SWE1015	Biometric Systems	L	T	P	J	C
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Pre-requisite	MAT2001	Syllabus version				
		v. 1.0				

Course Objectives:

1. **To understand design process of large scale biometric identification Systems.**
2. **To analyze problems in various biometric traits.**
3. **To design biometric systems from sensor to decision.**
4. **To Construct and evaluate the multimodal biometric Systems.**

Expected Course Outcome:

1. **Comprehard the concepts and terminology of biometric recognition system**
2. **Distinguish among various Biometric Technologies along with their advantages and disadvantages**
3. **Develop various biometric modality authentication systems**
4. **Improve existing algorithms used in personal authentication systems**
5. **Analyse Multi biometrics systems and applications**
6. **Identify and choose different evaluation techniques for biometric systems**
7. **Design of effective and secure biometric authentication system**
8. **Illustrate the applications of biometric systems in industry**

Student Learning Outcomes (SLO):	2,14,17

Module:1	Introduction of Biometrics	5 hours

Introduction, Fundamental of Technical Evaluations, Types of errors, Performance Metrics, Evaluation Methodologies, Design of Evaluation.

Module:2	Fingerprint Recognition	5 hours

Fingerprint Anatomy, History, Fingerprint Presentation and acquisition, Fingerprint Feature Extraction, Fingerprint Feature Matching, Automated Fingerprint Identification System.

Module:3	Face Recognition and Iris Recognition	6 hours

History, 2D Face Recognition -Face Presentation and acquisition, Feature Extraction and Matching, 3D Face Recognition, Iris Anatomy, History, Iris image acquisition, Iris Feature Extraction, Iris Feature Matching.

Module:4	Behavioral Biometrics and Multi Biometrics	6 hours

Hand geometry, Palm print, Dynamic Signature, Keystroke, Ear, DNA Voice and Gait,Need for Multi biometrics, Multi biometric system design, Data acquisition, Levels of fusion.

Module:5	Biometric Testing and Security	6 hours

Needs of Biometric testing, Biometric data considerations, Unimodal Performance Evaluation and Multimodal Performance Evaluation, Comparative tests, Biometric system security.

Module:6	Contemporary issues: Applications in biometrics	2 hours

	systems in industry		
	Total Lecture hours:		**30 hours**
Text Book(s)			
1.	Shimon K. Modi, Biometrics in Identity Management: Concepts to Applications, Artech House, 2011		
Reference Books			
1. G.R. Sinha, Sandeep B. Patil, Biometrics: Concepts and Applications ,Wiley , 2013. 2. James L. Wayman, Anil Jain, DavideMaltoni, Dario Maio , Biometric Systems: Technology, Design and Performance Evaluation, Springer 2010. 3. Anil Jain, Patrick Flynn, Arun Ross, Handbook of Biometrics, Springer,2008.			
Recommended by Board of Studies	12.06.2015		
Approved by Academic Council	No. 37	Date	16.06.2015