



UNSW Course Outline

ZEIT3404 Simulation - 2024

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General Course Information

Course Code : ZEIT3404

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 : 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 develop students' skills and competencies in problem solving, developing understanding and implementation skills to choose appropriate levels of abstraction, producing competencies in the analysis, design and implementation of modelling, simulation, and evaluating solution options, and developing skills in the implementation of one or more of the

following: ethical frameworks, social issues, and practical organisational and/or governmental problems. Topics will include concepts of modelling, continuous and discrete systems, random number generation and tests for randomness, time-stepped and event-stepped simulation, object oriented simulation techniques, statistical analysis of output, verification and validation approaches of simulation models.

Course Aims

The aim of this course is to acquaint students with the skills required to analyse and judge the appropriateness of different decisions made during the modelling and simulation life-cycle including the analysis, design, implementation, and validation of simulators and simulation.

Course Learning Outcomes

Course Learning Outcomes	Australian Computing Society (ACS)
CLO1 : Analyse and judge the appropriate levels of abstraction and design methodologies for modelling and simulation.	• ACS : Modelling, abstraction, design
CLO2 : Develop professional user-centred design and high-level programming skills for simulators.	• ACS : Programming • ACS : Systems Development
CLO3 : Evaluate and select appropriate data sampling and scientifically sound analysis methods.	• ACS : Data & Information Management
CLO4 : Combine independent with reflective learning to analyze and compose simulation-based computational solutions for societal, ethical, or governmental problems.	• ACS : Professionalism • ACS : Teamwork concepts and issues • ACS : Societal Issues • ACS : Interpersonal Communications

Course Learning Outcomes	Assessment Item
CLO1 : Analyse and judge the appropriate levels of abstraction and design methodologies for modelling and simulation.	• Modelling Report • Group Reflection Essay • Class Participation
CLO2 : Develop professional user-centred design and high-level programming skills for simulators.	• Tutorial and Lab Time Quizzes • Simulation Report • Group Reflection Essay
CLO3 : Evaluate and select appropriate data sampling and scientifically sound analysis methods.	• Tutorial and Lab Time Quizzes • Simulation Report • Class Participation • Group Reflection Essay
CLO4 : Combine independent with reflective learning to analyze and compose simulation-based computational solutions for societal, ethical, or governmental problems.	• Modelling Report • Simulation Report • Class Participation • Group Reflection Essay

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

This course will be delivered in-person. Materials will be available in Moodle. Materials will be made available in the week they will be used. Self-directed learning is highly encouraged and this will help you in the successful completion of your project and report. Students are expected to

interact in the class and tutorials as this will be essential to validate your understanding of the topic, create a mutual understanding of expectation, and assist in the delivery of the learning outcomes.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates	Australian Computing Society (ACS)
Tutorial and Lab Time Quizzes Assessment Format: Individual	20%		• ACS : Modelling, abstraction, design
Modelling Report Assessment Format: Individual Short Extension: Yes (2 days)	20%		• ACS : Modelling, abstraction, design • ACS : Programming • ACS : Systems Development • ACS : Professionalism
Simulation Report Assessment Format: Individual Short Extension: Yes (2 days)	25%		• ACS : Modelling, abstraction, design • ACS : Programming • ACS : Systems Development • ACS : Data & Information Management • ACS : Professionalism
Group Reflection Essay Assessment Format: Group	25%		• ACS : Professionalism • ACS : Teamwork concepts and issues • ACS : Societal Issues
Class Participation Assessment Format: Individual	10%		• ACS : Professionalism • ACS : Interpersonal Communications

Assessment Details

Tutorial and Lab Time Quizzes

Course Learning Outcomes

- CL02 : Develop professional user-centred design and high-level programming skills for simulators.
- CL03 : Evaluate and select appropriate data sampling and scientifically sound analysis methods.

Detailed Assessment Description

Workload

This assessment will be conducted during tutorials and labs; it won't require extra workload

apart from revision of materials.

Aims

The aim of this assessment is to evaluate your understanding of some basic and important concepts in the subject.

Conditioning

Quizzes will run in an exam mode; close-book, no written or online notes.

Absence during the quiz time

Absence during the quiz time will incur a mark of 0. It will be at the discretion of the lecturer to assess the possibility for setting up a different quiz.

Marking and Feedback

Marks and feedback on each quiz will be provided at the conclusion of the quiz.

Modelling Report

Course Learning Outcomes

- CL01 : Analyse and judge the appropriate levels of abstraction and design methodologies for modelling and simulation.
- CL04 : Combine independent with reflective learning to analyze and compose simulation-based computational solutions for societal, ethical, or governmental problems.

Simulation Report

Course Learning Outcomes

- CL02 : Develop professional user-centred design and high-level programming skills for simulators.
- CL03 : Evaluate and select appropriate data sampling and scientifically sound analysis methods.
- CL04 : Combine independent with reflective learning to analyze and compose simulation-based computational solutions for societal, ethical, or governmental problems.

Group Reflection Essay

Course Learning Outcomes

- CL01 : Analyse and judge the appropriate levels of abstraction and design methodologies for modelling and simulation.

- CLO2 : Develop professional user-centred design and high-level programming skills for simulators.
- CLO3 : Evaluate and select appropriate data sampling and scientifically sound analysis methods.
- CLO4 : Combine independent with reflective learning to analyze and compose simulation-based computational solutions for societal, ethical, or governmental problems.

Class Participation

Course Learning Outcomes

- CLO1 : Analyse and judge the appropriate levels of abstraction and design methodologies for modelling and simulation.
- CLO3 : Evaluate and select appropriate data sampling and scientifically sound analysis methods.
- CLO4 : Combine independent with reflective learning to analyze and compose simulation-based computational solutions for societal, ethical, or governmental problems.

General Assessment Information

Use of Generative AI in Assessments

FULL ASSISTANCE WITH ATTRIBUTION

You can use generative AI software in this assessment to the extent specified in the assessment instructions. Any output of generative software within your assessment must be attributed with full referencing.

If the outputs of generative AI such as ChatGPT form part of your submission and is not appropriately attributed, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

- *To cite: OpenAI (Year Accessed). ChatGPT. OpenAI. <https://openai.com/models/chatgpt/>*
- *Please note that the outputs from these tools are not always accurate, appropriate, nor properly reference. You should ensure that you have moderated and critically evaluated the outputs from generative AI tools such as ChatGPT before submission.*

Grading Basis

Standard

Requirements to pass course

All assessment items must be submitted to pass this course with a minimum of 25% in each assessment and 50% overall average.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 15 July - 19 July	Lecture	Introduction
	Tutorial	
Week 2 : 22 July - 26 July	Lecture	Representation
	Tutorial	
Week 3 : 29 July - 2 August	Lecture	Modelling
	Laboratory	Mandatory Lab
	Tutorial	
Week 4 : 5 August - 9 August	Lecture	Agent based Simulation
	Laboratory	Mandatory Lab
	Tutorial	
Week 5 : 12 August - 16 August	Other	No Classes or labs - Friday Timetable on Tuesday
Week 6 : 19 August - 23 August	Lecture	Experimentation-1
	Laboratory	Mandatory Lab
Week 7 : 9 September - 13 September	Lecture	Experimentation-2
	Laboratory	Optional lab
Week 8 : 16 September - 20 September	Lecture	Experimentation-3
	Laboratory	Optional lab
Week 9 : 23 September - 27 September	Lecture	Discrete Event Simulation (DES)
	Laboratory	Optional lab
Week 10 : 30 September - 4 October	Lecture	Discrete Time Simulation (DTS) & Continuous Simulation
	Laboratory	Optional lab
Week 11 : 7 October - 11 October	Laboratory	Optional lab
Week 12 : 14 October - 18 October	Presentation	Students' Presentations
Week 13 : 21 October - 25 October	Presentation	Students' Presentations

Attendance Requirements

Class participation will be assessed using the Mentimeter online software and a record of the frequency of contributions and depth of discussion in the class. Classes in all weeks, tutorials in weeks 1 to 4, and labs in weeks 1-6 are all mandatory and count towards class participation.

Course Resources

Prescribed Resources

Recommended Text:

- Tang J., Leu G., and Abbass H.A. (2019). Simulation and Computational Red Teaming for Problem Solving. John Wiley & Sons, ISBN-10 1119527171, ISBN-13 9781119527176.

The following free-to-download software license will be used in the subject:

- AnyLogic Personal Learning Edition: <https://www.anylogic.com/downloads/>

A tutorial book for AnyLogic 8 is available online:

- AnyLogic 8 in Three Days: <https://www.anylogic.com/upload/al-in-3-days/anylogic-in-3-days.pdf>

Lecture slides and other materials will be provided to complement the above, as well as the exercises and assessments, which form an integral part of the resources.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Hussein Abbass			02 5114 5109	Please email to arrange a meeting time.	No	Yes

Other Useful Information

School-specific Information

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 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 Community, 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)