



## UNSW Course Outline

# ZPEM8310 Understanding Social-Technical Systems: Ideas, Spaces and Cultures - 2024

Published on the 30 Jun 2024

## General Course Information

Course Code : ZPEM8310

Year : 2024

Term : Semester 2

Teaching Period : Z2

Is a multi-term course? : No

Faculty : UNSW Canberra

Academic Unit : UC Science

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

The increasing ubiquity of digital information technologies and systems – from smartphones

and self driving cars to artificial intelligence and advanced robotics – is having unprecedented impacts on society and how we think about issues like privacy, security, responsibility, and trust in the future. The unfamiliar landscape inaugurated by new digital information systems also demands new ways of thinking and problem-solving within engineering disciplines. This course will introduce students to the intimate connection between ideas and practice - philosophical concepts and technological systems - in both historical and contemporary contexts. The questions the course poses are twofold: first, how have different genealogies of ideas about the human and the machine (such as cybernetics and complexity theory) fed into the evolution of today's digital information systems?; and second, what is the broader significance of such systems and

associated technologies in challenging conventional understandings of key concepts – including intelligence, autonomy, and responsibility – in ways that advance discussions about the political, ethical, and security issues associated with intelligent technologies?

Drawing on the latest research across the social sciences, the course will unpack these questions through a range of exciting topics, including the rise of online social networks and the associated challenges to traditional notions of privacy and identity; new understandings of security and trust in blockchain technologies and cryptocurrencies; and new conceptions of intelligence from 'Deep Blue' and 'Alpha Go' to the 'Blue Brain' project.

## Relationship to Other Courses

The course complements the **Master of Cyber Security Operations** and the **Master of Space Operations** programmes.

## Course Learning Outcomes

Course Learning Outcomes
CLO1 : Develop a critical understanding of the ideas and assumptions that underlie your design practice;
CLO2 : Demonstrate proficiency in conceptual vocabularies to support interdisciplinary projects across the physical and social sciences;
CLO3 : Apply social science concepts in order to explain the evolving nature of the relationship between theoretical concepts and the development of networked digital information systems in different cultural and geographical contexts; and
CLO4 : Evaluate the significance of 'socio-technical systems' as a unit of analysis that enables a more holistic, ethically-informed approach to problem solving within the context of technological change.

Course Learning Outcomes	Assessment Item
CLO1 : Develop a critical understanding of the ideas and assumptions that underlie your design practice;	<ul style="list-style-type: none"> <li>• Report Essay</li> <li>• Discussion Forum Contribution</li> </ul>
CLO2 : Demonstrate proficiency in conceptual vocabularies to support interdisciplinary projects across the physical and social sciences;	<ul style="list-style-type: none"> <li>• Report Essay</li> <li>• Discussion Forum Contribution</li> </ul>
CLO3 : Apply social science concepts in order to explain the evolving nature of the relationship between theoretical concepts and the development of networked digital information systems in different cultural and geographical contexts; and	<ul style="list-style-type: none"> <li>• Film Review</li> <li>• Report Essay</li> <li>• Discussion Forum Contribution</li> </ul>
CLO4 : Evaluate the significance of 'socio-technical systems' as a unit of analysis that enables a more holistic, ethically-informed approach to problem solving within the context of technological change.	<ul style="list-style-type: none"> <li>• Report Essay</li> </ul>

## Learning and Teaching Technologies

Moodle - Learning Management System | Blackboard Collaborate | Microsoft Teams

## Learning and Teaching in this course

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 **leadership** and **professional practice** in an **international** community.

This course aims to foster and develop students' capacities for critical, analytical, and creative thinking. This, along with the skills to write a clear and scholarly argument supported by relevant disciplinary and inter-disciplinary sources, is consistent with the development of the following attributes expected of UNSW graduates:

1. Understanding of their discipline in its interdisciplinary context.
2. Capable of independent and collaborative enquiry.
3. Rigorous in their analysis, critique, and reflection.
4. Able to apply their knowledge and skills to reframing and solving problems.

## Additional Course Information

From voice assistants and facial recognition to algorithmic recommender systems and computational photography, today's digital innovations continue to blur the boundaries between the social and the technical in ways that call for novel perspectives on technology. Indeed, in a world where social interactions and cultural environments are increasingly underwritten by technical processes, there is an urgent need to expand our intellectual engagements with machines beyond the boundaries of engineering disciplines to include insights from cutting-edge social science. In this course, we will examine what this new perspective might look like by shifting the frame of reference from technological materials and objects to socio-technical systems.

The concept of socio-technical systems developed in this course will challenge students to reconsider the kinds of processes that we need to consider when trying to understand how a given technological machine 'works' or 'functions'. Because they are not limited to the field of engineering problems, socio-technical systems require an understanding of the ideas, spaces and cultures that necessarily accompany technical innovations. This course will provide students with the opportunity to explore a socio-technical systems approach in relation to a range of contemporary technologies, with a specific focus on the concepts of intelligence, systems, and automation.

## Assessments

### Assessment Structure

Assessment Item	Weight	Relevant Dates
Film Review Assessment Format: Individual	25%	Start Date: Not Applicable Due Date: 06/09/2024 11:59 PM Post Date: 20/09/2024 12:00 AM
Report Essay Assessment Format: Individual	50%	Start Date: Not Applicable Due Date: 28/10/2024 11:59 PM Post Date: 08/11/2024 11:30 PM
Discussion Forum Contribution Assessment Format: Individual	25%	Start Date: Not Applicable Due Date: 18/10/2024 11:59 PM Post Date: 01/11/2024 11:30 PM

# **Assessment Details**

## **Film Review**

### **Assessment Overview**

This assessment requires the students to present a critical review of a film that addresses the first of the course's three themes - 'intelligence' - as a concept with particular relevance for understanding socio-technical systems. Students will be given a list of potential feature films to present on (e.g., 2001: A Space Odyssey; Her; Ex Machina; Blade Runner 2049, etc.) and will be expected to critically analyze the conceptualization of intelligence and evaluate its significance vis-a-vis broader understandings of AI in contemporary culture. The presentation should be no longer than 10 minutes and uploaded to Moodle as a VoiceThread file.

### **Course Learning Outcomes**

- CLO3 : Apply social science concepts in order to explain the evolving nature of the relationship between theoretical concepts and the development of networked digital information systems in different cultural and geographical contexts; and

### **Assessment Length**

10 minutes

### **Submission notes**

10 minute presentation to be uploaded to Moodle as a VoiceThread file.

### **Assessment information**

#### **Use of Generative Artificial Intelligence (AI): Planning Assistance**

As the course assessment tasks involve some planning or creative process, you are permitted to use software to generate initial ideas. However you must develop or edit those ideas to such a significant extent that what is submitted is your own work, i.e., only occasional AI generated words or phrases may form part of your final submission. It is a good idea to keep copies of the initial prompts to show your lecturer if there is any uncertainty about the originality of your work.

If the outputs of generative AI such as ChatGPT form a part of your submission, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

### **Assignment submission Turnitin type**

This is not a Turnitin assignment

# Report Essay

## Assessment Overview

In this critical research project students are required to conduct a case study of a specific technology or system (from a list supplied, or one they have chosen related to their own fields of interest in negotiation with the course convenor). They must critically use the approaches and concepts discussed in the course to help explain the evolving nature of the relationship between the ideas, spaces and cultures of their chosen case-study. Students will be encouraged to work on the project throughout the semester and to use the online forum to discuss particular case studies in relation to other cases and where appropriate concepts and theoretical approaches are raised. Informal feedback on these ideas will be provided throughout the semester. The word limit for this assignment is 3500 words (+/- 10%).

## Course Learning Outcomes

- CLO1 : Develop a critical understanding of the ideas and assumptions that underlie your design practice;
- CLO2 : Demonstrate proficiency in conceptual vocabularies to support interdisciplinary projects across the physical and social sciences;
- CLO3 : Apply social science concepts in order to explain the evolving nature of the relationship between theoretical concepts and the development of networked digital information systems in different cultural and geographical contexts; and
- CLO4 : Evaluate the significance of 'socio-technical systems' as a unit of analysis that enables a more holistic, ethically-informed approach to problem solving within the context of technological change.

## Assessment Length

3,500 words

## Assessment information

### **Use of Generative Artificial Intelligence (AI): Planning Assistance**

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If the outputs of generative AI such as ChatGPT form a part of your submission, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

### Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

## Discussion Forum Contribution

### Assessment Overview

Students are required throughout the semester to participate in weekly debate with their colleagues via the online discussion forum. Entries should be in the style of scholarly debate, informed by course readings and case studies. Each forum entry should be no more than 250 words in length. Students will be asked to nominate their two best entries for assessment at the end of the course, which they can expand upon to a maximum of 500 words each (+/- 10%) excluding quotes and references.

### Course Learning Outcomes

- CLO1 : Develop a critical understanding of the ideas and assumptions that underlie your design practice;
- CLO2 : Demonstrate proficiency in conceptual vocabularies to support interdisciplinary projects across the physical and social sciences;
- CLO3 : Apply social science concepts in order to explain the evolving nature of the relationship between theoretical concepts and the development of networked digital information systems in different cultural and geographical contexts; and

### Assessment Length

2 x 500 word blog posts

### Assessment information

#### **Use of Generative Artificial Intelligence (AI): Planning Assistance**

As the course assessment tasks involve some planning or creative process, you are permitted to use software to generate initial ideas. However you must develop or edit those ideas to such a significant extent that what is submitted is your own work, i.e., only occasional AI generated words or phrases may form part of your final submission. It is a good idea to keep copies of the initial prompts to show your lecturer if there is any uncertainty about the originality of your work.

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### Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

## General Assessment Information

In this course, students are required to reference following the APA 6 referencing style.

Information about referencing styles is available at: <https://guides.lib.unsw.adfa.edu.au/c.php?g=472948&p=3246720>

### Grading Basis

Standard

### Requirements to pass course

Students must achieve an overall score of 50% to pass this course.

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**.

## Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 15 July - 19 July	Lecture	Introduction 1 - Welcome to the Course
Week 2 : 22 July - 26 July	Lecture	Introduction 2 - Conceptualising Socio-technical Systems
	Seminar	Live Webinar 1 (discussing content from weeks 1-2)
Week 3 : 29 July - 2 August	Lecture	Intelligence 1 - Computation and the Morphing of Intelligence
Week 4 : 5 August - 9 August	Lecture	Intelligence 2 - Design Cultures and Intelligent Machines
Week 5 : 12 August - 16 August	Lecture	Intelligence 3 - Humanising Artificial Intelligence
	Seminar	Live Webinar 2 (discussing content from weeks 3-5)
Week 6 : 19 August - 23 August	Lecture	Systems 1 - Information and Feedback
Week 7 : 9 September - 13 September	Lecture	Systems 2 - Emergence and Control
Week 8 : 16 September - 20 September	Lecture	Systems 3 - Chaos and Contingency
	Seminar	Live Webinar 3 (discussing content from weeks 6-8)
Week 9 : 23 September - 27 September	Lecture	Automation 1 - Automation and the Evolution of Work
Week 10 : 30 September - 4 October	Lecture	Automation 2 - Algorithms and the Curation of Culture
Week 11 : 7 October - 11 October	Lecture	Automation 3 - Producing Knowledge in the Age of Big Data
	Seminar	Live Webinar 4 (discussing content from weeks 9-11)
Week 12 : 14 October - 18 October	Other	Conclusion
	Tutorial	Individual Tutorials (discussing essay plans)

# Attendance Requirements

Not Applicable - as no class attendance is required

## General Schedule Information

The delivery mode for this course is **online**. It has been designed to enable students to learn at their own pace. The content consists of 12 pre-recorded lectures and 4 'live' webinars. While attendance at the webinars is not mandatory, students are encouraged to attend these online events as they provide an excellent opportunity to ask questions, discuss ideas, and deepen their engagement with the course.

# Course Resources

## Prescribed Resources

There are no specific textbooks for this course. Key and recommended readings for each week are instead detailed in the course handbook. **All key readings will be made available for download via the course Moodle site.**

## Recommended Resources

There are, however, a number of books that provide a more general overview to some of the topics dealt with in this course which you may wish to consult. These include:

- Broad, E. (2018). *Made by Humans: The AI Condition*. Melbourne: Melbourne University Press.
- Broussard, M. (2023). *More than a Glitch: Confronting Race, Gender, and Ability Bias in Tech*. Cambridge, MA: The MIT Press.
- Crawford, K. (2021). *The Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*. New Haven and London: Yale University Press.
- Greenfield, A. (2017). *Radical Technologies: The Design of Everyday Life*. London: Verso.
- Johnson, D.G., & Wetmore, J.M. (eds.) (2021). *Technology and Society: Building our sociotechnical future* (2<sup>nd</sup> Edition). Cambridge, MA: MIT Press.

## 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
Lecturer	Tom Roberts		Room 336, Building 22 (Science North)	+61 2 5114 5028		No	Yes
	Andrew Lapworth					No	No