Bullock ,Wireshark for Security Professionals: Using Wireshark and the Metasploit Framework 1st Edition

### Tools for Assessment (50 Marks)

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|-------|--------|---------|------------|---------|------|-------|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

### Mapping

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|--------------------|-----------------|------------|-------------|
| 8 30/3/22<br>(Dr. V. Kavitha) | 30.3.22<br>P. K. Manoj Kumar | 30/3/22<br>Dr. K Selvavinayaki<br>Convenor<br>CDC | 3 0 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| 21U3DFE609 | **Core Paper XXII - Cyber Policing** | | |
| **Semester: VI** | **Credits: 4** | **CIA: 50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

**To gain knowledge in cyber policing**

**Course Outcomes (CO):**

| CO1 | To know about the history of Indian Police |
|---|---|
| CO2 | To gain knowledge in Police organization and structure |
| CO3 | To analysis about the crime prevention |
| CO4 | To understand about the police station routine work |
| CO5 | To understand about the public perception |

**Offered by: DCFS**

**Course Content**                                            **Instructional Hours / Week: 6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | History of Indian Police: Ancient period, Medieval period and British period- Modern policing-Community policing- Police Act, 1861- Police Commission Reforms and Recommendations- National Police Commission recommendations (NPC), 1979 | 1 | 1 |
| | **Instructional Hours** | | **18** |
| **II** | State police organization and structure – Urban and rural policing- Hierarchy in city police, district police and police battalion- Functioning of State Police: Law and Order, Intelligence and Special Unit- Central police organizations: RAW, IB, NIA, CBI, CISF, CRPF, RPF- Police research and Crime Statistics Organizations: BPR&D, NCRB. | 1 | 2 |
| | **Instructional Hours** | | **18** |
| **III** | Crime prevention: Patrolling, beat, surveillance, traffic regulation and maintenance of law & order- Collection of intelligence and its use- Use of scientific methods to tackle crime- Examination of crime scene and investigation- Methods of Investigation: Information, Modus Operandi and Interrogation, Recording of FIR, Case Diary, NC register, Collection of Evidence, Examination of Witnesses and Suspects, Confession of the accused and filing of charge Sheet. | 2 | 3.4 |
| | **Instructional Hours** | | **18** |
| **IV** | Police Station Routine: Roll Call, Duties of Prevention of Crime, Station Guards, Weekly routine duties of police men in cities and villages- Records maintained in police stations : General Diary, KD register, Prisoners Search Register, Duty Roaster, Sentry Relief Book, Duty Roster, Gun license register, Tapal register, arrest card and bail bond- New challenges faced by police: Cybercrime, financial frauds, terrorists, coastline security and organized crime- Community policing models and initiatives. | 1 | 5.6 |
| | **Instructional Hours** | | **18** |

| | | | |
|---|---|---|---|
| **V** | Public perception of police – Measures to improve police image in urban and rural areas- Measurements to improve police-public relationship through community policing- Measures to tackle corruption – Treatment of victims and offender by the police- Campaign to prevent drug abuse and to ensure safety of women in cities. | 2 | 7,8 |
| | **Instructional Hours** | | 18 |
| | **Total Hours** | | 90 |

**Text Book(s):**
1. Aleem, S. (1991). Women in Indian police (15th ed.). Chicago: Sterling Publishers Private Limited.
2. Barker, M., &Petley, J. (2001). Ill effects: The media/violence (2nd Ed.). London: RoutledgeBelson.

**Reference book(s):**
1. Fisher, Barry A. J. (2000). Techniques of crime scene investigation (6th Ed.). New York: CRC Press.
2. Diaz, S. M. (1976). New dimensions to the police role and functions in India. Hyderabad: National Police Academy.
3. Gautam, D. N. (1993). The Indian police: A study in fundamentals. New Delhi: Mittal Publications.
4. Krishna Mohan Mathur. (1994). IndianPolice: Roles and Challenges. Gyan Publishing House, New Delhi.
5. Krishna Mohan Mathur.(1989). Internal Security Challenges and Police in a Developing Society. RBSA Publishers.

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO\CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| M.Lth 30/3/2022 M.LEELAVATHI | 30.3.22 P.K.Manoj Kumar | 30/3/22 Dr.K.Selvavinayaki Convenor CDC | 3 0 MAR 2022 |

| Course Code | Title |
|---|---|
| **21U3ITE610** | **Discipline Specific Elective Paper III: Ethical Hacking** |
| **Semester: VI** | **Credits: 4** | **CIA:50 Marks** | **ESE: 50 Marks** |

**Course Objective:**
- To introduce the concepts of security and various kinds of attacks
- To explain about system hacking and penetration testing

**Course Outcome:**

| CO1 | Explain the importance of security and various types of attacks |
|---|---|
| CO2 | Understand the concepts of scanning |
| CO3 | Understand the concepts of system hacking |
| CO4 | Explain about penetration testing and its methodology |
| CO5 | Identify the various programming languages used by security professional |

**Offered by: DCFS**

**Course Content**                                 **Instructional Hours/Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| I | **Introduction To Hacking -** Introduction to Hacking – Importance of Security – Elements of Security – Phases of an Attack –Types of Hacker Attacks – Hacktivism – Vulnerability Research – Introduction to Foot printing –Information Gathering Methodology – Foot printing Tools – WHOIS Tools – DNS Information Tools– Locating the Network Range – Meta Search Engines | 1 | 1 |
| | **Instructional Hours** | | **18** |
| II | **Scanning And Enumeration -** Introduction to Scanning – Objectives – Scanning Methodology – Tools – Introduction to Enumeration – Enumeration Techniques – Enumeration Procedure – Tools | 2 | 2 |
| | **Instructional Hours** | | **18** |
| III | **System Hacking -** Introduction – Cracking Passwords – Password Cracking Websites – Password Guessing –Password Cracking Tools – Password Cracking Countermeasures – Escalating Privileges – Executing Applications – Key loggers and Spyware | 2 | 7 |
| | **Instructional Hours** | | **18** |
| IV | **Programming For Security Professionals -** Programming Fundamentals – C language – HTML – Perl – Windows OS Vulnerabilities – Tools for Identifying Vulnerabilities – Countermeasures – Linux OS Vulnerabilities – Tools for Identifying Vulnerabilities – Countermeasures | 2 | 9,10 |
| | **Instructional Hours** | | **18** |
| V | **Penetration Testing -** Introduction – Security Assessments – Types of Penetration Testing- Phases of PenetrationTesting– Tools – Choosing Different Types of Pen-Test Tools – Penetration Testing Tools | 2 | 11 – 14 |

| Instructional Hours | 18 |
|---|---|
| **Total Hours** | **90** |

**Text Books:**

1. EC-Council, "Ethical Hacking and Countermeasures: Attack Phases", Cengage Learning,2010.
2. Jon Erickson, "Hacking, 2nd Edition: The Art of Exploitation", No Starch Press Inc., 2008.
3. Michael T. Simpson, Kent Backman, James E. Corley, "Hands-On Ethical Hacking andNetwork Defense", Cengage Learning, 2013.

**Reference Books:**

1. Patrick Engebretson, "The Basics of Hacking and Penetration Testing – Ethical Hackingand Penetration Testing Made Easy", Second Edition, Elsevier, 2013.
2. RafayBoloch, "Ethical Hacking and Penetration Testing Guide", CRC Press, 2014

**Tools for Assessment (50 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| 8 | 8 | 10 | 8 | 8 | 8 | 50 |

**Mapping**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | H | H | H | L | M | M | L | M | H | M | H | M | L |
| **CO2** | M | M | M | M | H | M | M | M | M | L | M | H | H |
| **CO3** | H | L | M | H | M | M | L | H | H | L | H | L | M |
| **CO4** | M | H | L | M | L | L | H | M | M | L | L | M | L |
| **CO5** | M | M | H | H | M | H | M | H | H | L | M | M | H |

S- Strong; H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| *Rama* 30/3/22 | *signature* 30.3.22 | *signature* | *signature* |
| Dr J. RAMAPRABHA | P.K.manojkumar | Dr. K Selvavinayaki Convenor CDC | 30 MAR 2022 |

| Course Code | Title | | |
|---|---|---|---|
| **21U3DFE611** | **Discipline Specific Elective Paper III: Bio Informatics** | | |
| **Semester: VI** | **Credits: 4** | **CIA:50 Marks** | **ESE: 50 Marks** |

**Course Objective:**

- Understanding fundamentals of Bioinformatics
- Understanding concepts of Biological Sequences and Usage of Databases on sBioinformatics
- Applying Technologies to analyse molecular modelling and viewing.

**Course Outcome:**

| CO1 | Able to understand concepts and principles of bioinformatics systems |
|---|---|
| CO2 | Able to apply software tools to analyse, model molecular structures and sequences for bioinformatics. |
| CO3 | Understand the concept of Perl, CORBA |
| CO4 | Analyze different types of syntax and semantic errors |
| CO5 | Able to create application using concept of Perl. |

**Department Offered:** DCFS

**Course Content**            **Instructional Hours/Week:6**

| Unit | Description | Text Book | Chapter |
|---|---|---|---|
| **I** | **Introduction** – Objectives of Bioinformatics – Kind of data – Multiplicity of data and data mining – Major Bioinformatics databases – Data Integration – Data Analysis – Careers in Bioinformatics – Databases and Tools. | 1 | 1 |
| | **Instructional Hours** | | **18** |
| **II** | **Information Molecules and Information Flow –** Introduction – Basic Components – Structure of DNA – Structure of RNA – Genes – analyzing DNA. <br> **Using Linux –** Introduction to Linux – Basics of Linux System – Using Linux file system and Directories – Text processing – writing Shell programs. | 1 | 3,5 |
| | **Instructional Hours** | | **18** |
| **III** | **Programming with Perl –** Introduction to Perl – programming in Perl – Arrays – File Input and Output – Perl applications for bioinformatics. <br> **Relational and Object oriented Databases –** Introduction – Types of Databases – Object oriented Databases – CORBA – Managing Biological Databases – Tools for Sequence alignment. | 1 | 6,7,8,11 |
| | **Instructional Hours** | | **18** |
| **IV** | **Gene Prediction methods -** Introduction – using patterns to Predict genes–methods of Geneprediction – Geneprediction tools - Understanding and using Biological databases. | 1 | 14,18 |

| | | | |
|---|---|---|---|
| | **Proteomics –** Introduction – Proteome analysis – tools for proteome analysis – metabolic pathways – genetic networks | | |
| | **Instructional Hours** | | **18** |
| V | **Methods of statistical Analysis –** Introduction – Fundamentals of Probability and statistics –application of statistical tools. **Problem solving in Bioinformatics –** Introduction – Genomic analysis – strategies and Options for similarity search – Practical considerations – Flowchart for protein structure prediction | 1 | 20,21 |
| | **Instructional Hours** | | **18** |
| | Total Hours | | **90** |

**Text Book**
1. S. C.Rastogi, Namita Mendiratta & Parag Rastogi, Bioinformatics Concepts, Skills & Applications , CBS Publications, New Delhi,2003.

**Reference Books:**
1. Des Higgins & Willie Taylor I, **Bioinformatics sequence Structures and Databases**, Oxford University Press,2000.
2. Teresa K. Attwood and David J.Parry Smith, **Introduction to Bioinformatics**, Pearson Education, Singapore,2005
3. David. W. Mount. **Bioinformatics: sequence & Genome Analysis**, CBS Publications and Distributors, New Delhi,2005
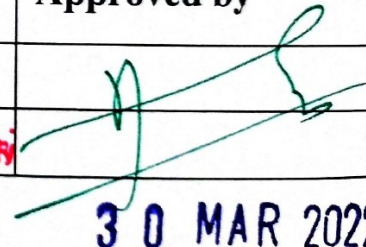
**Tools for Assessment (25 Marks)**

| CIA I | CIA II | CIA III | Assignment | Seminar | Quiz | Total |
|---|---|---|---|---|---|---|
| **8** | **8** | **10** | **8** | **8** | **8** | **50** |

**Mapping**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | H | H | L | M | M | L | M | H | M | H | M | L |
| CO2 | M | M | M | M | H | M | M | M | M | L | M | H | H |
| CO3 | H | L | M | H | M | M | L | H | H | L | H | L | M |
| CO4 | M | H | L | M | L | L | H | M | M | L | L | M | L |
| CO5 | M | M | H | H | M | H | M | H | H | L | M | M | H |

S- Strong; H-High; M-Medium; L-Low.

| Course Designed by | Verified by HoD | Checked by | Approved by |
|---|---|---|---|
| P.Jay 30/3/22 P.JEYANTHI | 20.3.22 P.K.Manojkumar | Dr.K.Selvavinayaki Convener CDC | 3 0 MAR 2022 |