



Department of Computer Applications

National Institute of Technology, Jamshedpur

(An Institution of national importance under MHRD, Govt. of India)

Autumn Semester Session 2020 – 2021

Course File

Batch	:	M.Tech. (1 st Semester)-2020
Course No.	:	CA4101
Course Title	:	Information Security
Instructor In-Charge	:	Dr. Chandrashekhar Azad
Contact	:	csazad.ca@nitjsr.ac.in/9430148516

Course Description:

Information Systems in Global Context, Threats to Information Systems, Risk Management, Security Considerations in Mobile and Wireless Computing, Information Security Building Blocks, Human Element security, Security Administration, Applications Security, Security of Operating Systems, Security Models, Frameworks, Standards and Methodologies, Security Metrics.

Course Objectives:

1. Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
2. Gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.
3. Develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
4. Develop an understanding of security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.

Course Outcomes:

At the end of the course, the students will:

1. have an understanding of the key themes and principles of information security management and be able to apply these principles in designing solutions to managing security risks effectively;
2. understand how to apply the principles of information security management in a variety of contexts;
3. have an appreciation of the interrelationship between the various elements of information security management and its role in protecting organisations.

Text Books

- T1. Nina Godbole, “Information Systems Security”, ISBN: 8126516925, 9788126516926, John Wiley & Sons, 2008
- T2. Whiteman, M.E. and Herbert, J.M., Principles of Information Security, Cengage Learning 2012, 4th Edition.

Reference Books

- R1. Atul Kahate, “Cryptography and Network Security”, McGrawHill Education (India).
- R2. Merkov, Breithaupt, “Information Security”, ISBN: 9788131712887, Pearson Education
- R3. Pachghare V.K., “Cryptography and Information Security”, ISBN: 978-81-203-3521-9 PHI Learning Pvt. Ltd., New Delhi
- R4. Schou, Shoemaker, “Information Assurance for the Enterprise”, ISBN: 9780070636545, Tata McGraw Hill
- R5. Sood, “Cyber Laws Simplified”, 1/e, ISBN: 9780070435063, Mc Graw Hill
- R6. Furnell, “Computer Insecurity”, ISBN: 1852339438, 9781852339432, Springer
- R7. William Stallings, Cryptography and Network Security: Principles and Practice (English) 5/E
- R8. Alexandar, “Introduction to Cryptography with Mathematical Foundation and Computer Implementations”, A Chapman and Hall Book

Lecture No.	Learning Objectives	Topics to be covered	Refer to chapter.
1-2	History of Information Systems and its Importance and Basics, Changing Nature of Information Systems, Need of Distributed Information Systems. Global Information System.	Information Systems in Global Context	T1:Ch.1 T2: Ch1& 2
3-7	Information Systems Security: Threats and attacks, Classification of Threats and Assessing Damages, Security Challenges in Mobile Devices, authentication Service Security, Mobile Devices-Security Implication for organizations, Laptops Security	Threats to Information Systems and Security in Mobile and Wireless Computing	T1:Ch.2 & 3
8-10	Basic Principles of IS, Confidentiality, Integrity, Availability and other terms. Information Classification and their Roles. Risk Management.	Building Blocks of IS	T1:Ch.5 T1:Ch 6 T2:CH 5
11-15	Physical Security-Needs, Natural Disasters and Controls, Basic Tenets of Physical Security of IS Resources, Physical Entry Controls, perimeter security for physical protection. Biometrics controls for security, Factors in Biometrics Systems, Benefits, Criteria for selection of biometrics, Design Issues in Biometric Systems, Interoperability Issues, Economic and Social Aspects, Legal Challenges.	Physical Security for IS and Biometrics Controls for Security	T1:Ch.7, 8, & 10 T2: Ch 9
16-20	N/W Security-Concepts, Dimensions, Establishing Security Perimeter for Network Protection. Cryptography-Applications, Roles, Digital Signature-Method of IS, Cryptographic Algorithms, Need for Intrusion Monitoring and Detection, Intrusion Detection.	Network Security, Cryptography and Intrusion Detection	T1:Ch.11, 13, 14 & 15, 16. T2: Ch 7 & 8
21-24	Firewalls, Design and Implementation Issues of Firewalls. VPN-Need, Tunneling, Authentication Mechanisms, Types of VPN, Security Concerns in VPN.	Firewalls, VPN	T1:Ch.15 & 16 T2: Ch 6
25-30	Applications Security, Security of Operating Systems	Applications Security, Security of Operating Systems	T1:Ch18, 20
31-35	ISO 27001, Systems Security Engineering Capability Maturity Model (SSE-CMM), Security Metrics, Privacy vs Security-Confusion and Conflict	Security Models, Frameworks, Standards and Method	T1:Ch.22, 23, 24, 28 & 29
36-40	IS and the Laws, Cyber Crimes, Indian IT Act, Ethical Issues in Intellectual Property and its various forms - Copyright, Patents, Trademark, Trade Name, Domain Name, Software Privacy, Plagiarism	Cyber Laws and Ethical Hacking	T1:Ch.27 & 38

Evaluation Scheme (EC):

EC No.	Evaluation Component	Duration	Weightage	Date & Time	Nature of Component
1.	Mid Term Examination	02 Hours	30%	Academic Calendar	Closed Book
2.	End Term Examination	03 Hours	40%	Academic Calendar	Closed Book
3.	Internal Assessment	--	30%	TBA	(Class Test, Attendance, Assignments/Reports/Projects/Seminars)

➔ **Online consultation hour:** Monday to Friday, 5PM to 6PM, Online

➔ **Notices:** All notices regarding the course will be displayed only on the Department of Computer Applications notice board.

Instructor In-Charge
CA4101