

## HUMAN FACTORS IN AVIATION

PSY 532

Spring 2000

Prof: William F. Moroney

TIME/PLACE: Mon and Wed 6-7:15 (28 Classes + Final + field trip),  
RM 325, St Joseph's Hall

William F. Moroney, Ph.D., CPE

Office # 229-2767, St Joe's, RM 305.

FAX 229-3900,

Home #: 885-7649, before 9 PM, please

EMAIL: MORONEY (if on St Joe server) or

Moroney@udayton.edu

Mail Box in St Joe's 325

Web Site is <http://homepages.udayton.edu/~moroney/>

(Check the section on Favorite Web Sites)

Office Hours: Mon & Tues: 1:15-2:00; To make the best  
use of our limited time, meetings arranged by  
appointment are preferred.

Graduate Assistant: Don Means, St Joe's, Rm 313,  
229-2175, meansced@flyernet.udayton.edu.

Home # 866-8437

### COURSE DESCRIPTION

The course will emphasize aviation's unique controls and displays, cockpit design/integration, simulation, crew coordination, safety and environmental factors influencing aircrew performance. We will also address the impact of advanced technology on aviation systems.

### Text:

Required: Weiner, E.L. and Nagel, D. C. (1988). Human Factors in Aviation. San Diego: Academic Press.

Recommended: Garland, D.J., Wise, J.A., and Hopkin, V.D. (1999). Handbook of Human Factors. Mahwah, NJ: Lawrence Erlbaum Associates. (On reserve (overnight) in library and in Reserve Section) Readings are indicated by "H".

**Overall Objectives:**

1. To familiarize you with the role of human factors in aviation systems.
2. Expose you to basic flight dynamics and the basic "jargon" of aviation.
3. To provide you with hands-on experience through the use of our Flight Simulator.
4. Allow you to demonstrate skills expected of human factor professionals engaged in aviation.
5. To introduce you to the impact of advanced technology on humans and the impact of humans on advanced technology.

**Specific Objectives**

- 1: Knowledge of Simulators & Simulation
  - A: Learn to "FLY" by using Microsoft Flight Simulator(4.0-98)
  - B: Learn the capabilities of simulators and learning "how you learn".
  - C: Experience Workload effects. Based on experience in flight simulator provide workload (TLX) data.
- 2: Learn about aircraft accidents in both the general aviation and commercial sectors. We will examine selected accident investigations performed by the National Transportation Safety Board (NTSB). Presentations will be scheduled during February and March. We will also address Crew/Cockpit Resource Management & automation
- 3: Cockpit design: Issues related to cockpit will be discussed.
- 4: Student Presentations: Each student will identify a topic of interest, write a paper on that topic and make a presentation to the class

**MISCELLANEOUS:**

## Field Trips:

Plan on one, perhaps two field trips, to WPAFB or other aviation related facilities. We will learn about human factors in advanced display development and some physiological measurement concerns. You will need to certify that you are a US Citizen, if you are NOT please tell me.

## Simulator Access:

Don Means or I will provide you with access to the simulator (RM 333B). Simulator times will need to be scheduled in advance, since the simulator area is also being used for a thesis related experiment. You are encouraged to participate in the thesis experiment.

**COURSE SCHEDULE, Spring 2000**  
(Subject to Change)

Date	TOPIC	Readings/ Assignments*
*****		
<b>PART 1: FLIGHT DYNAMICS/SIMULATION</b>		
Jan 5	Course Overview	
	Introduction to Flight and Human Factors	
	Entrance Exam	
Jan 10-19	Flight Dynamics	Preface, CH 1, CH 2, H1,H2
Jan 17	M.L.King Day (No class)	
Jan 22-26	Flight Dynamics (cont.) Simulators & Simulation	CH 17 CH 8, H15
Jan 26	<b>Paper topic due</b>	
Jan 31	<b>Exam # 1</b>	
*****		
<b>PART 2: ACCIDENTS</b>		
Jan 31, Feb 2,7,9	Introduction to accident investigations	
	System Safety	CH 3, H5, H26
	Human Error	Ch 9
		Readings
Feb 14-Mar 8	Sensation & Perception	CH 4, H6
Mar 13-17	Spring Break (No class)	
March 20 & 22	<b>NTSB presentations by students.</b>	CH 16
March 27,29 & April 3	Cockpit Resource Management	CH 7, H9
		Readings
April 3	<b>Exam # 2</b>	
	Automation	H7
*****		
<b>PART 3: Cockpit Design &amp; Paper Presentations</b>		
April 5,10 & 12	Cockpit Design	Notes, CH12,13,15
April 16 & 19	<b>Paper Presentations</b>	
April 26	Catch-up Class	
May 1	<b>Exam # 3</b>	

\* Dates are approximate, assignments are due on date assigned.  
Additional readings will be assigned.

## **ASSIGNMENTS:**

1. AIRCRAFT ACCIDENT AUTOPSY PRESENTATIONS:  
You will be assigned a NTSB report, which will be the basis for your presentation. Alternately, you can pick one from the NTSB web-site. The expected presentation format will be presented and demonstrated at the appropriate time during the course. You are to examine, integrate and present the human factors/ergonomics literature relevant to the accident.
2. SCHEDULING:  
Due 19 January:  
Dates and times when you would NOT be able to visit facilities at WPAFB between 0900 and 1430.
3. MINI-REPORTS: You will be assigned issues of "Aviation Week and Space Technology" for review. You are to select a significant human factors related article from the assigned issue for presentation in class. Identify the problem and describe/propose the solution. Minimum presentation time is 5 minutes; maximum presentation time is 10 minutes. Appropriate visuals are expected. Two presentations are expected. Provide me with a copy of the material you will cover one week prior to your presentation; see me if there are technical issues that need clarification.
4. PAPER AND PRESENTATION: You are to identify an area in which you are interested by January 24. The specific topic areas contained in the syllabus cannot be selected as a paper topic. Write a paragraph which identifies the topic and the specific issues you wish to learn about. We will meet shortly after that and schedule a time for the presentation, and discuss the contents. One week **prior** to your presentation, please provide me with a copy of the material you will present and two possible exam questions (essay format) and their answers based on your presentation. Your paper (APA format) and a copy are due on the day of your presentation.
5. SIMULATOR USE. I encourage you to learn about our flight simulator and will provide easy access. I would like you to learn how to fly an Instrument Landing System (ILS) approach. If you work at the task and introspect, you will learn about "how you learn" and what it means to develop a skill. We will discuss these topics in class. By next class (Jan 12) provide me with two one hour periods per week when you will be able to use the flight simulator. Pick an hour between 1 and 6 PM on Monday through Thurs. If you must cancel your appointment please call Don at 229-2175 or let me know, also send an email to the Psy 532 distribution list as a courtesy.

**Grading:**

Autopsy (copy to me)	
Presentation (copy to me)	100
Supporting reference materials	100
Paper	
Written	250
Presentation	100
Examinations	
#1	100
#2	100
#3	150
Mini Reports (2 at 50 Pts each)	100

**Conversions:**

A= 900+  
B= 800-899  
C= 750-799  
D= <750

**Policy:**

1. Honor Code applies. Submission of copied work is a violation and will result in a grade of zero for that exercise. Give credit where credit is due.
2. Knowledge of the assigned readings is presumed. I will assume that you have read and are prepared to discuss the assigned readings on the date assigned.
3. Assignments are due on the date assigned. Assignments received late lose 20 % of their value. Assignments which are late must be submitted within three days after they were due to receive ANY credit.
4. I will loan material to you, Failure to return the material to me prior to the last class will result in an incomplete until the material is returned.
5. Feedback: If something was not covered clearly in a class or a class related question occurs to you before the next class send an email to me or call me, and we will address the question in the next class.
6. Advise me of conflicts, problems, etc as soon as they arise. I assume all is well unless you tell me.