Samrat Ashok Technological Institute (Engg. College), Vidisha (M.P.)
(An autonomous Institute Affiliated to RGPV, Bhopal)
Computer Science Engineering Department

VIII-SEM B.Tech.	Subject Code	Subject Name / Title	Maximum Marks Allotted						Contract Hrs.			Total Credits
			Theory			Practical						
			End Sem	Mid Sem Exam	Quiz Assign ment	End Sem	Lab Work & Sessional	Total Marks	L	T	P	
	CS-1881(A)	Network Security and cryptography	70	20	10	-	-	100	3	-	-	3

Prerequisite:

Student should have prior knowledge of Discrete structure, Theory of computation and Computer Networks.

Course Objectives:

Understand OSI security architecture and classical encryption techniques.
Acquire fundamental knowledge on the concepts of finite fields and number theory.
Understand various block cipher and stream cipher models.
Describe the principles of public key cryptosystems, hash functions and digital signature.

Course Contents:

UNIT -I: Introduction to network security: Security Needs and Threats, Goals of network security, Types of Computer Crime and Criminals-scavenging, leakage, wire taping etc. Controlling Physical Access: Role of physical Security, Weakness, Types of Identification Badges, security factors. Desktop security: Challenges, security techniques, physical security and procedural methods, Protecting data hardware and software problem and their solutions. Role of Password network security, strength and weakness of password, Administering a password system, Virus, Worms, Trap doors, Trojan horse, Firewall.

UNIT-II: Security: Attacks, Services, Mechanism, OSI security architecture, Symmetric ciphers: Substitution Ciphers: Caesar cipher, Hill cipher, Play fair cipher, Mono-alphabetic Cipher, Poly-alphabetic cipher, Shannon Theorem, One Time pad, Transposition Cipher: Rail fence technique, Steganography.

UNIT- III: Block Cipher: Data confidentiality, Simplified DES, Feistal Structure, Blowfish, RC5, Data Encryption Standard, Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design principles, Block Cipher Modes of Operation. Advanced Encryption standard

UNIT- IV: Number Theory: Group, Ring, Field, Modular Arithmetic, Euclidean Theorem, Fermat's Theorem, Euler's Theorem, Chinese Remainder Theorem, Public Key Cryptography: RSA algorithm. Diffie-Hellman Key Exchange Algorithm, Elliptic Curve Cryptography.

UNIT- V: Cryptographic Data Integrity: Hash Function, Requirement and security, Secure hash algorithm (SHA) and its Version, Message Digest MD-4 and MD-5, RIPMED, Message Authentication Codes, Digital Signature standard, Key Management and Distribution, PKI,

User Authentication Protocol: Kerberos. Transport layer Security: SSL, TLS, HTTPS, Email Security: PGP, S/MIME, IP Security.

Reference Books: -

1. William Stallings "Cryptography and Network Security-Principles and Practice Forth Edition", Prentice Hall Publication.
2. Behrouz A. Forouzan, Debdeep Mukhopadhyay "Cryptography and Network Security Second Edition" Tata Macgraw Hill Education.

Course Outcomes: Student will be able to

CO-1: Define basic concepts and algorithms of cryptography, including encryption/decryption and hash functions.
CO-2: Solve and Relate mathematic concepts behind the cryptographic algorithms.
CO-3: Define various network security practice applications.
CO-4: Analyze protocols for various security objectives with cryptographic tools.
CO-5: Apply various security algorithms to solve security related problem.

Mapping of CO and PO:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	2		1	1								2	
CO-2	3	2			1								1	
CO-3	3		2	3									2	
CO-4					2								2	2
CO-5			3					2					2	

Samrat Ashok Technological Institute (Engg. College), Vidisha (M.P.)

(An autonomous Institute Affiliated to RGPV, Bhopal)
Computer Science Engineering Department

VIII-SEM B.Tech.	Subject Code	Subject Name / Title	Maximum Marks Allotted						Contract Hrs.			Total Credits
			Theory			Practical						
			End Sem	Mid Sem Exam	Quiz Assignment	End Sem	Lab Work & Sessional	Total Marks	L	T	P	
	CS-1882(C)	Digital Image Processing	70	20	10	-	-	100	3	-	-	3

Course Objective

1.To study the image fundamentals and mathematical transforms necessary for image processing.
2.To study the image enhancement techniques
3.To study image restoration procedures.
4.To study the image compression procedures.

UNIT I

Digital Image Fundamentals A simple image model, Sampling and Quantization. Relationship between pixels. Imaging geometry. Image acquisition systems, Different types of digital images.

UNIT II

Image Transformations Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine Transformation.

UNIT III

Image Enhancement Filters in spatial and frequency domains, Histogram based processing. Image subtraction, Averaging, Image smoothing, Nedion filtering, Low pass filtering, Image sharpening by High pass filtering.

UNIT IV

Image Encoding and Segmentation Encoding: Mapping, Quantizer, Coder. Error free compression, Lossy Compression schemes. JPEG Compression standard. Detection of discontinuation by point detection, Line detection, edge detection, Edge linking and boundary detection, Local analysis, Global processing via Hough transforms and graph theoretic techniques.

UNIT V

Mathematical Morphology Binary, Dilation, crosses, Opening and closing, Simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation.

Course Outcomes:

CO-1: Ability to apply principles and techniques of digital image processing in applications related to design and analysis of digital imaging systems.

CO-2: Ability to analyze and implement image processing algorithms to real problems.

CO-3: Gaining of hands-on experience in using software tools for processing digital images.

CO-4: Interpret image segmentation and representation techniques.

Mapping of COs and POs.

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO_{11}	PO_{12}
CO-1	3	1	3	1	1	3	3	3	1	1	1	2
CO-2	3	1	1	2	1	2	1	2	2	1	2	3
CO-3	2	1	2	3	2	1	3	3	3	1	3	2
CO-4	1	3	3	2	1	3	2	1	2	2	2	0

References Books:

1. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing Pearson.
2. Sonka, Digital Image Processing & Computer Vision, Cengage Learning.
3. Jayaraman, Digital Image Processing, TMH.
4. Pratt, Digital Image Processing, Wiley India.
5. Annadurai, Fundamentals of Digital Image Processing,Pearson Education.

Samrat Ashok Technological Institute (Engg. College), Vidisha (M.P.)
(An autonomous Institute Affiliated to RGPV, Bhopal)
Computer Science Engineering Department

VIII-SEM B.Tech.	Subject Code	Subject Name / Title	Maximum Marks Allotted						Contract Hrs.			Total Credits
			Theory			Practical						
			End Sem	Mid Sem Exam	Quiz Assign ment	End Sem	Lab Work & Sessional	Total Marks	L	T	P	
	CS-1883	Major Project Final	-	-	-	400	150	550	-	-	16	8

Procedure:

a) Each defined project needs to be from Industry/Research organization/Govt. organization/socio-technical issues.
b) Project identification should be based on Analysis carried out by the students after completion of B.E Semester 6th Examination but before starting of the 7th Semester.
c) Problem definition for the project needs to be submitted by every student in the first week of the 7th Semester to his/her college.
d) Each definition will be evaluated based on merit in the beginning of the 7^{th} semester itself by the College.

Facilitation:

You may contact your Major Project In charge co-ordinator/Faculty /Department Head for skilful Analysis.

Guidelines for the Students:

1. The project work will be in-house industry project, where student need to implement project related to any domain of industry like education, legal, manufacturing, design, pharmaceutical, Ecommerce, etc.

2. Students are required to get approval of project definition from the department.

3. After approval of project definition students are required to report their project work weekly to respective internal guide.
4. Maximum 4 students can allow working in particular project group.

5. The students are required to identify their project within two weeks of the commencement of the classes and they are required to follow all the rules and instructions issued by department.

6. Each student or student group would work under the guidance of the Faculty from the College. In case any problem/other issue arises for the smooth progress of Inter Departmental project work discovery/Practical Training, it should be immediately brought to the notice of the major project in charge co-ordinator/Faculty.

7. The students are required to submit **Project Report** to their Head of the Department with the remarks of guide in their College during **Eighth week** of the semester.

Major Project CO's:

Part-I-VII Semester

CO1- Identify the problem domain correctly and to represent problem using mathematical structures and logics.

CO2- Analyze possible solution strategies and investigate problem domain and design feasible solutions for it.

Part-II-VIII Semester

CO3- Make use of cutting edge tools and technologies to derive solutions for the problems and carried a detailed studied about the feasibility and societal impact of solutions.

CO4- Acknowledges the previous work and support required in the solution. Justify the role of individual in project work. Demonstrate leadership skills in team work.

CO5- Present and communicate the importance of solutions of problem domain. Conduct and accomplish all the subtasks for project completion in time and cost effective manner and conclude the project work with possible scopes.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3			2								2	2
CO2	2	3		3		1	2						2	
CO3			3		3	2	3						2	2
CO4								3	3					
CO5					2					3	3	3		2

Mapping COs-POs: