UNSW Course Outline

ZEIT8030 Big Data and Decision Analytics for Security - 2024

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General Course Information

Course Code : ZEIT8030
Year : 2024
Term : Semester 2
Teaching Period : Z2
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : School of Systems and Computing
Delivery Mode : Online
Delivery Format : Standard
Delivery Location : UNSW Canberra at ADFA
Campus : UNSW Canberra
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course introduces students to Big Data, decision analytics, and the use of Big Data for decision making with an emphasis on security. The course includes an overview of Big Data, data collection, data storage, data security, and regularity and compliance issues. The basic

analytics will cover data analysis, prediction, classification, data anomaly, knowledge and pattern discovery, and simulation and decision making. The course will also study a number of real-world scenarios related big data use in security intelligence.

Big Data represents information from big and often dynamic data sets in variety of forms collected from multiple autonomous or connected sources. Current best practices, compliance and regulatory requirements have dramatically increased the production and retention of data.

Methods used for working with Big Data are very different from traditional analysis. Big Data caries a lot of noise that needs to be filtered out, it is dynamic, and can be untrustworthy. Traditional tools and approaches are either not efficient or not capable to respond to the need of smart security intelligence and immediate incident management and response.

We will define what structured, semi structured and unstructured data is and discuss different approaches to extract useful and context aware security intelligence. Different Technologies for analysing Big Data will be evaluated during the course. We will look at some of the tools used over the course of the semester.

Course Aims

The aim of this course is to understand what structured, semi structured and unstructured data is, and the different approaches to extract useful and context-aware security intelligence. The student will also develop some basic skills in applying relevant open source tools.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : On successful completion of this course, students will be able to: Describe the different sources of data, data structures and the attached meta data, and the difference between data at rest and data in motion.
CLO2 : On successful completion of this course, students will be able to: Apply the principles of data quality, data dynamics, data ethics and data compliance.
CLO3 : On successful completion of this course, students will be able to: Understand how different techniques for data profiling, anomaly detection, user behaviour analytics and predictive analytics work.
CLO4 : On successful completion of this course, students will be able to: Develop analytics operational plans for different scenarios, and conduct collection, processing and analysis of data sets on a basic level.

Course Learning Outcomes	Assessment Item
CLO1 : On successful completion of this course, students will be able to: Describe the different sources of data, data structures and the attached meta data, and the difference between data at rest and data in motion.	• Presentation and Feedback • Quiz 1 • Research report
CLO2 : On successful completion of this course, students will be able to: Apply the principles of data quality, data dynamics, data ethics and data compliance.	• Presentation and Feedback • Research report
CLO3 : On successful completion of this course, students will be able to: Understand how different techniques for data profiling, anomaly detection, user behaviour analytics and predictive analytics work.	• Quiz 2 • Research report
CLO4 : On successful completion of this course, students will be able to: Develop analytics operational plans for different scenarios, and conduct collection, processing and analysis of data sets on a basic level.	• Research report

Learning and Teaching Technologies

Moodle - Learning Management System

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Presentation and Feedback	30%	Due Date: Week 7: 09 September - 13 September
Quiz 1	10%	Due Date: 12/08/2024 11:59 PM
Quiz 2	10%	Due Date: 29/09/2024 11:59 PM
Research report Short Extension: Yes (3 days)	50%	Due Date: 20/10/2024 11:59 PM

Assessment Details

Presentation and Feedback

Assessment Overview

Brief presentation, i.e. slides with voice-over. The presentation should be about one of a number of data analysis use cases provided by the lecturers, which the student should interpret and

comment upon, given the contents learned in the first half of the course. The presentation will be assessed on depth of analysis, quality of insights provided, and quality of presentation. Students are requested to view one or more presentations of fellow students, and provide brief feedback.

Course Learning Outcomes

- CLO1 : On successful completion of this course, students will be able to: Describe the different sources of data, data structures and the attached meta data, and the difference between data at rest and data in motion.
- CLO2 : On successful completion of this course, students will be able to: Apply the principles of data quality, data dynamics, data ethics and data compliance.

Quiz 1

Assessment Overview

Online self-marked test (quiz) on the contents of the course's introductory modules.

Course Learning Outcomes

- CLO1 : On successful completion of this course, students will be able to: Describe the different sources of data, data structures and the attached meta data, and the difference between data at rest and data in motion.

Quiz 2

Assessment Overview

Online self-marked test (quiz) on various theoretical and mathematical modules in the course.

Course Learning Outcomes

- CLO3 : On successful completion of this course, students will be able to: Understand how different techniques for data profiling, anomaly detection, user behaviour analytics and predictive analytics work.

Research report

Assessment Overview

Students will study a recent academic paper in the field of cyber security in which data is analysed and/or decision analytics is performed. The student is required to study the case, and repeat and where possible improve the analysis, using the theory and tools learned in the course, and subsequently write a research report on their findings. Students have the option to choose one of the papers pre-selected by the lecturers, or propose a paper they have found themselves (to be approved by the lecturers). The report will be assessed on depth of understanding, quality of analysis, level of skill in applying the learned techniques, originality of the approach, and quality of writing.

Course Learning Outcomes

- CLO1 : On successful completion of this course, students will be able to: Describe the different sources of data, data structures and the attached meta data, and the difference between data at rest and data in motion.
- CLO2 : On successful completion of this course, students will be able to: Apply the principles of data quality, data dynamics, data ethics and data compliance.
- CLO3 : On successful completion of this course, students will be able to: Understand how different techniques for data profiling, anomaly detection, user behaviour analytics and predictive analytics work.
- CLO4 : On successful completion of this course, students will be able to: Develop analytics operational plans for different scenarios, and conduct collection, processing and analysis of data sets on a basic level.

General Assessment Information

As this assessment task involves some planning or creative processes, you are permitted to use software to generate initial drafts [or ideas, structures, etc]. However, you must develop or edit those ideas to such a significant extent that what is submitted is your own work, i.e., what is generated by the software should not be a part of your final submission. It is a good idea to keep copies of your initial drafts to show your lecturer if there is any uncertainty about the originality of your work. Please note that your submission will be passed through an AI-text detection tool. If your marker has concerns that your answer contains passages of AI-generated text that have not been sufficiently modified you may be asked to explain your work, but we recognise that you are permitted to use AI generated text as a starting point and some traces may remain. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.

Grading Basis

Standard

Course Schedule

Attendance Requirements

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

General Schedule Information

This course is delivered only through distance delivery mode. Students are expected to spend about 150 hours of study. Students are expected to participate in online seminars, contribute to the discussion forums and undertake data analysis on approved case studies. Attendance is via

off campus / online participation.

Course Resources

Prescribed Resources

None

Recommended Resources

None

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Yawen (Wendy) Chen		UNSW Canberra		by email or appointment	No	Yes

Other Useful Information

School-specific Information

The Leaning 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 10,
• Mac OSX Sierra,
• iPad IOS10

Further details:

Moodle System Requirements

Moodle Log In

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 1333

For 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

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 4pm, Mon to Fri)