SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology

B. Tech. Semester VII

Subject Name: **Steganography and data hiding** **Subject Code: BTEC15701**
Type of course: OE
Prerequisite: Digital Signal and Image Processing
Rationale: This course will help to strengthen the knowledge of various data hiding techniques and analyze the robustness of the security of data and documents.

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	100
3	0	0	3	60	25	15	-	-	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. no.	Topics	Teaching Hrs.	Module % Weightage
1.	**Introduction:** Information hiding, steganography, and watermarking; History of Watermarking and Steganography; Importance of Digital Watermarking and Steganography; Applications of Watermarking and Steganography; Properties of watermarking system, Steganography and Stegnalysis system.	7	15
2.	**Perceptual Models:** Communication based models of watermarking; Geometric models of watermarking, Modeling watermark detection by correlation	6	15
3.	**Watermarking with Side Information** Informed Embedding, Watermarking using side information, Practical application of watermarking with side information.	7	15
4.	**Robust Watermarking and Watermark Security** Various approaches of robust watermarking, Robustness to Volumetric Distortions, Robustness to temporal and geometric distortion, security requirement, watermark security and cryptography	7	15
5.	**Content Authentication** Exact Authentication, Selective Authentication, Localization, Restoration	6	10

6.	**Steganography:** Overview of Steganography, Text and Image Steganography: Data hiding in Raw images, LSB embedding. Data hiding in palette images- Palette format, Hiding by decreasing color depth, GIF Shuffle. Data hiding in JPEG images:	6	20
7.	**Steganalysis:** Principle, Approaches, ROC analysis, Sample pair analysis, Attacks using histogram characteristics function, Spatial domain stegnalysis, Feature selection criteria	6	10

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
30	30	20	10	10	-

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Digital Watermarking and steganography	I.J.Cox, M.L.Miller	Amesterdam Morgen Kaufmann Publisher	2007	2nd
2.	Steganography in Digital Media	J.Fridrich	Cambridge University Press	2009	3rd

Course Outcome:

Sr. No.	CO Statement After learning this subject students will be able to	Marks % weightage
CO-1	Differentiate among Steganography, Watermarking and Steganalysis	25
CO-2	Explain the importance of geometric models of watermarking and dirty paper codes.	20
CO-3	Apply concept of robust watermarking security and content authentication in real life applications.	20
CO-4	Analyze the concept of text and image steganography.	20
CO-5	Describe spatial domain techniques and attacks on steganalysis techniques.	15

Mapping with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12
CO-1	3	2	1	2	2	-	2	-	-	-	2	-
CO-2	3	2	1	1	1	2	2	-	-	-	2	-
CO-3	3	2	2	3	3	3	2	-	-	-	2	-
CO-4	3	3	3	2	3	3	3	-	3	3	2	3
CO-5	3	2	2	2	2	2	3	-	-	2	2	-