GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering (Minor/Honours Degree Syllabus)

Subject Code : 116AH01

Subject Name : Steganography and Digital Watermarking

WEF Academic Year :	2021-22
Semester :	6
Category of the Course :	Compulsory

Prerequisite : Image and Video Processing, Linear Algebra.

Course Objective : The objective of course is to provide an insight to steganography techniques. Watermarking techniques along with attacks on data hiding and integrity of data is included in this course.

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
03	00	00	03	70	00	00	00	70

Course Content :

Sr. No.	Course Content	No. of Hours	% of Weightage
1	**Module 1 :** **Steganography :** Overview, History, Methods for hiding (text, images, audio, video, speech etc.). **Steganalysis:** Active and Malicious Attackers, Active and passive Steganalysis.	8	20
2	**Module : 2** Frameworks for secret communication (pure steganography, secret key, public key steganography), Steganography algorithms (adaptive and non-adaptive).	8	20
3	**Module 3 :** **Steganography techniques:** Substitution systems, Spatial Domain, transform domain techniques, Spread spectrum, Statistical steganography.	6	10
4	**Module 4 :** Detection, Distortion, Techniques: LSB Embedding, LSB Steganalysis using primary sets.	6	10
5	**Module 5 :** **Digital Watermarking**: Introduction, Difference between Watermarking and Steganography, Classification (Characteristics and Applications), types and techniques (Spatial-domain, Frequency-domain, and Vector quantization-based watermarking), Watermark security & authentication.	9	30

6	**Module 6 :** Recent trends in Steganography and digital watermarking techniques. Case study of LSB Embedding, LSB Steganalysis using primary sets.	5	10
	Total :	**42**	**100**

Text books / References :

1. Peter Wayner, "Disappearing Cryptography – Information Hiding: Steganography & Watermarking", Morgan Kaufmann Publishers, New York, 2002
2. Ingemar J. Cox, Matthew L. Miller, Jeffrey A. Bloom, Jessica Fridrich, TonKalker, "Digital Watermarking and Steganography", Margan Kaufmann Publishers, New York, 2008.
3. Information Hiding: Steganography and Watermarking-Attacks and Countermeasures by Neil F. Johnson, Zoran Duric, Sushil Jajodia.
4. Information Hiding Techniques for Steganography and Digital Watermarking by Stefan Katzenbeisser, Fabien A. P. Petitcolas

Corresponding Online Resources :

1. Cyber Security, https://swayam.gov.in/nd2_cec20_cs09/preview.
2. Introduction to Cyber Security, https://swayam.gov.in/nd2_nou20_cs01/preview

Course Outcome :

After Completion of the Course, Student will able to :

Sr. No.	Course Outcomes	RBT Level*
01	Learn the concept of information hiding.	UN
02	Survey of current techniques of steganography and learn how to detect and extract hidden information.	AN
03	Learn watermarking techniques and through examples understand the concept.	UN

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

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