



UNSW

UNSW Course Outline

ZEIT2803 Introduction to Human Factors in Aviation - 2024

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General Course Information

Course Code : ZEIT2803

Year : 2024

Term : Semester 1

Teaching Period : Z1

Is a multi-term course? : No

Faculty : UNSW Canberra

Academic Unit : UC Science

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

The focus of the course is aviation human factors - the study of the relationship between the safety and efficiency of an aviation system and the people, tasks, environment, and technology making up that system, incorporating: human behaviour, human information processing, decision

making and situation awareness, human error, automation, simulation, and training.

A number of aircraft incidents and accidents will be analysed to illustrate key concepts in flight safety. Industry practitioners may deliver guest lectures in order to emphasize the applied aspects of the theory discussed, and local field trips to aviation safety related civil and military organisations are planned.

Course Aims

This course aims to provide learners with the knowledge of the fundamental concepts associated with human factors in aviation. In addition, this course aims to develop students' understanding of various elements that influence safety in aviation, including: aircrew, aircraft, maintenance, management, and regulations with an emphasis on human performance. This course also aims to build competencies underlying a range of aviation safety skills and apply knowledge of aviation safety practically throughout students' careers.

Relationship to Other Courses

ZEIT2803 Introduction to Human Factors in Aviation is a core course in the Aviation Major in the Bachelor of Science Degree. ZEIT2803 serves as a pre-requisite for a follow-up course ZEIT3801 Advanced Aviation Safety in Year 3.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Explain fundamental aviation safety and human factors concepts, accident statistics in both civil and military environment. Reflect on learnt content.
CLO2 : Examine how human capabilities and limitations affect human performance in aviation context. Actively participate in discussions about the aviation safety concepts.
CLO3 : Evaluate and interpret aviation safety case studies, with the focus on human performance.
CLO4 : Apply accident models of causation when conducting an aircraft accident investigation.
CLO5 : Critically evaluate contemporary issues of aviation safety and formulate effective countermeasures to address these issues.

Course Learning Outcomes	Assessment Item
CLO1 : Explain fundamental aviation safety and human factors concepts, accident statistics in both civil and military environment. Reflect on learnt content.	<ul style="list-style-type: none">• Quizzes• Case Study• Laboratory report• Final Exam
CLO2 : Examine how human capabilities and limitations affect human performance in aviation context. Actively participate in discussions about the aviation safety concepts.	<ul style="list-style-type: none">• Quizzes• Case Study• Laboratory report• Final Exam
CLO3 : Evaluate and interpret aviation safety case studies, with the focus on human performance.	<ul style="list-style-type: none">• Case Study• Laboratory report• Final Exam
CLO4 : Apply accident models of causation when conducting an aircraft accident investigation.	<ul style="list-style-type: none">• Case Study• Laboratory report• Final Exam
CLO5 : Critically evaluate contemporary issues of aviation safety and formulate effective countermeasures to address these issues.	<ul style="list-style-type: none">• Laboratory report• Final Exam

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams | Echo 360

Learning and Teaching in this course

A number of methodologies and learning strategies will be employed to enhance the learning abilities of the students.

- Adult learning principles – Students as adult learners are expected to be motivated, engaged

in learning and more self-directed than young learners. Adults tend to learn because they want to or see the direct benefit of learning, rather than because they are told or are expected to. Students are encouraged to use own experience to facilitate learning.

- Case study-based learning – Actual accident and incident case studies will be used to illustrate aviation safety issues. Case study facilitation will develop practical skills, including teamwork, communication, cooperation, leadership, group decision-making, etc.
- Practical tutorials/ labs – Students will be exposed to real world facilitated training that aims to establish positive cultural attitudes and influence safe behaviour in the field.
- Independent research – Students who possess self-discipline and motivation will be able to work independently to gain knowledge that will have direct application in their workplace.

The following activities will be used in this course to support your learning:

- Laboratory sessions – students will be able to *develop basic skills in one of the human factors areas, digital human modelling. Students will familiarise with the concepts of safe ergonomic environment, including various anthropometric measurements, and human machine interaction. This activity will allow to assess human factors risks in the operational environment.*
- Compulsory and recommended readings will extend knowledge and provide additional views of the aviation safety processes and practices;
- Accident investigation case studies will enable to further understand specific details of the accident investigation, root causes and their consequences, as well as discuss their preventive measures.
- Guest speaker lectures from defence, industry and government representatives, as well as field trips will extend your knowledge and understanding of the topics under consideration directly from the experts in the field.
- Online resources and learning activities will support gaining practical knowledge and experience in the topics of the course.

The lecturer's teaching approach is to assist students in recognising the links between what is learnt in the classroom (the theory) and how this is relevant in the workplace (practical application); as well as to create a positive collaborative learning environment, where everyone is actively participating in various activities. This includes: individual work, group work, and work in pairs.

Students diversity in terms of learning styles is valued. With this purpose, various teaching methods will be applied to meet the diverse needs, including verbal content delivery, online video conferencing, video clips of related topics, written reports, graphical representation of aviation accidents to name a few.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Quizzes Assessment Format: Individual	10%	Due Date: Multiple
Case Study Assessment Format: Group	20%	Due Date: 14/05/2024 09:00 AM Post Date: 28/05/2024 09:00 AM
Laboratory report Assessment Format: Individual	20%	Due Date: 03/06/2024 09:00 AM Post Date: 17/06/2024 09:00 AM
Final Exam Assessment Format: Individual	50%	Due Date: TBC

Assessment Details

Quizzes

Assessment Overview

Quizzes will allow you revise the content of lectures, summarise your knowledge of the course modules, and will test your understanding of the course content.

Course Learning Outcomes

- CLO1 : Explain fundamental aviation safety and human factors concepts, accident statistics in both civil and military environment. Reflect on learnt content.
- CLO2 : Examine how human capabilities and limitations affect human performance in aviation context. Actively participate in discussions about the aviation safety concepts.

Detailed Assessment Description

Detailed assessment description of this assessment is provided in the Course Assessment Guide in the 'Assessment' section on Moodle.

Use of Generative Artificial Intelligence (AI). NO ASSISTANCE. For this assessment, it is prohibited to use any software or service to search for or generate information or answers. If its use is detected, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include OOF, suspension and exclusion.

Case Study

Assessment Overview

The Case Study Project (i.e., a written report and a presentation) will allow you to demonstrate your ability to integrate the knowledge and skills acquired throughout your course (theory) in your

group project (practical application), work in a group and develop effective teamwork, communication, leadership, critical thinking, and presentation skills. Specifically, this project will provide the opportunity for you to practically apply accident models of causation when conducting aircraft accident investigation and human error analysis of the case study.

Course Learning Outcomes

- CLO1 : Explain fundamental aviation safety and human factors concepts, accident statistics in both civil and military environment. Reflect on learnt content.
- CLO2 : Examine how human capabilities and limitations affect human performance in aviation context. Actively participate in discussions about the aviation safety concepts.
- CLO3 : Evaluate and interpret aviation safety case studies, with the focus on human performance.
- CLO4 : Apply accident models of causation when conducting an aircraft accident investigation.

Detailed Assessment Description

Detailed assessment description of this assessment is provided in the Course Assessment Guide in the 'Assessment' section on Moodle.

Use of Generative Artificial Intelligence (AI). SIMPLE EDITING ASSISTANCE For this assessment task, you may use standard editing and referencing software, but not generative AI. You are permitted to use the full capabilities of the standard software to answer the question (Microsoft Office suite, Grammarly).

Assignment submission Turnitin type

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

Laboratory report

Assessment Overview

The **laboratory report** will provide you with an opportunity to prepare an individual summary of your work in the Aviation simulation laboratory. This report will include a summary of results of your work and reflection on the task as required for the laboratory work.

Course Learning Outcomes

- CLO1 : Explain fundamental aviation safety and human factors concepts, accident statistics in both civil and military environment. Reflect on learnt content.
- CLO2 : Examine how human capabilities and limitations affect human performance in aviation context. Actively participate in discussions about the aviation safety concepts.
- CLO3 : Evaluate and interpret aviation safety case studies, with the focus on human performance.
- CLO4 : Apply accident models of causation when conducting an aircraft accident

investigation.

- CLO5 : Critically evaluate contemporary issues of aviation safety and formulate effective countermeasures to address these issues.

Detailed Assessment Description

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Final Exam

Assessment Overview

The final exam will allow you reviewing and reflecting on the course content and demonstrating your understanding of fundamental aviation human factors concepts, accident statistics in both civil and military environment.

Course Learning Outcomes

- CLO1 : Explain fundamental aviation safety and human factors concepts, accident statistics in both civil and military environment. Reflect on learnt content.
- CLO2 : Examine how human capabilities and limitations affect human performance in aviation context. Actively participate in discussions about the aviation safety concepts.
- CLO3 : Evaluate and interpret aviation safety case studies, with the focus on human performance.
- CLO4 : Apply accident models of causation when conducting an aircraft accident investigation.
- CLO5 : Critically evaluate contemporary issues of aviation safety and formulate effective countermeasures to address these issues.

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General Assessment Information

Assessment items are evaluated based on assessment task requirements and detailed marking rubrics. Marks and *constructive feedback* to each assessment will be provided summarising great aspects about submission and recommendations for further improvement. Constructive feedback has been found the most effective feedback for students' learning.

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 detailed description of each assessment, including task scope, format, length of submission, and marking rubrics are summarised in the Course Assessment Guide, which is uploaded in Moodle under "Assessments" section. Each assessment will be marked based on marking rubrics and in accordance with the task description and task requirements. Further information concerning the assessment, will be distributed in class well before the due dates.

The results to each assessment will be provided within or no later than **10 business days since the date of submission**, in accordance with **UNSW Assessment Policy**

Grading Basis

Standard

Requirements to pass course

The following compulsory components are required as minimum performance standards:

- The overall pass mark is 50%.
- Students must submit all assignments in due time (unless a request for special considerations is provided in accordance with the University's standard guidelines).

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 26 February - 1 March	Lecture	Lecture 1. Welcome & Course Overview. Lecture 2. Introduction to Human Factors in Aviation.
Week 2 : 4 March - 8 March	Tutorial	Tutorial 1. Introduction to Human Factors in Aviation
	Assessment	Quiz 1. Introduction to Human Factors in Aviation
	Lecture	Lecture 3. Human Performance: Capabilities & Limitations. Lecture 4. Decision-Making.
Week 3 : 11 March - 15 March	Tutorial	No Class (Lost)
	Assessment	Quiz 2. Human Performance: Capabilities & Limitations. Decision-Making.
	Lecture	Lecture 5. Human Error & Violations. Lecture 6. Aircraft Accident Investigation; Accident Models of Causation.
Week 4 : 18 March - 22 March	Assessment	Quiz 3. Human Error & Violations. Aircraft Accident Investigation. Accident Models of Causation.
	Tutorial	Tutorial 2. Human Error & Violations. Practical application of accident models of causation via the analysis of previous events (i.e., incidents, accidents).
	Fieldwork	ATSB Field Trip - a visit to the Australian Transport Safety Bureau is scheduled from 12 to 3:30pm.
Week 5 : 25 March - 29 March	Tutorial	Tutorial 3. Students' Learning Support - Lecture on critical thinking, writing, referencing. Assessment 2 - Information session and Q&A.
	Lecture	Lecture 7. Situational Awareness. Lecture 8. Workload.
Week 6 : 1 April - 5 April	Tutorial	No Class (Lost)
	Assessment	Quiz 4. Situational Awareness. Workload.
	Lecture	Lecture 9. Fatigue in Aviation. Lecture 10. Stress and Stress Management.
Week 7 : 22 April - 26 April	Assessment	Quiz 5. Fatigue & Stress.
	Laboratory	1400-1500 - Laboratory 1 (A)
	Laboratory	1500-1600 - Laboratory 1 (B)
	Group Work	Group Meetings - Assessment 2 Preparation
Week 8 : 29 April - 3 May	Laboratory	1400-1500 - Laboratory session 2 (A)
	Laboratory	1500 - 1600 - Laboratory session 2 (B)
	Group Work	Group Meetings - Assessment 2 Preparation
Week 9 : 6 May - 10 May	Laboratory	1400-1500 - Laboratory session 3 (A)
	Laboratory	1500-1600 - Laboratory session 3 (B)
	Group Work	Group Meetings - Assessment 2 Preparation
Week 10 : 13 May - 17 May	Fieldwork	DFSB Field Trip - a visit to the Defence Flight Safety Bureau. The trip will take place from 1400 to 16:30.
	Assessment	Assessment 2. Group Case Study (Report + Presentation)
Week 11 : 20 May - 24 May	Laboratory	1400-1500 - Laboratory session 4 (A)
	Laboratory	1500-1600 - Laboratory session 4 (B)
Week 12 : 27 May - 31 May	Laboratory	No Class (Reconciliation Day) Compensation Day: Monday 27 May classes to be delivered on Tuesday 28 May. Tuesday 28 May lost.
	Laboratory	1400-1500 - Laboratory session 5 (A)
	Laboratory	1500-1600 - Laboratory session 5 (B)
Week 13 : 3 June - 7 June	Lecture	Guest Lecture. Course Revision & Assessment 4 Information session and Q&A

Attendance Requirements

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

General Schedule Information

This course aims to provide a learning and teaching environment, where all students are actively engaged in learning process via interesting, challenging, and enjoyable activities. The course has four main components: lectures, tutorials, laboratory sessions and a field trip. These components should be seen as interactive and engaging, providing opportunities to ask questions and discuss various viewpoints.

The course schedule is scheduled as follows:

- **Lectures** - Tue 1200-1400, SR06 (Z-32-SR06).
- **Tutorials** - Mon 1400-1600, LTN 12 (Z-32-LT12). Note: Tutorials will start from WK2.
- **Laboratory sessions** - Fri 1000-1200, Z-17-G20 (Aviation Studio). Note: Labs will be conducted from WK7-9 and WK11-12.

Course Resources

Prescribed Resources

Compulsory Texts

- Salas, E., & Maurino, D. (2010). Human Factors in Aviation, 2nd ed., Elsevier, New York.
- Moriarty, C. D. (2014). *Practical human factors for pilots*. Academic Press.

Recommended Resources

Recommended Readings

- Swauger, S. (2023). Master Airline Pilot: Applying Human Factors to Reach Peak Performance and Operational Resilience. CRC Press.
- Cusick, S., Cortes, A., & Rodrigues, C. (2017). Commercial Aviation Safety, Sixth Edition. McGraw-Hill Education: New York.
- Fogarty, G., Murphy, P., McTernan, W., Cooper, R., Fry, C., Langford, K., Reid, N., & McLean, H. (2018). Aviation non-technical skills guidebook. Defence Aviation Safety Authority, Canberra, Australia.
- Green, R., Muir, H., James, M., Gradwell, D. & Green, R. (1996). Human Factors for Pilots. Aldershot: Ashgate Publishing.
- Wickens, C.D., Gordon Becker, S., & Lee, J.D. (2014). An Introduction to Human Factors Engineering 2nd Ed. Pearson New International Edition, New Jersey
- Harris, D. (2011) Human Performance on the Flight Deck. Ashgate Publishing Company. Farnham.

Note! Additional references will be provided via Moodle and lecture notes.

Course Evaluation and Development

This course is continuously reviewed by the experts in the field from academia and defence. The updates of the content, assessment and laboratory component undergo yearly review.

Specifically, the importance is given to the relevance and recency of information, as well as students' feedback in the course via practical activities, such as laboratory work, weekly discussions, field trips and case study analysis.

Feedback is collected throughout the semester. If you have any comments and suggestions, feel free to communicate it to the course convenor.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Oleksandra Molloy		Room 116, B26	+61 2 5114 5184	Consultations are available during working hours. Send an email to schedule a meeting.	No	Yes
Lab staff	Alexander Somerville		G20, B17		Consultations are available during working hours. Send an email to schedule a meeting	No	No

Other Useful Information

Academic Information

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 each 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 (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 Equitable 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 Plagiarism

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 \(unsw.edu.au\)](https://student.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.