



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

COURSE FILE

Name of the Faculty: Dr. Gitosree Khan

Designation: Associate Professor

Department: Information Technology

Academic Year: 2025-26

Course Name: Cryptography and Network Security

Course Code: PEC-IT801B

Regulation: MAKAUT (2018)

Program: B. Tech in Information Technology

Year & Semester: 4th Year, 8th Semester

Batch: 2022-2026



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Table of Contents

S. No.	Item description
1	Institute Vision and Mission, Departmental Vision and Mission, PEOs, POs, and PSOs
1.1	Institute Vision and Mission
1.2	Departmental Vision and Mission
1.3	Program Educational Objectives (PEOs), Program Outcomes (POs), and Program Specific Outcomes (PSOs)
2	Course Syllabus
3	Course Information Sheet
3.1	Course Pre-requisite/Exposure
3.2	Course Description
3.3	Course Objectives
3.4	Course Content
3.5	Course Outcomes
3.6	Justification of Course Outcomes
3.7	CO-PO/PSO Relationship Matrix
3.8	Justification of CO-PO/PSO Mapping
3.9	Class Time Table
3.10	Lesson Plan
3.11	Teaching Pedagogy
3.12	Assessment Methodology
3.13	Curricular Gap
4	Course Delivery Details
4.1	Institutional Academic Calendar
4.2	Departmental Academic Calendar
4.3	Course Delivery Details and Adherence to Academic Calendar
5	Teaching Pedagogy
5.1	Lecture Notes
5.2	List of Power Point Presentations
5.3	List of Videos
5.4	Problem Sheets/Tutorial Materials
5.5	Quiz Questions
6	Previous Years' University Question Papers
7	List of Students
8	Documentation of Slow and Advanced Learners



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

- 8.1 Quiz Questions for Identification of Slow Learners, Solution, Assessment, and Sample Copies of Corrected Answer Scripts
- 8.2 List of Slow Learners
- 8.3 List of Advanced Learners
- 8.4 Time Table for Remedial Class and Class for Advanced Learners
- 8.5 Notes for Slow Learners
- 8.6 Notes for Advanced Learners
- 8.7 Attendance Sheet for Slow Learners with Signature
- 8.8 Attendance Sheet for Advanced Learners with Signature
- 8.9 Quiz Questions for Slow Learners (Taken at the End of Remedial Class Schedule), Solution, Assessment, and Sample Copies of Corrected Answer Scripts

- 9 Events Organized for Curricular Gap**
 - 9.1 Notice for Guest Lecture
 - 9.2 Attendance of Students with Signature
 - 9.3 Quiz Questions on Curricular Gap, Solution, Assessment, and Sample Copies of Corrected Answer Scripts

- 10 Continuous Assessments, University Results, and End Semester Students' Survey**
 - 10.1 Topics for Presentation (on CO1), Rubrics, Assessment, and Sample Copies of Presentation
 - 10.2 Topics for Report Writing (on CO2), Rubrics, Assessment, and Sample Copies of Report Writing
 - 10.3 Class Test 1 (on CO1, CO2, and CO3), Scheme of Evaluation, Model Answer, Assessment, and Sample Corrected Copies of Class Test 1
 - 10.4 Class Test 2 (on CO4, and CO5), Scheme of Evaluation, Model Answer, Assessment, and Sample Corrected Copies of Class Test 2
 - 10.5 Assessment of Quiz (Conducted by University, on CO1 to CO5)
 - 10.6 Assignment (on CO1 to CO5), Scheme of Evaluation, Model Answer, Assessment, and Sample Corrected Copies of Assignment
 - 10.7 University Question Paper, Mapping with CO, Answer Key, University Results and Results Analysis
 - 10.8 End Semester Students' Survey (CO Learning Assessment), Mapping with CO, Sample Students' Survey

- 11 Impact Analysis of Slow Learners (Please add one column for the final year students on placement/higher studies/entrepreneurship)**

- 12 CO, PO and PSO Attainment**
 - 12.1 CO Attainment
 - 12.2 PO Attainment
 - 12.3 Observations on CO and PO Attainment
 - 12.4 CO and PO Attainment of the Entire Class
 - 12.5 Action Plan for Next Academic Year Based on CO and PO attainment



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

**INSTITUTE VISION, MISSION,
DEPARTMENTAL VISION, MISSION,
PEOs, POs, AND PSOs**



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

INSTITUTE

VISION

To emerge as a progressive and premier institute for Engineering and Technology education with ethical values for creative engineering solutions commensurate with global changes.

MISSION

- Offer quality education through modern accessible, comprehensive and research-oriented teaching – learning process.
- Create opportunities for students and faculty members in acquiring knowledge through research and development.
- Providing effective interface with industry by strengthening Industry-Institute interaction and developing entrepreneurial skills.
- Meet ever-changing needs for the nation through rational evolution towards sustainable and environment friendly technologies.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Department of Information Technology

VISION

The Information Technology Department will become a centre for advanced learning through research and development of innovative applications of information in industry and society.

MISSION

- To create a learner-centric environment that motivates the students in adapting emerging technologies of the rapidly evolving information society.
- To incubate students to grow as industry ready professionals, proficient research scholars and enterprising entrepreneurs.
- To promote social, environmental and technological responsiveness among the members of the faculty and students.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: The graduates of IT will have strong domain knowledge of IT fundamentals, principles, tools and technologies along with a strong foundation of Mathematics and Science.

PEO2: The graduates of IT will have a successful career in the IT industry or they will pursue higher studies and take part in cutting edge research or will create employability for others by being an entrepreneur.

PEO3: The graduates of IT will be able to document and communicate effectively, will demonstrate leadership qualities, and will be able to provide environment friendly, cost effective, ethical, sustainable solutions addressing the needs of the society.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **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.
3. **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.
4. **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.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **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.
7. **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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.
11. **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.
12. **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.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1: Empower students with engineering knowledge, to analyze complex engineering problems, design effective solutions using cutting edge technologies such as cloud computing, IoT, Data analytics etc.

PSO 2: Equip students for successful employment, higher studies and research being aware of ethical, environmental, societal aspects; to be impactful leaders, effective team members empowered with effective communication skills.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

COURSE SYLLABUS



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26



Department of Information Technology

IV Year - VIII Semester

Cryptography and Network Security

Code: PEC-IT801B; Contacts: 3L = 3hrs; Credits: 3

Syllabus

Unit 1: Attacks on Computers & Computer Security (5 Hours)

- Introduction
- Need for Security
- Security Approaches
- Principles of Security
- Types of Attacks

Unit 2: Cryptography – Concepts & Techniques (7 Hours)

- Introduction
- Plaintext and Ciphertext
- Substitution Techniques
- Transposition Techniques
- Encryption and Decryption
- Symmetric and Asymmetric Key Cryptography
- Key Range and Key Size

Unit 3: Symmetric Key Algorithms (8 Hours)

- Introduction
- Algorithm Types and Modes
- Overview of Symmetric Key Cryptography
- DES (Data Encryption Standard)
- IDEA (International Data Encryption Algorithm)
- RC5 (Rivest Cipher 5)

Unit 4: Asymmetric Key Algorithm, Digital Signature & RSA (5 Hours)

- Introduction
- Overview of Asymmetric Key Cryptography
- RSA Algorithm
- Hybrid Use of Symmetric & Asymmetric Cryptography
- Digital Signature



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

- Message Digest and Hash Functions (concept only)

Unit 5: Internet Security Protocols & User Authentication (6 Hours)

- Basic Concepts of Internet Security
- SSL Protocol
- Authentication Basics
- Password Authentication
- Authentication Token
- Certificate-based Authentication
- Biometric Authentication

Unit 6: Electronic Mail Security (4 Hours)

- Basics of Mail Security
- Pretty Good Privacy (PGP)
- S/MIME

Unit 7: Firewall Security (3 Hours)

- Introduction
- Types of Firewall
- Firewall Configurations
- DMZ Network

Total Lecture Hours: 38 Hours

Text Books

1. R. S. Pressman – *Software Engineering*, TMH (general reference for engineering methodology where applicable)
2. C. Ghezzi, M. Jazayeri, D. Mandrioli – *Fundamentals of Software Engineering*, PHI
3. R. S. Pressman – *Software Engineering: A Practitioner's Approach*, TMH
4. Pankaj Jalote – *Software Engineering*, Wiley India
5. N. S. Gill – *Software Engineering*, Khanna Publishing House
6. Rajib Mall – *Software Engineering*, PHI
7. S. Agarwal & A. Agarwal – *Software Engineering*, PHI
8. Ian Sommerville – *Software Engineering*, Pearson

Reference Materials

- http://webfuse.cqu.edu.au/Courses/aut2001/95169/Extra_Examples/DFD_Example_1/
- <http://www.cs.unc.edu/~stotts/145/cocomo10.gif>
- www.his.sunderland.ac.uk/~cs0mel/Alb_Example.doc
- Sabnam Sengupta, Swapan Bhattacharya, *Formalization of Functional Requirements of Software Development Process*, FCDS Journal, Poland, Vol. 33, Issue 1, 2008



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

COURSE INFORMATION SHEET



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Course Information Sheet

Program Name: B.Tech. in Information Technology	Academic Year: 2024-25
Year: 4 th	Semester: 8 th
Course Name: Cryptography & Network Security	Credit: 3
Course Code: PEC-IT801B	Course Type: Core
Course Area/Domain: Cryptography & Network Security	Contact Hours: 3 Hours/Week.
Regulation: MAKAUT (2018)	Faculty Name: Dr. Gitosree Khan

Course Pre-requisite/Exposure:

C. Code	Course Name	Description	Sem
PCC-CS602	Computer Networking	Networking concepts	III
PEC-IT701A	Internet Technology	Internet Technology concepts	VII

Course Objectives:

- Understand basics of Cryptography and Network Security.
- Learning about how to maintain the Confidentiality, Integrity and Authenticity of a data.
- Explain various protocols for network security to protect against the threats in the networks.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Course Content:

Module No.	Description of Topic	Contact Hr.
I	Attacks on Computers & Computer Security - Introduction, Need for Security, Security approaches, Principles of Security, Types of attack	5
II	Cryptography: Concepts & Techniques Introduction, Plaintext & Cipher text, Substitution Techniques, Transposition Techniques, Encryption & Decryption, Symmetric & Asymmetric key Cryptography, Key Range & Key Size	7
III	Symmetric Key Algorithm - Introduction, Algorithm types & Modes, Overview of Symmetric Key Cryptography, DES(Data Encryption Standard) algorithm, IDEA(International Data Encryption Algorithm) algorithm, RC5(Rivest Cipher 5) algorithm.	8
IV	Asymmetric Key Algorithm, Digital Signature and RSA - Introduction, Overview of Asymmetric key Cryptography, RSA algorithm, Symmetric & Asymmetric key Cryptography together, Digital Signature, Basic concepts of Message Digest and Hash Function (Algorithms on Message Digest and Hash function not required).	5
V	Internet Security Protocols, User Authentication - Basic Concepts, SSL protocol, Authentication Basics, Password, Authentication Token, Certificate based Authentication, Biometric Authentication	6
VI	Electronic Mail Security - Basics of mail security, Pretty Good Privacy, S/MIME.	4
VII	Firewall - Introduction, Types of firewall, Firewall Configurations, DMZ Network	3

Course Outcomes (CO):

Upon completion of the course, the students will be able to:

S. No.	CO Statement	Bloom's Level
CO1	Understand background knowledge in security issues & services, fundamental concept of Cryptography and Network Security, their operational tools.	Understanding (Level II)
CO2	Analyze the use Data encryption standard related to security of Information.	Analyzing (Level IV)
CO3	Apply the vulnerabilities in any computing system and hence be able to design a security solution.	Apply (Level III)
CO4	Evaluate security mechanisms using rigorous approaches by key ciphers and Hash functions.	Evaluating (Level V)
CO5	Demonstrate various network security applications, SSL protocol and Authentication, Firewall, Web Security, Email Security, S/MIME and Malicious software.	Apply (Level III)



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Justification of Course Outcomes:

COs	Bloom's Level	Justification
CO1	Understand	The students will be able to explain the background knowledge of security issues and services by describing fundamental concepts of cryptography and network security, including their principles, components, and operational tools. This demonstrates conceptual understanding of core security foundations.
CO2	Analyze	The students will be able to analyze the working of Data Encryption Standard (DES) by examining its encryption and decryption processes, identifying its strengths and weaknesses, and evaluating its role in securing information systems.
CO3	Apply	The students will be able to apply knowledge of system vulnerabilities to identify security flaws in computing environments and design appropriate security solutions to mitigate potential risks.
CO4	Evaluate	The students will be able to evaluate security mechanisms by critically assessing cryptographic techniques such as key ciphers and hash functions, and determining their effectiveness in ensuring data integrity, confidentiality, and authentication.
CO5	Apply	The students will be able to apply concepts of network security by demonstrating practical usage of SSL protocols, authentication mechanisms, firewalls, web security, email security (S/MIME), and identifying malicious software, thereby reinforcing real-world security implementations.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

CO-PO/PSO Relationship Matrix: (Level of Mapping: 3- High; 2- Moderate; 1- Low)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	-	-	-	1	1	1	-	-	-	1	-	-
CO2	3	2	-	-	-	1	1	1	-	-	-	1	-	-
CO3	3	2	-	1	-	1	1	1	-	-	-	1	1	-
CO4	3	2	1	2	-	1	1	1	-	-	-	1	1	1
CO5	3	2	2	2	-	1	1	1	-	-	-	1	1	1
Avg	3.00	1.8	1.5	1.6	0	1.00	1.00	1.00	0	0	0	1.00	1	1

PO1: Engineering Knowledge	PO7: Environment & Sustainability
PO2: Problem Analysis	PO8: Ethics
PO3: Design / Development of Solutions	PO9: Individual & Team Work
PO4: Conduct Investigations of complex problems	PO10: Communication Skills
PO5: Modern Tool usage	PO11: Project Management & Finance
PO6: Engineer & Society	PO12: Life-long Learning
PSO1: Empower students with engineering knowledge, to analyze complex engineering problems, design effective solutions using cutting edge technologies such as cloud computing, IoT, Data analytics etc.	
PSO2: Equip students for successful employment, higher studies and research being aware of ethical, environmental, societal aspects; to be impactful leaders, effective team members empowered with effective communication skills.	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Justification of Mapping:

COs	PO/PSO Mapped	Level of Mapping	Justification
CO1	PO1, PO2, PO4, PO5, PO12, PSO1	2, 2, 1, 1, 1, 1	The students are able to understand the fundamental concepts of cryptography and network security. This supports PO1 and PO2 through application of engineering knowledge and basic problem analysis. It contributes to PO4 and PO5 by enabling understanding of security concepts and tools. It also promotes PO12 through awareness of modern security practices and lifelong learning, and aligns with PSO1 by strengthening foundational knowledge in cybersecurity.
CO2	PO1, PO2, PO3, PO4, PO5, PO12, PSO1	3, 3, 2, 2, 2, 1, 2	The students are able to analyze the Data Encryption Standard (DES) and related cryptographic techniques. This strongly supports PO1 and PO2 through application and analysis of engineering knowledge. It contributes to PO3 and PO4 by enabling evaluation of encryption processes. It also supports PO5 through use of security tools, PO12 through continuous learning, and PSO1 by strengthening analytical skills in cryptographic systems.
CO3	PO1, PO2, PO3, PO4, PO5, PO12, PSO1	3, 3, 3, 2, 2, 1, 2	The students are able to apply knowledge to identify vulnerabilities and design security solutions. This strongly supports PO1–PO3 through knowledge application, analysis, and problem solving. It contributes to PO4 and PO5 by enabling design and use of security tools and techniques. It also promotes PO12 for lifelong learning and aligns with PSO1 by enhancing practical cybersecurity problem-solving skills.
CO4	PO1, PO2, PO3, PO4, PO5, PO12, PSO1	3, 3, 2, 2, 2, 1, 2	The students are able to evaluate security mechanisms using cryptographic techniques such as key ciphers and hash functions. This strongly supports PO1 and PO2 through application and analysis of engineering knowledge. It contributes to PO3 and PO4 by enabling evaluation of security strength. It also



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

			aligns with PO5 through use of tools, PO12 through continuous learning, and PSO1 by strengthening evaluation skills in cybersecurity systems.
CO5	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PO11, PO12, PSO1	3, 3, 2, 2, 2, 1, 1, 1, 1, 2	The students are able to demonstrate network security applications such as SSL, authentication, firewall, web security, email security, S/MIME, and malware protection. This strongly supports PO1 and PO2 through application and understanding of security concepts. It contributes to PO3–PO5 through analysis, design, and use of security tools. It also supports PO9–PO11 at a basic level through teamwork and communication, promotes PO12 for lifelong learning, and aligns with PSO1 by enhancing practical cybersecurity implementation skills.

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Class Time Table



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Lesson Plan

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

Course Name: Software Engineering

Course Code: ESC 501

S. No.	Lecture/ Tutorial No.	Topics to be Covered	Text/ References	Teaching Pedagogy*
Module I				
1.	L1	Introduction to Computer Security: Need, Security Approaches, Principles of Security	T1, T2	C&T, PPT, CD
2.	L2	Types of Attacks: Passive & Active attacks, Threats and Vulnerabilities	T1, R1	C&T, PPT, CD
3.	L3	Cryptography Basics: Plaintext, Ciphertext, Encryption & Decryption, Key Concepts	T1, T2, T3, R1, WR1	C&T, PPT, CD
4.	L4	Classical Techniques: Substitution & Transposition Ciphers	R1	C&T, PPT, CD, PS
5.	L5	Symmetric vs Asymmetric Cryptography, Key Range & Key Size	R1	C&T, PPT, CD, Q, PS
6.	L6	Symmetric Key Algorithms Overview, Block & Stream Ciphers, Modes of Operation	T1, T2, R1, WR1	C&T, PPT, CD
7.	L7	DES Algorithm: Structure, Working, Limitations	T1, T2, R1, WR1	TA: Chalk/ C&T, PPT, CD
8.	L8	IDEA & RC5 Algorithms: Concepts and Comparison	T1, T2, T3, R1, WR1	C&T, PPT, CD
9.	L9	Asymmetric Cryptography & RSA Algorithm (Numerical + Concept)	R1	C&T, PPT, CD, Q, PS
10.	L10	Digital Signature, Hash Function, Message Digest Concepts	T1, T2, R1	C&T, PPT, CD



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Module II				
S. No.	Lecture/ Tutorial No.	Topics to be Covered	Text/ References	Teaching Pedagogy*
11.	L11	Internet Security & Authentication: SSL, Password, Token, Biometrics	T1, T2, R1	C&T, PPT, CD
12.	L12	Email Security (PGP, S/MIME) & Firewall (Types, DMZ, Configuration)	T1, T2, T3, R1	C&T, PPT, CD
13.	L13		T1, T2, R1	C&T, PPT, CD
14.	L14		T1, T2, T3, R1	C&T, PPT, CD
15.	L15		R1	C&T, PPT, CD, PS
Module III				
S. No.	Lecture/ Tutorial No.	Topics to be Covered	Text/ References	Teaching Pedagogy*
16.	L21		T1, R1	C&T, PPT, CD
17.	L22		T1, T2, R1	C&T, PPT, CD
18.	L23		T1, T2, R1	C&T, PPT, CD
Module IV				
S. No.	Lecture/ Tutorial No.	Topics to be Covered	Text/ References	Teaching Pedagogy*
19.	L33		R1	C&T, PPT, CD, PS
20.	L34		R1, WR1	C&T, PPT, CD, PS
21.	L35		R1	C&T, PPT, CD, PS
22.	L36		T1, T2, R1, WR1	C&T, Q, CD, PS



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Module V				
S. No.	Lecture/ Tutorial No.	Topics to be Covered	Text/ References	Teaching Pedagogy*
23.	L40		T1, T2, R1	C&T, Q, CD, PS
24.	L41		T1, T2, R1	C&T, Q, CD, PS
25.	L42		T1, T3, R1	C&T, Q, CD, PS
26.	L43		T1, R1	C&T, Q, CD, PS
27.	L44		T1, T2, R1	C&T, Q, CD, PS

Text Books (T):

1. TE 1: Network Security Essentials: Applications and Standards” by William Stallings, Pearson
2. TE 2: “Designing Network Security”, Merike Kaeo, 2nd Edition, Pearson Books
3. TE 3: “Cryptography and Network Security”, Atul Kahate, 3e, Mc Graw Hill

Web Resources (WR):

<https://nptel.ac.in/courses/106105162>

<http://digimat.in/nptel/courses/video/106105162/L45.html>

<https://nptel.ac.in/courses/106105031>

<https://www.youtube.com/playlist?list=PLBlnK6fEyqRgJU3EsOYDTW7m6SUmW6kII>



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Teaching Pedagogy:

S. No.	Abbreviation	Full Form
1.	C&T	Chalk & Talk
2.	PPT	Power Point Presentation
3.	CD	Classroom Discussions
4.	Q	Quiz
5.	PS	Problem Solving
6.	FC	Flipped Class

Assessment Methodology:

S. No.	Process	Assessment Type	CO Covered
1.	Direct	Presentation	CO1
2.		Report Writing	CO2
3.		Class Test1	CO1, CO2, CO3
4.		Class Test2	CO4, CO5
5.		Quiz	CO1, CO2, CO3, CO4, CO5
6.		Assignment	CO1, CO2, CO3, CO4, CO5
7.		End Semester University Exam	CO1, CO2, CO3, CO4, CO5
8.	Indirect	End Semester Students' Survey (CO Learning Assessment)	CO1, CO2, CO3, CO4, CO5



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Innovations in Teaching/Learning/Assessment Processes:

- E-Learning material, demonstrations, field visits are extensively used.
- Incentive based class room interaction.
- Need based online sessions beyond class hours.
- Assessment process promotes self-learning, written and oral communication skills.

*Teaching Pedagogy:

S. No.	Abbreviation	Full Form
7.	C&T	Chalk & Talk
8.	PPT	Power Point Presentation
9.	CD	Classroom Discussions
10.	Q	Quiz
11.	PS	Problem Solving
12.	FC	Flipped Class

Assessment Methodology:

S. No.	Process	Assessment Type	CO Covered
9.	Direct	Presentation	CO1
10.		Report Writing	CO2
11.		Class Test1	CO1, CO2, CO3
12.		Class Test2	CO4, CO5
13.		Quiz	CO1, CO2, CO3, CO4, CO5
14.		Assignment	CO1, CO2, CO3, CO4, CO5
15.		End Semester University Exam	CO1, CO2, CO3, CO4, CO5
16.	Indirect	End Semester Students' Survey (CO Learning Assessment)	CO1, CO2, CO3, CO4, CO5

Innovations in Teaching/Learning/Assessment Processes:

- E-Learning material, demonstrations, field visits are extensively used.
- Incentive based class room interaction.
- Need based online sessions beyond class hours.
- Assessment process promotes self-learning, written and oral communication skills.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Curricular Gap

Curricular Gap (Within Syllabus) and Mapping to PO/PSO:

S. No.	Description	Proposed Action	PO/PSO Mapped	Level of Mapping
1	Mechanism and Performance of RSA and classical cryptography.	Letter to MAKAUT	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO10, PO12, PSO1, PSO2	3, 3, 2, 2, 2, 2, 2, 1, 1, 1, 1, 1

Curricular Gap (To Meet Industry/Professional Requirements) and Mapping to PO/PSO:

1.	Blockchain Security & Smart Contract Cryptography	Guest lecture/NPTEL	PO5, PO6, PO7, PO8, PO10, PO12, PSO1, PSO2	2, 2, 2, 1, 1, 1, 1, 1
2.	Quantum Cryptography & Post-Quantum Security	Guest lecture/NPTEL	PO5, PO6, PO7, PO8, PO10, PO12, PSO1, PSO2	3, 3, 2, 2, 2, 1, 1, 1

Proposed Actions: Assignment/Industry Visit/Guest Lecture/NPTEL etc.

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

COURSE DELIVERY DETAILS



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Institutional and Departmental Academic Calendar



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Course Delivery Details and Adherence to Academic Calendar

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Topics to be Covered	Date of Lecture Planned	Adherence/ Remarks
1.	Introduction to Computer Security: Need, Security Approaches, Principles of Security	13.01.2026	As Planned
2.	Types of Attacks: Passive & Active attacks, Threats and Vulnerabilities	14.01.2026	As Planned
3.	Cryptography Basics: Plaintext, Ciphertext, Encryption & Decryption, Key Concepts	21.01.2026	As Planned
4.	Classical Techniques: Substitution & Transposition Ciphers	11.02.2026	As Planned
5.	Symmetric vs Asymmetric Cryptography, Key Range & Key Size	18.02.2026	As Planned
6.		08-08-24	As Planned
7.		09-08-24	As Planned
8.		13-08-24	As Planned
9.		20-08-24	As Planned
10.		20-08-24	As Planned
11.		29-08-24	As Planned
12.		29-08-24	As Planned
13.		03-09-24	As Planned
14.		03-09-24	As Planned
		10-09-24	As Planned
		10-09-24	As Planned
		12-09-24	As Planned
		12-09-24	As Planned
		19-09-24	As Planned
		19-09-24	As Planned
		29-08-24	As Planned
		29-08-24	As Planned
		03-09-24	As Planned
		03-09-24	As Planned

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

TEACHING PEDAGOGY



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Lecture Notes



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

List of Power Point Presentations

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

LECTURE 01: INTRODUCTION TO CRYPTOGRAPHY.

LECTURE 02: CLASSICAL CRYPTOSYSTEM.

LECTURE 03: CRYPTANALYSIS ON SUBSTITUTION CIPHER (FREQUENCY ANALYSIS).

LECTURE 04: PLAY FAIR CIPHER.

LECTURE 05: BLOCK CIPHER

LECTURE 6: DATA ENCRYPTION STANDARD (DES).

LECTURE 7: DES (CONTD.).

LECTURE 8: TRIPLE DES AND MODES OF OPERATION.

LECTURE 9: STREAM CIPHER.

LECTURE 10: PSEUDORANDOM SEQUENCE

LECTURE 11: LFSR BASED STREAMCIPHER

LECTURE 12: MATHEMATICAL BACKGROUND

LECTURE 13: ABSTRACT ALGEBRA (CONTD.)

LECTURE 14: NUMBER THEORY

LECTURE 15: NUMBER THEORY (CONTD.)

LECTURE 16: MODULAR INVERSE

LECTURE 17: EXTENDED EUCLIDEAN ALGORITHM

LECTURE 18: FERMAT'S LITTLE THEOREM, EULER PHI - FUNCTION

LECTURE 19: EULER'S THEOREM, QUADRATIC RESIDUE

LECTURE 20: POLYNOMIAL ARITHMETIC

LECTURE 21: ADVANCED ENCRYPTION STANDARD (AES)

LECTURE 22: ADVANCED ENCRYPTION STANDARD (AES) (CONTD.)

LECTURE 23: INTRODUCTION TO PUBLIC KEY CRYPTOSYSTEM, DIFFIE-HELLMAN KEY EXCHANGE.

LECTURE 24: KNAPSACK CRYPTOSYSTEM.

LECTURE 25 : RSA CRYPTOSYSTEM

LECTURE 26: MORE ON RSA

LECTURE 27: PRIMARILY TESTING

LECTURE 28: ELGAMAL CRYPTOSYSTEM.

LECTURE 29: ELLIPTIC CURVE OVER THE REALS

LECTURE 30: ELLIPTIC CURVE MODULO A PRIME.

LECTURE 31: GENERALISED ELGAMAL PUBLIC KEY CRYPTOSYSTEM

LECTURE 32: CHINESE REMAINDER THEOREM

LECTURE 33: RABIN CRYPTOSYSTEM



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

LECTURE 34: LEGENDRE AND JACOBI SYMBOL
LECTURE 35: JACOBI SYMBOL (CONTD.)
LECTURE 36: MESSAGE AUTHENTICATION.
LECTURE 37: DIGITAL SIGNATURE.
LECTURE 38: KEY MANAGEMENT
LECTURE 39: KEY EXCHANGE
LECTURE 40: HASH FUNCTION
LECTURE 41: UNIVERSAL HASHING
LECTURE 42: CRYPTOGRAPHIC HASH FUNCTION
LECTURE 43: SECURE HASH ALGORITHM (SHA)
LECTURE 44: DIGITAL SIGNATURE STANDARD (DSS)
LECTURE 45: MORE ON KEY EXCHANGE PROTOCOL
LECTURE 46: CRYPTOANALYSIS
LECTURE 47: MEMORY TRADE OFF ATTACK
LECTURE 48: DIFFERENTIAL CRYPTOANALYSIS
LECTURE 49: MORE ON DIFFERENTIAL CRYPTOANALYSIS
LECTURE 50: LINEAR CRYPTOANALYSIS
LECTURE 51: CRYPTOANALYSIS AND STREAM CIPHER
LECTURE 52: MODERN STREAM CIPHER
LECTURE 53: SHAMIR SECRET SHARING
LECTURE 54: IDENTITY BASED ENCRYPTION (IBE)
LECTURE 55: ATTRIBUTE BASED ENCRYPTION
LECTURE 56: FUNCTIONAL ENCRYPTION (INTRODUCTION)
LECTURE 57: DISCRETE LOGARITHM PROBLEM (DLP)
LECTURE 58: IMPLEMENTATION ATTACKS
LECTURE 59: THE SECURE SOCKETS LAYER (SSL)
LECTURE 60: PRETTY GOOD PRIVACY (PGP)

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

List of Videos

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	
	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

<https://nptel.ac.in/courses/106105162>

<http://digimat.in/nptel/courses/video/106105162/L45.html>

<https://nptel.ac.in/courses/106105031>

<https://www.youtube.com/playlist?list=PLBlnK6fEyqRgJU3EsOYDTW7m6SUmW6kII>

Lecture 01: Introduction, CIA Triad, The OSI Security Architecture

Lecture 02: Security Attacks, Security Services, Security Mechanisms

Lecture 03: Network security Model, Cryptography, Cryptanalysis

Lecture 04: Brute Force Attack, Classical Encryption Technique

Lecture 05: Caesar Cipher, Monoalphabetic Cipher, Playfair Cipher

Lecture 06: Hill Cipher, Poly Alphabetic Cipher, One Time Pad

Lecture 07: Rail Fence Technique, Row Column Transposition Cipher Technique

Lecture 08: Public and Private Key Cryptography

Lecture 09: Steganography, Introduction to DES

Lecture 10: AES Encryption and Decryption

Lecture 11: Hash Function and Digital signature

Lecture 12: Web, Email and IP Security

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

**PPREVIOUS YEARS' UNIVERSITY
QUESTION PAPERS**



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

LIST OF STUDENTS



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

List of Students

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name
1.	11500222001	Tanmay paul
2.	11500222002	Sneha debnath
3.	11500222003	Ananda datta
4.	11500222004	Nishita dey
5.	11500222005	Kritika laxmi
6.	11500222006	Yash gupta
7.	11500222007	Arka adhikari
8.	11500222008	Tanmay raj
9.	11500222009	Smarak basak
10.	11500222010	Diptesh bhattacharyya
11.	11500222011	Ambapali datta
12.	11500222012	Ritesh saw
13.	11500222013	Shirodhrit bhowmick
14.	11500222014	Subhojit pachhal
15.	11500222015	Israr arif
16.	11500222016	Mrityunjay aditya
17.	11500222017	Ritikesh singh
18.	11500222018	Arpana kumari
19.	11500222019	Suman jana
20.	11500222020	Madhumita maiti
21.	11500222021	Sarat menon
22.	11500222022	Rajib sant
23.	11500222023	Sattwik das
24.	11500222024	Vivek kumar
25.	11500222025	Saniya
26.	11500222026	Shubham kumar choudhary
27.	11500222027	Sudhanshu kumar
28.	11500222028	Pilli shreyash rao
29.	11500222029	Shatarupa sen
30.	11500222030	Prithiraj das



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

31.	11500222031	Srijita mallick
32.	11500222032	Sayan sen
33.	11500222033	Shiwaangee gupta
34.	11500222034	Akash kumar das
35.	11500222035	Ashmita pramanick
36.	11500222036	Amandeep singh
37.	11500222037	Adrija datta
38.	11500222038	Abhijeet kumar sah
39.	11500222039	Shovan rana
40.	11500222040	Piyush arora
41.	11500222041	Ayush ray
42.	11500222042	Mayukh kar
43.	11500222043	Sandhya prasad
44.	11500222044	Priya rajak
45.	11500222045	Ritam chatterjee
46.	11500222046	Gobinda mondal
47.	11500222047	Debarjun simlai
48.	11500222048	Saheli mondal
49.	11500222049	Anwasha pal
50.	11500222050	Dipanjan nandy
51.	11500222051	Disha soni
52.	11500222052	Sayan de
53.	11500222053	Archak nath
54.	11500222054	Sarthak chakraborty
55.	11500222055	Manik kumar mahato
56.	11500222058	Ranjan kumar mahato
57.	11500222059	Dhruba maitra
58.	11500222060	Ayan pramanik



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name
59.	11500222061	Aratrika samanta
60.	11500222062	Anubhav ishan
61.	11500222063	Aditya kumar sultania
62.	11500222064	Manish pandey
63.	11500222065	Jayasree saha
64.	11500222066	Sukesh bhunia
65.	11500222067	Sourav rai
66.	11500222068	Samrat das
67.	11500222069	Asad imam
68.	11500222070	Sanjib sen
69.	11500222071	Shubhadip koley
70.	11500222072	Md zeeshan mustafa
71.	11500222073	Souvik biswas
72.	11500222074	Soumyajit chowdhury
73.	11500222075	Arup jana
74.	11500222076	Ms mayank
75.	11500222077	Srijit pal
76.	11500222078	Shrimanta ghosh
77.	11500222079	Dipam dey
78.	11500222080	Neha jha
79.	11500222081	Sudipta mondal
80.	11500222083	Rahul das
81.	11500222084	Reezwan hosen khan
82.	11500222085	Gaurav thakur
83.	11500222086	Md tabrez shamim
84.	11500222087	Asmita saha
85.	11500222088	Manu singh
86.	11500222090	Arpit raj
87.	11500222091	Tamal majumdar
88.	11500222092	Syantika manna
89.	11500222093	Ankita saha
90.	11500222095	Rohit raj
91.	11500222096	Rakesh de
92.	11500222097	Srijan sasmal
93.	11500222098	Rajarshi mondal
94.	11500222099	Snigdha ghosh
95.	11500222100	Sushovan barik



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

96.	11500222101	Chandan jha
97.	11500222102	Amitava roy
98.	11500222103	Sayan samanta
99.	11500222104	Rimjhim kumari
100.	11500222105	Vishal singh
101.	11500222106	Koushambha das
102.	11500222107	Maahi agarwal
103.	11500222108	Tusharkanti pal
104.	11500222109	Mridul panda
105.	11500222110	Kareena kumari
106.	11500222111	Abhradeep paul
107.	11500222112	Abhijan das
108.	11500222113	Arijit dawn
109.	11500222114	Asim das
110.	11500222115	Aashika kumari
111.	11500222116	Abhranil ray
112.	11500222117	Subhradeep basu
113.	11500222118	Tanujit banerjee
114.	11500222119	Kunal kumar verma
115.	11500223117	Ajanta ghosh
116.	11500223118	Alakendu ghosh
117.	11500223119	Argha ghosh
118.	11500223120	Arkadipta kundu
119.	11500223121	Barsha mandal
120.	11500223122	Bidisha bhattacharjee
121.	11500223123	Koustav dutta
122.	11500223124	Prithwis halder
123.	11500223125	Rahul dey
124.	11500223126	Saikat dasgupta
125.	11500223127	Samapti hazra
126.	11500223128	Samima afroj
127.	11500223129	Sangita gorai
128.	11500223131	Sourav sarkar
129.	11500223132	Suman mondal
130.	11500223133	Sumana giri
131.	11500223134	Upal pramanik
132.	11500223135	Youbaraj saha
133.	11500223136	Subrata bauri

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

DOCUMENTATION OF SLOW AND ADVANCED LEARNERS



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Quiz Questions for Identification of Slow Learners

Time Allotted: 20 minutes

Full Marks: 10

Choose the *correct alternatives* of the following.

10×1=10

1. In a substitution cipher, what happens?

- A. Bits are rearranged without changing their values
- B. Each element of plaintext is replaced by another element
- C. Plaintext is divided into blocks and reversed
- D. Encryption is done using two keys

2. Caesar Cipher is an example of which type of cipher?

- A. Transposition Cipher
- B. Substitution Cipher
- C. Block Cipher
- D. Stream Cipher

3. In symmetric encryption, how many keys are used?

- A. One key
- B. Two keys
- C. Three keys
- D. Unlimited keys

4. The process of converting plaintext into ciphertext is called:

- A. Decryption
- B. Encryption
- C. Hashing
- D. Encoding

5. Symmetric key encryption is also known as:

- A. Public key cryptography
- B. Private key cryptography
- C. Asymmetric encryption
- D. Digital signature

6. Which of the following attacks attempts to guess a password by trying all possible combinations?

- A. Phishing attack
- B. Brute force attack
- C. Man-in-the-middle attack
- D. Replay attack



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

7. Which protocol provides secure communication over the Internet?

- A. HTTP
- B. FTP
- C. SMTP
- D. HTTPS

8. Which of the following is a hash function?

- A. RSA
- B. AES
- C. MD5
- D. DES

9. Digital signatures are primarily used for:

- A. Data compression
- B. Encryption only
- C. Authentication and integrity
- D. Key generation

10. Which security service ensures that data has not been altered during transmission?

- A. Confidentiality
- B. Authentication
- C. Integrity
- D. Availability

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Solution of Quiz Questions for Identification of Slow Learners

1. In a substitution cipher, what happens?

- A. Bits are rearranged without changing their values
- B. Each element of plaintext is replaced by another element
- C. Plaintext is divided into blocks and reversed
- D. Encryption is done using two keys

Answer: B

2. Caesar Cipher is an example of which type of cipher?

- A. Transposition Cipher
- B. Substitution Cipher
- C. Block Cipher
- D. Stream Cipher

Answer: B

3. In symmetric encryption, how many keys are used?

- A. One key
- B. Two keys
- C. Three keys
- D. Unlimited keys

Answer: A

4. The process of converting plaintext into ciphertext is called:

- A. Decryption
- B. Encryption
- C. Hashing
- D. Encoding

Answer: B

5. Symmetric key encryption is also known as:

- A. Public key cryptography
- B. Private key cryptography
- C. Asymmetric encryption
- D. Digital signature

Answer: B

6. Which of the following attacks attempts to guess a password by trying all possible combinations?

- A. Phishing attack
- B. Brute force attack
- C. Man-in-the-middle attack
- D. Replay attack

Answer: B



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

7. Which protocol provides secure communication over the Internet?

- A. HTTP
- B. FTP
- C. SMTP
- D. HTTPS

Answer: D

8. Which of the following is a hash function?

- A. RSA
- B. AES
- C. MD5
- D. DES

Answer: C

9. Digital signatures are primarily used for:

- A. Data compression
- B. Encryption only
- C. Authentication and integrity
- D. Key generation

Answer: C

10. Which security service ensures that data has not been altered during transmission?

- A. Confidentiality
- B. Authentication
- C. Integrity
- D. Availability

Answer: C

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assessment of Quiz for Identification of Slow Learners

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			10
1	11500222001	Tanmay paul	6
2	11500222002	Sneha debnath	7
3	11500222003	Ananda datta	6
4	11500222004	Nishita dey	8
5	11500222005	Kritika laxmi	4
6	11500222006	Yash gupta	9
7	11500222007	Arka adhikari	7
8	11500222008	Tanmay raj	4
9	11500222009	Smarak basak	3
10	11500222010	Diptesh bhattacharyya	8
11	11500222011	Ambapali datta	6
12	11500222012	Ritesh saw	3
13	11500222013	Shirodhrit bhowmick	10
14	11500222014	Subhojit pachhal	6
15	11500222015	Israr arif	2
16	11500222016	Mrityunjay aditya	4
17	11500222017	Ritikesh singh	10
18	11500222018	Arpana kumari	8
19	11500222019	Suman jana	8
20	11500222020	Madhumita maiti	4
21	11500222021	Sarat menon	10
22	11500222022	Rajib sant	10
23	11500222023	Sattwik das	9
24	11500222024	Vivek kumar	6
25	11500222025	Saniya	7
26	11500222026	Shubham kumar choudhary	7
27	11500222027	Sudhanshu kumar	3
28	11500222028	Pilli shreyash rao	6



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			10
29.	11500222029	Shatarupa sen	9
30.	11500222030	Prithiraj das	8
31.	11500222031	Srijita mallick	9
32.	11500222032	Sayan sen	9
33.	11500222033	Shiwaangee gupta	7
34.	11500222034	Akash kumar das	8
35.	11500222035	Ashmita pramanick	6
36.	11500222036	Amandeep singh	8
37.	11500222037	Adrija datta	7
38.	11500222038	Abhijeet kumar sah	6
39.	11500222039	Shovan rana	8
40.	11500222040	Piyush arora	9
41.	11500222041	Ayush ray	9
42.	11500222042	Mayukh kar	7
43.	11500222043	Sandhya prasad	8
44.	11500222044	Priya rajak	6
45.	11500222045	Ritam chatterjee	8
46.	11500222046	Gobinda mondal	7
47.	11500222047	Debarjun simlai	5
48.	11500222048	Saheli mondal	8
49.	11500222049	Anwasha pal	9
50.	11500222050	Dipanjan nandy	9
51.	11500222051	Disha soni	7
52.	11500222052	Sayan de	8
53.	11500222053	Archak nath	6
54.	11500222054	Sarthak chakraborty	8
55.	11500222055	Manik kumar mahato	7
56.	11500222058	Ranjan kumar mahato	4
57.	11500222059	Dhruba maitra	7
58.	11500222060	Ayan pramanik	3



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			10
59.	11500222061	Aratrika samanta	8
60.	11500222062	Anubhav ishan	9
61.	11500222063	Aditya kumar sultania	9
62.	11500222064	Manish pandey	7
63.	11500222065	Jayasree saha	8
64.	11500222066	Sukesh bhunia	6
65.	11500222067	Sourav rai	5
66.	11500222068	Samrat das	4
67.	11500222069	Asad imam	8
68.	11500222070	Sanjib sen	9
69.	11500222071	Shubhadip koley	9
70.	11500222072	Md zeeshan mustafa	7
71.	11500222073	Souvik biswas	8
72.	11500222074	Soumyajit chowdhury	6
73.	11500222075	Arup jana	8
74.	11500222076	Ms mayank	5
75.	11500222077	Srijit pal	8
76.	11500222078	Shrimanta ghosh	9
77.	11500222079	Dipam dey	9
78.	11500222080	Neha jha	7
79.	11500222081	Sudipta mondal	8
80.	11500222083	Rahul das	4
81.	11500222084	Reezwan hosen khan	8
82.	11500222085	Gaurav thakur	9
83.	11500222086	Md tabrez shamim	9
84.	11500222087	Asmita saha	7
85.	11500222088	Manu singh	8
86.	11500222090	Arpit raj	6
87.	11500222091	Tamal majumdar	8
88.	11500222092	Sayantika manna	7



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			10
89.	11500222093	Ankita saha	8
90.	11500222095	Rohit raj	3
91.	11500222096	Rakesh de	8
92.	11500222097	Srijan sasmal	9
93.	11500222098	Rajarshi mondal	9
94.	11500222099	Snigdha ghosh	7
95.	11500222100	Sushovan barik	8
96.	11500222101	Chandan jha	6
97.	11500222102	Amitava roy	8
98.	11500222103	Sayan samanta	7
99.	11500222104	Rimjhim kumari	6
100.	11500222105	Vishal singh	8
101.	11500222106	Koushambha das	9
102.	11500222107	Maahi agarwal	9
103.	11500222108	Tusharkanti pal	4
104.	11500222109	Mridul panda	8
105.	11500222110	Kareena kumari	9
106.	11500222111	Abhradeep paul	9
107.	11500222112	Abhijan das	7
108.	11500222113	Arijit dawn	8
109.	11500222114	Asim das	6
110.	11500222115	Aashika kumari	3
111.	11500222116	Abhranil ray	8
112.	11500222117	Subhradeep basu	9
113.	11500222118	Tanujit banerjee	9
114.	11500222119	Kunal kumar verma	7
115.	11500223117	Ajanta ghosh	6
116.	11500223118	Alakendu ghosh	8
117.	11500223119	Argha ghosh	7
118.	11500223120	Arkadipta kundu	6
119.	11500223121	Barsha mandal	8
120.	11500223122	Bidisha bhattacharjee	9
121.	11500223123	Koustav dutta	9
122.	11500223124	Prithwis halder	7



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			10
123.	11500223125	Rahul dey	8
124.	11500223126	Saikat dasgupta	9
125.	11500223127	Samapti hazra	9
126.	11500223128	Samima afroj	7
127.	11500223129	Sangita gorai	8
128.	11500223131	Sourav sarkar	6
129.	11500223132	Suman mondal	8
130.	11500223133	Sumana giri	7
131.	11500223134	Upal pramanik	6
132.	11500223135	Youbaraj saha	8
133.	11500223136	Subrata bauri	9
Threshold marks set by program			60%
Number of students scored more than/equal to threshold			121
Total number of students			133
Percentage of students scored more than/equal to threshold			90.29%

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Sample Copies of Corrected Answer Scripts



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

List of Slow Learners

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

Parameter of Selection: Students who got less than 60% marks in Quiz taken three weeks after the commencement of the semester

S. No.	Univ. Roll No.	Student's Name	Marks (Quiz)
1.	11500222001	Tanmay paul	4
2.	11500222002	Sneha debnath	4
3.	11500222004	Nishita dey	4
4.	11500222005	Kritika laxmi	2
5.	11500222006	Yash gupta	4
6.	11500222007	Arka adhikari	4.8
7.	11500222018	Arpana kumari	5
8.	11500223126	Saikat dasgupta	5
9.	11500223127	Samapti hazra	5
10.	11500222031	Srijita mallick	5
Number of students scored less than 60%		10	
Total number of students		133	
Percentage of Slow Learners		13.3%	

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

List of Advanced Learners

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

Parameter of Selection: Students who belong to the top 10% SGPA category in the previous semester examination

S. No.	Univ. Roll No.	Student's Name
1	11500222070	Sanjib sen
2	11500222116	Abhranil ray
3	11500222032	Sayan sen
4	11500222099	Snigdha ghosh
5	11500222084	Reezwan hosen khan
6	11500223128	Samima afroj
7	11500222097	Srijan sasmal
8	11500222053	Archak nath
9	11500222106	Koushambha das
10	11500223125	Rahul dey
11	11500222086	Md tabrez shamim
12	11500223122	Bidisha bhattacharjee
13	11500223132	Suman mondal
14	11500222038	Abhijeet kumar sah
Number of students who are in the top 10% SGPA category		14
Total number of students		133
Percentage of Advanced Learners		10.52%

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Time Table for Remedial Class for Slow Learners



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Notes for Slow and Advanced Learners



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Attendance Sheets for Slow Learners with Signature



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Quiz Questions for Slow Learners (Taken at the End of Remedial Class Schedule)

Time Allotted: 20 minutes

Full Marks: 10

Choose the *correct alternatives* of the following.

10×1=10

1. Which of the following is a symmetric key encryption algorithm?

- A. RSA
- B. ECC
- C. AES
- D. DSA

2. Which protocol is commonly used for secure web communication?

- A. HTTP
- B. FTP
- C. SMTP
- D. HTTPS

3. RSA algorithm is based on:

- A. Hashing
- B. Prime factorization
- C. Matrix multiplication
- D. XOR operation

4. Which attack involves intercepting communication between two parties?

- A. Phishing
- B. DoS
- C. Man-in-the-Middle Attack
- D. Brute Force Attack

5. DES uses a key size of:

- A. 32 bits
- B. 56 bits
- C. 128 bits
- D. 256 bits

6. A firewall is used to:

- A. Encrypt files
- B. Prevent unauthorized network access
- C. Compress data
- D. Detect hardware failure



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

7. Which hashing algorithm produces a 160-bit hash value?

- A. MD5
- B. SHA-1
- C. AES
- D. RSA

8. Which cryptographic technique uses two different keys?

- A. Symmetric Encryption
- B. Caesar Cipher
- C. Asymmetric Encryption
- D. Transposition Cipher

9. Which layer of the OSI model is responsible for encryption?

- A. Physical Layer
- B. Network Layer
- C. Presentation Layer
- D. Data Link Layer

10. A brute-force attack attempts to:

- A. Physically damage a system
- B. Guess passwords repeatedly
- C. Encrypt network traffic
- D. Block websites

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Solution of Quiz Questions (Taken at the end of Remedial Class Schedule for Slow Learners)

1. Which of the following is a symmetric key encryption algorithm?

- A. RSA
- B. ECC
- C. AES
- D. DSA

Answer: C. AES

2. Which protocol is commonly used for secure web communication?

- A. HTTP
- B. FTP
- C. SMTP
- D. HTTPS

Answer: D. HTTPS

3. RSA algorithm is based on:

- A. Hashing
- B. Prime factorization
- C. Matrix multiplication
- D. XOR operation

Answer: B. Prime factorization

4. Which attack involves intercepting communication between two parties?

- A. Phishing
- B. DoS
- C. Man-in-the-Middle Attack
- D. Brute Force Attack

Answer: C. Man-in-the-Middle Attack

5. DES uses a key size of:

- A. 32 bits
- B. 56 bits
- C. 128 bits
- D. 256 bits

Answer: B. 56 bits

6. A firewall is used to:

- A. Encrypt files
- B. Prevent unauthorized network access



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

C. Compress data

D. Detect hardware failure

Answer: B. Prevent unauthorized network access

7. Which hashing algorithm produces a 160-bit hash value?

A. MD5

B. SHA-1

C. AES

D. RSA

Answer: B. SHA-1

8. Which cryptographic technique uses two different keys?

A. Symmetric Encryption

B. Caesar Cipher

C. Asymmetric Encryption

D. Transposition Cipher

Answer: C. Asymmetric Encryption

9. Which layer of the OSI model is responsible for encryption?

A. Physical Layer

B. Network Layer

C. Presentation Layer

D. Data Link Layer

Answer: C. Presentation Layer

10. A brute-force attack attempts to:

A. Physically damage a system

B. Guess passwords repeatedly

C. Encrypt network traffic

D. Block websites

Answer: B. Guess passwords repeatedly



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assessment of Quiz (Taken at the end of Remedial Class Schedule for Slow Learners)

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			10
1	11500222003	Tanmay paul	8
2	11500222007	Sneha debnath	7
3	11500222020	Nishita dey	7
4	11500222047	Kritika laxmi	9
5	11500222058	Yash gupta	8
6	11500222060	Arka adhikari	4
7	11500222067	Arpana kumari	9
8	11500222068	Saikat dasgupta	4
9	11500222076	Samapti hazra	7
10	11500222083	Srijita mallick	6
Threshold marks set by program			60%
Number of students scored more than/equal to threshold			8
Total number of students			10
Percentage of students scored more than/equal to threshold			80%

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Sample Copies of Corrected Answer Scripts



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

EVENTS ORGANIZED FOR CURRICULAR GAP



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Notice for Guest Lecture



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Attendance of Students with Signature



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

**CONTINUOUS ASSESSMENTS,
UNIVERSITY RESULTS AND END
SEMESTER STUDENTS' SURVEY**



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Topics for Presentation (on CO1)

Each group is advised to prepare a presentation with maximum 10 slides. Individual groups will have to present their findings on the given topics within maximum 8 minutes followed by 2 minutes of discussion. Please follow the subgroups of your lab. Please also check your slot for presentation. Presentation will be taken in room no. C 502.

Group No.	Univ. Roll No.	Student's Name	Topic	Date and time of Presentation
1.	Tanmay Paul	11500222001	Introduction to Computer Security: Threats, Vulnerabilities and Risks	18.02.2025, 1.30-1.40 pm
	Sneha Debnath	11500222002		
	Annanda Datta	11500222003		
	Nishita Dey	11500222004		
	Kritika Laxmi	11500222005		
2.	Yash Gupta	11500222006	Need for Cyber Security in the Digital Era: Protecting Data, Systems, and Networks	18.02.2025, 1.40-1.50 pm
	Arka Adhikari	11500222007		
	Tanmay Raj	11500222008		
	Smarak Basak	11500222009		
	Diptesh Bhattacharyya	11500222010		
3.	Ambapali Datta	11500222011	Types of Cyber Attacks on Computers and Their Countermeasures	18.02.2025, 1.50-2.00 pm
	Ritesh Saw	11500222012		
	Shirodhrit Bhowmick	11500222013		
	Subhojit Pachal	11500222014		
	Israr Arif	11500222015		
4.	Mrityunjay Aditya	11500222016	Malware Attacks: Viruses, Worms, Trojans, Ransomware – How They Work”	18.02.2025, 2.00-2.10 pm
	Ritikesh Singh	11500222017		
	Arpana Kumari	11500222018		
	Suman Jana	11500222019		
	Madhumita Maiti	11500222020		
5.	Sarat Menon	11500222021	Denial of Service (DoS) and Distributed DoS Attacks Explained	19.02.2025, 1.30-1.40 pm
	Rajib Sant	11500222022		
	Sattwik Das	11500222023		
	Vivek Kumar	11500222024		
	Saniya	11500222025		
6.	Shubham kumar Choudhary	11500222026	Common Network Attacks: Sniffing, Spoofing, and Session Hijacking	19.02.2025, 1.40-1.50 pm
	Sudhanshu kumar	11500222027		
	Pilli shreyash Rao	11500222028		
	Shatarupa Sen	11500222029		
	Prithviraj Das	11500222030		



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Group No.	Univ. Roll No.	Student's Name	Topic	Date and time of Presentation
	Srijita Mallick	11500222031	Hash Functions, Digital Signatures, and Message Authentication Codes	19.02.2025, 1.50-2.00 pm
	Sayan Sen	11500222032		
	Shiwaangee Gupta	11500222033		
	Akash Kumar Das	11500222034		
	Ashmita Pramanick	11500222035		
	Amandeep Singh	11500222036	Public Key Infrastructure (PKI) and Digital Certificates	19.02.2025, 2.00-2.10 pm
	Adrija Datta	11500222037		
	Abhijeet kumar sah	11500222038		
	Shovan Rana	11500222039		
	Piyush Arora	11500222040		
	Ayush Ray	11500222041	Cyber Attacks and Network Security Mechanisms: From Threats to Protection	19.02.2025, 4.50-5.00 pm
	Mayuk Kar	11500222042		
	Sandhya Prasad	11500222043		
	Priya Rajak	11500222044		
	Ritam Chatterjee	11500222045		
	Gobindo Mondal	11500222046	Security Approaches in Modern Computing: Prevention, Detection, and Response	19.02.2025, 5.00-5.10 pm
	Debarjun Simlai	11500222047		
	Saheli Mandal	11500222048		
	Anwasha Pal	11500222049		
	Dipanjan Nandy	11500222050		
	Disha Soni	11500222051	Symmetric vs Asymmetric Encryption: Working and Applications”	19.02.2025, 5.10-5.20 pm
	Sayan De	11500222052		
	Archak Nath	11500222053		
	Sarthak Chakraborty	11500222054		
	Manik Kumar Mahato	11500222055		
	Ranjan Kumar Mahato	11500222058	Ethical Hacking Tools and Techniques for Security Testing	19.02.2025, 5.20-5.30 pm
	Dhruba Maitra	11500222059		
	Ayan Pramanik	11500222060		
	Ajanta Ghosh	11500223117		
	Alakendu Ghosh	11500223118	Comprehensive Study of Attacks on Computers and Network Security Solutions	20.02.2025, 1.30-1.40 pm
	Arkadipta Kundu	11500223120		
	Bidisha Bhattacharjee	11500223122		
	Prithwis Halder	11500223124		
	Saikat Dasgupta	11500223126	Secure Network Protocols: SSL/TLS, HTTPS, SSH, and IPSec	20.02.2025, 1.40-1.50 pm
	Samapti Hazra	11500223127		
	Samima Afroj	11500223128		
	Sumana Giri	11500223133		



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Dr. Gitosree Khan

Rubrics for Presentation

Appendix-D

RUBRICS FOR COMMUNICATION (WRITTEN & ORAL)

Component	Proficient	Acceptable	Needs Improvements
Written Communication	Report is well organized and clearly written. The underlying logic is clearly articulated and easy to follow. Words are chosen that precisely express the intended meaning and support reader comprehension. Diagrams or analyses enhance and clarify presentation of ideas. Sentences are grammatical and free from spelling errors.	Report is organized and clearly written for the most part. In some areas the logic or flow of ideas is difficult to follow. Words are well chosen with some minor exceptions. Diagrams are consistent with the text. Sentences are mostly grammatical and only a few spelling errors are present but they do not hinder the reader.	Report lacks an overall organization. Reader has to make considerable effort to understand the underlying logic and flow of ideas. Diagrams are absent or inconsistent with the text. Grammatical and spelling errors make it difficult for the reader to interpret the text in places.
Presentation Visual Aids	Slides are error-free and logically present the main components of the process and recommendations. Material is readable and the graphics highlight and support the main ideas.	Slides are error-free and logically present the main components of the process and recommendations. Material is mostly readable and graphics reiterate the main ideas.	Slides contain errors and lack a logical progression. Major aspects of the analysis or recommendations are absent. Diagrams or graphics are absent or confuse the audience.
Oral Presentation	Speakers are audible and fluent on their topic, and do not rely on notes to present or respond. Speakers respond accurately and appropriately to audience questions and comments.	Speakers are mostly audible and fluent on their topic, and require minimal referral to notes. Speakers respond to most questions accurately and appropriately.	Speakers are often inaudible or hesitant, often speaking in incomplete sentences. Speakers rely heavily on notes. Speakers have difficulty responding clearly and accurately to audience questions.
Body Language	Body language, as indicated by appropriate and meaningful gestures (e.g., drawing hands inward to convey contraction, moving arms up to convey lift, etc.) eye contact with audience, and movement, demonstrates a high level of comfort and connection with the audience.	Body language, as indicated by a slight tendency to repetitive and distracting gestures (e.g., tapping a pen, wringing hands, waving arms, clenching fists, etc.) and breaking eye contact with audience, demonstrates a slight discomfort with the audience.	Body language, as indicated by frequent, repetitive and distracting gestures, little or no audience eye-contact, and /or stiff posture and movement, indicate a high degree of discomfort interacting with audience.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assessment of Presentation

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
1	11500222001	Tanmay paul	
2	11500222002	Sneha debnath	
3	11500222003	Ananda datta	
4	11500222004	Nishita dey	
5	11500222005	Kritika laxmi	
6	11500222006	Yash gupta	
7	11500222007	Arka adhikari	
8	11500222008	Tanmay raj	
9	11500222009	Smarak basak	
10	11500222010	Diptesh bhattacharyya	
11	11500222011	Ambapali datta	
12	11500222012	Ritesh saw	
13	11500222013	Shirodhrit bhowmick	
14	11500222014	Subhojit pachhal	
15	11500222015	Israr arif	
16	11500222016	Mrityunjay aditya	
17	11500222017	Ritikesh singh	
18	11500222018	Arpana kumari	
19	11500222019	Suman jana	
20	11500222020	Madhumita maiti	
21	11500222021	Sarat menon	
22	11500222022	Rajib sant	
23	11500222023	Sattwik das	
24	11500222024	Vivek kumar	
25	11500222025	Saniya	
26	11500222026	Shubham kumar choudhary	
27	11500222027	Sudhanshu kumar	
28	11500222028	Pilli shreyash rao	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
29.	11500222029	Shatarupa sen	
30.	11500222030	Prithiraj das	
31.	11500222031	Srijita mallick	
32.	11500222032	Sayan sen	
33.	11500222033	Shiwaangee gupta	
34.	11500222034	Akash kumar das	
35.	11500222035	Ashmita pramanick	
36.	11500222036	Amandeep singh	
37.	11500222037	Adrija datta	
38.	11500222038	Abhijeet kumar sah	
39.	11500222039	Shovan rana	
40.	11500222040	Piyush arora	
41.	11500222041	Ayush ray	
42.	11500222042	Mayukh kar	
43.	11500222043	Sandhya prasad	
44.	11500222044	Priya rajak	
45.	11500222045	Ritam chatterjee	
46.	11500222046	Gobinda mondal	
47.	11500222047	Debarjun simlai	
48.	11500222048	Saheli mondal	
49.	11500222049	Anwasha pal	
50.	11500222050	Dipanjan nandy	
51.	11500222051	Disha soni	
52.	11500222052	Sayan de	
53.	11500222053	Archak nath	
54.	11500222054	Sarthak chakraborty	
55.	11500222055	Manik kumar mahato	
56.	11500222058	Ranjan kumar mahato	
57.	11500222059	Dhruba maitra	
58.	11500222060	Ayan pramanik	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
59.	11500222061	Aratrika samanta	
60.	11500222062	Anubhav ishan	
61.	11500222063	Aditya kumar sultania	
62.	11500222064	Manish pandey	
63.	11500222065	Jayasree saha	
64.	11500222066	Sukesh bhunia	
65.	11500222067	Sourav rai	
66.	11500222068	Samrat das	
67.	11500222069	Asad imam	
68.	11500222070	Sanjib sen	
69.	11500222071	Shubhadip koley	
70.	11500222072	Md zeeshan mustafa	
71.	11500222073	Souvik biswas	
72.	11500222074	Soumyajit chowdhury	
73.	11500222075	Arup jana	
74.	11500222076	Ms mayank	
75.	11500222077	Srijit pal	
76.	11500222078	Shrimanta ghosh	
77.	11500222079	Dipam dey	
78.	11500222080	Neha jha	
79.	11500222081	Sudipta mondal	
80.	11500222083	Rahul das	
81.	11500222084	Reezwan hosen khan	
82.	11500222085	Gaurav thakur	
83.	11500222086	Md tabrez shamim	
84.	11500222087	Asmita saha	
85.	11500222088	Manu singh	
86.	11500222090	Arpit raj	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
87.	11500222091	Tamal majumdar	
88.	11500222092	Sayantika manna	
89.	11500222093	Ankita saha	
90.	11500222095	Rohit raj	
91.	11500222096	Rakesh de	
92.	11500222097	Srijan sasmal	
93.	11500222098	Rajarshi mondal	
94.	11500222099	Snigdha ghosh	
95.	11500222100	Sushovan barik	
96.	11500222101	Chandan jha	
97.	11500222102	Amitava roy	
98.	11500222103	Sayan samanta	
99.	11500222104	Rimjhim kumari	
100.	11500222105	Vishal singh	
101.	11500222106	Koushambha das	
102.	11500222107	Maahi agarwal	
103.	11500222108	Tusharkanti pal	
104.	11500222109	Mridul panda	
105.	11500222110	Kareena kumari	
106.	11500222111	Abhradeep paul	
107.	11500222112	Abhijan das	
108.	11500222113	Arijit dawn	
109.	11500222114	Asim das	
110.	11500222115	Aashika kumari	
111.	11500222116	Abhranil ray	
112.	11500222117	Subhradeep basu	
113.	11500222118	Tanujit banerjee	
114.	11500222119	Kunal kumar verma	
115.	11500223117	Ajanta ghosh	
116.	11500223118	Alakendu ghosh	
117.	11500223119	Argha ghosh	
118.	11500223120	Arkadipta kundu	
119.	11500223121	Barsha mandal	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
120.	11500223122	Bidisha bhattacharjee	
121.	11500223123	Koustav dutta	
122.	11500223124	Prithwis halder	
123.	11500223125	Rahul dey	
124.	11500223126	Saikat dasgupta	
125.	11500223127	Samapti hazra	
126.	11500223128	Samima afroj	
127.	11500223129	Sangita gorai	
128.	11500223131	Sourav sarkar	
129.	11500223132	Suman mondal	
130.	11500223133	Sumana giri	
131.	11500223134	Upal pramanik	
132.	11500223135	Youbaraj saha	
133.	11500223136	Subrata bauri	
Threshold marks set by program			60%
Number of students scored more than/equal to threshold			
Total number of students			133
Percentage of students scored more than/equal to threshold			

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Sample Corrected Copies of Presentation



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Topics for Report Writing (on CO2)

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

Group No.	Univ. Roll No.	Student's Name	Topic
1.	Tanmay Paul	11500222001	Comparative Analysis of Substitution and Transposition Techniques
	Sneha Debnath	11500222002	
	Annanda Datta	11500222003	
	Nishita Dey	11500222004	
	Kritika Laxmi	11500222005	
2.	Yash Gupta	11500222006	Encryption and Decryption Process in DES: Structural and Security Analysis
	Arka Adhikari	11500222007	
	Tanmay Raj	11500222008	
	Smarak Basak	11500222009	
	Diptesh Bhattacharyya	11500222010	
3.	Ambapali Datta	11500222011	Role of Key Range and Key Size in Ensuring Security: Analytical Study of DES
	Ritesh Saw	11500222012	
	Shirodhrit Bhowmick	11500222013	
	Subhojit Pachal	11500222014	
	Israr Arif	11500222015	
4.	Mrityunjay Aditya	11500222016	Comparative Security Analysis of Symmetric and Asymmetric Key Cryptography
	Ritikesh Singh	11500222017	
	Arpana Kumari	11500222018	
	Suman Jana	11500222019	
	Madhumita Maiti	11500222020	
5.	Sarat Menon	11500222021	Analytical Evaluation of Symmetric Key Cryptography in Network Security
	Rajib Sant	11500222022	
	Sattwik Das	11500222023	
	Vivek Kumar	11500222024	
	Saniya	11500222025	
6.	Shubham kumar Choudhary	11500222026	Block Cipher Concept and Analytical Study of DES as a Symmetric Key Algorithm
	Sudhanshu kumar	11500222027	
	Pilli shreyash Rao	11500222028	
	Shatarupa Sen	11500222029	
	Prithviraj Das	11500222030	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Group No.	Univ. Roll No.	Student's Name	Topic
	Srijita Mallick	11500222031	Algorithm Types in Symmetric Cryptography
	Sayan Sen	11500222032	
	Shiwaangee Gupta	11500222033	
	Akash Kumar Das	11500222034	
	Ashmita Pramanick	11500222035	
	Amandeep Singh	11500222036	Impact of Block Cipher Modes on Confidentiality and Integrity in DES
	Adrija Datta	11500222037	
	Abhijeet kumar sah	11500222038	
	Shovan Rana	11500222039	
	Piyush Arora	11500222040	
	Ayush Ray	11500222041	Brute Force Attack Analysis on DES and Its Security Limitations
	Mayuk Kar	11500222042	
	Sandhya Prasad	11500222043	
	Priya Rajak	11500222044	
	Ritam Chatterjee	11500222045	
	Gobindo Mondal	11500222046	Analytical Study of DES in Securing Network Communication Systems
	Debarjun Simlai	11500222047	
	Saheli Mandal	11500222048	
	Anwasha Pal	11500222049	
	Dipanjan Nandy	11500222050	
	Disha Soni	11500222051	Plaintext and Ciphertext Transformation: Security Analysis Using DES Algorithm
	Sayan De	11500222052	
	Archak Nath	11500222053	
	Sarthak Chakraborty	11500222054	
	Manik Kumar Mahato	11500222055	
	Ranjan Kumar Mahato	11500222058	Role of DES in Symmetric Key Cryptography
	Dhruba Maitra	11500222059	
	Ayan Pramanik	11500222060	
	Ajanta Ghosh	11500223117	
	Alakendu Ghosh	11500223118	Evolution from DES to AES: Security Improvement Analysis
	Arkadipta Kundu	11500223120	
	Bidisha Bhattacharjee	11500223122	
	Prithwis Halder	11500223124	
	Saikat Dasgupta	11500223126	Transposition Techniques and Their Relevance to Modern Block Ciphers
	Samapti Hazra	11500223127	
	Samima Afroj	11500223128	
	Sumana Giri	11500223133	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

General Instruction:

Prepare Report of around ten pages for each topic. The format of the report is attached.

Last date of the submission of report is 04/03/25.

Please upload pdf formats of report on Moodle.

Report format (Recommended)

Sections:

- Title
- Abstract
- Introduction
- Use Case Diagram (if any)
- Working principle
- Applications
- Conclusions
- References

Style:

Times New Roman, 1.5 spaced, using 12-point font, margins should be one inch on each side (justify; align text to both the left and right margins).

Page limit:

Around 10 pages.

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Rubrics for Report Writing

Rubrics for Report writing & Assignments for CA2

Component		Proficient	Acceptable	Needs Improvements
Written Communication		Report is well organized and clearly written. The underlying logic is clearly articulated and easy to follow. Words are chosen that precisely express the intended meaning and support reader comprehension. Diagrams or analyses enhance and clarify presentation of ideas. Sentences are grammatical and free from spelling errors.	Report is organized and clearly written for the most part. In some areas the logic or flow of ideas is difficult to follow. Words are well chosen with some minor exceptions. Diagrams are consistent with the text. Sentences are mostly grammatical and only a few spelling errors are present but they do not hinder the reader.	Report lacks an overall organization. Reader has to make considerable effort to understand the underlying logic and flow of ideas. Diagrams are absent or inconsistent with the text. Grammatical and spelling errors make it difficult for the reader to interpret the text in places.

PI Code	PI	Marks	Very Poor Up to 20%	Poor Up to 40%	Average Up to 60%	Good Up to 80%	Very good Up to 100%
2.1.2	Identify engineering systems, variables, and parameters to solve the problems - IA	02	Engineering systems are not identified. Variables, and parameters to solve the problems are not defined	Engineering systems are identified but not clear. Variables, and parameters to solve the problems are not defined	Engineering systems are clear. Variables, and parameters to solve the problems are not defined	Engineering systems are identified. Variables, and parameters to solve the problems are partially defined	Engineering systems are identified. Variables, and parameters to solve the problems are completely defined
9.3.1	Present results as a team, with smooth integration of contributions from all individual efforts – GA + IA	03	No Contribution from an individual to a team	Contributions from an individual to a team is minimal	Contributions from an individual to a team is moderate	A contribution from an individual to a team is good but not well groomed in team.	Contribution from an individual to a team is good and results in an integrated team presentation.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assessment of Report Writing

Course Name & Code: Cryptography & Network Security	Course Code: PEC IT 801B
Year & Semester: 5 th Yr, 8 th Sem	Branch & Section: IT, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
1	11500222001	Tanmay paul	
2	11500222002	Sneha debnath	
3	11500222003	Ananda datta	
4	11500222004	Nishita dey	
5	11500222005	Kritika laxmi	
6	11500222006	Yash gupta	
7	11500222007	Arka adhikari	
8	11500222008	Tanmay raj	
9	11500222009	Smarak basak	
10	11500222010	Diptesh bhattacharyya	
11	11500222011	Ambapali datta	
12	11500222012	Ritesh saw	
13	11500222013	Shirodhrit bhowmick	
14	11500222014	Subhojit pachhal	
15	11500222015	Israr arif	
16	11500222016	Mrityunjay aditya	
17	11500222017	Ritikesh singh	
18	11500222018	Arpana kumari	
19	11500222019	Suman jana	
20	11500222020	Madhumita maiti	
21	11500222021	Sarat menon	
22	11500222022	Rajib sant	
23	11500222023	Sattwik das	
24	11500222024	Vivek kumar	
25	11500222025	Saniya	
26	11500222026	Shubham kumar choudhary	
27	11500222027	Sudhanshu kumar	
28	11500222028	Pilli shreyash rao	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
	11500222029	Shatarupa sen	
	11500222030	Prithiraj das	
	11500222031	Srijita mallick	
	11500222032	Sayan sen	
	11500222033	Shiwaangee gupta	
	11500222034	Akash kumar das	
	11500222035	Ashmita pramanick	
	11500222036	Amandeep singh	
	11500222037	Adrija datta	
	11500222038	Abhijeet kumar sah	
	11500222039	Shovan rana	
	11500222040	Piyush arora	
	11500222041	Ayush ray	
	11500222042	Mayukh kar	
	11500222043	Sandhya prasad	
	11500222044	Priya rajak	
	11500222045	Ritam chatterjee	
	11500222046	Gobinda mondal	
	11500222047	Debarjun simlai	
	11500222048	Saheli mondal	
	11500222049	Anwasha pal	
	11500222050	Dipanjan nandy	
	11500222051	Disha soni	
	11500222052	Sayan de	
	11500222053	Archak nath	
	11500222054	Sarthak chakraborty	
	11500222055	Manik kumar mahato	
	11500222058	Ranjan kumar mahato	
	11500222059	Dhruba maitra	
	11500222060	Ayan pramanik	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
		Max Marks →	25
	11500222061	Aratrika samanta	
	11500222062	Anubhav ishan	
	11500222063	Aditya kumar sultania	
	11500222064	Manish pandey	
	11500222065	Jayasree saha	
	11500222066	Sukesh bhunia	
	11500222067	Sourav rai	
	11500222068	Samrat das	
	11500222069	Asad imam	
	11500222070	Sanjib sen	
	11500222071	Shubhadip koley	
	11500222072	Md zeeshan mustafa	
	11500222073	Souvik biswas	
	11500222074	Soumyajit chowdhury	
	11500222075	Arup jana	
	11500222076	Ms mayank	
	11500222077	Srijit pal	
	11500222078	Shrimanta ghosh	
	11500222079	Dipam dey	
	11500222080	Neha jha	
	11500222081	Sudipta mondal	
	11500222083	Rahul das	
	11500222084	Reezwan hosen khan	
	11500222085	Gaurav thakur	
	11500222086	Md tabrez shamim	
	11500222087	Asmita saha	
	11500222088	Manu singh	
	11500222090	Arpit raj	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	20
	Max Marks →		25
	11500222091	Tamal majumdar	
	11500222092	Syantika manna	
	11500222093	Ankita saha	
	11500222095	Rohit raj	
	11500222096	Rakesh de	
	11500222097	Srijan sasmal	
	11500222098	Rajarshi mondal	
	11500222099	Snigdha ghosh	
	11500222100	Sushovan barik	
	11500222101	Chandan jha	
	11500222102	Amitava roy	
	11500222103	Sayan samanta	
	11500222104	Rimjhim kumari	
	11500222105	Vishal singh	
	11500222106	Koushambha das	
	11500222107	Maahi agarwal	
	11500222108	Tusharkanti pal	
	11500222109	Mridul panda	
	11500222110	Kareena kumari	
	11500222111	Abhradeep paul	
	11500222112	Abhijan das	
	11500222113	Arijit dawn	
	11500222114	Asim das	
	11500222115	Aashika kumari	
	11500222116	Abhranil ray	
	11500222117	Subhradeep basu	
	11500222118	Tanujit banerjee	
	11500222119	Kunal kumar verma	
	11500223117	Ajanta ghosh	
	11500223118	Alakendu ghosh	
	11500223119	Argha ghosh	
	11500223120	Arkadipta kundu	
	11500223121	Barsha mandal	



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			
	11500223122	Bidisha bhattacharjee	
	11500223123	Koustav dutta	
	11500223124	Prithwis halder	
	11500223125	Rahul dey	
	11500223126	Saikat dasgupta	
	11500223127	Samapti hazra	
	11500223128	Samima afroj	
	11500223129	Sangita gorai	
	11500223131	Sourav sarkar	
	11500223132	Suman mondal	
	11500223133	Sumana giri	
	11500223134	Upal pramanik	
	11500223135	Youbaraj saha	
	11500223136	Subrata bauri	
Threshold marks set by program			60%
Number of students scored more than/equal to threshold			
Total number of students			133
Percentage of students scored more than/equal to threshold			

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Sample Copies of Report Writing



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

B. P. PODDAR INSTITUTE OF MANAGEMENT & TECHNOLOGY

Class Test 1 / B.TECH/IT (NEW)/SEM 5/ESC 501/2024-25

SOFTWARE ENGINEERING

Time Allotted: 50 minutes

Full Marks: 25

OUTCOME BASED EDUCATION (OBE)

Question No.	Knowledge Domain & Level	Allotted Marks	CO
1(a-e)	Understand (L2)	5	CO1
2	Analyze (L4)	5	CO1
3	Understand (L2)	5	CO1
4a	Remember (L1)	2	CO2
4b	Apply (L3)	3	CO3
5	Apply (L3)	5	CO3
6a	Understand (L2)	2	CO1
6b	Apply (L3)	3	CO3

Group-A

(Multiple Choice Type Questions)

Answer the following questions (any five):

5×1=5

- 1 (i)is a graphical notation for depicting process design.
(ii) A decision table should be used.....
(iii) Potential risks are best directed by_____ model.
(iv) model put much more emphasis on reusability.
(v) When can white-box testing be started?
A) After SRS Creation B) After Installation C) After Programming D) After Designing
- (vi) Which of the following is the most important feature of the spiral model?
A) Efficiency management B) Time management C) Risk Management D) Quality management
- (vii) Which of the following is not considered as an option for achieving reliable cost and effort estimation?
A) The ability to translate the size estimate into human effort, calendar time, and dollars
B) Use relatively simple decomposition techniques to generate project cost and effort estimates.
C) Base estimates on similar projects that have already been completed
D) Use one or more empirical models for software cost and effort estimation



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Group-B (Short Answer Type Questions)

Answer any four of the following:

4×5=20

2. Explain briefly how spiral model address the shortcomings of waterfall model. Mention the strengths and weaknesses of the spiral model. (5)
3. Define capability and Key process areas of Capability Maturity model (CMM). What are the quantities that determine the degree of capability of a software reliability model? (5)
4. (a) Explain the development phases of the detailed COCOMO model. (2)

 (b) A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 40000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.8 for the software development on embedded systems, while the exponentiation factor is given as 1.20. What is the estimated effort in person-months? (3)
5. The availability of a complex software is 90%. Its Mean Time Between Failure (MTBF) is 200 days. Because of the critical nature of the usage, the organization deploying the software further enhanced it to obtain an availability of 95%. In the process, the Mean Time To Repair (MTTR) increased by 5 days. What is the MTBF of the enhanced software? (5)
6. a) Why is SRS also known as the black-box specification of system? Differentiate between functional testing and structural testing. (2)

 b) Define the failure intensity of the Basic model. Assume a program will experience a total of 200 failures. Initial failure intensity is 16 failure/ CPU hr. It has now experienced 50 failures. Determine the following after specifying the formula a. Current failure intensity b. Decrement of failure intensity c. Failure intensity at 100 CPU hr. (3)



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Question–CO Mapping Table (CO1 to CO3)

Question No.	Question Description	Mapped CO	Justification
1(a–e)	Overview of System Analysis & Design, Business System Concept, System Development Life Cycle, Waterfall Model Spiral Model, Feasibility Analysis, Technical Feasibility, Cost- Benefit Analysis, COCOMO model.	CO1	These questions require understanding SDLC model and feasibility study of the software and identifying cost estimation model.
2	Explain briefly how spiral model address the shortcomings of waterfall model. Mention the strengths and weaknesses of the spiral model.	CO1	Understand student's comprehension of lifecycle evolution from the Waterfall Model to the Spiral Model, including comparative analysis and risk management concepts.
3	Define capability and Key process areas of Capability Maturity model (CMM). What are the quantities that determine the degree of capability of a software reliability model?	CO2	Remember the concepts of software process maturity and reliability metrics.
4a	Explain the development phases of the detailed COCOMO model.	CO2	Develop a software focuses on explaining the development phases of the COCOMO estimation model.
4b	A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 40000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.8 for the software development on embedded systems, while the exponentiation	CO3	Apply the Basic COCOMO estimation model to calculate development effort, which supports proper planning and management of software quality activities at the organizational level.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

	factor is given as 1.20. What is the estimated effort in person-months?		
5	The availability of a complex software is 90%. Its Mean Time Between Failure (MTBF) is 200 days. Because of the critical nature of the usage, the organization deploying the software further enhanced it to obtain an availability of 95%. In the process, the Mean Time To Repair (MTTR) increased by 5 days. What is the MTBF of the enhanced software?	CO3	Apply the concepts of reliability and availability formulas to quantitatively evaluate and improve software quality at the system and organizational level. Student can able to demonstrate practical application of quality assurance metrics aligned with Bloom's Level 3 (Apply).
6a	Why is SRS also known as the black-box specification of system? Differentiate between functional testing and structural testing.	CO3	Focuses on the mechanisms of black-box testing. Require understanding the types of testing and focuses on the aspects of a software program that are tested during the following Testing processes.
6b	Define the failure intensity of the Basic model. Assume a program will experience a total of 200 failures. Initial failure intensity is 16 failure/ CPU hr. It has now experienced 50 failures. Determine the following after specifying the formula a. Current failure intensity b. Decrement of failure intensity c. Failure intensity at 100 CPU hr.	CO3	Apply a software reliability growth model and compute failure intensity using quantitative formulas, which reflects practical application of quality assurance techniques.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Scheme of Evaluation of Class Test 1

Q.No.	Question	Marks Awarded	CO Mapping	Cognitive Level	Marks (M) to be awarded
1(a-e)	Overview of System Analysis & Design , Business System Concept, System Development Life Cycle, Waterfall Model Spiral Model, Feasibility Analysis, Technical Feasibility, Cost- Benefit Analysis, COCOMO model.	1	CO1	Understand	If Correct M=1
2	Explain briefly how spiral model address the shortcomings of waterfall model. Mention the strengths and weaknesses of the spiral model.	1	CO1	Understand	If Correct M=5
3	Define capability and Key process areas of Capability Maturity model (CMM). What are the quantities that determine the degree of capability of a software reliability model?	1	CO1	Understand	If Correct M=5
4a	Explain the development phases of the detailed COCOMO model.	1	CO2	Create	If Correct M=2
4b	A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 40000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.8 for the software	1	CO3	Apply	If Correct M=3



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

	development on embedded systems, while the exponentiation factor is given as 1.20. What is the estimated effort in person-months?				
5	The availability of a complex software is 90%. Its Mean Time Between Failure (MTBF) is 200 days. Because of the critical nature of the usage, the organization deploying the software further enhanced it to obtain an availability of 95%. In the process, the Mean Time To Repair (MTTR) increased by 5 days. What is the MTBF of the enhanced software?	1+2+1+1	CO3	Apply	If Correct M=5
6a	Why is SRS also known as the black-box specification of system? Differentiate between functional testing and structural testing.	2+3	CO1	Apply	If Correct M=2
6b	Define the failure intensity of the Basic model. Assume a program will experience a total of 200 failures. Initial failure intensity is 16 failure/ CPU hr. It has now experienced 50 failures. Determine the following after specifying the formula a. Current failure intensity b. Decrement of failure intensity c. Failure intensity at 100 CPU hr.	1+2+2	CO3	Apply	If Correct M=3



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Model Answer of Class Test 1

Group-A: Very Short Answer Questions (1×5 = 5)

- Structure Chart is a graphical notation for depicting process design.
 - A decision table should be used when there are complex combinations of conditions and actions.
 - Potential risks are best directed by Spiral Model.
 - Object-Oriented Model puts much more emphasis on reusability.
 - White-box testing can be started after Programming. (Correct Answer: C)
 - Most important feature of Spiral Model: Risk Management. (Correct Answer: C)
 - Not considered as estimation option: The ability to translate the size estimate into human effort, calendar time, and dollars.

Group-B: Short Answer Type Questions (4×5 = 20)

- Explain briefly how spiral model address the shortcomings of waterfall model. Mention the strengths and weaknesses of the spiral model. (5)
 - Handles changing requirements through iterative cycles.
 - Emphasizes risk analysis in every phase.
 - Allows customer feedback at each iteration.Strengths: Risk-focused, flexible, suitable for large projects.
Weaknesses: Expensive, complex, requires risk expertise.

- Define capability and Key process areas of Capability Maturity model (CMM). What are the quantities that determine the degree of capability of a software reliability model? (5)

Capability: Ability of an organization to consistently develop high-quality software.

Key Process Areas (KPA): Requirements Management, Project Planning, Quality Assurance, Configuration Management, Process Improvement.

Reliability Quantities: Failure Intensity, MTBF, MTTR, Availability.

- Explain the development phases of the detailed COCOMO model. (2)
 - A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 40000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.8 for the software development on embedded systems, while the exponentiation factor is given as 1.20. What is the estimated effort in person-months? (3)



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Development Phases of Detailed COCOMO: Product Design, Detailed Design, Coding & Unit Testing, Integration & Testing.

Effort Estimation:

Given: LOC = 40000 (40 KLOC), $a = 2.8$, $b = 1.20$

Effort = $a \times (\text{KLOC})^b$

Effort = $2.8 \times (40)^{1.20} \approx 234$ Person-Months

5. The availability of a complex software is 90%. Its Mean Time between Failure (MTBF) is 200 days. Because of the critical nature of the usage, the organization deploying the software further enhanced it to obtain an availability of 95%. In the process, the Mean Time to Repair (MTTR) increased by 5 days. What is the MTBF of the enhanced software? (5)

Availability = $\text{MTBF} / (\text{MTBF} + \text{MTTR})$

Initial MTTR ≈ 22.22 days

New MTTR = 27.22 days

New MTBF ≈ 517 days

6. a) Why is SRS also known as the black-box specification of system? Differentiate between functional testing and structural testing. (2)
- b) Define the failure intensity of the Basic model. Assume a program will experience a total of 200 failures. Initial failure intensity is 16 failure/ CPU hr. It has now experienced 50 failures. Determine the following after specifying the formula a. Current failure intensity b. Decrement of failure intensity c. Failure intensity at 100 CPU hr. (3)

SRS is called black-box specification because it specifies what the system should do, not how it is implemented.

Functional Testing: Tests functionality based on requirements.

Structural Testing: Tests internal code structure (white-box testing).

Failure Intensity Formula: $\lambda = \lambda_0 (1 - \mu / V)$

Current failure intensity = 12 failures/CPU hr



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assessment of Class Test 1

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
1.	11500222001	Tanmay paul	4	2	5			11
2.	11500222002	Sneha debnath	3	3	5			11
3.	11500222003	Ananda datta	3	0	10			13
4.	11500222004	Nishita dey	2			1	8	11
5.	11500222005	Kritika laxmi	4	1	8			17
6.	11500222006	Yash gupta	4	0	5			9
7.	11500222007	Arka adhikari	3	0	10			13
8.	11500222008	Tanmay raj	3		3	1		7
9.	11500222009	Smarak basak	4		0	12		16
10.	11500222010	Diptesh bhattacharyya	3		5	14		22
11.	11500222011	Ambapali datta	4	3	8			15
12.	11500222012	Ritesh saw	5	0	12			24
13.	11500222013	Shirodhrit bhowmick	3		3	9		15
14.	11500222014	Subhojit pachhal	5		5	14		24
15.	11500222015	Israr arif	3		3	15		21
16.	11500222016	Mrityunjay aditya	2		3	6		11
17.	11500222017	Ritikesh singh	3	2	9			14
18.	11500222018	Arpana kumari	3	2	6			11
19.	11500222019	Suman jana	4	3	9			16
20.	11500222020	Madhumita maiti	5	3	11			19
21.	11500222021	Sarat menon	5			0	9	14
22.	11500222022	Rajib sant	3			0	6	9
23.	11500222023	Sattwik das	5	5	11			21
24.	11500222024	Vivek kumar	6	4	9			19
25.	11500222025	Saniya	3	3	10			16
26.	11500222026	Shubham kumar choudhary	5			4	6	15
27.	11500222027	Sudhanshu kumar	3	0	10			13
28.	11500222028	Pilli shreyash rao	4	1	7			12



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
29.	11500222029	Shatarupa sen	4	5	6			15
30.	11500222030	Prithiraj das	5	4	7			16
31.	11500222031	Srijita mallick	4			5	9	18
32.	11500222032	Sayan sen	4			1	11	16
33.	11500222033	Shiwaangee gupta	6	2	9			17
34.	11500222034	Akash kumar das	4	3	11			18
35.	11500222035	Ashmita pramanick	6		2	9		17
36.	11500222036	Amandeep singh	3		5	7		15
37.	11500222037	Adrija datta	3		2	14		19
38.	11500222038	Abhijeet kumar sah	4	3	8			15
39.	11500222039	Shovan rana	6	3	10			19
40.	11500222040	Piyush arora	4		3	9		16
41.	11500222041	Ayush ray	6	0	5			11
42.	11500222042	Mayukh kar	3	4	10			17
43.	11500222043	Sandhya prasad	4	3	9			16
44.	11500222044	Priya rajak	2			3	11	16
45.	11500222045	Ritam chatterjee	2			3	12	17
46.	11500222046	Gobinda mondal	2			3	9	14
47.	11500222047	Debarjun simlai	5	0	13			18
48.	11500222048	Saheli mondal	4	3	9			16
49.	11500222049	Anwasha pal	4	5	13			22
50.	11500222050	Dipanjan nandy	3		4	9		16
51.	11500222051	Disha soni	3		3	10		16
52.	11500222052	Sayan de	2	2	7			11
53.	11500222053	Archak nath	5	4	12			21
54.	11500222054	Sarthak chakraborty	4	4	11			19
55.	11500222055	Manik kumar mahato	3			3	9	15
56.	11500222058	Ranjan kumar mahato	3			0	14	17



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
57.	11500222059	Dhruba maitra	3	3	5			11
58.	11500222060	Ayan pramanik	3	2	8			13
59.	11500222061	Aratrika samanta	4		2	5		11
60.	11500222062	Anubhav ishan	3		3	5		11
61.	11500222063	Aditya kumar sultania	3		0	10		13
62.	11500222064	Manish pandey	2		1	8		11
63.	11500222065	Jayasree saha	4	1	8			13
64.	11500222066	Sukesh bhunia	4	0	5			9
65.	11500222067	Sourav rai	3	0	10			13
66.	11500222068	Samrat das	3			3	1	7
67.	11500222069	Asad imam	4			0	12	16
68.	11500222070	Sanjib sen	3	5	14			22
69.	11500222071	Shubhadip koley	4	3	8			15
70.	11500222072	Md zeeshan mustafa	5	0	12			17
71.	11500222073	Souvik biswas	3		3	9		15
72.	11500222074	Soumyajit chowdhury	5		5	14		24
73.	11500222075	Arup jana	3		3	15		21
74.	11500222076	Ms mayank	2		3	6		11
75.	11500222077	Srijit pal	3	2	9			14
76.	11500222078	Shrimanta ghosh	3	2	6			11
77.	11500222079	Dipam dey	4	3	9			16
78.	11500222080	Neha jha	5			3	11	19
79.	11500222081	Sudipta mondal	5			0	9	14
80.	11500222083	Rahul das	3			0	6	9
81.	11500222084	Reezwan hosen khan	5	5	11			21
82.	11500222085	Gaurav thakur	6		4	9		19
83.	11500222086	Md tabrez shamim	3		3	10		16
84.	11500222087	Asmita saha	5	4	6			15



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
85.	11500222088	Manu singh	3	0	10			13
86.	11500222090	Arpit raj	4	1	7			12
87.	11500222091	Tamal majumdar	4		5	6		15
88.	11500222092	Sayantika manna	5		4	7		16
89.	11500222093	Ankita saha	4	5	9			18
90.	11500222095	Rohit raj	4	1	11			16
91.	11500222096	Rakesh de	6	2	9			17
92.	11500222097	Srijan sasmal	4		3	11		18
93.	11500222098	Rajarshi mondal	6		2	9		17
94.	11500222099	Snigdha ghosh	3	5	7			15
95.	11500222100	Sushovan barik	3	2	14			19
96.	11500222101	Chandan jha	4	3	8			15
97.	11500222102	Amitava roy	6			3	10	19
98.	11500222103	Sayan samanta	4			3	9	16
99.	11500222104	Rimjhim kumari	6			0	5	11
100.	11500222105	Vishal singh	3	4	10			17
101.	11500222106	Koushambha das	4	3	9			16
102.	11500222107	Maahi agarwal	2	3	11			16
103.	11500222108	Tusharkanti pal	2		3	12		17
104.	11500222109	Mridul panda	2	3	9			14
105.	11500222110	Kareena kumari	5	0	13			18
106.	11500222111	Abhradeep paul	4	3	9			16
107.	11500222112	Abhijan das	4			5	13	22
108.	11500222113	Arijit dawn	3			4	9	16
109.	11500222114	Asim das	3			3	10	16
110.	11500222115	Aashika kumari	2	2	7			11
111.	11500222116	Abhranil ray	5			4	12	21
112.	11500222117	Subhradeep basu	4	4	11			19



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
113.	11500222118	Tanujit banerjee	4	2	9			15
114.	11500222119	Kunal kumar verma	4	4	8			16
115.	11500223117	Ajanta ghosh	5			3	5	13
116.	11500223118	Alakendu ghosh	4			2	10	16
117.	11500223119	Argha ghosh	4	5	6			15
118.	11500223120	Arkadipta kundu	4	2	9			15
119.	11500223121	Barsha mandal	5		4	7		16
120.	11500223122	Bidisha bhattacharjee	4		4	8		16
121.	11500223123	Koustav dutta	4	5	9			18
122.	11500223124	Prithwis halder	4	4	8			16
123.	11500223125	Rahul dey	4		1	11		16
124.	11500223126	Saikat dasgupta	3	2	15			20
125.	11500223127	Samapti hazra	4	2	12			18
126.	11500223128	Samima afroj	2		3	12		17
127.	11500223129	Sangita gorai	6	2	9			17
128.	11500223131	Sourav sarkar	4	4	8			16
129.	11500223132	Suman mondal	3			2	15	20
130.	11500223133	Sumana giri	4			2	9	15
131.	11500223134	Upal pramanik	4			2	12	18
132.	11500223135	Youbaraj saha	4	3	11			18
133.	11500223136	Subrata bauri	2	3	12			17
Threshold marks set by program								60%
Number of students scored more than/equal to threshold								
Total number of students								133
Percentage of students scored more than/equal to threshold								

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Sample Corrected Copies of Class Test 1



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

B. P. PODDAR INSTITUTE OF MANAGEMENT & TECHNOLOGY

Class Test 2/ B.TECH /IT (NEW)/SEM 5/ESC 501/2024-25

SOFTWARE ENGINEERING

Time Allotted: 50 minutes

Full Marks: 25

OUTCOME BASED EDUCATION (OBE)

Question No.	Knowledge Domain & Level	Allotted Marks	CO
1(a-e)	Understand (L2)	5 (1 each)	CO4, CO5
2	Analyze (L4)	5	CO4
3	Analyze (L4)	5	CO5
4	Create (Level 6)	2	CO4
5	Evaluate (Level 5)	3	CO4
6	Create (Level 6)	5	CO5

Group-A

(Multiple Choice Type Questions)

Answer the following questions (any five):

5×1=5

1 a. Which technique is commonly used to represent project activities and their dependencies?

- A. SWOT Analysis
- B. Network Diagram
- C. Pareto Chart
- D. Fishbone Diagram

b. In a project network diagram, the longest path is called:

- A. Shortest Path
- B. Critical Path
- C. Slack Path
- D. Float Path

c. Which cost estimation technique uses historical data from similar projects?

- A. Bottom-up estimation
- B. Analogous estimation
- C. Parametric estimation
- D. Three-point estimation



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

- d. Which UML diagram represents the static structure of a system?
- A. Sequence Diagram
 - B. Activity Diagram
 - C. Class Diagram
 - D. Use Case Diagram
- e. Which UML diagram is primarily used to model user interactions with the system?
- A. Use Case Diagram
 - B. State Diagram
 - C. Activity Diagram
 - D. Object Diagram

Group-B (Short Answer Type Questions)

Answer any four of the following:

4×5=20

2. Define Critical Path and explain its importance in project scheduling. A project consists of multiple interdependent activities with varying durations. Analyze how the critical path can be identified and explain its impact on project completion if one critical activity is delayed. (2+3)
3. What is a UML Class Diagram? Given a software system with modules like Login, Payment, and Order Processing: Analyze which UML diagrams (class, sequence, activity) would best represent its structure and behavior, and justify your choice. (2+3)
4. Design a project schedule and network diagram for an Online Food Delivery System. (5)
Include:
- Activity sequencing
 - Time estimation (PERT/CPM)
 - Identification of critical path.
5. A project manager must choose between bottom-up and parametric cost estimation. Evaluate which method is more appropriate for a large-scale software project and justify your decision. (5)
6. Create a UML model for a Banking System including: (5)
- Class diagram
 - Sequence diagram for transaction process
 - Use case diagram to analyze system structure and behavior.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Question–CO Mapping Table (CO3 to CO4)

Question No.	Question Description	Mapped CO	Justification
1(a–e)	Concepts on Develop project schedule and network diagram for different projects using standard metrics and models and analyze the structure and behaviour of a software system using modern engineering tools like UML diagrams.	CO4, CO5	Understanding project schedule, network diagram and UML diagrams concepts
2	Define Critical Path and explain its importance in project scheduling. A project consists of multiple interdependent activities with varying durations. Analyze how the critical path can be identified and explain its impact on project completion if one critical activity is delayed.	CO4	Students build schedules, diagrams, and plans using integrated models
3	What is a UML Class Diagram? Given a software system with modules like Login, Payment, and Order Processing: Analyze which UML diagrams (class, sequence, activity) would best represent its structure and behavior, and justify your choice.	CO5	Students interpret and examine UML diagrams to understand systems
4	Design a project schedule and network diagram for an Online Food Delivery System. Include: <ul style="list-style-type: none"> ➤ Activity sequencing ➤ Time estimation 	CO4	Students actively create solutions by combining knowledge of scheduling models, cost constraints, and uncertainty handling.



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

	(PERT/CPM) Identification of critical path.		
5	A project manager must choose between bottom-up and parametric cost estimation. Evaluate which method is more appropriate for a large-scale software project and justify your decision	CO4	Students actively create solutions by combining knowledge of scheduling models, cost constraints, and uncertainty handling.
6	Create a UML model for a Banking System including: <ul style="list-style-type: none">➤ Class diagram➤ Sequence diagram for transaction process➤ Use case diagram to analyze system structure and behavior.	CO5	Students interpret and examine UML diagrams to understand systems

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Scheme of Evaluation of Class Test 2

Q.No.	Question	Marks Awarded	CO Mapping	Cognitive Level	Marks (M) to be awarded
1. a	Which technique is commonly used to represent project activities and their dependencies? A. SWOT Analysis B. Network Diagram C. Pareto Chart D. Fishbone Diagram	1	CO4, CO5	Understand (L2)	If Correct M=1
1.b	In a project network diagram, the longest path is called: A. Shortest Path B. Critical Path C. Slack Path D. Float Path	1	CO4, CO5	Understand (L2)	If Correct M=1
1. c	Which cost estimation technique uses historical data from similar projects? A. Bottom-up estimation B. Analogous estimation C. Parametric estimation D. Three-point estimation	1	CO4, CO5	Understand (L2)	If Correct M=1
1. d	Which UML diagram represents the static structure of a system? A. Sequence Diagram B. Activity Diagram C. Class Diagram D. Use Case Diagram	1	CO4, CO5	Understand (L2)	If Correct M=1
2	Define Critical Path and explain its importance in project scheduling. A project consists of multiple interdependent activities with varying durations. Analyze how the	2+3	CO4	Analyze (L4)	If Correct M=5



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

	critical path can be identified and explain its impact on project completion if one critical activity is delayed.				
3	<p>What is a UML Class Diagram?</p> <p>Given a software system with modules like Login, Payment, and Order Processing: Analyze which UML diagrams (class, sequence, activity) would best represent its structure and behavior, and justify your choice.</p>	2+3	CO5	Analyze (L4)	If Correct M=5
4	<p>Design a project schedule and network diagram for an Online Food Delivery System. Include:</p> <ul style="list-style-type: none"> ➤ Activity sequencing ➤ Time estimation (PERT/CPM) <p>Identification of critical path.</p>	5	CO4	Create (Level 6)	If Correct M=5
5	<p>A project manager must choose between bottom-up and parametric cost estimation. Evaluate which method is more appropriate for a large-scale software project and justify your decision.</p>	5	CO4	Evaluate (Level 5)	If Correct M=5
6	<p>Create a UML model for a Banking System including:</p> <ul style="list-style-type: none"> ➤ Class diagram ➤ Sequence diagram for transaction process <p>Use case diagram to analyze system structure and behavior.</p>	5	CO5	Create (Level 6)	If Correct M=5

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Model Answer of Class Test 2

Group-A: Very Short Answer Questions

(1×5 = 5)

1 a. Which technique is commonly used to represent project activities and their dependencies?

- A. SWOT Analysis
- B. Network Diagram
- C. Pareto Chart
- D. Fishbone Diagram

Answer: B. Network Diagram

b. In a project network diagram, the longest path is called:

- A. Shortest Path
- B. Critical Path
- C. Slack Path
- D. Float Path

Answer: B. Critical Path

c. Which cost estimation technique uses historical data from similar projects?

- A. Bottom-up estimation
- B. Analogous estimation
- C. Parametric estimation
- D. Three-point estimation

Answer: B. Analogous estimation

d. Which UML diagram represents the static structure of a system?

- A. Sequence Diagram
- B. Activity Diagram
- C. Class Diagram
- D. Use Case Diagram

Answer: C. Class Diagram

e. Which UML diagram is primarily used to model user interactions with the system?

- A. Use Case Diagram
- B. State Diagram
- C. Activity Diagram
- D. Object Diagram

Answer: A. Use Case Diagram



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Group-B: Short Answer Type Questions

(4×5 = 20)

2. Define Critical Path and explain its importance in project scheduling. What is risk management in project planning?

The critical path is the longest sequence of dependent activities that determines the minimum project duration. Any delay in critical activities delays the entire project.

Risk management involves identifying, analyzing, and mitigating uncertainties that may impact project objectives.

3. What is a UML Class Diagram? Difference between aggregation and composition in UML.

A class diagram represents the static structure of a system, showing classes, attributes, methods, and relationships.

Aggregation: Weak “has-a” relationship (independent lifecycles)

Composition: Strong relationship (dependent lifecycle)

4. Explain PERT and CPM techniques with examples.

PERT uses probabilistic time estimates (O, M, P)

CPM uses fixed durations

Both help identify critical path and optimize scheduling

5. Describe cost estimation techniques in project management.

Analogous estimation

Parametric estimation

Bottom-up estimation

Three-point estimation

6. Explain different UML diagrams used to analyze system structure and behavior.

Structure diagrams: Class, Component, Deployment

Behavior diagrams: Sequence, Activity, State Machine, Use Case



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assessment of Class Test 2

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
1.	11500222001	Tanmay paul	4	2	9			15
2.	11500222002	Sneha debnath	4	4	8			16
3.	11500222003	Ananda datta	4	2	3			9
4.	11500222004	Nishita dey	5			3	5	13
5.	11500222005	Kritika laxmi	4			2	10	16
6.	11500222006	Yash gupta	4	5	6			15
7.	11500222007	Arka adhikari	4	2	9			15
8.	11500222008	Tanmay raj	5		4	7		16
9.	11500222009	Smarak basak	4		4	8		16
10.	11500222010	Diptesh bhattacharyya	4	5	9			18
11.	11500222011	Ambapali datta	4	4	8			16
12.	11500222012	Ritesh saw	4		1	11		16
13.	11500222013	Shirodhrit bhowmick	3	2	5	5	5	20
14.	11500222014	Subhojit pachhal	4	2	12			18
15.	11500222015	Israr arif	2		3	12		17
16.	11500222016	Mrityunjay aditya	6	2	9			17
17.	11500222017	Ritikesh singh	4	4	8			16
18.	11500222018	Arpana kumari	3	2	6			11
19.	11500222019	Suman jana	4	3	9			16
20.	11500222020	Madhumita maiti	5	3	11			19
21.	11500222021	Sarat menon	5	0	9			14
22.	11500222022	Rajib sant	3	0	6			9
23.	11500222023	Sattwik das	5	5	11			21
24.	11500222024	Vivek kumar	6	4	9			19
25.	11500222025	Saniya	3	3	10			16
26.	11500222026	Shubham kumar choudhary	5	4	6			15
27.	11500222027	Sudhanshu kumar	3	0	10			13
28.	11500222028	Pilli shreyash rao	4	1	7			12



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
29.	11500222029	Shatarupa sen	3	0	10			13
30.	11500222030	Prithiraj das	4	1	7			12
31.	11500222031	Srijita mallick	4		5	6		15
32.	11500222032	Sayan sen	5		4	7		16
33.	11500222033	Shiwaangee gupta	4	5	9			18
34.	11500222034	Akash kumar das	4	1	11			16
35.	11500222035	Ashmita pramanick	6	2	9			17
36.	11500222036	Amandeep singh	4		3	11		18
37.	11500222037	Adrija datta	5			3	5	13
38.	11500222038	Abhijeet kumar sah	4			2	10	16
39.	11500222039	Shovan rana	4	5	6			15
40.	11500222040	Piyush arora	4	2	9			15
41.	11500222041	Ayush ray	5		4	7		16
42.	11500222042	Mayukh kar	4		4	8		16
43.	11500222043	Sandhya prasad	4	5	9			18
44.	11500222044	Priya rajak	4	4	8			16
45.	11500222045	Ritam chatterjee	4		1	11		16
46.	11500222046	Gobinda mondal	3	2	15			20
47.	11500222047	Debarjun simlai	4	2	12			18
48.	11500222048	Saheli mondal	2		3	12		17
49.	11500222049	Anwasha pal	6	2	9			17
50.	11500222050	Dipanjan nandy	4	4	8			16
51.	11500222051	Disha soni	4	2	9			15
52.	11500222052	Sayan de	4	4	8			16
53.	11500222053	Archak nath	5	4	12			21
54.	11500222054	Sarthak chakraborty	4	4	11			19
55.	11500222055	Manik kumar mahato	3	3	9			15
56.	11500222058	Ranjan kumar mahato	3	0	14			17



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
57.	11500222059	Dhruba maitra	3	0	10			13
58.	11500222060	Ayan pramanik	4	1	7			12
59.	11500222061	Aratrika samanta	4		5	6		15
60.	11500222062	Anubhav ishan	5		4	7		16
61.	11500222063	Aditya kumar sultania	4	5	9			18
62.	11500222064	Manish pandey	4	1	11			16
63.	11500222065	Jayasree saha	6	2	9			17
64.	11500222066	Sukesh bhunia	4		3	11		18
65.	11500222067	Sourav rai	6		2	9		17
66.	11500222068	Samrat das	3	5	5	2		15
67.	11500222069	Asad imam	3	2	14			19
68.	11500222070	Sanjib sen	4		1	11		16
69.	11500222071	Shubhadip koley	3	2	15			20
70.	11500222072	Md zeeshan mustafa	4	2	12			18
71.	11500222073	Souvik biswas	2		3	12		17
72.	11500222074	Soumyajit chowdhury	6	2	9			17
73.	11500222075	Arup jana	4	4	8			16
74.	11500222076	Ms mayank	4	2	9			15
75.	11500222077	Srijit pal	4	4	8			16
76.	11500222078	Shrimanta ghosh	4	2	3			9
77.	11500222079	Dipam dey	5			3	5	13
78.	11500222080	Neha jha	4			2	10	16
79.	11500222081	Sudipta mondal	4	5	6			15
80.	11500222083	Rahul das	4	2	9			15
81.	11500222084	Reezwan hosen khan	5		4	7		16
82.	11500222085	Gaurav thakur	4		4	8		16
83.	11500222086	Md tabrez shamim	3	3	10	16	3	3
84.	11500222087	Asmita saha	5	4	6	15	5	4



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
85.	11500222088	Manu singh	3	0	10			13
86.	11500222090	Arpit raj	4	1	7			12
87.	11500222091	Tamal majumdar	4		5	6		15
88.	11500222092	Sayantika manna	5		4	7		16
89.	11500222093	Ankita saha	4	5	9			18
90.	11500222095	Rohit raj	4	1	11			16
91.	11500222096	Rakesh de	6	2	9			17
92.	11500222097	Srijan sasmal	4		3	11		18
93.	11500222098	Rajarshi mondal	6		2	9		17
94.	11500222099	Snigdha ghosh	3	5	7			15
95.	11500222100	Sushovan barik	3	2	14			19
96.	11500222101	Chandan jha	4	3	8			15
97.	11500222102	Amitava roy	6			3	10	19
98.	11500222103	Sayan samanta	4			3	9	16
99.	11500222104	Rimjhim kumari	6			0	5	11
100.	11500222105	Vishal singh	3	4	10			17
101.	11500222106	Koushambha das	4	3	9			16
102.	11500222107	Maahi agarwal	2	3	11			16
103.	11500222108	Tusharkanti pal	2		3	12		17
104.	11500222109	Mridul panda	2	3	9			14
105.	11500222110	Kareena kumari	5	0	13			18
106.	11500222111	Abhradeep paul	4	3	9			16
107.	11500222112	Abhijan das	4	5	13			22
108.	11500222113	Arijit dawn	3	4	9			16
109.	11500222114	Asim das	3	3	10			16
110.	11500222115	Aashika kumari	2	2	7			11
111.	11500222116	Abhranil ray	5	4	12			21
112.	11500222117	Subhradeep basu	4	4	11			19



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Q1	Q2	Q3	Q4	Q5	Total
Max Marks →			5	5	5	5	5	25
113.	11500222118	Tanujit banerjee	3	0	10			13
114.	11500222119	Kunal kumar verma	4	1	7			12
115.	11500223117	Ajanta ghosh	5		4	7		16
116.	11500223118	Alakendu ghosh	4	5	9			18
117.	11500223119	Argha ghosh	4	1	11			16
118.	11500223120	Arkadipta kundu	6	2	9			17
119.	11500223121	Barsha mandal	4		3	11		18
120.	11500223122	Bidisha bhattacharjee	6		2	9		17
121.	11500223123	Koustav dutta	3	5	7			15
122.	11500223124	Prithwis halder	3	2	14			19
123.	11500223125	Rahul dey	4	3	8			15
124.	11500223126	Saikat dasgupta	6			3	10	19
125.	11500223127	Samapti hazra	4			3	9	16
126.	11500223128	Samima afroj	6			0	5	11
127.	11500223129	Sangita gorai	3	4	10			17
128.	11500223131	Sourav sarkar	4	3	9			16
129.	11500223132	Suman mondal	2	3	11			16
130.	11500223133	Sumana giri	2		3	12		17
131.	11500223134	Upal pramanik	2	3	9			14
132.	11500223135	Youbaraj saha	5	0	13			18
133.	11500223136	Subrata bauri	4	3	9			16
Threshold marks set by program								60%
Number of students scored more than/equal to threshold								
Total number of students								133
Percentage of students scored more than/equal to threshold								

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Sample Corrected Copies of Class Test 2



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assessment of Quiz (Conducted by University, on CO1 to CO5)

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
1.	11500222001	Tanmay paul	22
2.	11500222002	Sneha debnath	22
3.	11500222003	Ananda datta	22
4.	11500222004	Nishita dey	21
5.	11500222005	Kritika laxmi	22
6.	11500222006	Yash gupta	22
7.	11500222007	Arka adhikari	19
8.	11500222008	Tanmay raj	22
9.	11500222009	Smarak basak	24
10.	11500222010	Diptesh bhattacharyya	21
11.	11500222011	Ambapali datta	25
12.	11500222012	Ritesh saw	18
13.	11500222013	Shirodhrit bhowmick	22
14.	11500222014	Subhojit pachhal	21
15.	11500222015	Israr arif	22
16.	11500222016	Mrityunjay aditya	25
17.	11500222017	Ritikesh singh	22
18.	11500222018	Arpana kumari	25
19.	11500222019	Suman jana	22
20.	11500222020	Madhumita maiti	16
21.	11500222021	Sarat menon	22
22.	11500222022	Rajib sant	22
23.	11500222023	Sattwik das	25
24.	11500222024	Vivek kumar	22
25.	11500222025	Saniya	22
26.	11500222026	Shubham kumar choudhary	22
27.	11500222027	Sudhanshu kumar	22
28.	11500222028	Pilli shreyash rao	24



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
29.	11500222029	Shatarupa sen	22
30.	11500222030	Prithiraj das	25
31.	11500222031	Srijita mallick	22
32.	11500222032	Sayan sen	21
33.	11500222033	Shiwaangee gupta	22
34.	11500222034	Akash kumar das	0
35.	11500222035	Ashmita pramanick	22
36.	11500222036	Amandeep singh	21
37.	11500222037	Adrija datta	22
38.	11500222038	Abhijeet kumar sah	22
39.	11500222039	Shovan rana	21
40.	11500222040	Piyush arora	22
41.	11500222041	Ayush ray	22
42.	11500222042	Mayukh kar	21
43.	11500222043	Sandhya prasad	18
44.	11500222044	Priya rajak	22
45.	11500222045	Ritam chatterjee	22
46.	11500222046	Gobinda mondal	20
47.	11500222047	Debarjun simlai	20
48.	11500222048	Saheli mondal	19
49.	11500222049	Anwasha pal	25
50.	11500222050	Dipanjan nandy	21
51.	11500222051	Disha soni	22
52.	11500222052	Sayan de	21
53.	11500222053	Archak nath	21
54.	11500222054	Sarthak chakraborty	22
55.	11500222055	Manik kumar mahato	25
56.	11500222058	Ranjan kumar mahato	21



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
57.	11500222059	Dhruba maitra	25
58.	11500222060	Ayan pramanik	21
59.	11500222061	Aratrika samanta	20
60.	11500222062	Anubhav ishan	25
61.	11500222063	Aditya kumar sultania	25
62.	11500222064	Manish pandey	25
63.	11500222065	Jayasree saha	20
64.	11500222066	Sukesh bhunia	25
65.	11500222067	Sourav rai	25
66.	11500222068	Samrat das	22
67.	11500222069	Asad imam	25
68.	11500222070	Sanjib sen	25
69.	11500222071	Shubhadip koley	25
70.	11500222072	Md zeeshan mustafa	25
71.	11500222073	Souvik biswas	25
72.	11500222074	Soumyajit chowdhury	25
73.	11500222075	Arup jana	25
74.	11500222076	Ms mayank	20
75.	11500222077	Srijit pal	25
76.	11500222078	Shrimanta ghosh	25
77.	11500222079	Dipam dey	25
78.	11500222080	Neha jha	25
79.	11500222081	Sudipta mondal	25
80.	11500222083	Rahul das	25
81.	11500222084	Reezwan hosen khan	25
82.	11500222085	Gaurav thakur	25
83.	11500222086	Md tabrez shamim	25
84.	11500222087	Asmita saha	25



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
85.	11500222088	Manu singh	25
86.	11500222090	Arpit raj	25
87.	11500222091	Tamal majumdar	25
88.	11500222092	Sayantika manna	25
89.	11500222093	Ankita saha	25
90.	11500222095	Rohit raj	17
91.	11500222096	Rakesh de	25
92.	11500222097	Srijan sasmal	25
93.	11500222098	Rajarshi mondal	20
94.	11500222099	Snigdha ghosh	25
95.	11500222100	Sushovan barik	25
96.	11500222101	Chandan jha	25
97.	11500222102	Amitava roy	25
98.	11500222103	Sayan samanta	25
99.	11500222104	Rimjhim kumari	20
100.	11500222105	Vishal singh	25
101.	11500222106	Koushambha das	22
102.	11500222107	Maahi agarwal	25
103.	11500222108	Tusharkanti pal	20
104.	11500222109	Mridul panda	20
105.	11500222110	Kareena kumari	25
106.	11500222111	Abhradeep paul	25
107.	11500222112	Abhijan das	25
108.	11500222113	Arijit dawn	25
109.	11500222114	Asim das	25
110.	11500222115	Aashika kumari	22
111.	11500222116	Abhranil ray	25
112.	11500222117	Subhradeep basu	25



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
113.	11500222118	Tanujit banerjee	25
114.	11500222119	Kunal kumar verma	25
115.	11500223117	Ajanta ghosh	25
116.	11500223118	Alakendu ghosh	25
117.	11500223119	Argha ghosh	25
118.	11500223120	Arkadipta kundu	22
119.	11500223121	Barsha mandal	25
120.	11500223122	Bidisha bhattacharjee	25
121.	11500223123	Koustav dutta	25
122.	11500223124	Prithwis halder	25
123.	11500223125	Rahul dey	15
124.	11500223126	Saikat dasgupta	21
125.	11500223127	Samapti hazra	25
126.	11500223128	Samima afroj	25
127.	11500223129	Sangita gorai	25
128.	11500223131	Sourav sarkar	25
129.	11500223132	Suman mondal	25
130.	11500223133	Sumana giri	25
131.	11500223134	Upal pramanik	25
132.	11500223135	Youbaraj saha	18
133.	11500223136	Subrata bauri	25
Threshold marks set by program			60%
Number of students scored more than/equal to threshold			
Total number of students			133
Percentage of students scored more than/equal to threshold			

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assignment (on CO1 to CO5)

1. Write the observations, inference, notes for each assignment separately. Write the observations wherever necessary with explanation of the details.
2. Submit the assignment as a single file for all questions at the end of the classroom teaching. The last date of submission of is 10th May 2025 or one week after the completion of teaching-learning in classroom whichever is later.

S. No.	Assignment Task	Marks	CO	PO
1.	Why is the analysis stage of software engineering considered so important? What approaches can be taken to ensure it is successful?	5	CO1	PO1, PO2, PO3, PSO1
2.	Define feasibility study. What are the contents we should contain in feasibility report? Discuss functional and non-functional requirements?	5	CO1	PO1, PO2, PO3, PO11, PSO1, PSO2
3.	What are the principal causes for software development project failure? According to the Standish Report, approximately how often do these projects fail to meet their user's needs and/or fail to meet their schedules? What software engineering principles can be applied to reduce this risk?	5	CO4	PO2, PO3, PO11, PSO2
4.	What is the advantage of using prototype software development model instead of waterfall model? Also explain the effect of defining a prototype on the overall cost of the software project?	5	CO1	PO2, PO3, PSO1
5.	What major shortcoming of the Waterfall Model does the Spiral Model address? How does the Spiral Model handle the need for risk management and address the need of accurately determining the software requirements?	5	CO1	PO2, PO3, PO4, PSO1
6.	How can we derive the size of software product? What are function points? What are software project estimation techniques available?	5	CO3	PO1, PO2, PO11, PSO1
7.	Compute function point value for a project with the following domain characteristics: No. of I/P = 30 No. of O/P = 62 No. of user Inquiries = 24 No. of files = 8 No. of external interfaces = 2 Assume that all the complexity adjustment	5	CO4	PO1, PO2, PSO1



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

	values are average. Assume that 14 algorithms have been counted.			
8.	What is the difference between a Class Diagram and an Object Diagram? Explain Class Diagram with Example.	5	CO5	PO1, PO3, PSO1
9.	Differentiate Between Structural and Behavioral Diagrams. Draw and explain Activity Diagram for Library Management System.	5	CO5	PO1, PO3, PO5, PSO1
10.	Compare DFD, Decision Tree, Decision Table, and Structured English. Draw a Decision Tree for Loan Approval System.	5	CO2	PO1, PO2, PO3, PSO1
11.	What are the components of a DFD? Explain each? Differentiate between Logical DFD and Physical DFD.	5	CO2	PO1, PO2, PSO1
12.	A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 40000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.8 for the software development on embedded systems, while the exponentiation factor is given as 1.20. What is the estimated effort in person-months?	5	CO4	PO1, PO2, PO11, PSO1
13.	The availability of a complex software is 90%. Its Mean Time Between Failure (MTBF) is 200 days. Because of the critical nature of the usage, the organization deploying the software further enhanced it to obtain an availability of 95%. In the process, the Mean Time To Repair (MTTR) increased by 5 days. What is the MTBF of the enhanced software?	5	CO3	PO1, PO2, PO4, PSO1, PSO2

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Scheme of Evaluation of Assignment

1.

Description	Marks awarded	Knowledge level attained
Explanation of importance of analysis stage	2	Understand
Approaches to ensure successful analysis	2	Apply
Logical justification / conclusion	1	Analyze

2.

Description	Marks awarded	Knowledge level attained
Definition of feasibility study	1	Remember
Contents of feasibility report	2	Understand
Functional requirements explanation	1.5	Understand
Non-functional requirements explanation	1.5	Understand

3.

Description	Marks awarded	Knowledge level attained
Causes of software project failure	2	Understand
Standish Report statistics	1	Remember
Software engineering principles to reduce risk	2	Apply

4.

Description	Marks awarded	Knowledge level attained
Advantages of prototype model	2	Understand
Comparison with waterfall model	2	Analyze
Effect of prototype on cost	1	Analyze

5.

Description	Marks awarded	Knowledge level attained
Shortcoming of waterfall addressed by spiral model	2	Understand
Risk management explanation	2	Analyze
Requirement refinement in spiral model	1	Apply



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

6.

Description	Marks awarded	Knowledge level attained
Software size derivation	1.5	Understand
Function point definition	1.5	Remember
Estimation techniques	2	Understand

7.

Description	Marks awarded	Knowledge level attained
Identification of components (I/P, O/P, etc.)	2	Apply
Complexity adjustment handling	1.5	Apply
Final FP calculation	1.5	Apply

8.

Description	Marks awarded	Knowledge level attained
Difference explanation	2	Understand
Class diagram explanation	2	Understand
Example diagram explanation	1	Apply
Difference explanation	2	Understand

9.

Description	Marks awarded	Knowledge level attained
Differences between structural & behavioral diagrams	2	Understand
Activity diagram drawing	2	Apply
Explanation of LMS activity flow	1	Analyze
Differences between structural & behavioral diagrams	2	Understand

10.

Description	Marks awarded	Knowledge level attained
Comparison of DFD, Decision Tree, Table, Structured English	2	Analyze
Decision tree construction	3	Apply



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

11.

Description	Marks awarded	Knowledge level attained
Components of DFD explanation	3	Understand
Logical vs Physical DFD difference	2	Analyze

12.

Description	Marks awarded	Knowledge level attained
Identification of formula & parameters	2	Apply
Effort calculation steps	2	Apply
Final answer & interpretation	1	Analyze

13.

Description	Marks awarded	Knowledge level attained
Understanding reliability formulas	2	Understand
Calculation of MTBF / MTTR relation	2	Apply
Final result & interpretation	1	Analyze

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Model Answer of Assignment

1. Importance of Analysis Stage & Approaches (3+2)

(a) Importance of Analysis Stage (3 Marks)

The analysis stage in Software Engineering is the most critical phase of the Software Development Life Cycle (SDLC) because it defines what the system should do before designing or coding begins.

Importance:

- Requirement Identification:
- It helps in clearly identifying user needs and system requirements.
- Reduces Errors and Rework:
- Proper analysis avoids misunderstanding, reducing costly changes later.
- Foundation for Design:
- The entire system design is based on the analysis document (SRS).

Improves Communication:

- Acts as a bridge between users and developers.
- Project Success Factor:
- Most project failures occur due to poor requirement analysis.

(b) Approaches for Successful Analysis (2 Marks)

Requirement Gathering Techniques:

- Interviews
- Questionnaires
- Observation
- Modeling Techniques:
- Data Flow Diagrams (DFD)
- UML diagrams

Prototyping:

- Early working model to validate requirements
- User Involvement:
- Continuous feedback from stakeholders

2. Feasibility Study & Requirements (1+2+2)

(a) Definition (1 Mark)

A feasibility study is the process of evaluating whether a software project is technically, economically, and operationally feasible before development begins.

(b) Contents of Feasibility Report (2 Marks)

1. Technical Feasibility:



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Whether required technology is available.

2. Economic Feasibility:

Cost vs benefit analysis.

3. Operational Feasibility:

Whether users can operate the system.

4. Schedule Feasibility:

Whether project can be completed on time.

5. Legal & Organizational Feasibility (optional):

Compliance with laws and policies.

(c) Functional and Non-Functional Requirements (2 Marks)

Functional Requirements:

- Define what the system does
- Example:
- Login system
- Data entry
- Report generation

Non-Functional Requirements:

- Define how the system performs
- Example:
- Security
- Performance
- Reliability
- Usability

3. Software Project Failure

(a) Causes of Failure

- Poor requirement gathering
- Lack of user involvement
- Unrealistic deadlines
- Poor project management
- Changing requirements

(b) Standish Report Statistics

- According to the Standish Group Report:
- ~30% projects are successful
- ~50% are challenged (over budget, delayed)
- ~20% fail completely

(c) Software Engineering Principles to Reduce Risk



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

- Proper Requirement Engineering
- Iterative Development (Agile Model)
- Risk Management Planning
- User Involvement throughout SDLC
- Early Testing and Validation
- Modular Design Approach

4. Prototype vs Waterfall Model

(a) Advantages of Prototype Model

- Early user feedback
- Better requirement clarity
- Reduced risk of failure
- Improved user satisfaction

(b) Effect on Cost (2 Marks)

- Initial cost increases due to prototype development
- Overall cost decreases due to:
 - Reduced rework
 - Fewer errors in final system

5. Spiral Model

(a) Shortcoming Addressed

The Spiral Model addresses the major drawback of Waterfall Model, which is:

- Lack of risk analysis
- No flexibility for requirement changes

(b) Risk Management & Requirements (3 Marks)

- Each spiral cycle includes risk analysis phase
- Prototype is developed to reduce uncertainty
- Requirements are refined in every iteration
- Continuous customer feedback is included

6. Software Size & Estimation

(a) Software Size Derivation

Software size can be measured using:

- Lines of Code (LOC)
- Function Points (FP)

(b) Function Points

Function Points measure software size based on functionality provided to the user.

Components:

- Inputs
- Outputs



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

- User Queries
- Files
- External Interfaces

(c) Estimation Techniques

- COCOMO Model
- Function Point Analysis
- Expert Judgment
- Delphi Technique
- LOC-based Estimation

7. Function Point Calculation

Given: Inputs = 30; Outputs = 62; Inquiries = 24; Files = 8; External Interfaces = 2

Total = 126

Step 1: Unadjusted Function Points

Assume average weight = 4

$$\text{UFP} = 126 \times 4 = 504$$

Step 2: Adjustment

Given 14 algorithms counted → add 14

$$\text{Adjusted FP} = 504 + 14 = 518$$

Answer: Function Point = 518

8. Class Diagram vs Object Diagram

(a) Differences (2 Marks)

Class Diagram Object Diagram

Blueprint of system Snapshot of system

Static structure Dynamic instance

General representation Specific objects

(b) Class Diagram Example (3 Marks)

Example: Library System

- Class: Book
- Attributes: title, author
- Methods: issue(), return()
-
- Class: Student
-



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

- Attributes: name, roll_no
- Methods: borrowBook()
- Relationship:
- Student → borrows → Book

9. Structural vs Behavioral + Activity Diagram (2+3)

(a) Difference

Structural: static structure (Class, Object)

Behavioral: dynamic behavior (Activity, Sequence)

(b) Activity Diagram – Library System

Start

↓

Login

↓

Search Book

↓

Book Available?

/ \

Yes No

↓

↓

Issue End

↓

Return Book

↓

End

10. DFD vs Decision Models + Decision Tree

Comparison:

- Model Purpose
- DFD Data flow representation
- Decision Tree Decision making flow
- Decision Table Rule-based system
- Structured English Algorithmic description



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Decision Tree – Loan Approval

Income > Threshold?

/ \

Yes No

/ \

Credit Score? Reject

/ \

Good Poor

| |

Approve Reject

11. DFD Components

Components:

- External Entity:
- Source or destination of data (e.g., user)
- Process:
- Transforms input into output

Data Flow:

- Movement of data between components

Data Store:

- Storage of data (database/files)
- Logical vs Physical DFD:
- Logical DFD Physical DFD
- What system does How system is implemented
- No technology details Includes hardware/software

12. COCOMO Model

Given: LOC = 40000 → 40 KLOC

a = 2.8; b = 1.20

Formula: Effort = a × (KLOC)^b

Effort = 2.8 × (40)^{1.20}

40^{1.20} ≈ 83.66; Effort = 2.8 × 83.66

= 234.25 person-months

Answer: Effort = 234.25 Person-Months



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

13. MTBF Problem

Given: Availability = 90% → 95%

MTBF = 200 days; MTTR increases by 5 days

Step 1: Initial MTTR

$$A = \text{MTBF} / (\text{MTBF} + \text{MTTR})$$

$$0.90 = 200 / (200 + \text{MTTR})$$

$$\text{MTTR} = 22.22 \text{ days}$$

Step 2: New MTTR

$$\text{MTTR} = 22.22 + 5 = 27.22 \text{ days}$$

Step 3: New MTBF\

$$0.95 = \text{MTBF} / (\text{MTBF} + 27.22)$$

$$\text{MTBF} \approx 517 \text{ days}$$

Answer: MTBF = 517 days (approx.)

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Assessment of Assignment (Conducted by University, on CO1 to CO5)

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
1.	11500222001	Tanmay paul	22
2.	11500222002	Sneha debnath	22
3.	11500222003	Ananda datta	22
4.	11500222004	Nishita dey	21
5.	11500222005	Kritika laxmi	22
6.	11500222006	Yash gupta	22
7.	11500222007	Arka adhikari	19
8.	11500222008	Tanmay raj	22
9.	11500222009	Smarak basak	24
10.	11500222010	Diptesh bhattacharyya	21
11.	11500222011	Ambapali datta	25
12.	11500222012	Ritesh saw	18
13.	11500222013	Shirodhrit bhowmick	22
14.	11500222014	Subhojit pachhal	21
15.	11500222015	Israr arif	22
16.	11500222016	Mrityunjay aditya	25
17.	11500222017	Ritikesh singh	22
18.	11500222018	Arpana kumari	25
19.	11500222019	Suman jana	22
20.	11500222020	Madhumita maiti	16
21.	11500222021	Sarat menon	22
22.	11500222022	Rajib sant	22
23.	11500222023	Sattwik das	25
24.	11500222024	Vivek kumar	22
25.	11500222025	Saniya	22
26.	11500222026	Shubham kumar choudhary	22
27.	11500222027	Sudhanshu kumar	22
28.	11500222028	Pilli shreyash rao	24



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
29.	11500222029	Shatarupa sen	22
30.	11500222030	Prithiraj das	25
31.	11500222031	Srijita mallick	22
32.	11500222032	Sayan sen	21
33.	11500222033	Shiwaangee gupta	22
34.	11500222034	Akash kumar das	0
35.	11500222035	Ashmita pramanick	22
36.	11500222036	Amandeep singh	21
37.	11500222037	Adrija datta	22
38.	11500222038	Abhijeet kumar sah	22
39.	11500222039	Shovan rana	21
40.	11500222040	Piyush arora	22
41.	11500222041	Ayush ray	22
42.	11500222042	Mayukh kar	21
43.	11500222043	Sandhya prasad	18
44.	11500222044	Priya rajak	22
45.	11500222045	Ritam chatterjee	22
46.	11500222046	Gobinda mondal	20
47.	11500222047	Debarjun simlai	20
48.	11500222048	Saheli mondal	19
49.	11500222049	Anwasha pal	25
50.	11500222050	Dipanjan nandy	21
51.	11500222051	Disha soni	22
52.	11500222052	Sayan de	21
53.	11500222053	Archak nath	21
54.	11500222054	Sarthak chakraborty	22
55.	11500222055	Manik kumar mahato	25
56.	11500222058	Ranjan kumar mahato	21



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
57.	11500222059	Dhruba maitra	25
58.	11500222060	Ayan pramanik	21
59.	11500222061	Aratrika samanta	20
60.	11500222062	Anubhav ishan	25
61.	11500222063	Aditya kumar sultania	25
62.	11500222064	Manish pandey	25
63.	11500222065	Jayasree saha	20
64.	11500222066	Sukesh bhunia	25
65.	11500222067	Sourav rai	25
66.	11500222068	Samrat das	22
67.	11500222069	Asad imam	25
68.	11500222070	Sanjib sen	25
69.	11500222071	Shubhadip koley	25
70.	11500222072	Md zeeshan mustafa	25
71.	11500222073	Souvik biswas	25
72.	11500222074	Soumyajit chowdhury	25
73.	11500222075	Arup jana	25
74.	11500222076	Ms mayank	20
75.	11500222077	Srijit pal	25
76.	11500222078	Shrimanta ghosh	25
77.	11500222079	Dipam dey	25
78.	11500222080	Neha jha	25
79.	11500222081	Sudipta mondal	25
80.	11500222083	Rahul das	25
81.	11500222084	Reezwan hosen khan	25
82.	11500222085	Gaurav thakur	25
83.	11500222086	Md tabrez shamim	25
84.	11500222087	Asmita saha	25



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
85.	11500222088	Manu singh	25
86.	11500222090	Arpit raj	25
87.	11500222091	Tamal majumdar	25
88.	11500222092	Sayantika manna	25
89.	11500222093	Ankita saha	25
90.	11500222095	Rohit raj	17
91.	11500222096	Rakesh de	25
92.	11500222097	Srijan sasmal	25
93.	11500222098	Rajarshi mondal	20
94.	11500222099	Snigdha ghosh	25
95.	11500222100	Sushovan barik	25
96.	11500222101	Chandan jha	25
97.	11500222102	Amitava roy	25
98.	11500222103	Sayan samanta	25
99.	11500222104	Rimjhim kumari	20
100.	11500222105	Vishal singh	25
101.	11500222106	Koushambha das	22
102.	11500222107	Maahi agarwal	25
103.	11500222108	Tusharkanti pal	20
104.	11500222109	Mridul panda	20
105.	11500222110	Kareena kumari	25
106.	11500222111	Abhradeep paul	25
107.	11500222112	Abhijan das	25
108.	11500222113	Arijit dawn	25
109.	11500222114	Asim das	25
110.	11500222115	Aashika kumari	22
111.	11500222116	Abhranil ray	25
112.	11500222117	Subhradeep basu	25



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			25
113.	11500222118	Tanujit banerjee	25
114.	11500222119	Kunal kumar verma	25
115.	11500223117	Ajanta ghosh	25
116.	11500223118	Alakendu ghosh	25
117.	11500223119	Argha ghosh	25
118.	11500223120	Arkadipta kundu	22
119.	11500223121	Barsha mandal	25
120.	11500223122	Bidisha bhattacharjee	25
121.	11500223123	Koustav dutta	25
122.	11500223124	Prithwis halder	25
123.	11500223125	Rahul dey	15
124.	11500223126	Saikat dasgupta	21
125.	11500223127	Samapti hazra	25
126.	11500223128	Samima afroj	25
127.	11500223129	Sangita gorai	25
128.	11500223131	Sourav sarkar	25
129.	11500223132	Suman mondal	25
130.	11500223133	Sumana giri	25
131.	11500223134	Upal pramanik	25
132.	11500223135	Youbaraj saha	18
133.	11500223136	Subrata bauri	25
Threshold marks set by program			60%
Number of students scored more than/equal to threshold			
Total number of students			133
Percentage of students scored more than/equal to threshold			

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Sample Corrected Copies of Assignment



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

University Question Paper 2024-25
(End Semester Examination)



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Answer Key of University Question Paper



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

University Results

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			100
1.	11500222001	Tanmay paul	65
2.	11500222002	Sneha debnath	55
3.	11500222003	Ananda datta	55
4.	11500222004	Nishita dey	75
5.	11500222005	Kritika laxmi	55
6.	11500222006	Yash gupta	65
7.	11500222007	Arka adhikari	65
8.	11500222008	Tanmay raj	65
9.	11500222009	Smarak basak	65
10.	11500222010	Diptesh bhattacharyya	75
11.	11500222011	Ambapali datta	85
12.	11500222012	Ritesh saw	65
13.	11500222013	Shirodhrit bhowmick	75
14.	11500222014	Subhojit pachhal	55
15.	11500222015	Israr arif	75
16.	11500222016	Mrityunjay aditya	75
17.	11500222017	Ritikesh singh	55
18.	11500222018	Arpana kumari	55
19.	11500222019	Suman jana	65
20.	11500222020	Madhumita maiti	35
21.	11500222021	Sarat menon	45
22.	11500222022	Rajib sant	45
23.	11500222023	Sattwik das	75
24.	11500222024	Vivek kumar	55
25.	11500222025	Saniya	75
26.	11500222026	Shubham kumar choudhary	65
27.	11500222027	Sudhanshu kumar	65
28.	11500222028	Pilli shreyash rao	65



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			100
29.	11500222029	Shatarupa sen	65
30.	11500222030	Prithiraj das	75
31.	11500222031	Srijita mallick	75
32.	11500222032	Sayan sen	75
33.	11500222033	Shiwaangee gupta	65
34.	11500222034	Akash kumar das	45
35.	11500222035	Ashmita pramanick	75
36.	11500222036	Amandeep singh	65
37.	11500222037	Adrija datta	75
38.	11500222038	Abhijeet kumar sah	65
39.	11500222039	Shovan rana	55
40.	11500222040	Piyush arora	65
41.	11500222041	Ayush ray	75
42.	11500222042	Mayukh kar	65
43.	11500222043	Sandhya prasad	55
44.	11500222044	Priya rajak	75
45.	11500222045	Ritam chatterjee	65
46.	11500222046	Gobinda mondal	75
47.	11500222047	Debarjun simlai	55
48.	11500222048	Saheli mondal	85
49.	11500222049	Anwasha pal	65
50.	11500222050	Dipanjan nandy	75
51.	11500222051	Disha soni	85
52.	11500222052	Sayan de	75
53.	11500222053	Archak nath	65
54.	11500222054	Sarthak chakraborty	75
55.	11500222055	Manik kumar mahato	45
56.	11500222058	Ranjan kumar mahato	85



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			100
57.	11500222059	Dhruba maitra	65
58.	11500222060	Ayan pramanik	45
59.	11500222061	Aratrika samanta	75
60.	11500222062	Anubhav ishan	65
61.	11500222063	Aditya kumar sultania	65
62.	11500222064	Manish pandey	55
63.	11500222065	Jayasree saha	65
64.	11500222066	Sukesh bhunia	55
65.	11500222067	Sourav rai	55
66.	11500222068	Samrat das	65
67.	11500222069	Asad imam	55
68.	11500222070	Sanjib sen	85
69.	11500222071	Shubhadip koley	75
70.	11500222072	Md zeeshan mustafa	65
71.	11500222073	Souvik biswas	65
72.	11500222074	Soumyajit chowdhury	75
73.	11500222075	Arup jana	55
74.	11500222076	Ms mayank	45
75.	11500222077	Srijit pal	75
76.	11500222078	Shrimanta ghosh	55
77.	11500222079	Dipam dey	65
78.	11500222080	Neha jha	65
79.	11500222081	Sudipta mondal	55
80.	11500222083	Rahul das	55
81.	11500222084	Reezwan hosen khan	75
82.	11500222085	Gaurav thakur	75
83.	11500222086	Md tabrez shamim	85
84.	11500222087	Asmita saha	65



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			100
85.	11500222088	Manu singh	75
86.	11500222090	Arpit raj	95
87.	11500222091	Tamal majumdar	65
88.	11500222092	Sayantika manna	75
89.	11500222093	Ankita saha	75
90.	11500222095	Rohit raj	75
91.	11500222096	Rakesh de	45
92.	11500222097	Srijan sasmal	65
93.	11500222098	Rajarshi mondal	75
94.	11500222099	Snigdha ghosh	45
95.	11500222100	Sushovan barik	65
96.	11500222101	Chandan jha	65
97.	11500222102	Amitava roy	65
98.	11500222103	Sayan samanta	75
99.	11500222104	Rimjhim kumari	65
100.	11500222105	Vishal singh	85
101.	11500222106	Koushambha das	65
102.	11500222107	Maahi agarwal	85
103.	11500222108	Tusharkanti pal	75
104.	11500222109	Mridul panda	65
105.	11500222110	Kareena kumari	65
106.	11500222111	Abhradeep paul	75
107.	11500222112	Abhijan das	65
108.	11500222113	Arijit dawn	55
109.	11500222114	Asim das	45
110.	11500222115	Aashika kumari	85
111.	11500222116	Abhranil ray	65
112.	11500222117	Subhradeep basu	65



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

S. No.	Univ. Roll No.	Student's Name	Total
Max Marks →			100
113.	11500222118	Tanujit banerjee	65
114.	11500222119	Kunal kumar verma	75
115.	11500223117	Ajanta ghosh	75
116.	11500223118	Alakendu ghosh	55
117.	11500223119	Argha ghosh	65
118.	11500223120	Arkadipta kundu	65
119.	11500223121	Barsha mandal	75
120.	11500223122	Bidisha bhattacharjee	75
121.	11500223123	Koustav dutta	75
122.	11500223124	Prithwis halder	75
123.	11500223125	Rahul dey	75
124.	11500223126	Saikat dasgupta	75
125.	11500223127	Samapti hazra	85
126.	11500223128	Samima afroj	85
127.	11500223129	Sangita gorai	45
128.	11500223131	Sourav sarkar	75
129.	11500223132	Suman mondal	75
130.	11500223133	Sumana giri	65
131.	11500223134	Upal pramanik	55
132.	11500223135	Youbaraj saha	65
133.	11500223136	Subrata bauri	55
Threshold marks set by program			50%
Number of students scored more than/equal to threshold			122
Total number of students			133
Percentage of students scored more than/equal to threshold			91.72%

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

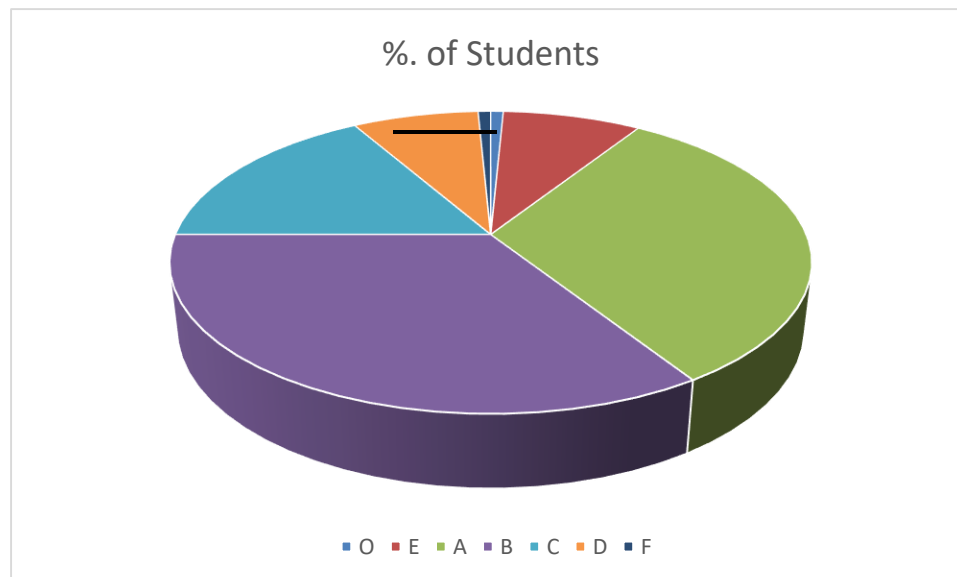
Department of Information Technology

Academic Year: 2025-26

University Results Analysis

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

Grade	No. of Students	% of Students
O	1	0.75
E	11	8.27
A	42	31.57
B	45	33.83
C	22	16.54
D	10	7.51
F	1	0.75
Total	133	100.00



Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

End Semester Students' Survey (CO Learning Assessment)

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

Please answer all questions on a 5-point scale (5- Excellent, 4- Good, 3- Fair, 2- Average, 1- Poor):

S. No.	Please rate for the following attributes	Rating
1.	Up to which extent are you able to understand the Software Development Life Cycle (SDLC) and its phases in software development?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
2.	How effectively can you apply process models such as Waterfall and Spiral models in software development scenarios?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
3.	To what extent are you able to perform feasibility analysis including technical feasibility and cost-benefit analysis (COCOMO model)?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
4.	How confidently can you design system models using DFDs, context diagrams, and structured analysis techniques?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
5.	Up to which extent are you able to differentiate between functional and object-oriented design approaches?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
6.	How effectively can you apply testing techniques such as unit testing, integration testing, verification, and validation?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
7.	To what extent are you able to use software metrics for monitoring and controlling software quality and project progress?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
8.	How effectively can you apply project management concepts such as scheduling, staffing, and software configuration management?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
9.	Up to which extent are you able to design UML diagrams such as class, sequence, activity, and state diagrams?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
10.	How well can you analyze and model real-world systems using UML diagrams for software design and implementation?	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>

Signature (optional)



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Mapping of End Semester Students' Survey (CO Learning Assessment) with CO

Question No.	CO1	CO2	CO3	CO4	CO5
1.	Y				
2.	Y				
3.		Y			
4.		Y			
5.			Y		
6.			Y		
7.				Y	
8.				Y	
9.					Y
10.					Y

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Sample Students' Survey



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

IMPACT ANALYSIS OF SLOW LEARNERS



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Impact Analysis of Slow Learners

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

S. No.	Univ. Roll No.	Student's Name	(Presentation)	(Report Writing)	Quiz (After Remedial Class)	(Class Test1)	(Class Test2)	(Quiz, conducted by univ.)	(Assignment)	End Semester Univ. Exam
Max Marks →			25	25	10	25	20	25	25	100
1	11500222003	Ananda datta	20	15	7	13	9	22	22	55
2	11500222007	Arka adhikari	20	13	8	13	15	19	19	65
3	11500222020	Madhumita maiti	23	15	3	19	19	16	16	35
4	11500222047	Debarjun simlai	20	15	10	18	18	20	20	55
5	11500222058	Ranjan kumar mahato	13	13	8	17	17	21	21	85
6	11500222060	Ayan pramanik	12	15	4	13	12	21	21	45
7	11500222067	Sourav rai	12	8	10	13	17	25	25	55
8	11500222068	Samrat das	12	10	7	7	15	22	22	65
9	11500222076	Ms mayank	12	8	6	11	15	20	20	45
10	11500222083	Rahul das	22	22	4	9	15	25	25	55
11	11500222095	Rohit raj	18	8	10	16	16	17	17	75
12	11500222108	Tusharkanti pal	20	15	10	17	17	20	20	75
13	11500222115	Aashika kumari	20	20	6	11	11	22	22	85
Threshold marks set by program			60%	60%	60%	60%	60%	60%	60%	50%
Number of students scored more than/equal to threshold			8	7	10	5	10	13	13	6
Total number of students			13	13	13	13	13	13	13	13
Percentage of students scored more than/equal to threshold			61.53%	53.84%	76.92%	38.46%	76.92%	100%	100%	46.15%
Remarks/Impact Analysis			61.53% of slow learners passed in presentation.	53.84% of slow learners passed in report writing.	76.92% of slow learners passed in quiz.	38.46% of slow learners passed in class test1.	76.92% of slow learners passed in class test2.	100% of slow learners passed in quiz.	100% of slow learners passed in assignment.	46.15% of slow learners passed in university exam.

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

CO, PO, AND PSO ATTAINMENT



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Overall Course Outcome Attainment

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

Section A

	Weightage	CO1	CO2	CO3	CO4	CO5
Internal Exam	20%	3	0	1	0	0
University Exam	80%	3	3	3	3	3
CO Attainment (Direct)	90%	3	2.4	2.6	2.4	2.4
CO Attainment (Indirect)	10%	2.5	2.8	2.6	2.5	2.7
Final CO Attainment		2.95	2.44	2.6	2.50	2.61
Overall CO Attainment		2.62				

S. No.	CO Statement	Final CO Attainment
CO1	Understand software lifecycle processes and models including traditional and modern approaches.	2.95
CO2	Design software using requirement models like DFD, decision tree, decision table, structured English.	2.44
CO3	Apply software testing and quality assurance techniques with relevant standards to ensure reliable software at the modular system and organizational level.	2.60
CO4	Develop project schedule and network diagram for different projects using standard metrics and models like cost estimation, scheduling and risk management.	2.41
CO5	Analyze the structure and behaviour of a software system using modern engineering tools like UML diagrams.	2.43
Overall Course Outcome Attainment		2.57

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

PO/PSO→	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
Average of CO-PO mapping	2.8	2.6	2	2.2	0.5			1			1	0.5	2.2	1
PO Attainment	2.45	2.27	1.75	1.92	0.44	0.00	0.00	0.88	0.00	0.00	0.88	0.44	1.92	0.88

CO Contribution to PO/PSO: 33%- Level 1,
67%- Level 2,
100%- Level 3

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Observations on CO and PO Attainment

Course Name & Code: Software Engineering	Course Code: ESC 501
Year & Semester: 3 rd Yr, 5 th Sem	Branch & Section: Information Technology, Sec- A & B
Name of the Faculty: Dr. Gitosree Khan	

Set Target for CO attainment for this course was 1.98.

1. It is observed that the set target value has been attained for all Cos and the difference with the target is more than 10%.
2. PO attainment has been found to be slightly less than the mapped value.
3. 91.84% students scored more than or equal to the threshold marks in the end semester university examination.
4. Following the OBE manual, target for next academic year is 2.6.

CO Attainment of the Entire Class:

Set Target for CO Attainment	1.98
Overall CO Attainment of Sec A	2.57
Overall CO Attainment of Sec B	2.75
Average CO Attainment of the Class	2.62

PO Attainment of the Entire Class:

PO/PSO→	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
Average of CO-PO mapping	2.8	2.6	2	2.2	0.5			1			1	0.5	2.2	1
PO Attainment of Sec A	2.39	2.22	1.71	1.88	0.43			0.86			0.86	0.43	1.88	0.86
PO Attainment of Sec B	2.50	2.32	1.78	1.96	0.45			0.89			0.89	0.45	1.96	0.89
Average PO Attainment of the Class	2.45	2.27	1.75	1.92	0.44	0.00	0.00	0.88	0.00	0.00	0.88	0.44	1.92	0.88

Dr. Gitosree Khan



B. P. Poddar Institute of Management & Technology

Department of Information Technology

Academic Year: 2025-26

Plan of Action:

1. As the CO attainment of the entire class is high (1.98), next year's CO attainment value will be taken as 2.6.
2. One NPTEL course on Analog Communication is to be offered.
3. Guest Lectures on this course is to be organized.
4. One Seminar is to be organized.

Dr. Gitosree Khan