

San José State University
Department of Aviation and Technology
AVIA 62, Instrument Flight Techniques, Fall 2017

Course and Contact Information

Instructor:	Dr. Tyler Spence
Office Location:	IS 102
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Email:	tyler.spence@sjsu.edu
Office Hours:	M – 3:00 PM to 4:00 PM T – 11:00 AM to 12:00 PM, or other times by appointment
Class Days/Time:	AVIA 62-01 (46719) (Lecture): M 9:00 – 10:45 AM AVIA 62-11 (46720) (Lab): M 12:00 – 14:45 PM
Classroom:	IS 133 (both Lecture and Lab)
Prerequisites:	AVIA 2

Course Format

Course materials such as syllabus, handouts, lecture slides, assignment instructions, etc. can be found on [Canvas Learning Management System course login website](https://sjsu.instructure.com/) (<https://sjsu.instructure.com/>). Reference materials for studying are available for free online, and constant review of such material is highly recommended. This makes the use of a laptop or other readily available computer essential. Labs and exams may require the use of an E6B computer, a current Low-Altitude En Route Chart, and a current set of approach plates and terminal procedures (see required material section). Short online courses and activities may also be required for earning extra-credit.

Technology Intensive Course

This course requires the use of advanced simulator technology and computer systems throughout the semester. All basic equipment necessary to operate the training devices and simulators will be provided. The simulators range in complexity from stationary training devices for specific tasks to a full-motion RedBird Simulator. Users of the full-motion simulator may experience discomfort or disorientation at certain times. **Sam Shaw** (samshaw@gmail.com) will be the Teaching and Lab Assistant for the course. He will be available to address any issues with the simulators or questions regarding the missions. He will also be available for extra **scheduled** simulator sessions.

Course Description

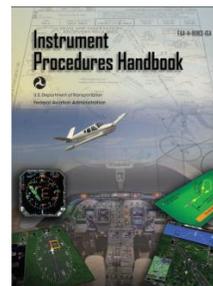
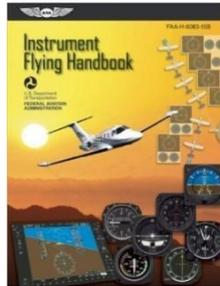
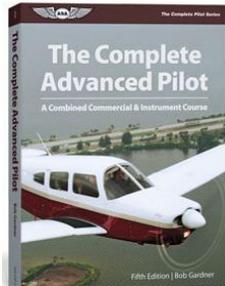
Flight procedures; radio navigation; air traffic control; use of instrument charts; flight simulator exercises on instrument flight maneuvers, departure and approach procedures.

Course Learning Outcomes (CLO) (Required)

Upon successful completion of this course, students will be able to:

- CLO 1. Describe and identify aircraft instrument flight systems and their operating characteristics.
- CLO 2. Correctly use charts and publications for IFR flight for planning and navigation.
- CLO 3. Analyze the importance of weather for Marginal Visual and Instrument Meteorological Conditions, and identify local weather phenomena.
- CLO 4. Use resources in pre-flight planning and calculate fuel use, weight and balance, and route and weather planning for IFR navigation and IFR cross-country flight.
- CLO 5. Learn to recognize the human factors & limitations that affect pilot aviation safety on IFR flight plans and in Instrument Meteorological Conditions for safe decision-making.
- CLO 6. Describe procedures for all IFR flight phases including IFR emergencies
- CLO 7. Conduct a simulated instrument flight from takeoff to landing, including approach and missed approach procedures, to Airmen Certification Standards.
- CLO 8. Satisfactorily answer at least 70% of the knowledge questions in the Airmen Certification Standards for Instrument Airplane.

Required Texts/Readings



The Complete Advanced Pilot: A Combined Commercial & Instrument Course

Fifth Edition

By: Bob Gardner; ISBN: 978-1-61954-085-9

Price: ~ \$22 (Amazon)

Instrument Flying Handbook - 2012

U.S. Department of Transportation (FAA); FAA-H-8083-15B

Price (download): Free @ FAA.gov

Instrument Procedures Handbook - 2015

U.S. Department of Transportation (FAA); FAA-H-8083-16A

Price (download): Free @ FAA.gov

Aeronautical Information Manual (AIM) - 2017

U.S. Department of Transportation (FAA);

Price (download): Free @ FAA.gov

Other Readings (All of these FAA texts are available online and are also found in course CANVAS):

- Advanced Avionics Handbook (2009)
- Aeronautical Chart Users Guide. (2013)
- Airplane Flying Handbook (2016)
- Aviation Weather Services (2016)
- Federal Aviation Regulations (2017)
- Flight Navigator Handbook (2011)
- Pilot’s Handbook of Aeronautical Knowledge (2016)

Other Technology Requirements

In addition to the flight training devices and simulators, it may be useful to have associated flight materials necessary to complete an instrument flight. When conducting simulator and computer training flights, you may find it useful to have your flight bag equipment with you.

Required Equipment

- E6B Flight Computer
- Current Low Altitude En-Route Aeronautical Chart for San Francisco Bay (L-3)
- Plotter for FAA Low Altitude En-Route Charts
- US Standard for Terminal Instrument Procedures- Southwest Volume 2
- Chart Supplement for Southwest US (formerly Airport/Facility Directory)
- Watch or timer

Course Requirements and Assignments

- **Three mid-course Examinations:** Covering the weekly study blocks as shown above.
- **Seven Laboratory Missions:** Simulator-based profiles covering different aspects of instrument flying

LAB EMPHASIS	
1	Basic Airwork (pitch/bank/power settings)
2	Advanced Airwork #1 (+ timed turns; partial panel)
3	Advanced Airwork #2 (+ intercepts; airway work)
4	SIDs + Holding
5	STARS + ILS Approach + Missed Approach
6	Non-Precision Approaches
7	RNAV (GPS) Approaches + ILS Approaches
Checkride	Vectors to either VOR, ILS or RNAV (GPS) Approach

- **Laboratory Checkride:** Profile-based simulator evaluation based on the laboratory missions.
- **Extra Credit:** Students can earn extra credit by completing one or more of the following Aircraft Owners and Pilots Association's (AOPA) Air Safety Foundation (ASF) online Safety Courses. These courses provide additional information on critical aspects of instrument flying, and enable students to assess their level of understanding. At Final Exam time, provide me with a copy of your ASF Course Completion Register (*transcript*), which AOPA maintains under your name and shows the dates of completion of each course, as evidence of timely completion of these courses. Use your pilot certificate number, or SJSU student number to sign-in for the courses, which can be found at: www.aopa.org/Education/Online-Courses
- *Single-Pilot IFR*
- *Do the Right Thing: Decision Making for Pilots*
- *Essential Aerodynamics: Stalls, Spins, and Safety*
- *GPS for IFR Operations*
- *IFR Chart Challenge: VOR Approach*
- *IFR Chart Challenge: RNAV Approach*
- *IFR Chart Challenge: ILS Approach*
- *IFR Insights: Charts*
- *Know Before You Go: Navigating Today's Airspace*
- *IFR Insights: Regulations*
- *A Pilot's Guide to Flight Services*

Final Examination or Evaluation

An FAA-style multiple choice, comprehensive exam. Students scoring 80% or higher will receive certification of completing the ground training required to take the actual FAA Instrument Knowledge Examination

Grading Information (Required)

Grading percentage breakdown is shown in the table below, and is based on the following:

Item	Weight
Exam #1	15%
Exam #2	15%
Exam #3s	15%
Final Exam (Comprehensive)	30%
Lab Missions	15% 30 %
Lab Checkride	10%
TOTAL	100%
Extra Credit (1% per unit)	5% Maximum

Determination of Grades

There will be no curving of grades. Final grades will be assigned as follows:

- A: from 90% to 100%
- B: from 80% to 89%
- C: from 70% to 79%
- D: from 60% to 69%
- F: less than 60%

Classroom Protocol

Class participation and attendance is strongly encouraged. No late work will be accepted without explicit prior consent given by the instructor. Students are expected to maintain professional attitudes while using simulator equipment. For this course, the simulators are your aircraft and you should treat scenarios as if you are Pilot in Command. Cell-phones should be put in silent mode prior to entering class and personal laptops should not be used in any distracting manner.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

Aviation 62 / Instrument Flight Techniques, Fall 2017, M: 9:00 to 10:45 (Lec), 12:00 to 14:45 (Lab)

The following is a tentative schedule for the class. Changes to the following schedule will be communicated promptly by the instructor

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1 Lec	8/28	Class Introduction
1 Lab	8/28	Lab Orientation,
2 Lec	9/4	LABOR DAY No Class or Lab
3 Lec	9/11	Flight Instruments, CAP Ch 1-2, IFH Ch 5-6
3 Lab	9/11	Flight Instruments and Attitude Flying
4 Lec	9/18	Analog Instruments and Attitude Flying
4 Lab	9/18	Brief Lab 1: Basic Airwork (pitch/bank/power settings)
5 Lec	9/25	Electronic Flight Displays and Attitude Flying, CAP Ch 12, IFH Ch 1,
5 Lab	9/25	Brief Lab 2: Advanced Air
6 Lec	10/2	Navigation Systems and En-Route Structure, CAP Ch 6, IPH Ch 1, AIM Ch 2, IFH Ch 10
6 Lab	10/2	Navigation Instruments and Intercept Techniques
7 Lec	10/9	IFR Flight Planning Basics and Standard Departures,
7 Lab	10/9	Airports and Holding, Lab 1 Due
8 Lec	10/16	Exam #1
8 Lab	10/16	Brief Lab 3, Lab 2 Due
9 Lec	10/23	Approach Plate Interpretation and Human Factors
9 Lab	10/23	Brief Lab 4
10 Lec	10/30	Arrivals, ILS Approaches, and Missed Approaches
10 Lab	10/30	Brief Lab 5
11 Lec	11/6	Procedure Turns and Non-Precision Approaches,
11 Lab	11/6	Brief Lab 6, Lab 3 Due
12 Lec	11/13	Exam #2
12 Lab	11/13	RNAV (GPS) Approaches and Aerodynamics, Lab 4 Due
13 Lec	11/20	Weather
13 Lab	11/20	Brief Lab 7, Lab 5 Due
14 Lec	11/27	FARs and Miscellaneous Approaches
14 Lab	11/27	Finish Lab Missions, Lab 6 Due

Week	Date	Topics, Readings, Assignments, Deadlines
15 Lec	12/4	Exam #3
15 Lab	12/4	Lab Checkride
16 Lec	12/11	IFR Emergencies and Review
16 Lab	12/11	Lab Checkride, Lab 7 Due
Final Exam	12/18	IS 133, 7:15 AM to 9:30 AM