UNSW Course Outline

ZEIT3103 Digital Forensics - 2024

Published on the 09 Feb 2024

General Course Information

Course Code : ZEIT3103
Year : 2024
Term : Semester 1
Teaching Period : Z1
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : School of Systems and Computing
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : UNSW Canberra at ADFA
Campus : UNSW Canberra
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course will introduce students to Digital Forensics as part of the evidence and intelligence gathering process. The course will provide students with knowledge and understanding to enable the recovery of admissible evidence from computer and network systems. It will teach the skills and competencies necessary to understand how such evidence can be used for presentation in a

Court of Law or for Intelligence purposes. The course will also develop knowledge and understanding of advanced forensic computing techniques and to acquire the skills to apply these successfully.

Course Aims

The aim of this course is to develop the students understanding of both Digital Forensics theory and professional practices. The students learn and implement recent technologies of Digital Forensics in Windows, Linux and network systems. Students also learn to implement digital forensics principles using advanced windows and Linux tools and Python scripts in a closed laboratory environment.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Demonstrate a theoretical and practical understanding of cybercrime and its relationship with the digital investigation process.
CLO2 : Apply the digital forensics approaches and frameworks in Linux, Windows and network systems, with describing in detail computer foundations especially data, booting process, and hard drive.
CLO3 : Analyse hard disks, including Master Boot Record (MBR), Guide Partition Table (GPT) in Windows and Linux, and file system types such as File Allocation Table (FAT) and New Technology File System (NTFS).
CLO4 : Develop data capturing, logging, and recovery techniques in differing operations systems for analysing data and finding evidence using machine learning.
CLO5 : Outline how Intelligent forensics techniques and their professional reports could be used as evidence in a court of law.

Course Learning Outcomes	Assessment Item
CLO1 : Demonstrate a theoretical and practical understanding of cybercrime and its relationship with the digital investigation process.	
CLO2 : Apply the digital forensics approaches and frameworks in Linux, Windows and network systems, with describing in detail computer foundations especially data, booting process, and hard drive.	
CLO3 : Analyse hard disks, including Master Boot Record (MBR), Guide Partition Table (GPT) in Windows and Linux, and file system types such as File Allocation Table (FAT) and New Technology File System (NTFS).	
CLO4 : Develop data capturing, logging, and recovery techniques in differing operations systems for analysing data and finding evidence using machine learning.	
CLO5 : Outline how Intelligent forensics techniques and their professional reports could be used as evidence in a court of law.	

Learning and Teaching Technologies

Moodle - Learning Management System | Blackboard Collaborate

Learning and Teaching in this course

This course employs a constructionist learning theory and has a strong focus on reinforcing theoretical concepts with practical implementation.

Course materials will be progressively published on the course's Moodle web site. Students will confirm the major learning outcomes of this course through the completion of the assessment items.

Developing Graduate Capabilities

Successful completion of this course contributes to the acquisition of UNSW graduate capabilities. UNSW aspires to develop globally focused graduates who are rigorous scholars, capable of leadershipand professional practice in an internationalcommunity.

This course contributes to the Knowledge Area 1: Technology Resources and Knowledge Area 2: ICT Problem Solving in Australian Computer Society Body of Knowledge.

The Learning Management System

Moodle is the Learning Management System used at UNSW Canberra. All courses have a Moodle site which will become available to students at least one week before the start of semester. Please find all help and documentation (including Blackboard Collaborate) at the Moodle Support page.

UNSW Moodle supports the following web browsers:

» Google Chrome 50+

» Safari 10+

** Internet Explorer is not recommended

** Addons and Toolbars can affect any browser's performance.

Operating systems recommended are:

Windows 7, 10, Mac OSX Sierra, iPad IOS10

If you need further assistance with Moodle:

For enrolment and login issues please contact:

IT Service Centre

Email: itservicecentre@unsw.edu.au

Phone: (02) 9385-1333

International: +61 2 9385 1333For all other Moodle issues please contact:

External TELT Support

Email: externalteltsupport@unsw.edu.au

Phone: (02) 9385-3331

International: +61 2 938 53331

Opening hours:

Monday – Friday 7:30am – 9:30 pm

Saturday & Sunday 8:30 am – 4:30pm

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Practical Reports Assessment Format: Individual	35%	Start Date: 26/02/2024 12:00 AM Due Date: Week 13: 03 June - 07 June
Written Essay Assignment Assessment Format: Individual	25%	Start Date: 18/03/2024 12:00 AM Due Date: Week 12: 27 May - 31 May
Project and Written Assignment Assessment Format: Group	40%	Start Date: 01/04/2024 12:00 AM Due Date: 17/06/2024 12:00 AM

Assessment Details
Practical Reports

<u>Assessment Overview</u>

The practical report 1, 2 and 3 are to be undertaken individually as an individual assessment. Practical report 1 consists of questions can be found in lab 1, and questions can be found in the slides of Week 1 and 2 as well as their student activities. The first Lab sheet (i.e., lab 1) will be given in Week 3. Feedback for the first submission will be given by the census date.

<u>Detailed Assessment Description</u>

- **LO1:** Demonstrate a theoretical and practical understanding of cybercrime and its relationship with the digital investigation process.
- **LO2:** Apply the digital forensics approaches and frameworks in Linux, Windows and network systems, with describing in detail computer foundations especially data, booting process, and hard drive.
- **LO3:** Analyse hard disks, including Master Boot Record (MBR), GUID Partition Table (GPT) in Windows and Linux, and file system types such as File Allocation Table (FAT) and New Technology File System (NTFS)
- **LO4:** Develop data capturing, logging, and recovery techniques in differing operations systems for analysing data and finding evidence using machine learning
- **LO5:** Outline how Intelligent forensics techniques and their professional reports could be used as evidence in a court of law.

<u>Submission notes</u>

All submissions will be made through Moodle and Turnitin.

<u>Assignment submission Turnitin type</u>

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Written Essay Assignment

<u>Assessment Overview</u>

The Written Essay Assignment is an individual task with deliverable in Week 12. The assignment covers CLO3, CLO4, and CLO5.

<u>Detailed Assessment Description</u>

- **LO3:** Analyse hard disks, including Master Boot Record (MBR), GUID Partition Table (GPT) in Windows and Linux, and file system types such as File Allocation Table (FAT) and New Technology File System (NTFS)
- **LO4:** Develop data capturing, logging, and recovery techniques in differing operations systems for analysing data and finding evidence using machine learning
- **LO5:** Outline how Intelligent forensics techniques and their professional reports could be

used as evidence in a court of law.

<u>Submission notes</u>

All submissions will be made through Moodle and Turnitin.

<u>Assignment submission Turnitin type</u>

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Project and Written Assignment

<u>Assessment Overview</u>

The Project and Written Assignment is a group task with deliverable on 19/06/2023. The group work will be graded using a mix of group and individual grading. The weight of group grading is 30%, and the weight of individual grading is 10%. The performance of the project presentation will determine individual grading (each student in the group will present a part of the project). Group grading will be determined by the quality of the written assignment and the output of the project. If a student wants to do the project individually, it will be accepted. If the project has an individual student, the assessment will be evaluated individually. The assignment covers CLO2, CLO3, CLO4, and CLO5.

<u>Detailed Assessment Description</u>

- **LO2:** Apply the digital forensics approaches and frameworks in Linux, Windows and network systems, with describing in detail computer foundations especially data, booting process, and hard drive.
- **LO3:** Analyse hard disks, including Master Boot Record (MBR), GUID Partition Table (GPT) in Windows and Linux, and file system types such as File Allocation Table (FAT) and New Technology File System (NTFS)
- **LO4:** Develop data capturing, logging, and recovery techniques in differing operations systems for analysing data and finding evidence using machine learning
- **LO5:** Outline how Intelligent forensics techniques and their professional reports could be used as evidence in a court of law.

<u>Submission notes</u>

All submissions will be made through Moodle and Turnitin.

<u>Assignment submission Turnitin type</u>

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

General Assessment Information

Assessment Requirements

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is **the only official mark**

The practical report 1, 2 and 3 are to be undertaken individually as an individual assessment. Practical report 1 consists of questions can be found in lab 1, and questions can be found in the slides of Week 1 and 2 as well as their student activities. The first Lab sheet (i.e., lab 1) will be given in Week 3. Feedback for the first submission will be given by the census date. More details about the submission points will be given via Moodle. The practical report 1 covers CLO1 and CLO2. The practical report work 2 and 3 covers CLO1, CLO2, CLO3, and CLO4.

The Written Essay Assignment is an individual task with deliverable in Week 12. The assignment covers CLO3, CLO4, and CLO5.The Project and Written Assignment is a group task with deliverable on 19/06/2023. The group work will be graded using a mix of group and individual grading. The weight of group grading is 30%, and the weight of individual grading is 10%. The performance of the project presentation will determine individual grading (each student in the group will present a part of the project). Group grading will be determined by the quality of the written assignment and the output of the project. If a student wants to do the project individually, it will be accepted. If the project has an individual student, the assessment will be evaluated individually. The assignment covers CLO2, CLO3, CLO4, and CLO5.

Late Submission of Assessment

UNSW has standardised the penalties for late Submissions. Unless prior arrangement is made with the lecturer or a formal application for special consideration is submitted, a penalty of 5% of the total available mark for the assessment will apply for each day that an assessment item is late up to a maximum of 5 days (120 hours) after which an assessment can no longer be submitted and a grade of 0 will be applied.

Grading Basis

Standard

Requirements to pass course

Assessment Criteria: Compulsory components or minimum performance standards

Students are not required to pass any one piece of assessment; you simply need to achieve 50% marks in the four assessment items to pass the course. Please note that final marks in this course may be moderated. For details about mark expectations and interpreting results, see the

UNSW Guide to Grades on MyUNSW at: https://my.unsw.edu.au/student/academiclife/assessment/GuideToUNSWGrades.html

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 26 February - 1 March	Lecture	An Overview of Digital Forensics
Week 2 : 4 March - 8 March	Lecture	Digital Forensics Foundations
Week 3 : 11 March - 15 March	Lecture	Fundamentals of Hard Disk Analysis
	Assessment	Assessment 1: Practical Report Weight: 5% Individual assessment Due Date: 17/3
Week 4 : 18 March - 22 March	Lecture	Advanced Hard Disk Analysis
Week 5 : 25 March - 29 March	Lecture	File System Analysis (Windows)
Week 6 : 1 April - 5 April	Lecture	Digital Forensics Requirements and Tools
Week 7 : 22 April - 26 April	Lecture	File Allocation Table (FAT) File System
	Assessment	Assessment 2: Practical report 2 Weight: 15% Individual assessment Due Date: 28/04
Week 8 : 29 April - 3 May	Lecture	New Technology File System (NTFS) File System
Week 9 : 6 May - 10 May	Lecture	FAT and NTFS Recovery
Week 10 : 13 May - 17 May	Lecture	Linux for Forensics
Week 11 : 20 May - 24 May	Lecture	Network Forensics
	Assessment	Assessment 4: Written Essay Assignment Weight: 25% Individual assessment Due Date: 26/05
Week 12 : 27 May - 31 May	Lecture	Machine Learning and Deep Learning for Digital Forensics
	Assessment	Assessment 3: Practical report 3 Weight: 15% Individual assessment Due Date: 02/06
Week 13 : 3 June - 7 June	Assessment	Assessment 5: Project and Written Assignment Weight: 40% Group/individual assessment Due Date: 09/06

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

The pace of lecturing will be constantly adjusted to the pace of learning of the students. The details of the content of the individual topics will be available on the Moodle Course site but an overall outline is provided here for reference.The indicative topic schedule for the course is shown below.

Course Resources

Recommended Resources

It is preferable for reading the topics of the course from the following textbook: *Moustafa, N., 2022. Digital Forensics in the Era of Artificial Intelligence. CRC Press. https://*

All relevant course materials will be provided online through the course's Moodle website. You are also expected to use the ADFA Academy library and other online resources to obtain additional information and resources.

Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of this course.

Students can also provide feedback during the semester via: direct contact with the lecturer, the "On-going Student Feedback" link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups. Student opinions really do make a difference. Refer to the Moodle site for this course to see how the feedback from previous students has contributed to the course development.

Important note: Students are reminded that any feedback provided should be constructive and professional and that they are bound by the Student Code of Conduct Policy https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Seth Enoka		Perth, WA		Email to schedule an appointment.	No	Yes
Teaching assistant	Xiaoxing Mo				Email to schedule an appointment.	No	No

Other Useful Information

Academic Information

Course Evaluation and Development

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Students can also provide feedback during the semester via: direct contact with the lecturer, the "On-going Student Feedback" link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups (where applicable). Student opinions really do make a difference. Refer to the Moodle site for your course to see how the feedback from previous students has contributed to the course development.

Important note: Students are reminded that any feedback provided should be constructive and professional and that they are bound by the Student Code of Conduct.

https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf

Equitable Learning Services (ELS)

Students living with neurodivergent, physical and/or mental health conditions or caring for someone with these conditions may be eligible for support through the Equitible Learning Services team. Equitable Learning Services is a free and confidential service that provides practical support to ensure your mental or physical health conditions do not adversely affect your studies.

Our team of dedicated **Equitable Learning Facilitators** (ELFs) are here to assist you through this process. We offer a number of services to make your education at UNSW easier and more equitable.

Further information about ELS for currently enrolled students can be found at: https://www.student.unsw.edu.au/equitable-learning

Academic Honesty and Plagarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW staff and students have a responsibility to adhere to this principle of academic integrity. All students are expected to adhere to UNSW's Student Code of Conduct. Find relevant information at: Student Code of Conduct (unsw.edu.au)

Plagiarism undermines academic integrity and is not tolerated at UNSW. It is defined as using the words or ideas of others and passing them off as your own, and can take many forms, from

deliberate cheating to accidental copying from a source without acknowledgement.

For more information, please refer to the following:

https://student.unsw.edu.au/plagiarism

Submission of Assessment Tasks

Special Consideration

Special Consideration is the process for assessing and addressing the impact on students of short-term events, that are beyond the control of the student, and that affect performance in a specific assessment task or tasks.

Applications for Special Consideration will be accepted in the following circumstances only:

- Where academic work has been hampered to a substantial degree by illness or other cause;
- The circumstances are unexpected and beyond the student's control;
- The circumstances could not have reasonably been anticipated, avoided or guarded against by the student; and either:

    (i) they occurred during a critical study period and was 3 consecutive days or more duration, or a total of 5 days within the critical study period; or

    (ii) they prevented the ability to complete, attend or submit an assessment task for a specific date (e.g. final exam, in class test/quiz, in class presentation)

Applications for Special Consideration must be made as soon as practicable after the problem occurs and at the latest within three working days of the assessment or the period covered by the supporting documentation.

By sitting or submitting the assessment task the student is declaring that they are fit to do so and cannot later apply for Special Consideration (UNSW 'fit to sit or submit' requirement).

Sitting, accessing or submitting an assessment task on the scheduled assessment date, after applying for special consideration, renders the special consideration application void.

Find more information about special consideration at: https://www.student.unsw.edu.au/special/consideration/guide

Or apply for special consideration through your MyUNSW portal.

Late Submission of assessment tasks (other than examinations)

UNSW has a standard late submission penalty of:

- 5% per day,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Electronic submission of assessment

Except where the nature of an assessment task precludes its electronic submission, all assessments must be submitted to an electronic repository, approved by UNSW or the Faculty, for archiving and subsequent marking and analysis.

Release of final mark

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is the only official mark.

School-specific Information

The Leaning Management System

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• Google Chrome 50+
• Safari 10+
Internet Explorer is not recommended. Addons and Toolbars can affect any browser's performance.

Operating systems recommended are:

• Windows 10,

• Mac OSX Sierra,

• iPad IOS10

Further details:

[Moodle System Requirements](#)

[Moodle Log In](#)

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Email: itservicecentre@unsw.edu.au

Phone: (02) 9385-1333

International: +61 2 9385 1333

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Saturday & Sunday 8:30 am – 4:30pm

[Study at UNSW Canberra](#)

Study at UNSW Canberra has lots of useful information regarding:

• Where to get help

• Administrative matters

• Getting your passwords set up

• How to log on to Moodle

• Accessing the Library and other areas.

[UNSW Canberra Student Hub](#)

For News and Notices, Student Services and Support, Campus Comminity, Quick Links,

Important Dates and Upcoming Events

School Contact Information

Deputy Head of School (Education): Dr Erandi Hene Kankanamge

E: e.henekankanamge@adfa.edu.au

T: 02 5114 5157

Syscom Admin Support: syscom@unsw.edu.au

T: 02 5114 5284

Syscom Admin Office: Building 15, Level 1, Room 101 (open 10am to 3pm, Mon to Fri)