AVT 116: Aircraft and Powerplant Instruments
Southern Illinois University
Spring, 2016 Syllabus

Instructor Information

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Days: Lecture T, R 10:00 – 10:50
Lab: Section 1 F, 10:00 – 11:50
Section 2 M, 10:00 – 11:50
Section 3 W, 10:00 – 11:50
Location: Lecture TEC 182
Lab AVIA 127

Course Information

Office Hours: T; R 1:00 - 2:50, M; F 2:00 – 2:50
Room 246B TEC

Course Description

Upon completion of this course students will have a knowledge of the operations, installation, marking and interpretation of synchro and servo systems for aircraft and powerplant instruments. They will be able to install, adjust and calibrate these instruments in accordance with FAA and manufacturers’ recommendations.

Specific Student Learning Objectives

The specific learning objectives are designed to fulfill the course objectives and the requirements prescribed by the Federal Aviation Administration. Upon Completion of this course the student shall

Have an understanding of aircraft instrument systems including the following:

Heading Indication, Speed Indication, Altitude Indication, Gyro Instrument systems,
Temperature indication, Liquid quantity indication, Electronic flight instrument systems and
Component position indication

Have an understanding of instrument system maintenance including the following:
Instrument removal, Instrument installation, Heading indication instrument inspection, check, service, troubleshooting and repair, Speed indication instrument inspection, check, service, troubleshooting and repair, Altitude indication inspection, check, service,
troubleshooting and repair, Pressure system inspection, check, service, troubleshooting and repair, Position indicating system inspection, check, service, troubleshooting and repair; including the use of built-in test equipment, Temperature system inspection, check, service troubleshooting and repair and Electronic flight instrument inspection, check, service, troubleshooting and repair

Have an understanding of powerplant instrument system including the following:

Temperature indication, R.P.M. indication, Manifold pressure indication, Engine pressure ratio indication, Torque meter and Fuel Flow indicator system

Required Text

Attendance Policy
A. Attendance is mandatory. As an approved part 147 A & P program each student is required to complete a defined number or hours to qualify for the written exams. The combined lecture and laboratory hours have been established to meet these requirements. In accordance with FAA requirement attendance must be documented for each student. Therefore, attendance will be taken at every scheduled lecture and lab. Whenever possible the student should notify the instructor in advance of an absence. It is also the student’s responsibility to obtain all hand-outs provided during the missed session.

B. Make-up of Missed Classes

The student will be given an opportunity to make-up any missed lecture or lab during the semester. This make-up is only applied to the final attendance reported to the FAA as meeting the hour requirements necessary to qualify for the FAA written exam. The student is also responsible for arranging with the instructor a make-up session.

Missed lectures can be made-up by writing a one page paper (typed, double-spaced with 12 point font) on the subject material covered during the absence. Missed lab periods must be made up with the instructor present while the student either works on specific lab projects or other tasks assigned by the instructor. All lab make-up must be arranged in advance with the instructor and will be accomplished during one of the other section lab periods or during the office hours listed at the top of this document.

C. Both lecture and lab periods will start promptly on the scheduled times. Students arriving late to a lecture or lab will be responsible for the material missed. Any student arriving more than 10 minutes after the scheduled start of a lecture or lab
will be counted as unexcused absent for course grade penalties. Three tardies of less than 10 minutes will also count as an unexcused absence.

D. **Excused absence**

The student should make every effort to attend each scheduled session. However sometimes events outside of the students control will result in a missed class. For example (Emergency room visits, death in the family, military duty, etc.) Whenever possible the student should notify the instructor in advance of the absence. The student is required to provide the instructor with proof of reason for the absence and the instructor will make the final determination whether it is excused. All excused absence that is made up within ten calendar days of the return to class or prior to the last day of scheduled class, whichever is the shorter, will not result in grade penalties. Excused absence not made-up within the time frame defined above will be assessed an absence penalty.

E. **Unexcused Absence**

Unexcused absence regardless of make-up time and excused absence not made-up with ten calendar days will result in a penalty assessed to the final grade as follows:

1) First absence = 1% point reduction
2) Second absence = 2% point reduction
3) Third absence = 4% point reduction
4) Fourth absence = 8% point reduction
5) Fifth absence = 16% point reduction

Five or more absence resulting in a penalty will result in a failing grade for the class. The penalties are assessed for either lecture or lab session. For example (first absence is a Lab, the student will be assessed 1% point penalty, the student then misses a Lecture session and is assessed an additional 2% penalty. The total penalty applied to the final grade is 3% points). **Five penalized absences will result in 31 percentage point deduction from final course grade.**

F. Any Student that has 5 or more attendance penalties will receive a failing grade for the course. Attendance penalties will be assessed for the following:

a. Excused absence not made-up within the time frame defined above
b. Unexcused absence regardless of make-up time period
c. Tardy by 10 minutes or more
d. Three (3) Tardy less than 10

G. Absence not made-up sessions will result in equivalent hour reduction toward FAA experience hour requirements. All full hour absence can be made-up to prevent FAA experience hour reductions. The student is responsible to schedule
the make-up session with the instructor. Make-up sessions must be completed by the Friday prior to the beginning of finals week.

**Grading Policy**

**A. Lecture** Grades for lectures will be determined by in-class quizzes and tests. All tests will be closed book and include topics covered during the lecture period. Quizzes will be open book.

**B. Lab** The lab grade will be based on performance of specific assignments that demonstrate the ability to apply information covered in this course. Each lab project must receive a passing grade to count as fulfillment of FAA curriculum. Lab projects will be given a pass or fail grade. The grade will be based on an oral evaluation conducted during the lab periods. A subjective evaluation by the instructor will be used to determine the lab grade. Each project will have defined requirements that will have an oral evaluation and/or a practical demonstration that must be passed before moving on to the next project or action. All lab projects will be given due dates. Adherence to the due dates will be part of the subjective evaluation.

**C. Final exam** The final exam will be a written exam that covers all material in both the lecture and lab sessions. The exam will be closed book.

**D. Final Course Grade** The final grade will be a composite of Lecture, Lab and Final Exam. Each will be worth approximately 1/3 of the final course grade. Attendance adjustments defined above will be applied to the final course grade respectively.

**E. Grading scale** The grade scale is as follows:

- A = 90% or higher
- B = 80% to 89.94
- C = 70% to 79.94
- D = 60% to 69.94
- F = Less than 60%

The FAA requires a minimum of 70% for all classes. Therefore a final course grade of less than 70% will not receive FAA credit for this course

**Coursework**

**Lecture** The lecture assignment will consist of reading from the course text and handouts provided during the lectures. The following is a schedule of lecture topics and reading assignment;
1/19  WK1  Lecture 1  Introduction to Aircraft and Powerplant Instruments
1/21  Wk1  Lecture 2  Pressure measuring
       Text A&P Technician Airframe Pg 11-2 through 11-6
1/26  WK2  Lecture 3  Altitude Indicators
       Text A&P Technician Airframe Pg 11-6 through 11-9
1/28  WK2  Lecture 4  Airspeed Indicators
       Text A&P Technician Airframe Pg 11-9 through 11-12
2/2   WK3  Lecture 5  Temperature Measuring
       Text A&P Technician Airframe Pg 11-12 through 11-15
2/4   WK3  Lecture 6  Mechanical Movement
       Text A&P Technician Airframe Pg 11-15 through 11-17
       Review for Test 1
2/9   Wk4  Lecture 7  Test 1
2/11  Wk4  Lecture 8  Test 1 Discussion
2/16  WK5  Lecture 9  Heading and Altitude
       Text A&P Technician Airframe Pg 11-18 through 11-21
2/18  WK5  Lecture 10 Direction indicating 1
       Text A&P Technician Airframe Pg 11-21 through 11-26
2/23  WK6  Lecture 11 Direction indicating 2
       Text A&P Technician Airframe Pg 11-21 through 11-26
2/25  WK6  Lecture 12 Instrument Pneumatic
       Text A&P Technician Airframe Pg 11-26 through 11-29
3/1   WK7  Lecture 13 Instrument System Servicing; Positive Pressure
       Systems; Pitot-static Systems
       Text A&P Technician Airframe Pg 11-30 through 11-33
3/3   WK7  Lecture 14 Fuel Quantity Indicating
       Text A&P Technician Airframe Pg 11-33 through 11-35
3/8   WK8  Lecture 15 Test 2 Review
3/10  WK 8  Lecture 16  Test 2
3/15  WK 9  Lecture 17  Spring Break
3/17  WK 9  Lecture 18  Spring Break
3/22  WK 10 Lecture 19  Test 2 Discussion, Fuel System Monitoring
       Text A&P Technician Airframe Pg 11-35
3/24  Wk 10 Lecture 20  Electronic Instruments 1
       Text A&P Technician Airframe Pg 11-35 through11-43
3/29  WK 11 Lecture 21  Electronic Instruments 2
       Text A&P Technician Airframe Pg 11-35 through11-43
3/31  WK 11 Lecture 22  Electronic Instruments 3
       Text A&P Technician Airframe Pg 11-35 through11-43
4/5   WK 12 Lecture 23  Instrument system installation and maintenance
       Text A&P Technician Airframe Pg 11-26 through11-49
4/7   WK 12 Lecture 24  Instrument system installation and maintenance
       Test 2
       Text A&P Technician Airframe Pg 11-26 through11-49
4/12  WK 13 Lecture 25  Review for Test 3
       Text A&P Technician Airframe Pg 11-35 through11-49
4/14  WK 13 Lecture 26  Test 3
4/19  WK 13 Lecture 27  Test 3 Discussion, Reciprocating engine instruments
       Text A&P Technician Powerplant Pg 2-2 through2-12
4/21  WK 14 Lecture 29  Reciprocating engine instruments 2
       Text A&P Technician Powerplant Pg 2-2 through 2-12
4/26  WK 14 Lecture 30  Turbine engine instruments
       Text A&P Technician Powerplant Pg 4-2 through 4-5
4/28  WK 15 Lecture 31  Review Test 4
       Text A&P Technician Powerplant Pg 4-2 through 4-5
5/3   WK 15 Lecture 32  Test 4
       Text A&P Technician Airframe Pg 11-50 through11-57
       Text A&P Technician Powerplant Pg 2-2 through2-12
Lab The lab work will be assessed by instructor review and evaluations of the following:

A. Project Worksheets Each student will be given a worksheet outlining the specific project to be completed. The worksheet includes both question section and hands-on tasks to be completed. The student is responsible for completing the worksheet and turning it into the instructor for evaluation.

B. Subjective Instructor Evaluation: The student will be evaluated based on oral examinations related to the project worksheet discussed above. It is important that each student is prepared to discuss and demonstrate specific actions from the worksheets. Most Oral reviews of the projects will be done as a group and all members of the group are expected to participate in the oral review.

University Policies

A. Academic Integrity: You are expected to submit your original work and adhere to the academic policies as stated in the SIU Student Conduct Code: [http://srr.siu.edu/student_conduct_code/](http://srr.siu.edu/student_conduct_code/). Any act of academic dishonesty, cheating or plagiarism in any form, including anonymous internet sources used in student papers, will be reported. These acts are taken seriously and the consequences may range from failing an assignment to expulsion from the university.

B. SIU Email: Your SIU email account is an official form of University communications. Your instructor will use SIU email as a primary means of electronic communications with our students. Please make sure that you maintain a valid password and acquire the habit of regularly checking your SIU email account for important instructor and University announcements. You may view the official SIU student Email policy at: [http://policies.siu.edu/ownership_link/email_ownership.html](http://policies.siu.edu/ownership_link/email_ownership.html)

C. Statement of Inclusive Excellence SIU contains people from all walks of life, from many different cultures and sub-cultures and representing all strata of society, nationalities, ethnicities, lifestyles and affiliations. Learning from and
working with people who differ from you is an important part of your education in this class, as well as an essential preparation for any career.

D. Emergency Procedures  SIU is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with SIU Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT’S website at http://bert.siu.edu the SIU Department of Public Safety’s web site http://dps.siu.edu (disaster drop down and video, “Shots Fired”) and in the Emergency Response Guideline pamphlet. Know how to respond to each type of emergency. Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

Student Services

A. Learning Support Services. The Center for Learning Support Services (CLSS) assists students of all cultures, abilities, backgrounds and identities with enhancing their self-management and interdependent learning skills. Programs offered by CLSS include; group study sessions; math tutoring; academic coaching; early intervention programs; and study skills seminars. For additional information please contact CLSS in Morris Library or visit the web site http://tutoring.siu.edu

B. Writing Center  The writing center offers free tutoring services and assistance with improving writing skills to all SIU undergraduate and graduate students and faculty. For center locations and hours, to schedule an appointment online, and to view information regarding the online Writing Lab (OWL) contact the Writing Center at https://write.siu.edu

C. Saluki Cares The purpose of Saluki Cares is to develop, facilitate and coordinate a university-wide program of care and support for students in any type of distress- physical, emotional, financial or personal. By working closely with faculty, staff, students and their families, SIU will continue to display a culture of care and demonstrate to our students and their families that they are an important part of the community. To make a referral to Saluki Cares click call or send http://salukicares.siu.edu ; (618) 453-5714 or siucares@siu.edu