

## Module Specification

### Module Summary Information

<b>1</b>	<b>Module Title</b>	File System Analysis
<b>2</b>	<b>Module Credits</b>	20
<b>3</b>	<b>Module Level</b>	4
<b>4</b>	<b>Module Code</b>	CMP4279

<b>5</b>	<b>Module Overview</b>
<p>This module will provide you with the knowledge and practical skills in analysing volumes and file systems, underlying concepts and data structures, specifically through the perspective of a digital forensic investigation. For each file system covered, this module addresses the analysis techniques and special considerations that a digital forensics investigator should make. Expert digital forensic examiners are increasingly required to demonstrate knowledge and skills in file system concepts and data structures even though professional tools such as EnCase and FTK will parse all common file systems; an intricate low-level understanding of file systems will allow the digital forensic examiner to evaluate the results of evidence processing by such tools.</p> <p>The module is delivered through a truly flipped methodology placing significant emphasis on the development of practical skills supported by blended learning and a variety of learning activities including lectures, seminars, practice-led, self-directed and experiential learning; in person and online through Virtual Learning Environments (VLE).</p> <p>Each practical session comprises a series of hands-on analytical experiments to progressively unpack the more advanced aspects of the topic being investigated. All practical sessions will be hosted in the specialist Computer Forensics Laboratory.</p> <p>The post session activities for each week will comprise a short formative Moodle quiz that will provide instant feedback on the theoretical material covered. For each week's lab session, there will be an accompanying video taking you step-by-step through the solutions of the practical lab exercises. In addition to the lab-based analytical experiments, each lab session will also provide you a short set of experiments which are to be conducted on your virtual machine in your own time allowing you to explore the broader aspects of the topic being investigated during the scheduled lab session to help reinforce your learning.</p> <p>Where appropriate, additional surgeries may be held to provide additional guidance, support and feedback.</p>	

6	Indicative Content
	<ul style="list-style-type: none"> <li>• Volumes and partitions concepts; MBR and GPT</li> <li>• Logical vs. physical structure</li> <li>• File system concepts; clusters, allocation units, BOOT records, metadata, logical vs. physical file size</li> <li>• FAT based file systems</li> <li>• exFAT file system</li> <li>• NTFS file system</li> <li>• UFS/Ext based file systems</li> <li>• Apple HFS/HFS+</li> <li>• RAID and other multiple physical/logical storage configurations</li> </ul>

7	Module Learning Outcomes	
	<b>On successful completion of the module, students will be able to:</b>	
	<b>1</b>	Describe the fundamentals of common file system structures and operations.
	<b>2</b>	Extract and interpret metadata from a file system.
	<b>3</b>	Demonstrate the ability to compute useful information from a file system's metadata.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
<b>1</b>	<b>X</b>		
<b>2, 3</b>			<b>X</b>

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
<b>Scheduled Learning (SL)</b> includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
<b>Directed Learning (DL)</b> includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	62	
<b>Private Study (PS)</b> includes preparation for exams	90	
<b>Total Study Hours:</b>	200	