1. **COURSE TITLE\*: Aircraft Communications and Instruments**
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*: AVIT 1203**
3. **PREREQUISITE(S)\*: COREQUISITE(S)\*:**
4. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*: 3 LECTURE HOURS\*: 2**

 **LABORATORY HOURS\*:1 (3.5 contact hrs) OBSERVATION HOURS\*:0**

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

This course will introduce the student to aircraft instrumentation, communication radios, navigation equipment, and position/warning systems. The students will understand how to inspect, check, troubleshoot, and service aircraft flight instrumentations systems both mechanical and electronic. Students will investigate VHF and HF communication radios, navigation equipment, and GPS used on today’s aircraft. In lab students will remove and install flight instrument radio equipment and perform pitot-static system leak checks. Students will test and service stall warning, gear warming, and anti-skid brake systems. Automatic Dependent Surveillance-Broadcast (ADS-B) theory, components, and operation

1. **LEARNING OUTCOMES\*:**

Students will gain knowledge of the following:

1. Radio operating principles
2. Antenna, static discharge wicks, and avionics identification, inspection, and mounting requirements
3. Interphone and intercom systems
4. Very high frequency (VHF), high frequency (HF), and SATCOM systems
5. Aircraft Communication Addressing and Reporting System (ACARS) theory, components, and operation
6. Emergency locator transmitter (ELT)
7. Automatic direction finder (ADF)
8. VHF omnidirectional range (VOR) theory, components, and operation
9. Distance measuring equipment (DME) theory, components, and operation
10. Instrument landing system (ILS) theory, components, and operation
11. Global positioning system (GPS) theory, components, and operation
12. Traffic collision avoidance system (TCAS), theory, components, and operation
13. Weather radar
14. Ground proximity warning system (GPWS) theory, components, and operation
15. Autopilot theory, components, and operation
16. Auto-throttle theory, components, and operation
17. Stability augmentation systems (SAS) (Rotorcraft)
18. Radio altimeter (RA) theory, components, and operation
19. Automatic Dependent Surveillance-Broadcast (ADS-B) theory, components, and operation
20. Transponder/encoder system
21. **ADOPTED TEXT(S)\*:**

FAA-H-8083-31A (Airframe Vol 1&2)

 Aviation Maintenance Technician Handbook 43.13-1B

<https://www.faa.gov/sites/faa.gov/files/regulations_policies/handbooks_manuals/aviation/amt_airframe_hb_vol_1.pdf>

<https://www.faa.gov/handbooksmanuals/aviation/aviation-maintenance-technician-handbook-airframe-volume-2>

<https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_43.13-1B_w-chg1.pdf>

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***
2. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: 0 – 59

Grades of 69 and below will not meet the requirements of the FAA for Mechanic

Certificate.

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

Test count – 40% of Final Grade

 Quizzes count – 10% of Final Grade

 Lab Grade counts – 50% of Final Grade

Class and lab attendance will be graded, two points will be deducted from the grade for each day missed. Quizzes cannot be made up. No test can be taken late without prior approval of the instructor.

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

May included but not limited to lecture and problems solving, group and lab projects, in-class and home assignments, quizzes and tests. Lab project will be individual and group. Attendance to class and lab is required.

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning outcomes tied to assignments / topics.)***

**Below is an example of how you might fill-in the course outline of classwork, assignments, tests, et al…**

|  |  |  |
| --- | --- | --- |
| **WEEK** | **DESCRIPTION** | **LEARNING OUTCOMES #** |
| WEEK 1 | Principles of pressure measurement, pressure-measuring instruments, absolute pressure, gauge pressure, differential pressure, manifold pressure gauge, pressure switches, altimeters | 18 |
| WEEK 2 | Airspeed indicators, machmeter, temperature-measuring instruments, nonelectrical temperature instruments, electrical temperature indicators | 16 |
| WEEK 3 | Mechanical movement measurement, gyroscopic instruments, direction-indicating instruments, magnetic compass | 8, 20 |
| WEEK 4 | Instrument pneumatic systems, venturl systems, vacuum pump systems, instrument system servicing, positive pressure systems, pitot-static system, static system testing | 17 |
| WEEK 5 | Quiz 1Fuel quantity indicating systems, mechanical indicators, direct current electrical indicators, capacitance fuel quantity systems, fuel system monitoring instruments, fuel pressure indicators, electronic instruments, EFIS, EADI, EHSI, ECAM, EICAS, auxiliary instruments | 5 |
| WEEK 6 | Instrument system installation and maintenance practices, panel layout, equipment and instrument mounting, range markings, compass swing, pitot-static system test | 2, 3 |
| WEEK 7 | Avionics that use radio waves, radio operating principles, basic radio components, antennas. | 1, 2 |
| WEEK 8 | Speakers and microphones, communications radios, intercom and interphone systems, SATCOM, SELCAL, navigational systems, VOR equipment check for IFR operations | 3, 4 |
| WEEK 9 | Test 1Distance measuring equipment (DME), area navigation, inertial navigation system, global positioning system (GPS), transponders, instrument landing system (ILS) | 9, 11 |
| WEEK 10 | Emergency locator transmitters (ELT), cockpit voice recorders and flight data recorders, radar altimeter, ground proximity warning system (GPWS), weather radar, Stormscope, TCAS -airborne collision avoidance system, types of antennas | 6, 12 |
| WEEK 11 | Autopilots and flight directors, types of autopilots, basic autopilot operation, autopilot components, flight management system (FMS)Thrust management computer (TMC), control wheel steering (CWS), flight director, autopilot maintenance | 7, 15, 16 |
| WEEK 12 | Installation and maintenance of avionics, cleaning of electronic equipment, switches and circuit breakers, bonding and shielding, static dischargers, installation methods, antenna installations | 2 |
| WEEK 13 | Antiskid brake control systems, antiskid system components, antiskid system test, antiskid system maintenance | 10 |
| WEEK 14 | Indicating and warning systems, stall warning indicator, angle-of-attack indicators, remote position indicating systems, configuration warning systems, mach airspeed warning systems, GPWS, EICAS | 13, 14 |
| WEEK 15 | Automatic Dependent Surveillance-Broadcast (ADS-B) theory, components, and operation | 19 |
| WEEK 16 | Final Exam |  |

* + Principles of pressure measurement, pressure-measuring instruments, absolute pressure, gauge pressure, differential pressure, manifold pressure gauge, pressure switches, altimeters
	+ Airspeed indicators, machmeter, temperature-measuring instruments, nonelectrical temperature instruments, electrical temperature indicators
	+ Mechanical movement measurement, gyroscopic instruments, direction-indicating instruments, magnetic compass
	+ Instrument pneumatic systems, venturl systems, vacuum pump systems, instrument system servicing, positive pressure systems, pitot-static system, static system testing
		- Quiz 1
	+ Fuel quantity indicating systems, mechanical indicators, direct current electrical indicators, capacitance fuel quantity systems, fuel system monitoring instruments, fuel pressure indicators, electronic instruments, EFIS, EADI, EHSI, ECAM, EICAS, auxiliary instruments
	+ Instrument system installation and maintenance practices, panel layout, equipment and instrument mounting, range markings, compass swing, pitot-static system test
	+ Avionics that use radio waves, radio operating principles, basic radio components, antennas.
	+ Speakers and microphones, communications radios, intercom and interphone systems, SATCOM, SELCAL, navigational systems, VOR equipment check for IFR operations
		- Test 1
	+ Distance measuring equipment (DME), area navigation, inertial navigation system, global positioning system (GPS), transponders, instrument landing system (ILS)
	+ Emergency locator transmitters (ELT), cockpit voice recorders and flight data recorders, radar altimeter, ground proximity warning system (GPWS), weather radar, Stormscope, TCAS -airborne collision avoidance system, types of antennas
	+ Autopilots and flight directors, types of autopilots, basic autopilot operation, autopilot components, flight management system (FMS)
	+ Thrust management computer (TMC), control wheel steering (CWS), flight director, autopilot maintenance
	+ Installation and maintenance of avionics, cleaning of electronic equipment, switches and circuit breakers, bonding and shielding, static dischargers, installation methods, antenna installations
	+ Antiskid brake control systems, antiskid system components, antiskid system test, antiskid system maintenance
	+ Indicating and warning systems, stall warning indicator, angle-of-attack indicators, remote position indicating systems, configuration warning systems, mach airspeed warning systems, GPWS, EICAS
	+ Automatic Dependent Surveillance-Broadcast (ADS-B) theory, components, and operation
	+ Final exam
1. **SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

Class and lab attendance will be graded. Quizzes cannot be made up. No test can be taken late without prior approval of the instructor.

**16. FERPA:\***

Students need to understand that their work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17. ACCOMMODATIONS: \***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431, X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.