

Mobile and Digital Forensics	L	T	P	Malware Analysis
	3	0	2	
Course Objective:Become knowlageble in mobile phone forensics and android forensics				
S. NO	Course Outcomes (CO)			
CO1	The use of mobile phones and digital devices across the globe has increased dramatically			
CO2	These devices are more susceptible to information security attacks			
CO3	Thus they also posses huge evidences which shall be used during crime scene investigation			
CO4	This course on mobile and digital forensics will provide a better understanding for these course participants on different forms of evidences in many digital devices,collections and interpretation of the same.			
S. NO	Contents			Hours

<b>UNIT 1</b>	Overview of wireless technologies and Security: Personal Area networks, Wireless Local Area Networks, Metropolitan Area Networks, Wide Area Networks.	<b>4</b>
<b>UNIT 2</b>	Wireless threats, Vulnerabilities and Security: Wireless LANs, War Driving, War Chalking, War Flying, Common Wi-fi security recommendations, PDA Security, Cell phones and Security, Wireless DoS attacks, GPS Jamming, Identity theft.	<b>8</b>
<b>UNIT 3</b>	CIA triad in mobile phones-Voice, SMS and Identification data interception in GSM: Introduction, practical setup and tools, implementation- Software and Hardware Mobile phone tricks: Netmonitor, GSM network service codes, mobile phone codes, catalog tricks and AT command set- SMS security issues	<b>10</b>
<b>UNIT 4</b>	Mobile phone forensics: crime and mobile phones, evidences, forensic procedures, files present in SIM card, device data, external memory dump, evidences in memory card, operators systems- Android forensics: Procedures for handling an android device, imaging android USB mass storage devices, logical and physical techniques10	<b>10</b>
<b>UNIT 5</b>	Digital forensics: Introduction – Evidential potential of digital devices: closed vs. open systems, evaluating digital evidence potential- Device handling: seizure	<b>10</b>
<b>TOTAL</b>		<b>42</b>

#### REFERENCES

<b>S.No.</b>	<b>Name of Books/Authors/Publishers</b>	<b>Year of Publication / Reprint</b>
<b>1</b>	Iosif I.Androulidakis,"Mobile Phone security and forensics: A practical approach", Springer publications, ISBN 978-3-319-29742-2	2012
<b>2</b>	Gregory Kipper, "Wireless Crime and Forensic Investigation",Auerbach publications	2007
<b>3</b>	Andrew Hoog,"Android Forensics:Investigation,Analysis and Mobile Security for google Android",Elsevier publications.	2011
<b>4</b>	Angus M.Marshall,"Digital forensics:Digital evidence in criminal investigations", John- Wiley and Sons.	2008

#### B.Tech. Information Technology

<b>Course code: Course Title</b>	<b>Course Structure</b>			<b>Pre-Requisite</b>
<b>Soft Computing</b>	<b>L</b>	<b>T</b>	<b>P</b>	Probability and statistics, Machine learning
	<b>3</b>	<b>1</b>	<b>0</b>	

**Course Objective:** 1. To design fuzzy systems for real-world problems using fuzzy logic and fuzzy sets.  
2. To design and describe the architecture and functioning of neural networks and neuro-fuzzy systems.  
3. To describe various evolutionary algorithms with application to real-world optimization problems.

S. NO.	Course Outcomes (CO)
CO1	Ability to distinguish between supervised, unsupervised and reinforcement learning.
CO2	Ability to construct a neural network architecture and describe its functioning mathematically.
CO3	Ability to execute operations with fuzzy sets and construct fuzzy rules.
CO4	Ability to solve simple problems involving fuzzy arithmetic and fuzzy numbers.
CO5	Ability to explain and compare different evolutionary algorithms.
CO6	Ability to construct the architecture and describe the functioning of neuro-fuzzy systems for simple application problems.

S. NO.	Contents	Contact Hours
UNIT 1	<b>Neural Networks:</b> Introduction to Learning Paradigms-Supervised, Unsupervised and reinforcement Learning. History of neural networks, overview of biological Neuro-systems, Mathematical Models of Neurons, ANN architecture and training algorithms- Perceptron, Multi-Layer Perceptron Model, Back Propagation algorithm, Applications of Artificial Neural	12
UNIT 2	<b>Fuzzy Logic:</b> Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation.	6
UNIT 3	<b>Operations on Fuzzy Sets:</b> Complement, Intersections, Unions, Combinations of Operations, Aggregation Operations. Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets. Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.	8
UNIT 4	<b>Evolutionary Optimization:</b> Introduction to evolutionary optimization algorithms - Genetic Algorithm, Particle Swarm Optimization, Grey Wolf Optimization, Artificial bee colony algorithm. Comparison to classical optimization using gradient descent and Meta-heuristic optimization algorithm - Simulated annealing.	10
UNIT 5	<b>Neuro-Fuzzy Systems:</b> Adaptive neuro-fuzzy inference systems - ANFIS, CANFIS, MANFIS. Architecture and learning process, Examples of application to real-world problems.	6

	<b>TOTAL</b>	<b>42</b>
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<b>S.No.</b>	<b>Name of Books/Authors/Publishers</b>	<b>Year of Publication / Reprint</b>
<b>1</b>	Jang, Sun, Mizutani, "Neuro-Fuzzy and Soft Computing: A Computational Approach to Learning and Machine Intelligence", Pearson Education India.	2015
<b>2</b>	G.J. Klir & B. Yuan, "Fuzzy Sets & Fuzzy Logic", PHI.	2009
<b>3</b>	T.J. Ross, "Fuzzy Logic with Engineering Applications", 3ed, Wiley.	2011
<b>4</b>	S. Rajasekaran & G. A.Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI.	2003
<b>5</b>	S. V. Kartalopoulos, "Understanding Neural Networks and Fuzzy Logic: Basic Concepts and Applications", IEEE Press – PHI.	1997