
MOS 3305A Human Factors in Aviation
Course Outline: Section – 001 / 2012

1. Course Information:

1.1. Class Location and Time:

Room: UCC-58

Time: 13:30-16:30

1.2. Instructor: Suzanne Kearns

Office: SSC 4428

Office Hours: Wednesday 4:30-6:30pm

Phone: 661-2111 x81465

Email: skearns4@uwo.ca

Website Address: <https://owl.uwo.ca/portal>

DAN Management and Organizational Studies strives at all times to provide accessibility to all faculty, staff, students and visitors in a way that respects the dignity and independence of people with disabilities. Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2111 ext 82147 for any specific question regarding an accommodation. More information about "Accessibility at Western" is available at: <http://accessibility.uwo.ca>

2. Calendar Description

- 2.1.** Psychology and physiology as they relate to human performance in a complex operating environment. Topics include pilot decision-making and crew resource management, interpersonal relations, effects of noise and vibration, pressure change, balance, motion sickness, jet lag, human factors in aircraft accidents.

3 lecture hours, 0.5 course

- 2.2. Antirequisite(s):** None

- 2.3. Prerequisite(s):** Enrollment in 3rd or 4th year of the Commercial Aviation Management module of BMOS

- 2.4.** Senate Regulations state, "unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites."

3. Textbooks

Wickens, C.D., Lee, J.D., Gordon, S.E., & Liu, Y. (2003). *An introduction to human factors engineering*. New York: Longman.

Kearns, S. (2010). *E-Learning in aviation*. Aldershot, England: Ashgate.

4. Course Objectives and Format

4.1. Course Objectives

1. To become aware of the capabilities and limitations of humans with respect to:
 - making machines and devices do what is intended
 - responding appropriately to machines and devices
 - the environment they operate in
 - designing better systems
 - maximizing safe and efficient operations
2. To become familiar with aviation research
3. To become capable of conducting aviation research reviews and applying the findings to real-world scenarios.
4. To create a human factors training program, built upon the ADDIE model.

4.2. Course format

- The course will be organized as a combination of lecture, group discussion, group activities, and student presentations.

5. Evaluation

5.1 Class Participation: A crucial element of this course is the sharing of ideas and opinions. Since each of us brings a unique background of experiences, much can be learned from class debate and discussion. However, perfect attendance alone will not guarantee a perfect participation grade. Your participation grade will be dependent on your *involvement* in class discussions and activities, questioning of student presentations, and attendance. Participation will account for 15% of your final grade.

Absences: All absences will impact your participation grade. As a rule of thumb, you can expect each absence to subtract 10% of your participation grade. Any absences that occur during the final two classes, on student presentation dates, will subtract 20% of your participation grade as class involvement during these presentations is very important. For medical absences, refer to the policy on accommodation for medical illness (<https://studentservices.uwo.ca/secure/index.cfm>). If you have a valid excuse for an absence you must inform the instructor before the intended date. It is the instructor's discretion whether or not to excuse an absence.

5.2 Executive Summary: You will work in groups of four or five to complete this project. This assignment is intended to get you to think about a human factors research topic that is of interest to you. You will be required to dig into human factors research and choose a topic. Once you have chosen your topic you will act as a "human factors expert" and design a four page executive summary describing the topic. The goal of the executive summary is to present human factors research in an interesting and understandable way. The executive summary should be geared towards an aviation audience, such as you might find in a local flight school. You must have your topic approved by the instructor. You must incorporate information from at least 5 peer-reviewed journal articles per group member into the executive summary (20 for 4-person groups or 25 for 5-person groups). When you turn in the assignment you should submit: 1) a colour, print-ready copy of the executive summary suitable for distribution to a general aviation audience, 2) cut-and-paste the EXACT text from the executive summary into a word processing document, within which all academic references must be clearly indicated so the instructor can see how and where you incorporated your research articles, and 3) an APA formatted reference sheet. Additional instructions will be provided in class. This executive summary is worth 20% of your final course grade.

Steps to Complete Project

1. Find a Topic: The textbook and articles from *Ergonomics*, *Ergonomics in Design*, *Human Factors*, *The International Journal of Aviation Psychology* and *Aviation, Space and Environmental Medicine* are full of relevant topics if you are searching for ideas. If you are having trouble or are unsure if your topic is appropriate visit the professor during office hours for suggestions.

2. Get it Approved: Once you have a topic that interests your group, submit it to the professor either after class, by e-mail, WebCT, or during office hours. The professor will either approve your topic or give you suggestions to refine your subject area. Each topic may only be researched by one group per course, so if you are especially interested in a specific topic get it approved early in the semester. The professor has the final say whether your topic is appropriate for the course.
3. Find Relevant Articles: After gaining approval, dig further into the research and find peer-reviewed journal articles that are relevant to your topic and combine to create a clear picture of the current research in that area.
4. Format an Executive Summary: You will write up a 4-page overview of your research topic. This overview should be presented in a manner that is appealing to a general aviation audience. Photographs and charts are appropriate. Your sheet of paper may be used in any manner of your choice, folded like a brochure, coloured paper, etc. However, you are encouraged to remember the principles of human factors when designing the executive summary. On separate sheets of paper you will need to provide the instructor with a Word document with the exact text from the executive summary and all references clearly integrated and an APA formatted reference list.

5.3 Training Program: The final assignment in the course is to convert the material from your group's executive summary into a training program. You will present your training program to the class and will also submit a 2-4 page training summary based on the ADDIE model. Your training program must be 25-30 minutes in duration and your group will present the training to the class during the last two weeks of the course. The training program **MUST** be based on the ADDIE model, which will be taught in the last few weeks of the course. The presentation should be interactive with the audience, informative, and entertaining. Students are encouraged to think of creative ways of making human factors training fun. The training should be geared towards a general aviation audience. Students will have access to a TV/DVD/VCR, overhead projector, and data projector for their presentations. The 2-4 page training summary will clearly describe each element of the ADDIE-M model and how your group's training program considered each element in the design of the training program. Some elements deal with the future (such as course evaluation), so students should present a plan on how it will be conducted. Additional details will be provided in class. PowerPoint slides from all groups and ADDIE summaries are due at the beginning of the second-last class of the semester. This policy was created to limit the advantage of students presenting on the second date, as they cannot change their presentation based on observing the successes or failures of other students. The training program is worth 20% of your final course grade, with the write-up worth 10% and the presentation worth 10%.

5.4 Final Examination: A comprehensive final examination will be given at the end of the semester. A final exam review will be given prior to the exam. The final exam will cover all information in the course, including readings, lectures, videos, examples, etc. Therefore it is crucial that you take good notes throughout the term and complete all assigned readings. The exam format may include multiple choice, fill-in-the-blanks, short answer, and/or essay questions. Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Evaluation Item	Percentage of Course Grade
5.1 Class Participation	15%
5.2 Executive Summary	20%
5.3 Training Program Presentation	20%
5.4 Final Examination	45%

Exams are in **short answer format**. Each exam, in total, will be scheduled for **3 hours** and are **closed book examinations**. **Dictionaries are NOT allowed into the examinations.**

Only non-programmable calculators will be allowed into the exams. If you are unsure, please ask your professor to check your calculator.

Hard-copy print outs of assignments and/or essays are due on the dates indicated, at 13:30. Any assignments turned in after 13:30 on the due date will incur a 10% late penalty per day. There are no exceptions to this policy.

If you are unable to turn in the assignment on the due date, you may ask another student to turn it in on your behalf. Electronic/mailed versions of assignments will not be accepted.

Students are responsible for material covered in the lectures as well as the assigned chapters/sections in the text. The midterm examination will be in class time. The final exam will be scheduled during the exam period. Exams will not be returned to students but may be reviewed in the instructor's office.

Students are **REQUIRED TO COMPLETE ALL COMPONENTS** of this course. There are no exceptions to this. Extra assignments to improve grades will **NOT** be allowed.

Exams will be scored using the program Scan Exam which examines the answer sheets for unusual coincidences in the pattern of answers given which may be indicative and used as supporting evidence of cheating.

Grades will **not** be adjusted on the basis of need. It is important to monitor your performance in the course. Remember: *You* are responsible for your grades in this course.

6. Lecture and Examination Schedule

September 12, 2012

Syllabus Overview

Course Introduction

Ch. 1

- What is human factors?
- The scope of human factors science

Research Methods

Ch. 2

- Introduction to Research Methods
- Experimental Research Methods
- Descriptive Methods
- Measuring Variables
- Qualities of Good Research

September 19, 2012

Visual System

Ch. 4

- The Stimulus: Light
- The Receptor System: The Visual System
- Sensory Processing Limitations
- Bottom-Up Versus Top-Down Processing
- Visual Search and Detection
- Spatial Topic: Midair Target Detection

Auditory, Tactile and Vestibular Systems

Ch. 5

- Sound: The Auditory Stimulus
- The Ear: The Sensory Transducer
- The Auditory Experience
- The Sound Transmission Problem
- Noise
- The Other Senses

September 26, 2012

Online Single-Pilot Resource Management

October 3, 2012

Cognition Ch. 6

- Information Processing Models
- Object and Pattern Perception
- Working Memory
- A Design Example
- Long-Term Memory
- Attention and Mental Resources

Decision Making Ch. 7

- Definition of Decision Making
- Classical Decision Theory
- Heuristics and Biases
- Naturalistic Decision Making
- Real-World Decision Making Model
- Improving Human Decision Making
- Problem Solving

October 10, 2012

Displays Ch. 8

- Ways of Classifying Displays
- Thirteen Principles of Display Design
- Alerting Displays
- Labels
- Monitoring
- Multiple Displays
- Navigation Displays and Maps
- Quantitative Information Displays: Tables and Graphs

Control Ch. 9

- Principles of Response Selection
- Discrete Control Activation
- Positioning Control Devices
- Verbal and Symbolic Input Devices
- Voice Input
- Continuous Control and Tracking

October 17, 2012

Engineering Anthropometry and
Workspace Design Ch. 10

- Human Variability and Statistics
- Anthropometric Data
- General Principles for Work-Space Design
- Design for Standing and Seated Work Areas

Work Physiology Ch. 12

- Muscle Structure and Metabolism
- The Circulatory and Respiratory Systems
- Energy Cost of Work and Workload Assessment
- Physical Work Capacity and Whole-Body Fatigue

October 24, 2012

- Stress and Workload Ch. 13
- Environmental Stressors
 - Psychological Stressors
 - Life Stress
 - Work Overload, Underload, and Sleep Disruption
- Automation Ch. 16
- Classes of Automation
 - Problems of Automation
 - Human-Centered Automation
 - Automation-Based Complex Systems

October 31, 2012

- Executive Summaries DUE**
- Selection and Training Ch. 18
- Personnel Selection
 - Performance Support and Job Aids
 - Types of Performance Support and Job Aids
 - Training Program Design
 - Training Concepts and Issues
- The Live of Aviation Training EIA Ch. 1

November 7, 2012

- Overview of instructional design process EIA Ch. 7
- Analysis EIA Ch. 8

November 14, 2012

Guest Speaker or Electronic Learning - TBD

November 21, 2012

- Design, Develop, Implement, Evaluate EIA Ch. 9-12

November 28, 2012

Student presentations of training programs
Presentation Notes Due from ALL groups

December 5, 2012

Student presentations of training programs
Final exam review

7. University Policy Regarding Illness

7.1. Illness

The University recognizes that a student's ability to meet his/her academic responsibilities may, on occasion, be impaired by medical illness. Illness may be acute (short term), or it may be chronic (long term), or chronic with acute episodes. The University further recognizes that medical situations are deeply personal and respects the need for privacy and confidentiality in these matters. However, in

order to ensure fairness and consistency for all students, academic accommodation for work representing 10% or more of the student's overall grade in the course shall be granted only in those cases where there is documentation supplied (see below for process) indicating that the student was seriously affected by illness and could not reasonably be expected to meet his/her academic responsibilities.

Documentation shall be submitted, as soon as possible, to the appropriate Dean's office (the Office of the Dean of the student's Faculty of registration/home Faculty) together with a request for relief specifying the nature of the accommodation being requested. These documents will be retained in the student's file, and will be held in confidence in accordance with the University's Official Student Record Information Privacy Policy [<http://www.uwo.ca/univsec/handbook/general/privacy.pdf>].

Once the petition and supporting documents have been received and assessed, appropriate academic accommodation shall be determined by the Dean's Office in consultation with the student's instructor(s). Academic accommodation may include extension of deadlines, waiver of attendance requirements for classes/labs/tutorials, arranging Special Exams or Incompletes, re-weighting course requirements, or granting late withdrawals without academic penalty.

Academic accommodation shall be granted only where the documentation indicates that the onset, duration and severity of the illness are such that the student could not reasonably be expected to complete his/her academic responsibilities. (Note: it will not be sufficient to provide documentation indicating simply that the student was seen for a medical reason or was ill.)

A form to be completed by off-campus physicians is available at:

<http://counselling.ssc.uwo.ca/forms/medicalNote.pdf>

Whenever possible, students who require academic accommodation should provide notification and documentation in advance of due dates, examinations, etc. Students must follow up with their professors and their Academic Counselling office in a timely manner.

In the case of a final examination in the course, the student must arrange for a Special Examination or Incomplete through their Dean's office, for which you will be required to provide acceptable documentation.

If you feel that you have a medical or personal problem that is interfering with your work, you should contact your instructor and the Faculty Academic Counselling Office as soon as possible. Problems may then be documented and possible arrangements to assist you can be discussed at the time of occurrence rather than on a retroactive basis. In general, retroactive requests for grade revisions on medical or compassionate grounds will not be considered.

7.2. Make Up Examinations

- The student must write a make-up exam if the regularly scheduled exam is missed for reasons for which adequate documentation is received by the instructor (this documentation must be supplied by the Academic Counselling office).

7.3. Attendance

- It is expected that students will attend all classes. The professor does not provide access to lecture notes. Students are encouraged to obtain missed lecture notes from a fellow student.

8. University Policy on Cheating and Academic Misconduct

- 8.1.** Cheating on exams will not be tolerated; students are referred to the university policy on scholastic offenses (see section 9.0 below). Looking at the test of another student, allowing another student to view your exam, or obtaining information about a test in advance are all examples of cheating. Students found cheating will receive a zero (0%) on that exam. A number of safeguards will be employed to discourage cheating. For example, examination supervisors (proctors) of the tests may ask students to move to another seat during the exam, cover their paper, avert their eyes from other students' papers, remove baseball caps, etc. This is not meant as a personal affront nor as an accusation of cheating, rather as vigilant attempts at proctoring. A copy of guidelines about how to avoid cheating can be obtained from the office of the Ombudsperson, Room 251 University Community Centre, (519) 661-3573.
- 8.2.** Students are responsible for understanding the nature of and avoiding the occurrence of plagiarism and other academic offenses. Students are urged to read the section on Scholastic Offenses in the Academic Calendar. Note that such offenses include plagiarism, cheating on an examination, submitting false or fraudulent assignments or credentials, impersonating a candidate, or submitting for credit in any course without the knowledge and approval of the instructor to whom it is submitted, any academic work for which credit has previously been obtained or is being sought in another course in the University or elsewhere. If you are in doubt about whether what you are doing is inappropriate, consult your instructor. A claim that "you didn't know it was wrong" will not be accepted as an excuse.
- 8.3.** The penalties for a student guilty of a scholastic offense include refusal of a passing grade in the assignment, refusal of a passing grade in the course, suspension from the University, and expulsion from the University.

9. Procedures For Appealing Academic Evaluations

- 9.1.** In the first instance, all appeals of a grade must be made to the course instructor (informal consultation). If the student is not satisfied with the decision of the course instructor, a written appeal must be sent to the Assistant Program Director or Designate of the BMOS program. If the response of the Assistant Director is considered unsatisfactory to the student, he/she may then appeal to the Dean of the Faculty in which the course of program was taken. Only after receiving a final decision from the Dean, may a student appeal to the Senate Review Board Academic. A Guide to Appeals is available from the Ombudsperson's Office.

10. Student Responsibilities

- 10.1.** Material covered in lectures will not always be the same as material covered in the textbook. These two sources should be viewed as complimentary and not redundant. As such, students who want to do well in this course are **strongly encouraged** to attend lectures on a regular basis. Please note that the instructor will not be providing copies of lectures notes or overheads. Therefore, if you miss a lecture, you should try to obtain this material from another student.

In this class, some students may be unaware that their private discussions are distracting to other people. If you feel that students are distracting your attention from the material, then you should ask them to be quiet. If you feel uncomfortable doing this (or the problem persists), then please see the instructor. In addition, please avoid engaging in private discussions with other students during the lectures.

To avoid unnecessary distractions, please arrive to each class on time.

11. Support Services

11.1. Support Services

The Registrar's office can be accessed for Student Support Services at <http://www.registrar.uwo.ca>
Student Support Services (*including the services provided by the USC listed here*) can be reached at:
<http://www.sdc.uwo.ca/>.

Student Development Services can be reached at: <http://westernusc.ca/services/>.

- 11.2. Students who are in emotional/mental distress should refer to Mental Health@Western
<http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help."

12. Other Issues

12.1. Grade Policy

The DAN Program has a grade policy which states that for courses in the x000-y000 range, the class average must fall between x% and y% for all sections of a course taught by the same instructor. In very exceptional circumstances only, class averages outside this range may be approved by the Assistant Director or Director. Class averages are not grounds for appeal.

12.2. Short Absences.

If you miss a class due to minor illness or other problems, check your course outlines for information regarding attendance requirements and make sure you are not missing a test or exam. Cover any readings and arrange to borrow the missed lectures notes from a classmate.

12.3. Extended Absences.

If you are absent more than approximately two weeks or if you get too far behind to catch up, you should consider reducing your workload by dropping one or more courses. The Academic Counsellors can help you to consider the alternatives. At your request, they can also keep your instructors informed about your difficulties.

12.4. Academic Concerns.

If you are in academic difficulty, it is strongly recommended that you see your academic counsellor.

12.5. Important Dates:

September 6, 2012 Fall Term classes begin.

September 14, 2012 Last day to add a full course or a first-term half course

October 8, 2012 Thanksgiving Holiday

November 5, 2012 Last day to drop a first-term half course without academic penalty

November 30, 2012 Last day to drop a full course without academic penalty

December 5, 2012 Fall Session classes end

December 6, 7, 2012 Study Days

December 8-19 Mid-year examination period

January 7, 2013 Winter Session classes begin.

January 15, 2013 Last day to add a second-term half course

February 18, 2013 Family Day

February 18-22, 2013 Reading Week

March 7, 2013 Last day to drop a second-term half course without academic penalty

March 29, 2013 Good Friday

April 11, 2013 Winter Session classes end.

April 12 & 13, 2013 Study Days.

April 14-30, 2013 April examination period.

13. Other Information

- Bring student identification to exams.
- Nothing is to be on/at one's desk during an exam except a pencil, an eraser, and the individual's student card

- Do not wear baseball caps to exams
- Do not bring music players, cell phones, beepers, or other electronic devices to exams

For The University of Western Ontario Senate Regulations, please see the Handbook of Academic and Scholarship Policy at: <http://www.uwo.ca/univsec/handbook/>