Sri Indu Institute of Engineering & Technology

Recognized Under 2(f) of UGC Act 1956
Approved by AICTE, New Delhi
Affiliated to JNTUH, Hyderabad.

COURSE FILE

ON

CRYPTOGRAPHY AND NETWORK SECURITY

Course Code - CS701PC

IV B.Tech I-SEMESTER

A.Y.: 2022-2023

Prepared by

Mrs.J.PUJITHA
Assistant Professor

B. Rahul Kanth
Computer Science & Engg. Dept.
SRI INDU INSTITUTE OF ENGG & TECH.
Sheriguda(V), Ibrahimpatnam(M), R.R.Dist-501 510.

PRINCIPAL
Sri Indu Institute of Engineering & Tech.
Sheriguda(Vill), Ibrahimpatnam
R.R. Dist. Telangana-501 510.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Academic Year	2022-2023
Course Title	CRYPTOGRAPHY & NETWORK SECURITY
Course Code	CS701PC
Programme	B.Tech
Year & Semester	IV year I-semester
Branch & Section	CSE-A
Regulation	R18
Course Faculty	Mrs. J.PUJITHA, Assistant Professor

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INSTITUTE VISION AND MISSION

Vision:

To become a premier institute of academic excellence by providing the world class education that transforms individuals into high intellectuals, by evolving them as empathetic and responsible citizens through continuous improvement.

Mission:

IM1: To offer outcome-based education and enhancement of technical and practical skills.

IM2: To continuous assess of teaching-learning process through institute-industry collaboration..

IM3: To be a centre of excellence for innovative and emerging fields in technology development with state-of-art facilities to faculty and students fraternity.

IM4: To create an enterprising environment to ensure culture, ethics and social responsibility among the stakeholders

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DEPARTMENT VISION AND MISSION

Vision:

To become a prominent knowledge hub for learners, strive for educational excellence with innovative and industrial techniques so as to meet the global needs.

Mission:

DM1 : To provide ambience that enhances innovations, problem solving skills, leadership qualities, decision making, team-spirit and ethical responsibilities.

DM2 : To impart quality education with professional and personal ethics, so as to meet the challenging technological needs of the industry and society.

DM3 : To provide academic infrastructure and develop linkage with the world class organizations to strengthen industry-academia relationships for learners.

DM4 : To provide and strengthen new concepts of research in the thrust area of Computer Science and Engineering to reach the needs of Government and Society.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: To develop trained graduates with strong academic and technical skills of modern computer science and engineering.

PEO2: To promote trained graduates with leadership qualities and the ability to solve real time problems using current techniques and tools in interdisciplinary environment.

PEO3: To motivate the graduates towards lifelong learning through continuing education and professional development.

PROGRAM SPECIFIC OUTCOMES

PSO1 : **Professional Skills:** To implement computer programs of varying complexity in the areas related to Web Design, Cloud Computing, Network Security and Artificial Intelligence.

PSO2: **Problem-Solving Skills**: To develop quality products using open ended programming environment.

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PROGRAMME OUTCOMES (POs)

PO1: **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: **Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: **Design/development of solutions:**Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech. in COMPUTER SCIENCE AND ENGINEERING

COURSESTRUCTURE&SYLLABUS(R18)

ApplicableFrom2018-19AdmittedBatch

IV YEAR I SEMESTER

S.No.	Course Code	CourseTitle	L	T	P	Credits
1	CS701PC	Cryptography & Network Security	3	0	0	3
2	CS702PC	Data Mining	2	0	0	2
3		Professional Elective-IV	3	0	0	3
4		Professional Elective-V	3	0	0	3
5		Open Elective-II	3	0	0	3
6	CS703PC	Cryptography& Network Security Lab	0	0	2	1
7	CS704PC	Industrial Oriented Mini Project / Summer Internship	0	0	0	2*
8	CS705PC	Seminar	0	0	2	1
9	CS706PC	Project Stage-I	0	0	6	3
		Total Credits	14	0	10	21

IV YEAR II SEMESTER

S.No.	Course Code	CourseTitle	L	T	P	Credits
1	SM801MS	Organizational Behaviour	3	0	0	3
2		Professional Elective-VI	3	0	0	3
3		Open Elective-III	3	0	0	3
4	CS802PC	Project Stage-II	0	0	14	7
		Total Credits	**9**	**0**	**14**	**16**

CS701PC:CRYPTOGRAPHYANDNETWORKSECURITY(PC)

IVYear B.Tech. CSE I-Sem **L T P C**

3 0 0 3

Course Objectives:

- Explain the objectives of information security
- Explain the importance and application of each of confidentiality ,integrity ,authentication and availability
- Understand various cryptographic algorithms.
- Understand the basic categories of threats to computers and networks
- Describe public-key cryptosystem.
- DescribetheenhancementsmadetoIPv4byIPSec
- Understand intrusions and intrusion detection
- Discuss the fundamental ideas of public-key cryptography.
- GenerateanddistributeaPGPkeypairandusethePGPpackagetosendanencryptede- mail message.
- Discuss Web security and Firewalls

Course Outcomes:

- Studentwillbeabletounderstandbasiccryptographicalgorithms,messageandweb authentication and security issues.
- Abilitytoidentifyinformationsystemrequirementsforbothofthemsuchasclientandserver.
- Abilitytounderstandthecurrentlegalissuestowardsinformationsecurity.

UNIT-I

Security Concepts: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security

CryptographyConceptsandTechniques: Introduction,plaintextandciphertext,substitution techniques,transpositiontechniques,encryptionanddecryption,symmetricandasymmetrickey cryptography, steganography, key range and key size, possible types of attacks.

UNIT-II

Symmetric key Ciphers: Block Cipher principles, DES ,AES, Blowfish,RC5,IDEA,Blockcipher operation, Stream ciphers, RC4.

Asymmetric key Ciphers : Principles of public key crypto systems, RSA algorithm, Elgamal Cryptography, Diffie-Hellman Key Exchange, Knapsack Algorithm.

UNIT-III

Cryptographic Hash Functions: Message Authentication, Secure Hash Algorithm (SHA-512), **Message authentication codes:** Authentication requirements, HMAC, CMAC, Digital signatures, Elgamal Digital Signature Scheme.

Key Management and Distribution: Symmetric Key Distribution Using Symmetric & Asymmetric Encryption, Distribution of Public Keys, Kerberos, X.509 Authentication Service, Public – Key Infrastructure

UNIT-IV

Transport-level Security: Web security considerations, Secure Socket Layer and Transport Layer Security, HTTPS, Secure Shell (SSH)

Wireless Network Security: Wireless Security, Mobile Device Security, IEEE 802.11 Wireless LAN, IEEE 802.11i Wireless LAN Security

UNIT-V

E-Mail Security: Pretty Good Privacy, S/MIME **IP Security:** IP Security overview, IP Security architecture ,Authentication Header,Encapsulatingsecuritypayload,Combiningsecurityassociations, Internet Key Exchange **Case Studies on Cryptography and security:** Secure Multiparty Calculation, Virtual Elections ,Single sign On, Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability.

TEXTBOOKS:

1. CryptographyandNetworkSecurity-PrinciplesandPractice:WilliamStallings,Pearson Education, 6th Edition
2. CryptographyandNetworkSecurity:AtulKahate,McGrawHill,3rdEdition

REFERENCEBOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. CryptographyandNetworkSecurity:ForouzanMukhopadhyay,McGrawHill,3rdEdition
3. Information Security ,Principles ,and Practice :Mark Stamp ,Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin ,Greg White, TMH
5. Introduction to Network Security :NealKrawetz, CENGAGE Learning
6. Network Security and Cryptography :Bernard Menezes CENGAGE Learning

COs and Mapping with PO/PSO

Course: CRYPTOGRAPHYANDNETWORKSECURITY (C411) Class: IV CSE-A

After completing this course the student will be able to:

C411.1 Understand various attacks on the Network and understanding the need for securitry (Knowledge)

C411.2 Apply various classical encryption techniques on messages and analyse various security services and mechanisms. (Application)

C411.3 Compare and contrast symmetric and asymmetric key cryptographic systems (Evaluation)

C411.4 Describe the cryptographic hash functions, message authentication codes and various key management and distribution techniques.(knowledge)

C411.5 Explain different protocols like SSL,TLS,HTTPS,SSH and various wireless network standards (Comprehension)

C411.6 Analyze how PGP and S/MIME is used to protect messages transmitted through E-Mail and explains IPSEC(Analysis)

Mapping of course outcomes with program outcomes:

High -3 Medium -2 Low-1

PO/PSO/ CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C411.1	2	3	3	-	-	-	-	-	-	-	-	-	2	-
C411.2	3	2	1	-	-	-	-	-	-	-	-	-	-	-
C411.3	3	2	3	-	-	-	-	-		-	-	1	-	1
C411.4	3	-	3	-	2	-	-	-	-	-	-	-	-	-
C411.5	1	-	2	2	3	-	-	-	-	2	-	-	-	-
C411.6	3	-	1	-	1	-	-	-	-	2	-	1	1	-
C411	2.5	2.3	2.1	2	2	-	-	-	-	2	-	1	-	-

CO – PO / PSO Mapping Justification

Course: Cryptography & network security **Class: IV B.Tech – I SEM – A – Sec**

PROGRAMME OUTCOMES (Pos):

PO1 **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO5 **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and 5odelling to complex engineering activities with an understanding of the limitations.

PO10 **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO12 **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO1	**Professional Skills:** The ability to implement computer programs of varying complexity in the areas related to web design, cloud computing and networking.
PSO2	**Problem-Solving Skills:** The ability to develop quality products using open ended programming environment.

C411.1	Understand various attacks on the Network and understanding the need for securitry. (Knowledge)
	Justification
PO1	Gain knowledge on various types of attacks on the network. (level 2)
PO2	Analyze how the datais corrupted during its transmission. (Level 3)
PO3	Able to conduct investigations to know other possible attacks on the network. (Level 3)
PSO1	Apply the gained knowledge networkingsecuritydomain. (Level 2)

C411.2 Apply various classical encryption techniques on messages and analyse various security services and mechanisms. (Application)

	Justification
PO1	Gainknowledge of various types of classical encryption techniques like substitution,transposition and steganography techniques(level 3)
PO2	Analyze how to convert the plain text into cipher text with the given key.(level 2)
PO3	Able to design solutions with the Above techniques. (Level 1)

C411.3 Compare and contrast symmetric and asymmetric key cryptographic systems (Evaluation)

	Justification
PO1	Gainknowledge of various types of symmetric and asymmetric key cryptographic systems. (level 3)
PO2	Analyse the problem to apply symmetric and asymmetric key cryptographic system. (level 2)
PO3	Able to design better solutions for security issues. (level 3)
PO12	encourage the independent learning of new technology in data network security. (level 1)
PSO1	Apply the gained knowledge networking securitydomain. (Level 1)

C411.4 Describe the cryptographic hash functions and message authentication codes and various key management and distribution techniques. (knowledge)

	Justification
PO1	Gain the knowledge of various cryptographic hash functions and message authentication codes. (level 3)
PO3	Apply the learnt knowledge to design the solutions. (level 3)
PO5	Demonstrates the knowledge about current software's and network security tools for data integrity and authentication. (level 2)

C411.5 Explain different protocols like SSL,TLS,HTTPS,SSH and various wireless network standards (Comprehension)

	Justification
PO1	Gain the knowledge of SSL and TLS protocols and various network standards (Level 1)
PO3	Able to analyse how SSL and TLS protocols are used in HTTPs. (Level 2)
PO4	analyse how SSL and TLS protocols are used in HTTPs. (Level 2)
PO5	Demonstrates the knowledge about different protocols like SSL,TLS,HTTPS,SSH (Level 3)
PO10	Able to communicate various network standards likeIEEE 802.11 Wireless LAN, IEEE 802.11i very effectively(level 2)

C411.6 Analyze how PGP and S/MIME is used to protect messages transmitted through E-Mail and explains IPSEC(Analysis)

	Justification
PO1	Gain the knowledge of PGP and S /MIME encryption algorithms. (level 3)
PO3	Able to apply the PGP package to send the encrypted message(Level1)
PO5	Demonstrates the knowledge about S/MIME is used to protect messages transmitted through E-Mail(Level1)
PO10	Select and apply the current tools and techniques used to encrypt the messages of Electronic Mail. (level 2)
PO12	Ability to absorb and interest for team/independent lifelong learning in the students community (level 1)
PSO1	Ability to classify the different standards of protocols in the network security.. (level 1)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

ACADEMIC CALENDAR 2022-23

B. Tech./B. Pharm. IV YEAR I & II SEMESTERS

I SEM

S. No	Description	Duration	
		From	To
1	Commencement of I Semester classwork	**29.08.2022**	
2	1st Spell of Instructions (including Dussehra Recess)	29.08.2022	31.10.2022 (9 Weeks)
3	Dussehra Recess	03.10.2022	08.10.2022 (1 Week)
4	First Mid Term Examinations	01.11.2022	07.11.2022 (1 Week)
5	Submission of First Mid Term Exam Marks to the University on or before	12.11.2022	
6	2nd Spell of Instructions	09.11.2022	03.01.2023 (8 Weeks)
7	Second Mid Term Examinations	04.01.2023	10.01.2023 (1 Week)
8	Preparation Holidays and Practical Examinations	11.01.2023	19.01.2023 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	17.01.2023	
10	End Semester Examinations	*20.01.2023*	02.02.2023(2 Weeks)

Note: No. of Working/instructional days: 94

II SEM

S. No	Description	Duration	
		From	To
1	Commencement of II Semester classwork	**03.02.2023**	
2	1st Spell of Instructions	03.02.2023	31.03.2023 (8 Weeks)
3	First Mid Term Examinations	01.04.2023	08.04.2023 (1 Week)
4	Submission of First Mid Term Exam Marks to the University on or before	15.04.2023	
5	2nd Spell of Instructions	10.04.2023	17.06.2023 (10 Weeks)
6	**Summer Vacation**	15.05.2023	27.05.2023 (2 Weeks)
7	Second Mid Term Examinations	19.06.2023	24.06.2023 (1 Week)
8	Preparation Holidays and Practical Examinations	26.06.2023	01.07.2023 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	01.07.2023	
10	End Semester Examinations	03.07.2023	15.07.2023 (2 Weeks)

Note: No. of Working/ instructional days: 91

REGISTRAR

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

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Website: https://siiet.ac.in/

TIME TABLE FOR A.Y 2022-23

Class: IV B. Tech CSE -A **Semester: I** **LH. NO: A-101** **W.E.F:29-08-2022**

Period/ Day	1	2	3	4	1:00-1:30	5	6	7
	9:40-10:30	10:30-11:20	11:20-12:10	12:10-1:00		1:30-2:20	2:20-3:10	3:10-4:00
Monday	C&NS	C&NS LAB(BATCH-I)/SEMINAR(BATCH-II)			LUNCH	RTS	LIB	POE
Tuesday	DM	RTS	C&NS	COUN		MINI PROJECT		
Wednesday	CC	MAJOR PROJECT STAGE -I				MAJOR PROJECT STAGE -I		
Thursday	RTS	C&NS	DM	INT		C&NS	DM	SPORTS
Friday	POE	RTS	CC	DM		CC	CO-C/SS/DAA	
Saturday	CC	POE	C&NS	DM		SEMINAR(BATCH-I) /C&NS LAB(BATCH-II)		

(T) – Tutorial (concern faculty)

Subject Code	Subject Name	Name of the Faculty	Subject Code	Subject Name	Name of the Faculty
CS701PC	Cryptography& Network Security	Mrs.J Pujitha	CS705PC	Seminar Coordinator	Mrs.S.Akhila / Dr. Bapathu Gangadhara Obula Reddy / Dr B Ratnakanth
CS702PC	Data Mining	Mr.K.Veera Kishore		CO-C/SS/DAA	Mrs.J Pujitha
CS714PE	Cloud Computing (PE-IV)	Mrs.K.Manmadha	Sports	Sports	Mr.P.Sriramulu
CS722PE	Real Time Systems (PE-V)	Mrs.M.Karuna	Internet	Internet	Mrs.K.Manmadha
	Principles of Entrepreneurship (OE-II)	Mr.N.B.C.Sidhhu	LIB	Library	Mrs.K.Manmadha
CS703PC	Cryptography& Network Security Lab	Mrs.J Pujitha / Mrs.B.S.Swapna Shanthi/ Mrs.N.Shilpa	COUN	Counselling	Mrs.K Anusha
CS704PC	Mini Project Coordinator	Mrs.M.Karuna/ Mrs.K.Manmadha/ Mrs. K.Anusha	CS706PC	Major Project (Stage-I)	Dr Sasi Kumar/Mrs.J Pujitha / Mrs.M.Karuna
Class In-Charge : Mrs.J Pujitha		Mentor 1 : Mrs.J Pujitha		Mentor 2: Mrs.M.Karuna	

Class In-Charge

HOD
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Lesson Plan

Course Title	Cryptography and Network Security
Course Code	CS701PC
Programme	B.Tech
Year & Semester	IV-year I-semester
Regulation	R18
Course Faculty	Mrs.J PUJITHA, Assistant Professor , CSE

LESSON PLAN

S.NO	Unit	TOPIC	Number of Sessions Planned	Teaching method/Aids	REFERENCE
1.	1	Introduction, The need for security	1	Black Board	T1,PPT
2.		Security approaches, Principles of security	1	Black Board	T1
3.		Types of Security attacks	1	Black Board	T1,W1
4.		Security services	1	Black Board	T1
5.		Security Mechanisms	1	Black Board	T1
6.		A model for Network,plain text and cipher text,encryption and decryption	1	Black Board	T1
7.		substitution techniques	2	Black Board	T1
8.		transposition techniques	1	Black Board	T1
9.		symmetric and asymmetric key cryptography	1	Black Board	T1
10.		steganography, key range and key size	1	Black Board	T1,PPT
11.		possible types of attacks	1	Black Board	T1
12.		Block Cipher principles	1	Black Board	T1,PPT
13.		DES	1	Black Board	T1,W2
14.		AES	1	Black Board	T1
15.		Blowfish	1	Black Board	T1
16.		RC5	1	Black Board	T1

17.	2	IDEA	1	Black Board	T1
18.		Block cipher operation	1	Black Board	T1
19.		Stream ciphers, RC4	1	Black Board	T1
20.		Principles of public key cryptosystems	1	Black Board	T1
21.		RSA algorithm,	1	Black Board	T1
22.		Elgamal Cryptography	1	Black Board	
23.		Diffie-Hellman Key Exchange	1	Black Board	T1
24.		Knapsack Algorithm.	1	Black Board	T1
25.	3	Message Authentication	1	Black Board	T1,PPT
26.		Secure Hash Algorithm (SHA-512)	1	Black Board	T1,PPT
27.		Message authentication codes: Authentication requirements	1	Black Board	T1,PPT
28.		HMAC	1	Black Board	T1
29.		CMAC	1	Black Board	T1
30.		Digital signatures, Elgamal Digital Signature Scheme	1	Black Board	T1
31.		Symmetric Key Distribution Using Symmetric & Asymmetric Encryption	1	Black Board	T1
32.		Distribution of Public Keys	1	Black Board	T1
33.		Kerberos	1	Black Board	T1,W3
34.		X.509 Authentication Service	1	Black Board	T1
35.		Public – Key Infrastructure	1	Black Board	T1
36.	4	Web security considerations	1	Black Board	T1
37.		Secure Socket Layer	1	Black Board	T1,PPT
38.		Transport Layer Security	1	Black Board	T1
39.		HTTPS	1	Black Board	T1
40.		Secure Shell (SSH)	1	Black Board	T1,W4
41.		Wireless Security, Mobile Device Security	1	Black Board	T1
42.		IEEE 802.11 Wireless LAN	1	Black Board	T1
43.		IEEE 802.11i Wireless LAN Security	1	Black Board	T1
44.	5	Pretty Good Privacy Secure Multiparty Calculation, Virtual Elections	2	Black Board	T2
45.		S/MIME	1	Black Board	T2,W5
46.		IP Security overview, IP Security architecture, Authentication Header	1	Black Board	T2,PPT
47.		Encapsulating security payload, Combining security associations	1	Black Board	T2
48.		Secure Multiparty	1	Black Board	T1

		Calculation, Virtual Elections			
49.		Single sign On, Secure Inter-branch Payment Transactions	1	Black Board	T1
50.		Cross site scripting vulnerability	1	Black Board	T1

TEXTBOOKS:

1. CryptographyandNetworkSecurity-PrinciplesandPractice:WilliamStallings,Pearson Education, 6th Edition
2. CryptographyandNetworkSecurity:AtulKahate,McGrawHill,3rdEdition

REFERENCEBOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. CryptographyandNetworkSecurity:ForouzanMukhopadhyay,McGrawHill,3rdEdition
3. Information Security ,Principles ,and Practice :Mark Stamp ,Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin ,Greg White, TMH
5. Introduction to Network Security :NealKrawetz, CENGAGE Learning

Network Security and Cryptography :Bernard Menezes CENGAGE Learning

WEB REFERENCES

W1:https://www.geeksforgeeks.org/cryptography-and-network-security-principles/

W2: https://www.youtube.com/watch?v=eCAHcfA-2c8&list=PL71FE85723FD414D7&index=11

W3: https://www.geeksforgeeks.org/kerberos/

W4:https://www.javatpoint.com/ssh-meaning

W5: https://cs.stanford.edu/people/eroberts/courses/soco/projects/2004-05/cryptography/smc.html

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

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Khalsa Ibrahimpatnam, Sheriguda (V), Ibrahimpatnam (M), Ranga Reddy Dist., Telangana – 501 510
Website: https://siiet.ac.in/

LECTURER NOTES

UNIT-1

https://drive.google.com/file/d/1M9QC_9TmW8fKhQo29Al8aQtKtYEcIUtk/view?usp=sharing

UNIT-2

https://drive.google.com/file/d/160FVHy7SB7jTYVIBUZ1U74q5ccXGtoH3/view?usp=sharing

https://drive.google.com/file/d/1XRlwmhs86Tsm9V1uzugl0ARHS7EF9HLt/view?usp=sharing

UNIT-3

https://drive.google.com/file/d/18tBdUAcFZ7116mumPbYmKHxvl5lZqn7e/view?usp=sharing

UNIT-4

https://docs.google.com/presentation/d/1JzDHyUSfLDEjWPF_-z1rzwI-nMCxavkW/edit?usp=sharing&ouid=115583240995509497339&rtpof=true&sd=true

UNIT-5

https://drive.google.com/file/d/1QPK2NuQl3AEEZhF0HlQlz5Qynkfz5GvA/view?usp=sharing

POWER POINT PRESENTATIONS

1.https://docs.google.com/presentation/d/1q3itM2RhGiLsZOGyJSmdy741cjSZmRbc/edit?usp=sharing&ouid=115583240995509497339&rtpof=true&sd=true

2. https://docs.google.com/presentation/d/13WCib6F00azNGV8gE_2oYB81tS-IVtV0/edit?usp=sharing&ouid=115583240995509497339&rtpof=true&sd=true

3.https://docs.google.com/presentation/d/1ko06trZzcjTGy3ttiJHHQmyO9lqBEZhu/edit?usp=sharing&ouid=115583240995509497339&rtpof=true&sd=true

4.https://docs.google.com/presentation/d/1IjbnLRmZqYAtgmLBmeVKy4rpRrdyKdaX/edit?usp=sharing&ouid=115583240995509497339&rtpof=true&sd=true

5. https://docs.google.com/presentation/d/17wbQB5O6JudiWnUVnwyf5UDKsWGK-N8K/edit?usp=sharing&ouid=115583240995509497339&rtpof=true&sd=true

R16

Code No: 136AW

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, May - 2019
CRYPTOGRAPHY AND NETWORK SECURITY
(Common to CSE, IT)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) What are security mechanisms? Explain. [2]
b) What is steganography? [3]
c) Do you agree with the statement that an increase in key size of 1 bit doubles the security of DES? Justify your answer. [2]
d) How keys are exchanged in Diffie-Hellman algorithm? [3]
e) Give a note on public key infrastructure. [2]
f) What problem was Kerberos designed to address? Explain. [3]
g) In SSL and TLS, why is there a separate change cipher spec protocol, rather than including change cipher spec message in the handshake protocol? [2]
h) Explain the IEEE 802.11Wireless LAN. [3]
i) What is transport mode and tunnel mode in IP sec? [2]
j) Give a brief note on Virtual Elections. [3]

PART - B

(50 Marks)

2.a) List and briefly define categories of Security Services and attacks.
b) How would you test a piece of cipher text to determine quickly if it was likely the result of a simple substation? Explain. [5+5]

OR

3. Consider a desktop publishing system used to produce documents for various organizations.
a) Give an example of a type of publication for which confidentiality of the stored data is the most important requirement.
b) Give an example of a type of publication in which data integrity is the most important requirement.
c) Give an example in which system availability is the most important requirement.[10]

4. AES consists of four functions in three layers. Which of the functions are primarily for confusion and which are primarily for diffusion? Which of the layers are for confusion and which are for diffusion? Justify your answers. [10]

OR

5.a) Critically analyze the security of RSA.

b) Differentiate between RC_5 and blowfish. [5+5]

6. List the main features of SHA-512 cryptographic hash function. What kind of compression function is used in SHA-512? [10]

OR

7. Explain Message Authentication Requirements and what are the attacks related to message communication? [10]

8. Is it possible in SSL for the receiver to recorder SSL record blocks that arrive out of order? If so, explain how it can be done. If not, why not? [10]

OR

9. Discuss the IEEE 802.11i Wireless LAN Security. [10]

10.a) Briefly explain the scenario of IP security and its Policy.

b) Explain IP security architecture and also explain basic combinations of security associations with a neat diagram. [5+5]

OR

11. List and explain the PGP services and explain how PGP message generation is done with a neat diagram. [10]

---oo0oo---

R16

Code No: 136AW

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2019
CRYPTOGRAPHY AND NETWORK SECURITY
(Common to CSE, IT)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) Differentiate between Interruption and Interception. [2]
b) Discuss about Masquerade in brief. [3]
c) List out the advantages of RC4 algorithm. [2]
d) Write about cipher block chaining mode of operation. [3]
e) What is the key size and Message Digest size in SHA1 algorithm? [2]
f) What are the benefits of Digital Signature? [3]
g) Summarize the functions of HTTP protocol. [2]
h) Discuss about the importance of security in mobile devices. [3]
i) What are the applications of IPSec? [2]
j) What are the advantages of Authentication Header Protocol? [3]

PART - B

(50 Marks)

2.a) Describe the model for network security with neat sketch.
b) Describe pervasive and specific security mechanisms in detail. [4+6]

OR

3.a) Write any three transposition ciphers with examples.
b) Discuss about Brute force attack in detail. [6+4]

4.a) Summarize the public key cryptographic principles. Explain RSA algorithm for given example, where $p = 3$ and $q = 11$.
b) Enumerate Diffie-Hellman Key exchange for encryption and decryption with suitable examples. [5+5]

OR

5. Enumerate in detail about the steps in Blow Fish Algorithm and explain the process of each round with a neat diagram. [10]

6.a) What is HMAC function? Summarize the design objectives of HMAC.
b) Explain about Elgamal Digital Signature Scheme. [5+5]

OR

7. Discuss about the message exchange mechanism in Kerberos version 4. [10]

8.a) What is SSL? Explain about SSL record protocol format.

b) Enumerate the functionalities of Secure Shell. [6+4]

OR

9. Explain the security constraints of IEEE 802.11i Wireless LAN in detail. [10]

10. Write general format of PGP message with a pictorial representation and explain. How PGP used for E-mail security? [10]

OR

11.a) Describe the functionalities of Internet Key Exchange Protocol.

b) How to provide security during Inter-branch Payment Transactions? [5+5]

---ooOoo---

Sri Indu Institute of Engineering & Technology

Sheriguda (V), Ibrahimpatnam (M), R.R.Dist-501 510

I- Mid Examinations, NOV-2022

Set – I

Year &Branch: IV CSE –A,B&C Date: 1-11-2022

Subject: C&NS Marks: 10 Time: 60 min

Answer any **TWO** Questions. All Question Carry Equal Marks 2*5=10 marks

(This question paper is prepared with Course Outcome and BT's mapping)

1. Describe briefly about types of attacks with a neat sketch. (C411.1) (Comprehension)(SM)

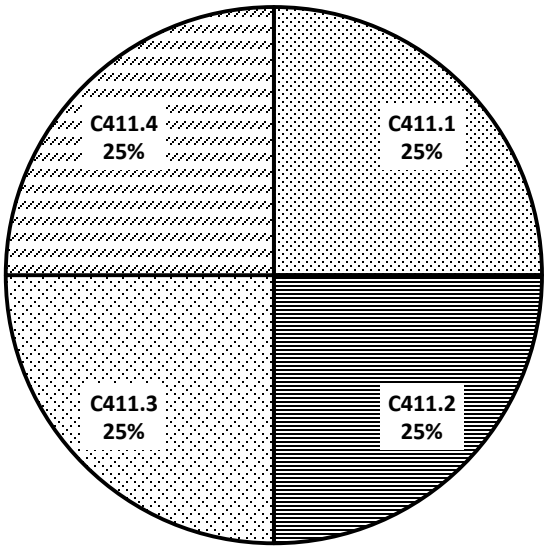
2.Describe the following (C411.2) (Knowledge)(5M)

a) play Fair cipher b) Rail fence technique

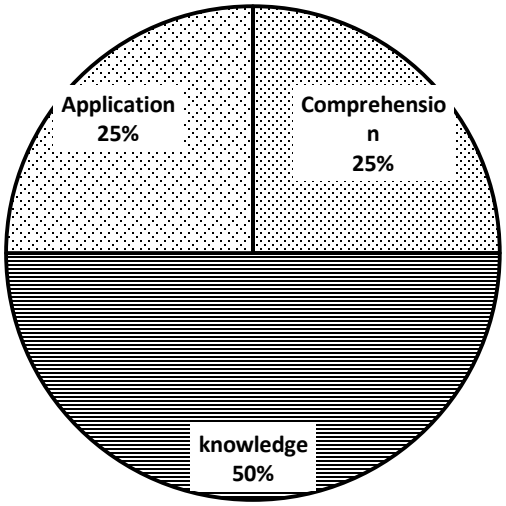
3.Draw and Explain about AES algorithm. (C411.3) (Application)(5M)

4. Describe the following HMAC(C411.4) (Knowledge)(5M)

QUESTION PAPER MAPPING WITH CO'S



QUESTION PAPER MAPPING WITH BT'S



Sri Indu Institute of Engineering & Technology

Sheriguda (V), Ibrahimpatnam (M), R.R.Dist-501 510

I- Mid Examinations, NOV-2022

Set – II

Year &Branch: IV CSE –A,B&C Date: 1-11-2022

Subject: C&NS Marks: 10 Time: 60 min

Answer any **TWO** Questions. All Question Carry Equal Marks 2*5=10 marks

(This question paper is prepared with Course Outcome and BT's mapping)

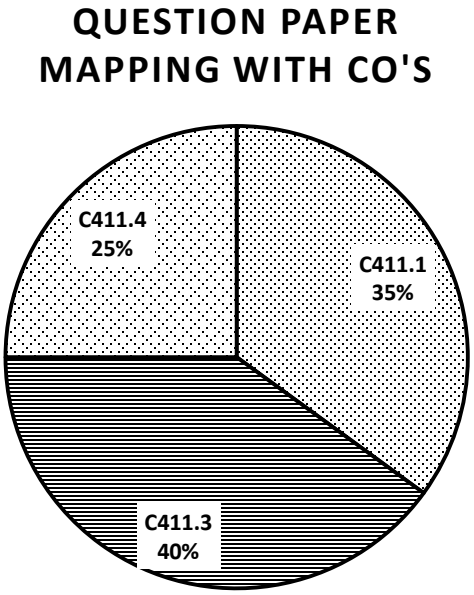
1. a) Write about principles of security. (C411.1) (Comprehension)(2M)

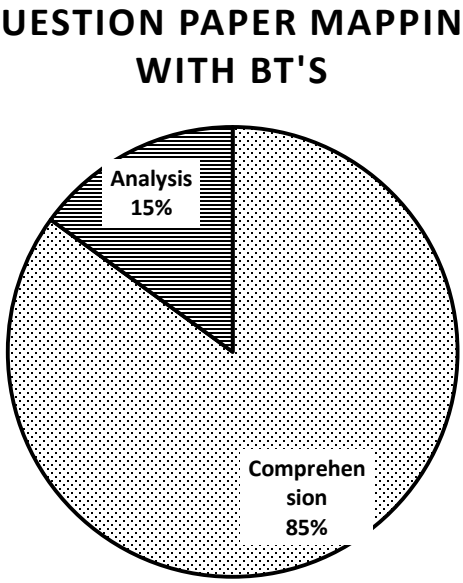
   b)Compare and Contrast the symmetric and asymmetric key cryptography(C411.3) (Analysis) (3M)

2. Explain about block cipher operations. (comprehension) (C411.3) (5M)

3. Write about Message authentication. (Comprehension) (C411.4) (`5M)

4. Explain about a) Steganograpghy(3M) b) Digital Signature(Comprehension) (2M) (C411.1)





SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech IV Year I Sem., I mid –Term Examinations, NOV-2022

CRYPTOGRAPHY AND NETWORK SECURITY

Objective Exam

Name:_____Hall ticket No: | | | | | | | | | | |

Answer All Questions. All Questions Carry Equal Marks. Time: 20Min. Marks: 10.

I choose the correct alternative:

1. Cipher text of the following Plain text "hello" using Ceaser cipher is [ ]

a) KHOOR b) IFMMP c) ABCCD d) OLLEH

2. Symmetric Encryption is also reffered to as [ ]

a)Conventional Encryption b) Single key Encryption c) a&b d) None

3. Which of the following is Steganography [ ]

a) Pin punctures b) Invisible ink c) a&b d) None

4. A powerful Tool used to look at the frequency of two letter combination [ ]

a) Di-graph b) Di-gram c)Diagram d)a&b

5. What is the Value of 33mod 26 [ ]

a) 1 b) 7 c)6 d)11

6. SHA-512 Produces output of _____ Message [ ]

a) 128 b) 512 c) 128 d)1024

7. Making the relationship between Statistics of cipher text and the value of encryption key is as complex as possible is called.. [ ]

a) Confusion b) Diffusion c)a&b d) permutation

8.RC4 is used in which of the following [ ]

a) SSH (Secure Shell) b) WPA c) a&b d) None

9. Which Mode of the Block cipher operation used in satellite communication [ ]

a) CTR b) OFB c) CFB d) CBC

10. Which of the following is stream Cipher [ ]

a) RC4 b)RC5 c) DES d)Blowfish

IL. Fill in the blanks:

1. _____Conceal the existence of message

2 a word equals to bits_____

3. The process of converting Plain text to cipher text is called_____

4.Asymmetric key encryption also known as_____

5.Expand ECB _____

6. _____involves trying every possible key until an intelligible transformation

(Plain text) is obtained

7. AES Stands for_____

8.Expansion of SPN_____

9. a change in one bit of plain text or one bit of key should produce a change

many bits of cipher text This is referred as_____

10. IDEA Stands for_____

Answer key

1.a

2.b

3.c

4.d

5.b

6.c

7.d

8.c

9.b

10.a

11.steganography

12.32

13.encryption

14.public key cryptography

15.electronic code book

16.ciphertext

17.advanced encryption standard

18.service principal name

19.decryption

20.international data encryption algorithm

C&NS Assignment -1 questions:

Write any 4 questions

1.Explain Transposition and Substitution Techniques (C411.1) (Comprehension)

2a)Explain about model for security network with diagram (C411.1) (Comprehension)

b) Explain about steganography and its features(C411.1) (Comprehension)

3.Describe briefly about types of attacks with a neat sketch(C411.1) (Knowledge)

4.Explain Block cipher operations with diagrams (C411.2) (Comprehension)

5.Draw and Explain about SHA algorithm(C411.3) (Application)

6.Explain briefly about security mechanisms(C411.1) (Comprehension)

MID-1 Answer Key:

https://drive.google.com/file/d/1I3qx8k9LZiez4adZ9QgUVxepe7KOzkm4/view?usp=sharing

Assignment Answer Key:

https://drive.google.com/file/d/1kx_ctBkHBMl8v4O4CPp-WLo3ZDGEgzpc/view?usp=sharing

Sri Indu Institute of Engineering & Technology

Sheriguda (V), Ibrahimpatnam (M), R.R.Dist-501 510

II- Mid Examinations, JAN-2023

Set – I

Year &Branch: IV CSE –A,B&C Date: 04-1-2023

Subject: C&NS Marks: 10 Time: 60 min

Answer any **TWO** Questions. All Question Carry Equal Marks 2*5=10 marks

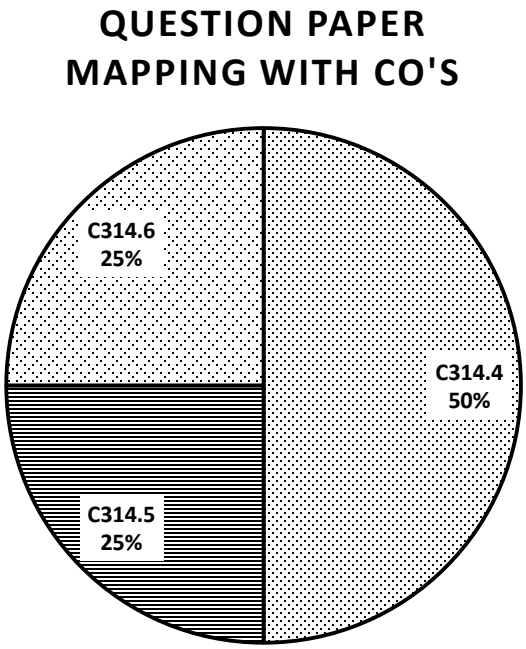
(This question paper is prepared with Course Outcome and BT's mapping)

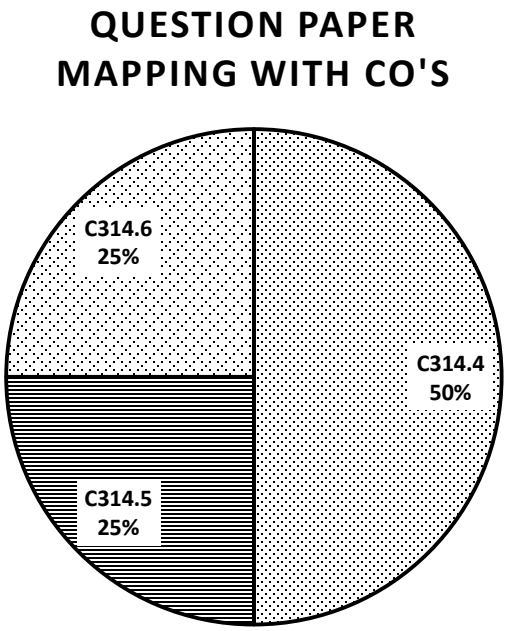
1. Explain Message Authentication Requirements and what are the attacks related tomessage communication? (COMPREHENSION)(5M) (C411.4)

2. Discuss the IEEE 802.11 Wireless LAN Security? (ANALYSIS)(5M) (C411.5)

3. Explain IP security architecture and also explain basic combinations of securityassociations with a neat diagram (COMPREHENSION) (5M) (C411.6)

4. List the main features of SHA-512 cryptographic hash function. What kind of compression function is used in SHA-512? (KNOWLEDGE) (5M) (C411.4)





Sri Indu Institute of Engineering & Technology

Sheriguda (V), Ibrahimpatnam (M), R.R.Dist-501 510

II- Mid Examinations, JAN-2023

Set – II

Year &Branch: IV CSE –A,B&C Date: 04-1-2023

Subject: C&NS Marks: 10 Time: 60 min

Answer any **TWO** Questions. All Question Carry Equal Marks 2*5=10 marks

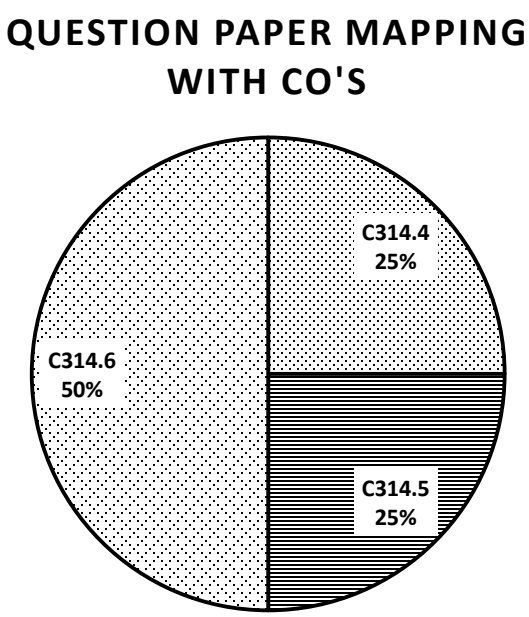
(This question paper is prepared with Course Outcome and BT's mapping)

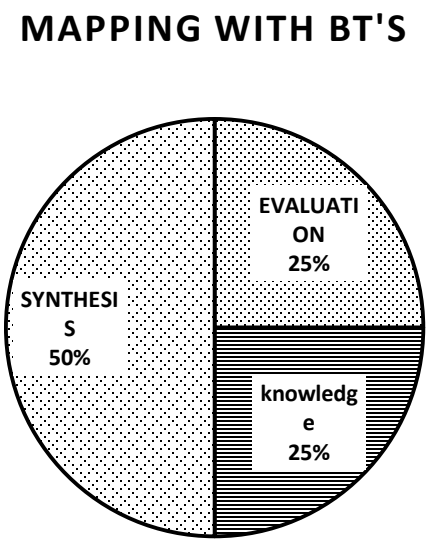
1.What is HMAC function? Summarize the design objectives of HMAC? (SYNTHESIS)(5M) (C411.4)

2. What is SSL? Explain about SSL record protocol format? (SYNTHESIS)(5M) (C411.5)

3. Describe the functionalities of Intemet Key Exchange Protocol? (KNOWLEDGE)(5M) (C411.6)

4. How to provide security during Inter-branch Payment Transactions? (EVALUATION)(5M) (C411.6)





SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech IV Year I Sem., II mid –Term Examinations, jan-2023

CRYPTOGRAPHY AND NETWORK SECURITY

Objective Exam

Name: _____ **Hall ticket No:** | | | | | | | | | | |

Answer All Questions. All Questions Carry Equal Marks. Time: 20Min. Marks: 10.

I choose the correct alternative:

1. When a hash function is used to provide message authentication, the hash function value is referred to as [ ]

a) Mrsage Field b) Mensage Digest c) Memage Score d)Message Leap

2. Message authentication code is also known as [ ]

a) key code b) hash code c) keyed hash function d)message key hash function

3. Another name for Message authentication codes is [ ]

a) cryptographic code break b) cryptographic code sum

c) cryptographic check sum d) cryptographic check break

4. MACs are also called [ ]

a) test word b) check word c) test bits d) none of the mentioned

5. MAC is a [ ]

a) one-to-one mapping b) many-to-one mapping

c) onto mapping d) none of the mentioned

6. Wi-Fi stands for [ ]

a) Wireless Fidelity b) Wireless LAN c)Wireless FLAN d) None of the mentioned

7. SSID slink for [ ]

a) Secure Service Identifier b) Secure Set independent Device

c)Secure Set identifier d) Service Set independent Device

8. VPN stands for [ ]

a) Visual Performance Node b) Virtual Private Network

c) Virtual Post Node d) Virtual post Network

9. Network layer firewall works as [ ]

a) Frame filter b) Packet filter c) Content filter d)Virus filter

10. Which one of the following is not an application hash functions? [ ]

a) One-way password file b) Key wrapping c) Virus Detection d) intrusion detection

II. Fill in the blanks:

1. A proxy firewall filters at _____

2._____ is a type of software designed to help the user's computer detect viruses and save them.

3. It can be a software program or a hardware device that filters all data packets coming through the internet, a network, etc, it is known as the_____

4. Code Red is a type of _____

5. Hash functions are extremely useful and appear in almost all_____ applications.

6. There are_____ types of computer virus.

7._____is a most common application of the hash functions.

8. A computer programs_____ is a malicious code which self-replicates by copying itself to other programs.

9. The virus hides itself from getting detected by_____ different ways.

10._____ infects the master boot record and it is challenging and a complex task to remove this virus.

Answer Key

1. Choose the correct alternative:

1.b

2.c

3.c

4.D

5.B

6.A

7.c

8.B

9.B

10. B

II. Fill in the blanks:

1. Application layer

2. Antivirus

3. Firewall

4. A computer virus

5. Information security

6.10

7. Data Integrity check

8. Virus

9.3

10. Boot Sector Virus

ASSIGNMENT QUESTIONS ((C&NS MID-2)

WRITE ANY FOUR QUESTIONS

1. Summarize key distribution scenario. (COMPREHENSION)((C411.5)
2. Describe different techniques proposed for the distribution of public keys(KNOWLEDGE)(C411.4)
3. Write short notes on the following: (KNOWLEDGE)(C411.5)

   a) IEEE 802.11 protocol architecture b) IEEE 802.11i services and phases.
4. Explain the following: (COMPREHENSION)(C411.5)

   a) SSH b) HTTPS
5. Describe about Kerberos (KNOWLEDGE)(C411.5)
6. Analyze the following: (Analysis)(C411.5)

   a) Wireless security b) mobile security

MID-2 Answer Key:

https://drive.google.com/file/d/1WWlJfO5az3CJiq1lqR8W4b8LcPUKd6Qy/view?usp=sharing

Assignment Aswer key:

https://drive.google.com/file/d/1jxX0bjDtjZs4wROVGY1yLfulUrb-r7E2/view?usp=sharing

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Khalsa Ibrahimpatnam, Sheriguda (V), Ibrahimpatnam (M), Ranga Reddy Dist., Telangana – 501 510
Website: https://siiet.ac.in/

Course Title	Cryptography and Network Security
Course Code	CS701PC
Programme	B.Tech
Year & Semester	IV-year I-semester
Regulation	R18
Course Faculty	Mrs.J PUJITHA, Assistant Professor , CSE

Slow learners:

S No	Roll no	No of backlogs	Internal-I Status	Internal-II Status
1	19X31A0510	5	14	16
2	19X31A0527	5	19	16
3	19X31A0556	5	15	16
4	19X31A0559	5	18	16
5	19X31A0546	4	14	16
6	19X31A0555	3	13	17

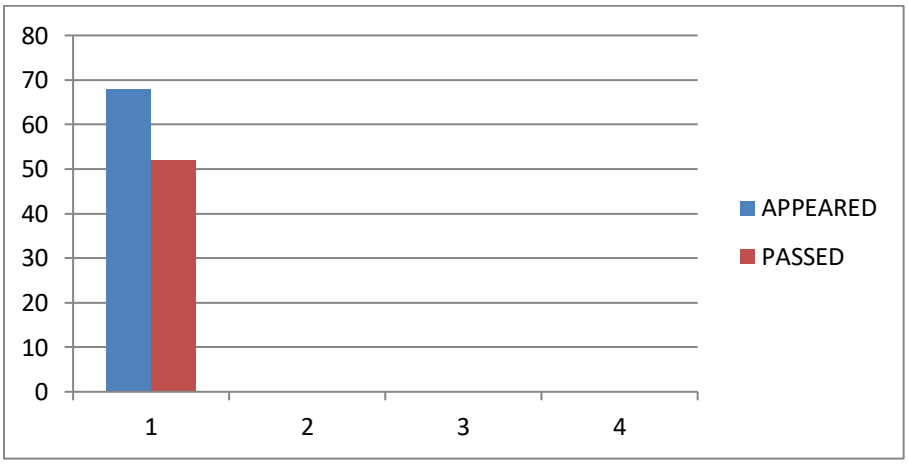
Advanced learners:

S.NO	ROLL.NO.	GATE MATERIAL
1	19X31A0503	Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.
2	19X31A0504	
3	19X31A0505	
4	19X31A0517	
5	19X31A0518	
6	19X31A0519	
7	19X31A0520	
8	19X31A0524	
9	19X31A0534	
10	19X31A0537	
11	19X31A0539	
12	19X31A0543	
13	19X31A0547	
14	19X31A0550	
15	19X31A0551	
16	19X31A0552	

BATCH CSE-IV BTECH I SEM CSE-A RESULT ANALYSIS

ACADAMIC YEAR	COURSE NAME	NUMBER OF STUDENTS		QUESTION PAPER SETTING		PASS%
		APPEARED	PASSED	INTERNAL	EXTERNAL	
2022-2023	Cryptography And Network Security(C411)	68	52	Course Faculty	Jntuh	76%

CRYPTOGRAPHY AND NETWORK SECURITY(C411) RESULT ANALYSIS



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Website: https://siiet.ac.in/

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

REMEDIAL CLASSES TIME TABLE

A.Y 2022-23 **SEMESTER-I**

BRANCH/ SEC	MON 4.00 PM-5.00 PM	TUE 4.00 PM-5.00 PM	WED 4.00 PM-5.00 PM	THUR 4.00 PM-5.00 PM	FRI 4.00 PM-5.00 PM
II CSE-A	A&DE	DS	C++	COA	COSM
II CSE-B	DS	A&DE	COSM	C++	COA
II CSE-C	COSM	COA	A&DE	DS	C++
III CSE-A	SE	FLAT	CN	WT	PPL
III CSE-B	WT	CN	SE	PPL	FLAT
III CSE-C	FLAT	WT	PPL	CN	SE
IVCSE-A	C&NS	DM	CC	POE	RTS
IV CSE-B	CC	RTS	C&NS	DM	POE
IV CSE-C	RTS	CC	POE	C&NS	DM

HOD
Computer Science & Engg. Dept.
SRI INDU INSTITUTE OF ENGG & TECH.
Sheriguda(V), Ibrahimpatnam(M), R.R.Dist-501 10

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Sri Indu Institute of Engineering & Tech
Sheriguda(Vill), Ibrahimpatnam
R.R. Dist. Telangana -501 510

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Computer Science and Engineering

Course Outcome Attainment (Internal Examination-1)

Name of the faculty : J PUJITHA Academic Year: 2022-23

Branch & Section: CSE - A Examination : I Internal

Course Name: C&NS Year: IV Semester: I

S.No	HT No.	Q1a	Q1b	Q2a	Q2 b	Q3a	Q3b	Q4a	Q4 b	Obj 1	A1
Max. Marks ==>		**5**		**5**		**5**		**5**		**10**	**5**
1	18X31A0511	5								8	**5**
2	18X31A0522	5				4					5
3	18X31A0531			5						8	5
4	18X31A0593					1				8	5
5	19X31A0501			5		4				9	5
6	19X31A0502			5		4				9	5
7	19X31A0503	5		4						9	5
8	19X31A0504					4		5		9	5
9	19X31A0505					5		4		9	5
10	19X31A0506	4		5						10	5
11	19X31A0507	5		4						9	5
12	19X31A0508			4		3				9	5
13	19X31A0509			5						9	5
14	19X31A0510	2				2					5
15	19X31A0511					3		3		8	5
16	19X31A0512			5		4				8	5
17	19X31A0513					4		3		8	5
18	19X31A0514	2				2					5
19	19X31A0515			5		4				9	5
20	19X31A0517					4		5		9	5
21	19X31A0518			4		5				9	5
22	19X31A0519					4		5		8	5
23	19X31A0520	4		5						9	5
24	19X31A0521			4		4				8	5
25	19X31A0522			3		3				7	5
26	19X31A0523	4						4		8	5
27	19X31A0524			4		5				8	5
28	19X31A0525					5		4		9	5
29	19X31A0526	5		4						9	5
30	19X31A0527							5		9	5
31	19X31A0528					5		4		6	5
32	19X31A0529	5		4						8	5

33	19X31A0530			4						9	5
34	19X31A0531					3		3		8	5
35	19X31A0532	3		4						8	5
36	19X31A0533			4		3				9	5
37	19X31A0534	5		4						8	5
38	19X31A0535			5		3				9	5
39	19X31A0536					3		3		8	5
40	19X31A0537			4		5				9	5
41	19X31A0538					4		4		8	5
42	19X31A0539					4		5		8	5
43	19X31A0540	4		5						8	5
44	19X31A0541			2				2			5
45	19X31A0542					4		4		9	5
46	19X31A0543	4		5						9	5
47	19X31A0544			1				2			5
48	19X31A0545					3		3		9	5
49	19X31A0546	4		5							5
50	19X31A0547			5		4				8	5
51	19X31A0548			0						9	5
52	19X31A0549					5		4		8	5
53	19X31A0550					5		4		8	5
54	19X31A0551			4		5				9	5
55	19X31A0552					5		4		9	5
56	19X31A0553			2				2			5
57	19X31A0554					5				9	5
58	19X31A0555			2				2			5
59	19X31A0556							2		8	5
60	19X31A0557			4		5				9	5
61	19X31A0558							4		9	5
62	19X31A0559					5		4		9	5
63	20X35A0501	4		4						8	5
64	20X35A0502			2				2			5
65	20X35A0503			4		4				9	5
66	20X35A0504			2				2			5
67	20X35A0505					4		4		8	5
68	20X35A0506			2				2			5
Target set by the faculty / HoD		3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	6.00	3.00

Number of students performed above the target	15	0	32	0	37	0	22	0	57	68
Number of students attempted	17	0	40	0	40	0	30	0	57	68
Percentage of students scored more than target	88%		80%		93 %		73%		100%	100 %

CO Mapping with Exam Questions:

CO - 1	**Y**		**Y**						Y	Y
CO - 2					**Y**		**Y**		Y	Y
CO - 3									Y	Y
CO - 4										
CO - 5										
CO - 6										

% Students Scored >Target %	88%		80%		93 %		73%		100%	100 %

CO Attainment based on Exam Questions:

CO - 1	88%		80%						100%	100 %
CO - 2					93 %		73%		100%	100 %
CO - 3									100%	100 %
CO - 4										
CO - 5										
CO - 6										

CO	**Subj**	obj	Asgn	Overall	Level
CO-1	84%	100 %	100 %	95%	3.00
CO-2	83%	100 %	100 %	94%	3.00
CO-3		100 %	100 %	100%	3.00
CO-4					
CO-5					
CO-6					

Attainment Level	
1	40%
2	50%
3	60%

Attainment (Internal 1 Examination) = **3.00**

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Computer Science and Engineering

Course Outcome Attainment (Internal Examination-2)

Name of the faculty : J PUJITHA Academic Year: 2022-23

Branch & Section: CSE - A Examination: I Internal

Course Name: C&NS Year : IV Semester: I

S.No	HT No.	Q1a	Q1b	Q2a	Q2b	Q3a	Q3b	Q4a	Q4b	Obj 4	A4
Max. Marks ==>		5		5		5		5		10	5
1	18X31A0511			5							5
2	18X31A0522	5		4						8	5
3	18X31A0531	4		4							5
4	18X31A0593			2							5
5	19X31A0501	5		5						9	5
6	19X31A0502			5		4				8	5
7	19X31A0503			5		5				9	5
8	19X31A0504					5		4		8	5
9	19X31A0505					4		4		8	5
10	19X31A0506	5		5						9	5
11	19X31A0507			5		4				8	5
12	19X31A0508					5				6	5
13	19X31A0509			5		2				8	5
14	19X31A0510					5				6	5
15	19X31A0511					4		4		8	5
16	19X31A0512			4		4				8	5
17	19X31A0513									8	5
18	19X31A0514					5		4			5
19	19X31A0515	4		5						8	5
20	19X31A0517			5		5				9	5
21	19X31A0518					5		4		9	5
22	19X31A0519			4		3				7	5
23	19X31A0520					5		4		8	5
24	19X31A0521	2		5						6	5
25	19X31A0522					5				6	5
26	19X31A0523	4		4						8	5
27	19X31A0524					4		4		8	5
28	19X31A0525					5		4		9	5
29	19X31A0526			5		5				9	5
30	19X31A0527					5				6	5
31	19X31A0528	5		4						9	5
32	19X31A0529			2		5				7	5

33	19X31A0530					2				9	5
34	19X31A0531	4		4						8	5
35	19X31A0532			4		3				8	5
36	19X31A0533			2				5		6	5
37	19X31A0534	5		5						9	5
38	19X31A0535					4		4		8	5
39	19X31A0536	4		4						8	5
40	19X31A0537			5		4				9	5
41	19X31A0538			4		3				8	5
42	19X31A0539	5		4						9	5
43	19X31A0540			5		5				9	5
44	19X31A0541			4		5				9	5
45	19X31A0542					4		4		8	5
46	19X31A0543	5		5						9	5
47	19X31A0544					5				6	5
48	19X31A0545			4		4				8	5
49	19X31A0546			5		5					5
50	19X31A0547	5		5						9	5
51	19X31A0548			5		5				9	5
52	19X31A0549					5		4		9	5
53	19X31A0550			5		5				9	5
54	19X31A0551					5		5		9	5
55	19X31A0552			5		3				8	5
56	19X31A0553			5		5					5
57	19X31A0554					5				6	5
58	19X31A0555			5						7	5
59	19X31A0556							5		6	5
60	19X31A0557	5		3						8	5
61	19X31A0558					5				6	5
62	19X31A0559					5		2		7	5
63	20X35A0501					4		4		8	5
64	20X35A0502			5						6	5
65	20X35A0503	5								6	5
66	20X35A0504			4		4				8	5
67	20X35A0505					4		4		9	5
68	20X35A0506			5		5					5
Target set by the faculty / HoD		3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	6.00	3.00

Number of students performed above the target	15	0	39	0	43	0	16	0	61	68
Number of students attempted	16	0	42	0	45	0	17	0	61	68
Percentage of students scored more than target	94%		93%		96 %		94 %		100%	100 %

CO Mapping with Exam Questions:

CO - 1										
CO - 2										
CO - 3										
CO - 4	**y**								y	y
CO - 5			**Y**						y	y
CO - 6					**y**		**y**		y	y

CO Attainment based on Exam Questions:

CO - 1										
CO - 2										
CO - 3										
CO - 4	94%								100%	100 %
CO - 5			93%						100%	100 %
CO - 6					96 %		94 %		100%	100 %

CO	**Subj**	obj	Asgn	Overall	Level
CO-1					
CO-2					
CO-3					
CO-4	94%	100%	100 %	98%	3.00
CO-5	93%	100%	100 %	98%	3.00
CO-6	95%	100%	100 %	98%	3.00

Attainment Level	
1	40%
2	50%
3	60%

Attainment (Internal Examination-2) = **3.00**

INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Computer Science and Engineering

Course Outcome Attainment (University Examinations)

Name of the faculty : J PUJITHA

Academic Year: 2022-23

Branch & Section: CSE - A

Year / Semester: IV / I

Course Name: C&NS

S.No	Roll Number	Marks Secured
1	18X31A0511	40
2	18X31A0522	32
3	18X31A0531	37
4	18X31A0593	30
5	19X31A0501	35
6	19X31A0502	26
7	19X31A0503	47
8	19X31A0504	40
9	19X31A0505	34
10	19X31A0506	41
11	19X31A0507	32
12	19X31A0508	33
13	19X31A0509	10
14	19X31A0510	4
15	19X31A0511	31
16	19X31A0512	39
17	19X31A0513	32
18	19X31A0514	28
19	19X31A0515	35
20	19X31A0517	35

S.No	Roll Number	Marks Secured
36	19X31A0533	38
37	19X31A0534	41
38	19X31A0535	34
39	19X31A0536	38
40	19X31A0537	39
41	19X31A0538	27
42	19X31A0539	46
43	19X31A0540	37
44	19X31A0541	2
45	19X31A0542	40
46	19X31A0543	41
47	19X31A0544	6
48	19X31A0545	16
49	19X31A0546	3
50	19X31A0547	40
51	19X31A0548	42
52	19X31A0549	36
53	19X31A0550	41
54	19X31A0551	34
55	19X31A0552	37

21	19X31A0518	36
22	19X31A0519	31
23	19X31A0520	44
24	19X31A0521	40
25	19X31A0522	29
26	19X31A0523	35
27	19X31A0524	40
28	19X31A0525	45
29	19X31A0526	47
30	19X31A0527	6
31	19X31A0528	32
32	19X31A0529	39
33	19X31A0530	10
34	19X31A0531	31
35	19X31A0532	33
Max Marks		75

Class Average mark	30
Number of students performed above the target	46
Number of successful students	68
Percentage of students scored more than target	68%
Attainment level	**3**

56	19X31A0553	19
57	19X31A0554	22
58	19X31A0555	23
59	19X31A0556	3
60	19X31A0557	31
61	19X31A0558	34
62	19X31A0559	9
63	20X35A0501	33
64	20X35A0502	13
65	20X35A0503	15
66	20X35A0504	33
67	20X35A0505	30
68	20X35A0506	21
69		
70		

Attainment Level	**% students**
1	40%
2	50%
3	60%

Course Outcome Attainment

Name of the faculty :	J PUJITHA	Academic Year:	2022-23
Branch & Section:	CSE - A	Examination:	I Internal
Course Name:	C&NS	Year:	IV
		Semester:	I

Course Outcomes	1st Internal Exam	2nd Internal Exam	Internal Exam	University Exam	Attainment Level
CO1	3.00		3.00	3.00	3.00
CO2	3.00		3.00	3.00	3.00
CO3	3.00		3.00	3.00	3.00
CO4		3.00	3.00	3.00	3.00
CO5		3.00	3.00	3.00	3.00
CO6		3.00	3.00	3.00	3.00
Internal & University Attainment:			3.00	3.00	
Weightage			25%	75%	
CO Attainment for the course (Internal, University)			0.75	2.25	
CO Attainment for the course (Direct Method)			3.00		

Overall course attainment level **3.00**

SRI INDU INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Computer Science and Engineering

Program Outcome Attainment (from Course)

Name of Faculty:	J PUJTHA	Academic Year:	2022-23
Branch & Section:	CSE - A	Year:	IV
Course Name:	C&NS	Semester:	I

CO-PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2
CO1	2	3	3	-	-	-	-	-	-	-	-	-	2	-
CO2	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	3	-	-	-	-	-		-	-	1	-	-
CO4	3	-	3	-	2	-	-	-	-	-	-	-	-	1
CO5	1	-	2	2	3	-	-	-	-	2	-	-	-	-
CO6	3	-	1	-	1	-	-	-	-	2	-	1	1	-
Course	2.5	2.3	2.1	2	2					2		1	2.5	1

CO	Course Outcome Attainment
CO1	3.00
CO2	3.00
CO3	3.00
CO4	3.00
CO5	3.00
CO6	3.00
Overall course attainment level	**3.00**

PO-ATTAINME

NT

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO1 1	PO1 2	**PSO1**	**PSO2**
CO Attainment	**2.50**	**2.30**	**2.10**	**2.00**	**2.00**					**2.00**		**1.00**	**2.50**	**1.00**

CO contribution to PO - 33%, 67%, 100% (Level 1/2/3)

ATTENDENCE REGISTER LINK

https://drive.google.com/file/d/1x6bSxr3WDvf2RxYAq5TwKRZnoqMbK0yZ/view?usp=sharing