MEMO

From: Dr. Brooke Wheeler, Graduate Program Chair
Thru: Dr. Korhan Oyman, Dean
To: Dr. Mark Archambault, Chair, Undergraduate Curriculum Committee
Subject: Dual-Numbered Courses

15 April 2019

The College of Aeronautics is requesting approval for the following courses to be dual-numbered courses:

- AHF 5101 Human Factors in Man-Machine Systems to be dual-numbered with AHF 3104 Human-Machine Systems
- AHF 5201 Human Performance 1 to be dual-numbered with AHF 4301 Human Performance 1

This change is grounded in the course content being similar, and faculty that instruct these courses have agreed to enforce different course requirements for undergraduate and graduate students. The attached syllabi highlight the different requirements for undergraduate and graduate students. The syllabi include both an online and on-campus syllabus version for AHF 5101/AHF 3104 and AHF 5201/AHF 4301 because these courses are offered in both modes.

Please let me know if you have any questions or if you need me to furnish additional information.
### AHF 5101 and AHF 3104 Final Project Requirements for Graduate & Undergraduate Students

<table>
<thead>
<tr>
<th>Graduate</th>
<th>Undergraduate</th>
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<tbody>
<tr>
<td><strong>Background (40 point)</strong></td>
<td><strong>Background (40 point)</strong></td>
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<tr>
<td>- Clearly described system</td>
<td>- Clearly described system</td>
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<tr>
<td>- Effective system diagram</td>
<td>- Effective system diagram</td>
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<td>- HIP components</td>
<td>- HIP components</td>
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<tr>
<td><strong>Problem Space (50 points)</strong></td>
<td><strong>Problem Space (50 points)</strong></td>
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<td>- 2-3 problems clearly articulated</td>
<td>- 1-2 problems clearly articulated</td>
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<tr>
<td>- All tied to HF principles</td>
<td>- All tied to HF principles</td>
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<tr>
<td>- 8 references</td>
<td>- 5 references</td>
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<tr>
<td><strong>Solution (50 points)</strong></td>
<td><strong>Solution (50 points)</strong></td>
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<tr>
<td>- Well thought out solutions</td>
<td>- Well thought out solutions</td>
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<td>- Tied to problem space and HF issues</td>
<td>- Tied to problem space and HF issues</td>
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<td><strong>Impact (20 points)</strong></td>
<td><strong>Impact (20 points)</strong></td>
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<td>- Quantifiable impacts</td>
<td>- Quantifiable impacts</td>
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<td>- Support from lit</td>
<td>- Support from lit</td>
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<tr>
<td>- 6 references</td>
<td>- 3 references</td>
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<tr>
<td><strong>Evaluation (20 points)</strong></td>
<td><strong>Evaluation (20 points)</strong></td>
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<td>- Plan to effectively evaluate impact</td>
<td>- Plan to effectively evaluate impact</td>
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<td>- MOEs</td>
<td>- MOEs</td>
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<tr>
<td><strong>Formatting and Style (20 points)</strong></td>
<td><strong>Formatting and Style (20 points)</strong></td>
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<tr>
<td>- APA</td>
<td>- APA</td>
</tr>
<tr>
<td>- Articulate</td>
<td>- Articulate</td>
</tr>
<tr>
<td>- No more than 15 pages</td>
<td>- No more than 10 pages</td>
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AHF 5101: Human Factors in Man Machine Systems

Final Project Requirements

Your final project for this course will be to leverage the human factors principles and methods you will be learning in this course to redesign a man-machine system interface that you believe to have human factors limitations.

The first step is to select an interface on which to focus. Please select an interface which requires significant interaction by a human and which has human factors limitations which need to be addressed. Selecting an interface at the right "level" is key. An airplane cockpit is too complex, whereas a single control is too simple. Interfaces such as those associated with onboard vehicle systems or smart phone apps are probably of adequate scope. I encourage you to choose an interface relevant to your current occupation or field of study and one with which you are very familiar or to which you have access. You will need to select an interface that is different from that used in your homework assignments. All interface selections must be approved by the instructor.

Once the interface has been selected, you will perform the activities necessary to develop a paper in the APA style format. This should be a paper in prose form, not bullet form answers like your homework assignments. The paper should be no more than 15 pages, double-spaced. The required paper sections are detailed below. I have included approximate page numbers, per section, as a guideline.

Required Paper Sections:

1. **Introduction (1/2-1 page):** Introduce the material to be covered in the paper. (Consider writing this section and the conclusion after the other sections have been developed as they should reflect what is going to be covered in the paper).

2. **Background (2-3 pages):** Describe the selected interface, including the following:
   a. Describe the performance goals, components, inputs and outputs (focus on the human interaction)
   b. Develop a system diagram which illustrates components, inputs, outputs. Feel free to also include system photos.
   c. Select a use case task involving interaction with the interface; describe the system interaction (including task goals, information processing requirements, and interaction requirements)
   d. Describe how the interface supports each of the following human information processing components: Perception, Attention, Memory, Decision Making

3. **Problem Space (2-3 pages):** Define the problem space by describing the human factors issues/problems associated with the interface. This should be a detailed discussion which leverages human factors concepts and methods presented in class. The discussion should present the problem and a discussion of why it is a problem, including several citations (at least 2-3 citations per issue/problem; a minimum of 8 references total in this section) from academic publications which have shown the issues lead to problems (e.g., performance problems, errors,
etc.). Consider the following topics and whether or not the design supports these principles/types of performance (pick those most relevant; it is not necessary to address all items). Feel free to address topics not included on the below list.

a. Three HSI design principles
b. Stress, Workload
c. Concurrent Task Performance/Multitasking and Multiple Resource Theory
d. Team Performance Competencies (e.g., Mutual Performance Monitoring, Backup Behavior, Closed Loop Communications, etc.)
e. Potential for errors (slip, lapse, mistake, HFACS categories)
f. Clutter, Extensive Menu Navigation
g. Sensory/Attentional/Cognitive/Memory Overload
h. Vigilance Decrement
i. Limited Situation Awareness
j. Mode Awareness/Errors
k. Missed signals/False Alarms
l. Cognitive Tunneling
m. Disorientation
n. Observability/directability
o. Reliance and trust

4. Solution (2-3 pages): Develop redesign recommendations and mitigation strategies for addressing the above identified issues. Where possible, aim for the gold standard in which you recommend issues being designed out. Specifically describe how the issues can be designed out. Also consider recommending specific mitigation strategies related to implementation of procedural controls and training. DO NOT just recommend “training” or “a procedure”. Detail specifically what should be included in the procedure or training and how it should be implemented.

5. Potential Impact (1-2 pages): Present a discussion of the potential performance improvements and error reductions associated with implementation of recommendations. Provide theoretical or empirical support for these potential impacts, including citations (at least 2-3 per recommendation, a minimum of 6 citations total for this section) from academic publications which found that similar methods led to desired effects). Also present a discussion of the feasibility of implementing the recommendations such as budget and schedule impacts.

6. Evaluation (1-2 pages): Develop a high level plan for assessing the potential impacts of the recommendations if implemented. Include Measures of Effectiveness (MOEs) and high level procedures for the conditions under which these measures could be obtained.

7. Conclusion (1/2-1 page): Conclude the paper.

All written assignments will be submitted via a Turn It In dropbox to check for plagiarism. If the paper has more than a 10% similarity index, you will have to revise and resubmit the assignment for possible credit. Assignments that have a similarity index over 20% will receive a 0.
Please reach out to me for assistance on this assignment. I am here to help. This is theoretically an exercise you may need to perform in your future careers and my goal is for you to leave this class fully able to do it well. If you have any questions, please do not hesitate to email me.
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**Required Paper Sections:**

1. **Introduction (1/2-1 page):** Introduce the material to be covered in the paper. (Consider writing this section and the conclusion after the other sections have been developed as they should reflect what is going to be covered in the paper).

2. **Background (2 pages):** Describe the selected interface, including the following:
   a. Describe the performance goals, components, inputs and outputs (focus on the human interaction)
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Florida Institute of Technology  
College of Aeronautics  
AHF 5201 & AHF 4301 Human Performance 1 (on-campus course)  
Spring 2019

Instructor:  
Dr. Deborah Carstens, College of Aeronautics, Skurla 205C

Catalog Course Descriptions (3-credit hours):  


Instructor Course Description:  
This course introduces the field of engineering psychology and human performance to graduate level students. This course presents and analyzes human factors and human performance issues in general applications, however the emphasis will be on the aviation industry and aircraft systems. Some topics to be covered include, but are not limited to, attention and perception, displays, real vs. virtual environments, language and communications, memory, training, decision making, workload, stress, and human error.

Course-Level Student Learning Objectives or Outcomes (SLOs):  
Students completing this course should be able to:
• Define Engineering Psychology and Human Performance  
• Explain the role Engineering Psychology and Human Performance has in the design of systems  
• Understand key concepts used in Engineering Psychology and Human Performance  
• Evaluate everyday challenges in aviation against Engineering Psychology and Human Performance concepts  
• Apply Engineering Psychology and Human Performance principles to improving aircraft design  
• Apply Engineering Psychology and Human Performance principles to improving pilot safety  
• Analyze pilot performance using Psychology and Human Performance principles  
• Write an aviation research paper using Engineering Psychology and Human Performance principles

SLO Assessment:  
The SLOs are to assess and grade students.

Textbook and References:  

Companion Web site: http://wps.ablongman.com/ab_msl_wickens_engineeringpsych_4/

Learning Management System:  
Other course material will be available through Canvas. Students are also expected to check Canvas weekly for up-to-date information about this class and class material.

Tentative Course Schedule (any modifications to the syllabus will be posted on Canvas):  
All reading assignments should be read BEFORE performing the chapter assignment.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 8(^{th}) &amp; 10(^{th})</td>
<td>Introduction to Engineering Psychology and Human Performance</td>
<td>1</td>
</tr>
<tr>
<td>January 11(^{th})</td>
<td>Last day to register or add a class</td>
<td></td>
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<tr>
<td>January 15(^{th}) &amp; 17(^{th})</td>
<td>Class Project Introduction, Teams &amp; Topics Established</td>
<td></td>
</tr>
<tr>
<td>January 18(^{th})</td>
<td>Last day to drop a class with full tuition refund and without receiving a grade of W</td>
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<tr>
<td>January 22(^{nd}) &amp; 24(^{th})</td>
<td>Signal Detection, Information Theory and Absolute Judgment</td>
<td>2</td>
</tr>
<tr>
<td>January 29(^{th}) &amp; January 31(^{st})</td>
<td>Attention in Perception and Display Space</td>
<td>3</td>
</tr>
<tr>
<td>February 5(^{th}) &amp; 7(^{th})</td>
<td>Spatial Displays</td>
<td>4</td>
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<tr>
<td>February 12(^{th})</td>
<td>Midterm</td>
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<tr>
<td>February 14(^{th})</td>
<td>Project Lab</td>
<td></td>
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<tr>
<td>February 19(^{th}) &amp; 21(^{st})</td>
<td>Spatial Cognition, Navigation and Manual Control</td>
<td>5</td>
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<tr>
<td>February 26(^{th})</td>
<td>Project Literature Review Presentations</td>
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<td>February 28(^{th})</td>
<td>Project Lab</td>
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<td>March 4(^{th}) – 8(^{th})</td>
<td>Spring Break</td>
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<tr>
<td>March 12(^{th}) &amp; 14(^{th})</td>
<td>Ethnographic Studies Lab Language and Communications</td>
<td>6</td>
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<tr>
<td>March 19(^{th}) &amp; 21(^{st})</td>
<td>Usability Testing Lab Memory and Training</td>
<td>7</td>
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<td>March 22(^{nd})</td>
<td>Last day to withdraw from a course with a final grade of W</td>
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<td>Date</td>
<td>Topic</td>
<td>Points</td>
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<tr>
<td>March 26&lt;sup&gt;th&lt;/sup&gt; &amp; 28&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Project</td>
<td></td>
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<tr>
<td>April 2&lt;sup&gt;nd&lt;/sup&gt; &amp; 4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Multitasking</td>
<td>10</td>
</tr>
<tr>
<td>April 9&lt;sup&gt;th&lt;/sup&gt; &amp; 11&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Automation</td>
<td>12</td>
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<tr>
<td>April 16&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Project Management</td>
<td></td>
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<tr>
<td>April 18&lt;sup&gt;th&lt;/sup&gt; &amp; 23&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>Research Project Paper due April 18&lt;sup&gt;th&lt;/sup&gt;.</td>
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<td></td>
<td>Presentations due April 18&lt;sup&gt;th&lt;/sup&gt; and 23&lt;sup&gt;rd&lt;/sup&gt;</td>
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<td>April 25&lt;sup&gt;th&lt;/sup&gt; &amp; 26&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Study Days – No Class</td>
<td></td>
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<tr>
<td>April 29&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Final Exam</td>
<td>5, 6, 7, 10, 12</td>
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<td>3:30 p.m. – 5:30 p.m.</td>
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**Grading Criteria:**
Assignments, exams, and the project will be graded on a point basis. The total points earned for the semester will then be totaled and the grade assigned according to the following scale:
A 90 – 100%
B 80 – 89%
C 70 – 79%
D 60 – 69%
F below 60%

**Research Paper = 250 points (25%)**
Research Presentation = 100 points (10%)
Midterm = 250 points (25%)
Final = 250 points (25%)
Labs/Assignments = 150 points (15%)
Total Points = 1000 points or 100%

**Note: There are different requirements for an undergraduate and graduate research project as defined in the Research Project section.**

**University and College Classroom Policies Summarized for Reference:**
[University academic honesty standards](#) will be strictly enforced. Incidents shall be treated in accordance with university policy as outlined in the [Student Handbook](#). For a review of plagiarism, see this [FIT Library website](#).

**What is Title IX?:** Title IX of the Educational Amendments Act of 1972 is the federal law prohibiting discrimination based on sex under any education program and/or activity operated by an institution receiving and/or benefiting from federal financial assistance. Behaviors that can be considered “sexual discrimination” include sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct, and gender discrimination. You are encouraged to report these behaviors. Reporting: Florida Tech can better
support students in trouble if we know about what is happening. Reporting also helps us to identify patterns that might arise – for example, if more than one complainant reports having been assaulted or harassed by the same individual. Florida Tech is committed to providing a safe and positive learning experience. To report a violation of sexual misconduct or gender discrimination, please contact Security at 321-674-8111. *Please note that as your professor, I am required to report any incidences to Security or to the Title IX Coordinator (321-674-8700). Confidential support for students is available by contacting the Student Counseling Center at 321-674-8050.

**Academic Accommodations:** Florida Tech is committed to equal opportunity for persons with disabilities in the participation of activities operated/sponsored by the university. Therefore, students with documented disabilities are entitled to reasonable educational accommodations. The Office of Disability Services (ODS) supports students by assisting with accommodations, providing recommended interventions, and engaging in case management services. It is the student’s responsibility to make a request to ODS before any accommodations can be approved/implemented. Also, students with approved accommodations are encouraged to speak with the course instructor to discuss any arrangements and/or concerns relating to their accommodations for the class. Office of Disability Services (ODS): Telephone: 321-674-8285 / Email: disabilityservices@fit.edu Website: www.fit.edu/disability

**Teaching Methods:**

**Course Requirements:**
If you do not understand the course material, please schedule time to meet with me in person or by phone as I’m here to help you succeed in understanding the material. The format to the course is primarily that of lectures, assignments, a research project with a presentation and paper component, and exams.

**Tests/Exam:**
There will be two exams each covering approximately half of the course material.

**Lab Exercises/Assignments:**
Lab exercises will periodically be assigned during class and homework assignments will periodically be assigned that will be performed outside of class.

**Research Project:**
The research project will consist of a topic of your choice in the area of Aviation that has been approved in advance by your instructor. A rubric will be posted in Canvas as a guideline for the research paper and presentation. Students will evaluate their team members and grades will be adjusted for team members that do not perform a fair share of the workload so that the project grade for each student reflects the effort put forth by each team member.

**Specific Undergraduate Research Project Requirements:**
Undergraduates will be responsible as a team member for the research project. Undergraduate students will give a presentation for the literature review assignment.

**Specific Graduate Research Project Requirements:**
Graduates will be responsible as a team member for the research project. Graduate students will give a presentation and submit a paper for the literature review assignment.

**Late/Missed Assignments:**
Late assignments are any assignments turned in by students after the due date. Late assignments will only be accepted for one week after the assignment due date. All late assignments will receive a 30%
grade reduction (e.g., if you get a 100/A on the assignment, your grade will be a 70/C). As for missed in-class labs, students not present will receive a grade of zero. Only if a student missed the lab due to an excused absence will it be allowed to be submitted for a grade. Examples of an excused absence is an athlete missing class for a game or a student with a doctor note.

**Assigned Readings:**
These are noted in the tentative class schedule. Class discussion is more interesting when students come prepared.

**Absences/Tardy:**
Eight or more times a student has any combination of being late or absent will result in automatic failure in the course. A student’s overall grade will be greatly reduced if there isn’t equal participation on the class team project. There is no extra-credit to alter end of the term grades so please attend class and participate in the course assignments and project.

**Incomplete (I) Grades:**
Incomplete (I) grades should only be awarded under unusual circumstances and must be approved by the Associate Dean. If a student misses a final or fails to complete an assignment and does not have a valid reason, a zero grade should be awarded and the overall grade based on that grade combined with all other course work completed. If an “I” grade is awarded for the fall semester, all make-up work must be completed no later than the sixth week of the spring semester.