Course Code CSD4002	Ethical Hacking	Course Type LTP	Credits 4

Course Objectives:

The prime objective of this course is to teach students how to think like a hacker, providing them with a deep understanding of security issues and concerns. In addition, this course also provides the students with specialist knowledge and experience of advanced hacking techniques and their countermeasures

- To enable students to ethically hacking the computer systems and having hand-on experience of sploits.
- "To provide students with strong foundational concepts and also advanced techniques and tools in order to enable them to build hacking and defensive solutions of varying complexity"
- To prepare students to critically analyze security problems and ethically develop innovative and research oriented methodologies to solve the problems identified.

Course Outcomes:

At the completion of this course,

- Students should be able to exploit the vulnerabilities related to computer system and networks using state of the art tools and technologies
- Students should be able to understand the core concepts related to malware, hardware and software vulnerabilities and their causes
- Students should be able to understand ethics behind hacking and vulnerability disclosure

Student Outcomes (SO): b, c, i, k, l

b. An ability to analyze a problem, identify and define the computing requirements appropriate to its solution.

c. An ability to design, implement and evaluate a system / computer-based system, process, component or program to meet desired needs

i. Design and conduct experiment as well as analyze and interpret data.

k. An ability to use current techniques, skills and tools necessary for computing engineering practice.

l. An ability to apply mathematical foundations, algorithmic principles and computer science theory in the modeling and design of computer-based systems (CS)

Unit No	Unit Content	No. of hours	SOs
1	Introduction: Understanding the importance of security, Concept of ethical hacking and essential Terminologies-Threat, Attack, Vulnerabilities, Target of Evaluation, Exploit. Phases involved in hacking, Foot printing, Scanning, System Hacking, Session Hijacking, Introduction to Ethical Disclosure: Ethics of Ethical Hacking, Ethical Hacking and the legal system, Proper and Ethical Disclosure	09	b,c,i
2	Penetration Testing and Tools: Using Metasploit, Using BackTrackLiveCD Linux Distribution, Sniffers: Active and passive sniffing. ARP poisoning and countermeasures. Man	10	c,i

	in the middle attacks, Spoofing and Sniffing attacks. Sniffing countermeasures		
3	Exploits: Programming Survival Skills, Basic Linux Exploits, Advanced Linux Exploits, Shellcode Strategies, Writing Linux Shellcode, Basic windows Exploits	09	c,i
4	Vulnerability Analysis: Passive Analysis, Advanced Static Analysis with IDA Pro, Advanced Reverse Engineering, Client-side browser exploits, Exploiting Windows Access Control Model for Local Elevation Privilege, Intelligent Fuzzing with Sulley, From Vulnerability to Exploit	08	c,i
5	Malware Analysis: Collecting Malware and Initial Analysis, Hacking Malware	07	c,i,k
6	**Guest Lecture on Contemporary Topics**	02	
	Total Hours:	45	

Mode of Teaching and Learning: *Flipped Class Room, Activity Based Teaching/Learning, Digital/Computer based models, wherever possible to augment lecture for practice/tutorial and minimum 2 hours lectures by industry experts on contemporary topics*

Mode of Evaluation and assessment:
The assessment and evaluation components may consist of unannounced open book examinations, quizzes, student's portfolio generation and assessment, and any other innovative assessment practices followed by faculty, in addition to the Continuous Assessment Tests and Final Examinations.

Text Books:

1.	Shon Harris, Allen Harper, Chris Eagle and Jonathan Ness, Gray Hat Hacking: The Ethical Hackers' Handbook, TMH Edition
2.	Network intrusion alert: an ethical hacking guide to intrusion detection, Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR, 2007

Reference Books:

1.	Jon Erickson, Hacking: The Art of Exploitation, SPD
2.	Hacking Exposed: Network Security Secrets & Solutions, Stuart McClure, Joel Scambray and George Kurtz, McGraw-Hill, 2005

Recommendation by the Board of Studies on	*22 June 2019*
Approval by Academic council on	
Compiled by	*Dr. Shandilya*