

Subject Description Form

Subject Code	EIE4114
Subject Title	Digital Forensics for Crime Investigation
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	<ol style="list-style-type: none"> 1. To provide students with basic concepts about digital forensic techniques for crime investigation 2. To appreciate how different forensic techniques are used for information security
Intended Subject Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <p><u>Category A: Professional/academic knowledge and skills</u></p> <ol style="list-style-type: none"> 1. Understand different approaches for digital forensics 2. Use different techniques for forensic investigation <p><u>Category B: Attributes for all-roundedness</u></p> <ol style="list-style-type: none"> 3. Present ideas and findings effectively
Subject Synopsis/ Indicative Syllabus	<p>Syllabus:</p> <ol style="list-style-type: none"> 1. <u>Digital and Computational Forensics Context</u> Introduction to digital and computational forensics; Historical aspects in digital and computational forensics; Introduction to techniques for multimedia manipulation; different classes of techniques for forensics: basic idea, framework and applications. 2. <u>Forensics based on Intrinsic Data</u> Models of digital data capturing device; idea of the use of intrinsic data in digital forensic investigation; introduction to forensics techniques using intrinsic data; applications in source device identification, device linking and integrity verification. 3. <u>Forensics based on Extrinsic Data</u> Introduction to techniques for multimedia content protection and authentication; different classes of watermarking techniques; performance measure; attacks modelling; copyright protection applications (e.g., ownership identification and transaction tracking). 4. <u>Digital Evidence</u> Models of digital evidence; event analytics: surveillance, monitoring, forensic and security; data evaluation from various domains (e.g., mobile phone, SMS messages and social media) for user behaviour and forensic analysis. 5. <u>Robustness of Forensic Techniques</u> Robustness and security of forensic techniques; adversary model; case studies of reliabilities of forensic techniques. <p>Laboratory Experiments:</p> <p>Practical Works:</p> <ol style="list-style-type: none"> 1. Evaluation of forensic techniques based on intrinsic data. 2. Evaluation of forensic techniques based on extrinsic data.

	3. Forensic analysis of digital evidence.																																															
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Student Study Effort Expected	Class contact (time-tabled):									
	• Lecture	24 Hours								
	• Tutorial/Laboratory/Practice Classes	15 Hours								
	Other student study effort:									
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours								
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours								
	Total student study effort:	105 Hours								
Reading List and References	<p>Textbooks:</p> <ol style="list-style-type: none"> Li Chang-Tsun, <i>"Emerging Digital Forensics Applications for Crime Protection, Prevention and Security"</i>, IGI Global 2013, doi:10.4018/978-1-4666-4006-1, 2013. Li Chang-Tsun and Anthony T.S. Ho, <i>"Crime Prevention Technologies and Applications for Advancing Criminal Investigation"</i>, IGI Global 2012, doi:10.4018/978-1-4666-1758-2, 2012. <p>Reference Books:</p> <ol style="list-style-type: none"> Larry Daniel and Lars Daniel, <i>"Digital Forensics for Legal Professionals"</i>, Syngress, 2011. Azah Kamilah Muda, Yun-Huoy Choo, Ajith Abraham and Sargur N. Srihari (editors), <i>"Computational Intelligence in Digital Forensics: Forensic Investigation and Applications"</i>, Springer, 2014. Husrev Taha Sencar and Nasir Memon (editors), <i>"Digital Image Forensics"</i>, Springer, 2013. John R. Vacca, <i>"Managing Information Security"</i>, Waltham, Mass., Syngress, 2014. Frank Y. Shih, <i>"Multimedia Security Watermarking, Steganography and Forensics"</i>, CRC Press, 2013. 									
Last Updated	November 2014									
Prepared by	Dr Bonnie Law									