A curriculum for private pilot airplane

Richard D. Thompson

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CURRICULUM DEVELOPMENT FOR
PRIVATE PILOT AIRPLANE

RICHARD D. THOMPSON, BVE, MA

CALIFORNIA STATE UNIVERSITY, SAN BERNARDINO
SEPTEMBER, 1990
CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO
A CURRICULUM FOR
PRIVATE PILOT AIRPLANE

A Project of the School of Education
In Partial Fulfillment of the Requirements of the Degree
of
Master of Arts
in
Education: Vocational Option
by
Richard D. Thompson, BVE, MA
San Bernardino, California
September, 1990
A CURRICULUM FOR
PRIVATE PILOT AIRPLANE

by

Richard D. Thompson, BVE, MA
SEPTEMBER, 1990

Approved by:

Advisor:  Dr. Ronald Pendleton

Second Reader: Dr. Joe English
The purpose of this project was to develop a competency based curriculum for private pilot airplanes for use at the community college or university level. The need for development of curricular materials for such a course was shown through the lack of availability of current materials, new teaching processes and evaluation of student needs. An emphasis on "Learning by doing" is of prime importance to be successful with the materials and information provided. Implementation of course materials will exceed, merely studying for a test.
PROCEDURE

Current literature was reviewed from ground schools that were federally approved and not approved. Informal surveys were then administered to Ground School students and Aeronautics Department faculty members at San Bernardino Valley College. Fixed-based operators and flight instructors were also surveyed to help develop the proposed curriculum. Reviewing the literature and surveys established the need for a competency-based ground school.

DESCRIPTION OF THE COMPETENCY-BASED CURRICULUM MATERIALS DEVELOPED:

The curricular materials for a Private Pilot Ground School were primarily developed for usage in a post-secondary setting. First, a brief course outline is presented which describes the course resources, topics, instructional methods, required tests and any additional supplemental tests or information. Next, a comprehensive syllabus (and course guide) are provided. The syllabus describes and explains all course requirements, required materials, course activities and resources. Class lesson plans are provided along with supplemental data to outline the objective of each class. The course is designed on a semester system. The class would meet twice a week for a three hour lesson for eighteen weeks. Flexibility is built into the syllabus.
for holidays at the end of the curriculum. If the curriculum was to be utilized in a quarter system, some modification would become necessary. Following the syllabus, an instructor's guide is provided which contains materials and helpful information to be used by the instructor. An introductory section explains how to use the instructor's guide and provides information about course design, recommended methods for evaluating students performance, record-keeping, and the role of the instructor. The remainder of the guide is broken down into class lessons which contain supplemental information. The information may be altered at the instructor's option.
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SECTION I INTRODUCTION

Statement of the Problem

The Objective

The objective of this project was to develop a competency-based curriculum for ground school (airplanes). The proposed course would offer hands-on training aids from other courses at San Bernardino Valley College currently being offered. These classes would primarily be ("Flight Lab") and ("Airframe and Powerplant Maintenance"). The hands-on training aids incorporated here would enhance retention within the ground school curriculum.

Context of the Problem

Attention to safety is a growing concern to everyone. According to Aircraft Owners and Pilots Association (AOPA) and the Federal Aviation Agency (FAA) approximately 85% of the accidents encountered were related to pilot error.

In the Southern California area, to include portions of Arizona and Nevada, 33% of all aircraft in the United States are based. This area contains the most congested and complex airspace throughout the nation. As a result to this airspace, it has become the most challenging for all pilots, not just the private pilots to operate within.

Currently there are four community colleges offering aviation courses locally: SBVC, Mount San Antonio College (Mt. Sac), Riverside City College (RCC), and Chaffey College.
Only two of these colleges offer full degree programs in Flight Operations: SBVC and Mt. Sac. Currently there is no competency-based ground school course available. The ground school is the foundation for the students to build upon. Primarily, the existing courses satisfy the FAA, but to a large extent merely teach to the written test which is required to be passed prior to receiving a private pilot certificate.

The proposed course would not increase the departments budget, it would merely utilize other valuable learning resources already available. The course would increase motivation by participation and enhance retention by utilizing hands-on techniques. The course would also enhance enrollment in other aviation related courses required for the Associate of Science Degree. Higher graduation rates could be expected and increased transfers to four year degree programs.

Problem Statement

There are no competency-based curriculum available for post-secondary courses in ground school (airplanes). The previously existing curriculum has not had a major revision in fourteen years at SBVC. In view of technological advances, changes to Federal Aviation Regulations and local airspace restrictions, this is inadequate.
Purpose of the Project

The purpose of the project was to develop an updated curriculum for ground school (airplanes). The new curriculum has been greatly expanded to include resources, training aids, simulators, mock-ups, and student activities not covered in the outdated curriculum. The course would be offered at SBVC both day and evenings during the Spring and Fall semesters.
DEFINITIONS

For the purpose of this project, the following terms will be defined as follows:

Federal Aviation Administration  (FAA) A Department of Transportation Agency which regulates air transportation.

Federal Aviation Regulations  (FAR) Aviation law regulated and enforced by the FAA.

Fixed Based Operator  (FBO) A place of business or an airport that may provide the following: Flight instruction, aircraft rental, services, supplies, fuel and parking or hangar rentals.

Ground School (Airplanes)  A curriculum designed to teach all information required by the FARs for Private Pilot Airplane.

Flight Operations Degree  A two year, associate degree offered at a community college.

Flight Simulator  A ground-based training devise used to familiarize pilots with correct use of flight controls and instruments.

A & P License  A license required by FAA to work on aircraft (Airframe and Powerplant).

Private Pilot Certificate  FAA certification permitting the holder to exercise the privilege of a private pilot listed part G1 of the FAR.

San Bernardino Valley College  (SBVC) A community college in San Bernardino, California.
ASSUMPTIONS

For the purpose of this project, it is assumed that:

1. Questionnaire research reliability produces valid information on the preferences of the respondents.
2. Practical application instruction "hands on" increases retention of material covered in lecture.
3. Equipment, supplies and support services available for courses offered at SBVC will remain available for the proposed course.

DELIMITATIONS

The parameters of the project are as follows:

1. The proposed course is designed for application in a community college. However, application at a university level would be equally important.

LIMITATIONS

The project is limited by:

1. Lack of literature documenting use of flight simulators and real aircraft in a ground school curriculum.
2. FAA regulations and requirements for student pilots and private pilot applicants.

SIGNIFICANCE OF THE PROJECT

It is obvious that the future of aviation is unlimited. The basic foundation to pilot training is dependent on the applicant receiving good competent ground training. The methods currently used in community colleges are not
providing hands-on training. It is projected that the proposed course would stimulate motivation, increase retention, retain enrollment, expose other related aviation courses, and assure proper initial training for tomorrow's professional pilots.

Summary of Section I

This introductory segment of the project, A Curriculum for Ground School (Airplanes), has identified the problem addressed by this project, and has briefly argued the importance of providing hands-on training to students enrolled in ground school courses.
ORGANIZATION OF THE REMAINDER OF THE PROJECT

The remainder of the project includes: A comprehensive review of the literature of ground school procedures and a section outlining the methodology used in conducting the research project and compiling the proposed course curriculum. The curriculum provides a course outline, comprehensive syllabus and course guide, and instructor's guide for the proposed course.
SECTION II REVIEW OF THE LITERATURE

INTRODUCTION

The review of the literature for ground school will proceed in the following manner. First, a review of current FAA requirements for aeronautical knowledge for private pilot applicants is presented. Then, the significance of various current and proposed training methods is addressed. At the conclusion of this chapter, a summary is provided.

FAA REQUIREMENTS FOR AERONAUTICAL KNOWLEDGE FOR PRIVATE PILOT APPLICANTS

The Federal Aviation Regulations (FAR) require all applicants for private pilot certificate to present evidence that he or she has received ground instruction in compliance with part 61.105;(a)1-5. Aeronautical knowledge. This evidence is to be presented in a form of a passing score of (70%) on the FAA Private Pilot written examination (FAR, 1990).

Such ground instruction includes the following topics for private pilot airplane applicants; the FAR applicable to private pilot privileges, limitations, and flight operations, accident reporting and use of Airman's Information Manual (AIM). In addition, ground instruction in Visual Flight Rules (VFR) navigation, pilotage, dead reckoning, and radio navigation must be included. Lastly,
the private pilot applicant must be able to evaluate critical weather situations and be able to read reports and forecasts, calculate weight and balance and know their effects on the aircraft, calculate performance charts, communication procedures, and interpret aircraft and engine instruments. This represents the maximum knowledge that must be understood and retained by the FARs.
THE SIGNIFICANCE OF CURRENT AND PROPOSED TRAINING METHODS FOR PRIVATE PILOT APPLICANTS

The ground instruction referred to earlier is currently received through a private pilot ground school course, individual instruction from a certified flight or ground instructor or home study courses. The first method is lacking in that it only relates to a minimum of hands-on training. This type of course is currently offered at the four community colleges serving the San Bernardino, Riverside, Pomona, and Walnut areas (Catalog survey, 1987). The ground instruction offered at the colleges are in compliance with FAA guidelines (Schlenker, 1985).

The second method is offered in combination with flight training available at various (FBOs). The instructor's time averages $20 per hour (Cost survey, 1990). Often this approach is very expensive and does not assure that all pertinent materials are received and retained.

The third type of ground training is relatively new to the aviation industry. It is generally constructed with a textbook, workbook, and training videos that supplement the written material. This type of ground instruction meets the minimum standards by the FAA but has no hands-on teaching incorporated. Materials and information are very limited (Student Survey, 1990).

A fourth type of ground instruction not included
previously would be beneficial and rewarding for student pilots. This method would include the usage of flight circulators, or instrument trainers available but not currently utilized in ground school operations. Flight simulators are widely used for both basic and advanced training. Air safety has improved since the FAA-approved simulators become available. The simulators give hands-on training to flight controls, instruments, and chart interpretation. This method would also include preflight operations on real aircraft. This would also provide hands-on training. In addition, preflight, maintenance operations, and logbooks would be studied and interpreted. Seeing and touching an aircraft and exposing basic non-safe conditions would result in better retention of such vital information. New materials such as composite structures and procedures would be introduced in which SBVC has the only class offered in the surrounding area.

The need for an updated course would be in accordance with current FARs; it is long overdue. The new course would help bridge the gap between what is now offered and what could be offered. The student survey indicated that fear, anxiety, and lack of a good training facility were the primary reasons for their lack of involvement in a ground school.

Events that lead to discomfort, physical or mental, are adersive to learning. (Mager, 1984) considered some
of these as fear, anxiety, pain, boredom, and physical discomfort. He also felt that pleasant settings and atmosphere would encourage learning and retention. The fear of failing could be a major roadblock to learning. A teacher should build up confidence in the learner. Criticism, poor evaluations, and anxiety may cause a student to limit their involvement or drop the course (Rogers, 1986). It is important that courses provide immediate potential for their application to help motivate students. Between the ages of 20 years and 50 years is the career development of most adults. (Rogers, 1986, p. 39), therefore it is important to provide immediate potential for application of skills learned. Pilots fall within this age group but because of aging, illness, and company policies, the sooner the student starts, the better the chances are for procuring a desirable career.

Competency-based instruction helps to eliminate anxieties with specific goals and hands-on instruction. In Principles of Instructional Design, Gagre (1974) spoke of performance objectives, sequential instruction, structured lessons, and assessing student performance, while Robert F. Mager (1984) describes what is now competency-based instruction based on three characteristics performance, conditions, and criteria. "Teaching can be compared to selling commodities." "No one can sell unless someone buys" (Dewey, 1959, P. 134). The ground school course at SBVC
and other institutions has been around for a long time, but it is now time to update ourselves with current information, materials, and teaching techniques. According to Dr. Ronald K. Pendleton (1990), there has been an increasing number of students enrolling in Vocational Education programs at CSUSB from SBVC Technical Division. This tends to show that higher education in a more familiar environment can help relieve anxieties and fears so common in most students.

Competency-based instruction with familiar surroundings, clear objectives, performance objectives, and hands-on training would decrease fear and anxieties. This course would probably succeed within the framework of Mager and Gagre and continue to grow as observed by Pendleton. The student would graduate from the course with skills, knowledge, and expertise in the aviation field. It would also contribute to higher education and self-evaluation.

The final exam in this course would be the FAA written test required by the FAA. A passing score of 70% would be acceptable to procure a private pilot's certificate.
SUMMARY OF SECTION II

The review of the literature began with the minimum FAA requirements for aeronautical knowledge for private pilot applicants. Current and proposed methods of ground instruction were then reviewed along with their apparent shortcomings and benefits. Then research was conducted to reinforce competency-based instruction including their results. Finally, the expected course final results were mentioned.
SECTION III METHODOLOGY

INTRODUCTION

This section will detail how the proposed project was carried out. First, the project design will be outlined and the populations which were sampled will be described. A description of the project and calendar of events will be provided next. Then, the sampling scheme and methods used to collect data will be described. Finally, this section will conclude with a summary.

PROJECT DESIGN

The design of this project is as follows: The need to establish a new competency-based curriculum was established in several different ways. First, a telephone survey was conducted to different flight schools to obtain information from their "Chief Instructors" about their students. Second, a survey was developed and implemented to all ground school students who have recently completed the course at SBVC and their faculty. Finally, a telephone survey was conducted to local FAA designated flight examiners.

Once the need was established, the course outline was developed and resource materials were located and obtained. Then, a comprehensive syllabus was developed and written. This was followed by a course guide and instructor's guide. The course syllabus and supplemental information were designed to meet a competency of a ninth grader.
Individual teachers may elect to administer a placement test in the first week of school to determine English, writing, and math skills. This is an option available for the teacher.

PROJECT SETTING

The setting for the majority of the project was the home of the developer. All pertinent information was brought here and processed.

The office of the Aeronautics Department at SBVC was also utilized to collect data, assess surveys, reproduce materials, and utilize various equipment and supplies.
CALENDAR OF EVENTS

June 05, 1990
*Wrote introduction section
*Wrote survey instruments
*Validated surveys
*Conducted phone surveys to flight schools and examiners

June 07, 1990
*Wrote limitations section
*Conducted student needs
*Survey of SBVC faculty and students
*Conducted examiners survey

July 2, 1990
*Conducted survey of college catalogs
*Wrote significance of the project section

July 05, 1990
*Wrote preliminary literature review section

July 10, 1990
*Wrote methodology section

July, 1990
*Wrote course outline
*Located and obtained resource materials
*Wrote syllabus and course guide

August, 1990
*Wrote instructor's guide

August, 1990
*Wrote summary, project completed

August 17, 1990
*Turned in final draft to readers

August 31, 1990
*Make any necessary revisions/corrections

September 26, 1990
*Turn in revised project to readers

October 10, 1990
*Turn in final draft to MA project committee

October, 1990
*Take approved final draft to printers

October, 1990
*Turned in bound project
SAMPLING SCHEME

Sampling of student needs took place in the following manner. Before administering the survey instruments, samples of each were distributed to advanced commercial pilots to check for readability, validity, and clarity. During the final week of school (Fall, 1990), students enrolled both in day and evening classes at SBVC in ground school were formally surveyed. The names were obtained from the current rosters of the class. The instructors were then given a packet of student needs surveys for each student. The instructor also received a faculty survey form. The instructor distributed the forms in class and returned the completed surveys along with the faculty survey.

The telephone survey of local FBOs and flight examiners phone numbers were obtained from the local FAA office in Riverside, California. This enabled the surveys to be completed with the appropriate people. Any FBO, chief instructor or examiner requesting the outcome of the survey was provided the information.

The survey of local college aviation programs was conducted by the project developer. The current courses were at SBVC and then compared with other courses available from current school catalogs.

DATA COLLECTION

Data was collected by the program developer through
the written surveys and telephone interviews as previously mentioned. The information was then recorded on the applicable forms (appendix A-E). The information was then condensed and evaluated by the project developer.

SUMMARY OF SECTION III

The methodology section first began with an introduction; then, the project design was outlined and a description of the population sampled was provided. A sampling scheme was provided and methods for the collection and documentation were outlined. Finally, a summary of this section was provided.
APPENDIX A

Cover Page for Student and Faculty Surveys
The purpose of this survey is to evaluate and improve the outdated curriculum at SBVC in ground school (airplanes). Your participation is totally voluntary. There is no consequence if you elect not to participate. The survey will stimulate growth and improve course contents for a current and safer curriculum in the future.

Your input would be greatly appreciated.
APPENDIX B

STUDENT SURVEY INSTRUMENTS
AERONAUTICS STUDENT SURVEY

DIRECTIONS: DO NOT SIGN YOUR NAME. Please fill out the survey to the best of your ability.

Course #: __________________________ Your age: _________

Reason for completing the course:
(  ) Aeronautics degree
(  ) To pass the FAA examination
(  ) General knowledge
(  ) Friend or spouse
(  ) Other

Were you satisfied with the course contents:
__________________________________________________________

__________________________________________________________

Was the material presented in a logical and meaningful way:
__________________________________________________________

__________________________________________________________

Are there any areas that could be improved: Please explain:
__________________________________________________________

__________________________________________________________

Comments:
__________________________________________________________

__________________________________________________________

__________________________________________________________
APPENDIX C

Instructor Survey Instrument
AERONAUTICS INSTRUCTOR SURVEY

DIRECTIONS: DO NOT SIGN YOUR NAME. Please fill out survey to the best of your ability.

Course #: Number of years teaching:

What is your average class size:

What percentage complete the course:

Was there any feedback from students to improve your course:

What would or could you do to improve the existing course:

A study is being made to determine the need for a competency-based ground school (airplanes) to include simulators and real aircraft as training aids. Please list any comments or suggestions use the back of this page if needed:
APPENDIX D

FBO Chief Instructor and Cost Survey
FBO CHIEF INSTRUCTOR AND COST SURVEY

Name of FBO: ____________________________________________
Contact person/title: ______________________________________
Airport location: __________________________________________
Address: _________________________________________________
Phone: ___________________________________________________

Instruction rates
Instructor: $per hr.: Block: Special rates:

_________ _________ _________ _________

Ground school rates if applicable: ___________________________

What is your opinion of ground schools (airplanes) in the local area:

What areas of concern do you think need improvement, if any:

Do you think a competency-based ground school, utilizing simulators and real aircraft would stimulate motivation, interest and help with retention:

Thank you for your time and support.
APPENDIX E

Examiner's Survey
APPENDIX E

EXAMINER'S SURVEY

Name of examiner: ____________________________

Years of experience in this area: ________________________

Address: _______________________________________

Phone: _________________________________________

When testing applicants for private pilot airplane, where do most people attain their ground school knowledge: ______

________________________________________________

________________________________________________

________________________________________________

Are there any areas that are continually weak or may need improvement: ________________________________

________________________________________________

________________________________________________

________________________________________________

Do you think a competency-based ground school utilizing simulators and real aircraft would stimulate motivation, interest, and help with retention: __________________________

________________________________________________

________________________________________________

________________________________________________

Thank you for your time and support.
REFERENCES


U.S. Department of Transportation, Federal Aviation Administration (1990), FAR AIM, Seattle: ASA.

Schlenker, R. (June, 1990), FBO Chief Instructor and Cost Survey), unpublished raw data.

Thompson, R. (June, 1990), (Community College Aeronautical Student and Faculty Survey), unpublished raw data.

Thompson, R. (July, 1990) (Community College Catalog Survey: Mt. San Antonio College, Chaffey College, Riverside City College, San Bernardino Valley College), unpublished raw data.

Thompson, R. (June, 1990), (Examiner's survey), unpublished raw data.

U.S. Department of Transportation, Federal Aviation Administration (1990), Private Pilot Written Test Questions, Answers, and Explanations, Seattle: ASA.
A CURRICULUM FOR

AERO 122, 142

PRIVATE PILOT GROUND SCHOOL (AIRPLANES)

Developed by:

Richard D. Thompson, BVE, MA
1990

San Bernardino Valley College

Aeronautics Department
SAN BERNARDINO VALLEY COLLEGE

Division: Technical  Department: Aeronautics

Course Outline

1. Course Number: Aero 122, 142
2. Course Name: Private Pilot Ground School (Airplane)
3. Hours, days per week: Hours: 3  Days: 2
4. Units: 6
5. Recommended Textbooks: See attached list
6. Course Objective:
The Student will be able to:
1. Obtain the required aeronautical knowledge required by the FAA to pass the Private Pilot written test (airplane).

7. Description on list TOPICS TO BE COVERED:
1. Assignments are from textbook, An Invitation to Fly.
2. Tests are constructed from the current question and answer booklet.
3. See attached list for assignments in relationship to each lesson number.

8. DESCRIPTION OF QUIZZES AND TESTING:
1. Quizzes: Short answer or essay questions.
2. Tests: Multiple choice with four possible answers.
3. Final: FAA administered multiple-choice with possible answers.

9. METHODS OF INSTRUCTION:
1. Lecture
2. Group discussion
3. Ground demonstration and directed discovery
10. USE OF VISUAL AIDS OR AUDIO AIDS
   1. VCR - tapes
   2. 16 mm films
   3. Flight simulators
   4. School's real aircraft

11. ADDITIONAL COMMENTS
    This course meets twice per week for three hours each lesson

PREPARED BY: RICHARD D. THOMPSON

DATE SUBMITTED: August 01, 1990
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Required/recommended texts:


5. Aircraft handbook/manuals appropriate to the type of aircraft utilized.
AERO 122, 142
PRIVATE PILOT GROUND SCHOOL
AIRPLANES
SYLLABUS AND COURSE GUIDE

Developed by:
Richard D. Thompson, BVE, MA
1990

Student: ____________________________
Semester: __________________________
Instructor: __________________________
Class hours: _________________________
Office hours: _________________________
Telephone: __________________________
Mail: _______________________________

SAN BERNARDINO VALLEY COLLEGE AERONAUTICS DEPARTMENT
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| 1 | | Introduction  
*Introduction *course objectives* college/facilities tour, paperwork |
| 2 | | History  
*History film, "We Saw It Happen"* Finish paperwork |
| 3 | | Chapter I (Prep)  
*FARS *terms/definitions*  
responsibilities *medical requirement*  
*student pilot certificate *preflight |
| 4 | | Science of Flight (Aircraft)  
Bernoell's Principle *Newton's Laws*  
*Lift *Controls and axis *4 forces  
*stall |
| 5 | | Science of Flight con't. (aircraft)  
*Load factors *trim tabs *stability  
*torque *flaps *"P" factor *wake turbulence |
| 6 | | Review for test  
*Review *Test on chapters I & II |
| **STAGE II LESSONS 7-10** | | |
| 7 | | Powerplant (aircraft)  
*Fuel *Inspections *Ignition *Electrical  
*Props *Carburetor/injection |
| 8 | | Flight instruments (simulation)  
*Pitot/static |
| 9 | | Flight instruments Con't. (simulation)  
*Gyros *Compass |
| 10 | | Review for test  
*Review *Test on chapters III & IV |
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*Computation  
*Weights  
*Center of gravity |
| 12       |      | Weight/balance cont. (Prep)  
*Adverse loading  
*Shifting weights  
*Safe/unsafe conditions/characteristics |
| 13       |      | Perforce (Prep)  
*Variables  
*Charts/graphs  
*Computations  
*Density altitude |
| 14       |      | Review for test |
| **STAGE IV LESSONS 15-18** |
| 15       |      | Airports/Airspace (Prep)  
*Airport markings  
*Traffic pattern  
*Lighting  
*Wind indicators  
*Basic communications  
*Control zones  
*Airport traffic areas |
| 16       |      | Airports/airspace cont. (Prep)  
*Advanced communications  
*Navigation  
*Special use airspace  
*Nightflying |
| 17       |      | Flight Publications  
*A/M  
*Exam-o-grams  
*Notices to airman  
*Charts  
*Airworthiness directives  
*Advisory circulars |
| 18       |      | Review for Test  
*Review  
*Test on chapters VII & X |
| **STAGE V LESSONS 19-23** |
| 19       |      | Review for Mid-Term  
*Review  
*Test on chapters I-VII & X |
| 20       |      | Basic Weather (prep)  
*Causes  
*Pressure systems  
*Ice  
*Fog  
*Clouds  
*Air mass  
*Fronts |
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*Pilot reports  
*Enroute flight advisory  
*Transcribed weather enroute broadcasts |
| 22       |      | Weather Review (Prep)  
*Review  
*Volume (4 A & B) of weather tapes (attached) |
| 23       |      | Review for Test (Prep)  
*Review  
*Test on VIII & IX |
| 24       |      | Regulations (Prep)  
*Parts 61, 91, 830 |
| 25       |      | Flight Computer (Prep)  
*Computation site |
| 26       |      | Flight Computer (Prep)  
*Wind side |
| 27       |      | Basic Navigation (Prep)  
*Plotter  
*Computer  
*Charts  
*Variation  
*Deviation  
*Latitude  
*Longitude |
| 28       |      | Radio Navigation (Simulation)  
*Testing equipment  
*Variable omni range  
*Non-directional beacons  
*Transponders |
| 29       |      | Composite Navigation (Simulation)  
*Sample cross country  
*Utilizing all navigational equipment combined together |
| 30       |      | Review for Test (Prep)  
*Review  
*Test on chapters XII, XIII, & XIV |
| 31       |      | Medical Factors, Emergencies  
*Vertigo  
*Hyperventilation  
*Hypoxia  
*Drinking  
*Drugs  
*Carbon monoxide  
*Emergencies (prep)  
*Regulations  
*Procedures  
*Fly aircraft  
*Don't panic |
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<td></td>
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<td>*Review</td>
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<tr>
<td>34</td>
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<td>FAA final exam</td>
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IMPORTANT - PLEASE READ

This syllabus presents the FORMAT for Aero 122, 142 in an organized, easy to follow manner. The course meets twice a week, three hours per meeting. The CLASS SCHEDULE is provided at the beginning of the syllabus. There are ten stages of instruction. The stages group together related information. Each stage of instruction will indicate a stage objective and completion standard. The individual lessons that make up each stage are given with a brief outline. It is imperative that students bring to class the required textbooks each and every class meeting. Additional handouts will be provided by the instructor. NOTE: This class will not merely prepare you for the FAA written test. It has been designed to cover many other aspects of ground and flight training. Lectures are based on the assumption that the student has read the assigned material.
1.02

AERO 122, 142

GRADING CRITERIA

The course will be graded by utilizing four scores: quizzes, tests, final, and attendance.

1. QUIZZES: Each class will normally begin with a quiz covering the material assigned and/or previous material. This will be accomplished by the instructor listing ten items or highlights from the assigned reading. The lecture will be primarily based around the quiz. Quizzes will be graded prior to the end of the lesson and returned.

2. TESTS: Tests are constructed to cover information covering the related material from the assigned chapters (see course outline). Tests, to include the mid-term, normally will be fifty multiple-choice questions. The test is constructed from the current Private Pilot Test Questions. Tests will be graded immediately and returned. No student should leave until questions missed have been reviewed. This is done to stimulate retention and ensure proper learning of the applicable information.

3. FINAL: The final will be the FAA designated written test for private pilot. The test will be administered by a FAA written test examiner. The FAA test score minimum is 70%. The tests are mailed, and graded by FAA in Oklahoma City. Test results are then mailed to the applicant. A copy of the results must be made and given to the instructor for a grade in this course.
4. **ATTENDANCE**: A percentage of your course grade will be dependent on your participation and attendance. The percentage of individual scores will be evaluated accordingly:

1. Quizzes: 15%
2. Tests: 50%  
   Total = 100%
3. Final: 25%
4. Attendance: 10%

The following breakdown of percentage scores will be applicable for a letter grade:

1. A 100-90
2. B 89-80
3. C 79-70
4. D 69-60
5. F 59 or less

**ABSENCE**: There is no excused absence unless prior arrangements have been made with the instructor. No make-up quizzes unless the day missed was excused. Tests will be made up on individual basis.
AERO 122, 142
PRIVATE PILOT GROUND SCHOOL

INSTRUCTOR'S GUIDE
(Confidential)

This guide contains materials and information for the course instructor

Developed by: Richard D. Thompson, BVE, MA
1990

San Bernardino Valley College, Aeronautics Department
SAN BERNARDINO VALLEY COLLEGE

DIVISION: Technical DEPARTMENT: Aeronautics

COURSE OUTLINE

1. Course Number: Aero 122, 142
2. Course Name: Private Pilot Ground School (Airplanes)
3. Hours/Days per week: Hours: 3 Days: 2
4. Units: 6
5. Recommended Textbooks: See attached list
6. Course Objective:
   The student will be able to:
   1. Obtain the required aeronautical knowledge required by the FAA to pass the Private Pilot written test (Airplane).

7. DESCRIPTION: TOPICS TO BE COVERED
   1. Assignments are from textbook. An Invitation to Fly.
   2. Tests are constructed from the current written test questions and answer booklet.
   3. See attached list for assignments in relationship to lesson number.

8. DESCRIPTION OF QUIZZES AND TESTING
   1. Quizzes: Each class will normally begin with a quiz covering the material to have been read or previous material. This will be accomplished by the instructor listing ten items or highlights from the assigned reading. The lecture will be focused primarily around these items. Quizzes will constitute 15% of
the student's grade.

2. Tests: Tests are constructed to cover information covering related material from the assigned chapters (see course outline attached). Tests, to include a mid-term covering all information up to that point, will constitute 50% of the student's grade. Tests are constructed from the current *Private Pilot Written Test Question and Answer* booklet. The final test is the FAA written test administered by an FAA written test examiner. The final will reflect 25% of the student's total grade. The remaining 10% of the student's grade is dependent upon attendance.

3. Special Circumstances: If a student has already passed the FAA exam, a similar final may be substituted by the instructor. If a student wishes to challenge the class, a similar FAA final exam may be administered by the instructor.

9. METHODS OF INSTRUCTION:

1. Lecture
2. Group discussion
3. Ground demonstration and directed discovery

10. USE OF VISUAL OR AUDIO AIDS:

1. VCR tapes
2. 16 mm films
3. Flight simulators
4. School aircraft
11. ADDITIONAL COMMENTS:

This course meets twice a week for three hours

PREPARED BY:  Richard D. Thompson

DATE SUBMITTED:  08/01/90
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STAGE I Objective/Completion Standard

Lesson 1 Introduction:
- Using this guide
- The course
- Student's Performance
- Suggestions

Lesson 2 History:
- Quiz outline history

Lesson 3 Definitions/Preflight
- Quiz
- Handout checklist
- Handout aircraft breakdown

Lesson 4 Science of Flight
- Quiz
- Give handout on aircraft axis

Lesson 5 Science of Flight Continued
- Quiz

Lesson 6 Review for Test
- No quiz
- Test for Stage I

STAGE II Objectives/Completion Standards

Lesson 7 Powerplant
- Quiz

Lesson 8 Flight Instruments
- Quiz
- "V" speeds

Lesson 9 Gyro Instruments/Compass
- Quiz

Lesson 10 Review for Test
- No quiz
- Test for Stage II

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IG 3.1
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IG 3.3A
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AERO 122, 142

INTRODUCTION
I. **STAGE I OBJECTIVE:** (18 hours) Introduce syllabus and related information and provide a history of aviation. In addition, the student will develop knowledge of FARs, theory of flight, stability, controls, axis, torque, "P" factor, trim tabs, medical requirements, load factors, and preflight.

II. **STAGE I COMPLETION STANDARDS:** The student will successfully complete STAGE I by obtaining a written test score of 70% or better.
Lesson 1. Introduction:  *Introduction *course outline
   *syllabus *enrollments *facility tour *no quiz

Objective:
   At the conclusion of this lesson, the student should
be able to:
*be knowledgeable of course criteria and grading
*have an introduction to available resources located at the
facility
*have all documentation for enrollment and course information

Completion Standard:
*The lesson will be considered successful when all appropriate
paperwork is completed and no further questions are observed.

Format:
*Hand out and explain course introduction paper
*Hand out and explain outline paper
*Verify enrollments
*Conduct facility tour
*Answer all pertinent questions
This guide is for the instructor only. The guide contains the information and materials necessary for instructing Aero 122, 142.

Each lesson is individually planned out. The lesson contains a quiz or test, if applicable, and master handouts. If tapes or movies are to be utilized, the location of them is supplied. The aircraft and simulators are located at SBVC.

The instructor's guide is numbered with a prefix of IG. The follow-number would indicate the lesson that is to be taught.

Duplication of materials should be arranged early in the course, if not before the course begins. Arrangements for the simulators and aircraft should be coordinated with other staff at SBVC to prevent a conflict or an overlapping of scheduling.
Aero 122, 142 is a six-unit competency-based course. The course meets twice per week for eighteen weeks. The course is an FAA-approved curriculum. The instructor must stress the importance of attendance, but should be flexible in case of an excused absence. Special consideration should be given to the student in order to help the student obtain information missed. The grading of quizzes and tests should be accomplished within the same lesson. These should be returned and then reviewed to help the student reevaluate any missed items. **No one** should leave the classroom with a question or doubt as to why they missed a quiz or test question. Every effort should be made to ensure that the instruction received is competency-based (learning by doing). The use of the aircraft simulators, charts, and graphs and the airframe and powerplant facility at SBVC should help ensure this.

**Quizzes:** The quizzes are normally given at the beginning of the class. The quizzes are included with each individual lesson, if applicable.

**Tests:** The tests are from questions in the current private pilot written test booklet. The tests are included in the individual lesson, if applicable.

**Final Exam:** The final exam is the FAA written test.
AERO 122, 142  The Course Continued

It will be administered and monitored by an FAA written test examiner. This will be accomplished on the day scheduled for the class final. It is imperative that each student returns a copy of that test to the instructor as soon as possible. This is done to determine the students' class grade and for the instructor to record the grades with the College.
AERO 122, 142

Student Performance

There are a total of 100 percentage points. The percentages are broken down as indicated below:

1. Tests - 50%
2. Final - 25%
3. Quizzes - 15%
4. Attendance - 10%
   \[ \frac{100\%}{100\%} \text{ Total} \]

Students who come to class and complete each activity should earn full credit. The total percentage points will determine the students' grade. There is no curve to produce normal distribution. This method will ensure fairness for everyone. There is no makeup for quizzes. Tests can be made up with special provisions.

Unexcused absence will result in a lower grade.

Excused absences will be handled on a one-on-one basis. It is very important that each student gains the knowledge and experience from each lesson/activity.
Preparation: The instructor needs to read everything in the course syllabus and instructor's guide. This must be done to help prepare for each lesson. The instructor's guide is a guide to help the instructor present the material in a meaningful way. This instructor's guide is not printed in granite, it is a suggested outline. Some deviation may become necessary and it is the instructor's prerogative to do so.

The Instructor's Role: The role of the instructor is to be an instructional facilitator, not a lecturer. Every effort must be made to stimulate "hands-on" learning. Competency-based curriculums are based on learning by doing, not learning by merely lecture.

Attitude: The instructor's attitude must be POSITIVE AND MOTIVATIONAL. The instructor must present himself/herself in a professional manner. This includes language and dress. Give credit where credit is due. Utilize positive reinforcement to encourage higher learning. Give your students every opportunity to advance in your course even if it means extra time or a special effort on your part.
Lesson 2

History:
*History Film "We Saw It Happen"
*Complete enrollments and required paperwork *no quiz

Objective:
At the conclusion of the lesson, the student should be able to:
*Outline the development of the airplane and applications through history.
*Relate to course outline and syllabus to determine objectives and completion standards.

Completion Standard:
*The lesson will be considered completed by outlining the development of the airplane and no further questions about the course are observed.

Format:
*Show film available through Armed Forces recruiters or Dick Thompson (instructor).
*Outline history of airplane
*Answer any questions
No Quiz

Students should outline history of the airplane
AERO 122, 142

Lesson 3
Lesson 3

Definitions/Preflight: *FARs *Terms/definitions *Responsibilities *Medical

Read Chapter 1 from: Requirements *Student pilot certificate *Preflight

Objectives:
At the conclusion of the lesson, the student should be able to:
*Understand most aviation abbreviations
*Medical requirements interpretation
*FARs (applicable)
*How to preflight

Completion Standard:
*The lesson will be considered successful when student can demonstrate a preflight inspection. Remaining information will be evaluated in Stage I test.

Format:
*Give quiz
*Hand out and explain checklist
*Preflight a school's aircraft
*Introduce FARs
*Discuss terms/definitions
*Private pilot responsibilities/requirements
*Review medical requirements
*Give handout on aircraft breakdown
AERO 122, 142

Class Lesson 3 Quiz
STAGE I

QUIZ (10 Items)

*FAR - Federal Air Regulation
*CFI - Certified Flight Instructor
*Dual - Receiving flight instruction
*Solo - Only occupant in aircraft
*PIC - Pilot in command
*Cross Country - Flying beyond 50 nautical miles
*Category Class, Type - Definitions
*Medical Expiration - 24 Calendar months
*Private Pilot Requirements - Review part (G1) FAR

Additional Items to be Covered:

*Logbooks
*Night time
*Endorsements
*Aircraft lights
PA-28-140/150/180 CHECK LIST
Check Owner's Handbook for Detailed Procedures!

1. Preflight
   A. Ignition OFF
   B. Master switch ON
      1. Check fuel quantity indicators
      2. Fuel pump ON check pressure - Green
      3. Fuel pump OFF
      4. Master switch OFF
   C. Windsheild/windows clean & good condition
   D. Cabin area loose objects secure
   E. Flaps extend 40° three notches
   F. Required documents - Registration, Airworthiness, Flight Manual
   G. Circuit breakers - check
   H. For I.F.R.
      1. Nav check within 10 hours & 10 days
      2. Static check - within 24 months

2. Outside Inspection
   A. Control surfaces and flaps
      1. Security of hinges
      2. Interference of operation
   B. All surfaces
      1. Damages
      2. Interference of snow, ice, mud, etc.
      180: 100 Oct. Blue
      1. Quantity - intended flight
      2. Cap secure
      3. Contamination - drain sumps
      4. Fuel vents - open
   D. Landing Gear - Check
      1. Tire - inflation/condition
      2. Strut - inflation main 4", nose 3" approx.
      3. Brakes - no leaks general condition
      4. Wheel pants - secure no cracks
   E. Propeller - general condition - oil leaks
   F. Oil - quantity minimum 6 qt. - cap secure
   G. Antennas - in place and secure
   H. Pitot tube - clear of obstruction
   I. Static Port - clear of obstruction
   J. Untie aircraft and remove chocks
ENTERING AIRPLANE
1. Flaps up - (before passengers board)
2. Parking brake set
3. Seat belts fastened
4. Review aircraft performance - consider
   1. Gross weight - T.O. distance
   2. Density altitude - angle of climb
   3. Runway condition and wind
   4. Departure path - angle of climb

STARTING
1. Radio equipment OFF
2. Brakes ON
3. Fuel ON (fullest tank)
4. Mixture full rich (high density altitude leaned)
5. Carb Heat OFF
6. Master Switch ON
7. Electric fuel pump ON
8. Throttle OPEN 1/4 inch
9. CLEAR area
10. Start engine
11. CHECK oil pressure
12. Radios ON - Transponder STBY
13. Rotating Beacon ON
14. Electric Fuel Pump ON
15. For taxi clearn area and NOTE WIND
16. Check brakes

WARM UP
Avoid prolonged idling at low r.p.m.
While holding, use 800-1000 r.p.m.

TAXI
1. Taxi path - clear continuously
2. Brake check - soon as practicable
3. Instrument check - D.G. and Turn needle
4. Control speed as much as practicable with throttle. Do not ride brakes with higher power setting than is necessary for smooth operation.
5. Taxi to clear hard surface area.
BEFORE TAKEOFF

1. Brakes ON
2. Fuel ON fuilile tank
3. Run up engine to 2000 rpm
4. a. Check Mags (175 rpm max drop 30 gph)
   b. Check Carb Heat
   c. Check engine instruments in green
   d. Check suction gauge
5. Reduce rpm to smooth idle - 300 to 1000 rpm
6. Electric fuel pump ON
7. Carb heat OFF
8. Mixture RICH (leaneed at high density altitude)
9. Trim SET (stabilator and rudder)
10. Controls FREE
11. Flaps 25° maximum for type of takeoff
12. Set flight instruments - altimeter, artificial horizon & directional gyro
13. Check circuit breakers
14. Check amp meter - for charging
15. Check primer - secured
16. Radio check
17. Close and latch door
18. Clear area

TAKEOFF

1. For normal takeoff rotate 60-70 mph - let fly off
2. Retract flaps
3. Fuel pump - OFF 1,000 ft. AGL or higher

NOTE: For detailed procedure for various takeoffs refer to Owners Manual

CLIMB - Refer to Owners Manual for learning procedures
Normal Climb Speed - 140-90/95; 180-95/100 IAS
Best angle climb speed - 74 mph IAS
Best rate climb speed - 85 mph IAS
NOTE: Normal and enroute climbs should be accomplished at 140-20/95 mph IAS, 180-95/100 mph IAS to facilitate cooling and visibility.

CRUISING
1. Level flight attitude - accelerate while trimming to desired T.A.S. (Refer to cruise performance chart for density altitude - Owners Handbook)
2. Power - Maximum 75% - refer to power setting in Owners Handbook
3. Lean mixture above 5,000 ft. pressure altitude Maintain constant airspeed - lean for peak rpm then drop in rpm - then richen mixture to peak rpm. Continue to richen to slight drop in rpm. Note sound for smooth operation.

ECONOMIC CRUISE
Refer to "Range vs Density Altitude Chart" in Owners Handbook for % power at altitude and range.

DESCENT - PROTECT THAT ENGINE
Plan enroute descent to avoid very lower power setting - not lower than 2,000 rpm should terrain prevent enroute descent, slow to 90 mph and reduce power in increments of 200 rpm to not lower than 1500 rpm RICHEN MIXTURE on the way down. Full rich below 5,000 ft. pressure altitude.

APPROACH AND LANDING
1. Seat backs - erect
2. Seat belts - fastened
3. Fuel - fullest tank
4. Electric fuel pump - ON
5. Mixture - set for altitude
6. Flaps - set (115 mph IAS max)
   (Approach and landing technique - refer to Owners Handbook for type of landing desired)

AFTER LANDING
Directional control is paramount
1. Flaps - UP
2. Fuel pump - OFF
Close your flight plan if radio contact with an FAA facility can be made.
PA-28-140/180 CHECKLIST

ENGINE SHUT-DOWN
1. Brake - ON
2. Throttle - 1,000 rpm
3. Radios - OFF
4. Switches - OFF
5. Mixture - IDLE CUT-OFF
6. Throttle - Close as engine dies
7. Master Switch - OFF
8. Ignition Switch - OFF
9. Hobbs meter - record reading
10. Remove all objects from airplane - including trash, cups and bottles
11. Tie airplane down
12. Release parking brake
13. Report malfunction of equipment

START PLANNING NEXT FLIGHT

Consider fuel requirements.
Fill tanks to prevent contamination.

CLOSE YOUR FLIGHT PLAN !!!!
EMERGENCY

BE INTIMATELY FAMILIAR WITH EMERGENCY PROCEDURES LISTED IN THE OWNERS MANUAL.
KNOW WHERE YOU ARE AT ALL TIMES.
KNOW LOCATION OF AIRPORTS AND TERRAIN.
KNOW WIND DIRECTION AND APPROXIMATE VELOCITY.
EMERGENCY FREQUENCY 121.5.
TRANSUPONDER 7700.
ENGINE POWER LOSS IN FLIGHT - ALTITUDE PERMITTING:

1. Airspeed - 83 mph IAS - establish while turning to landing area
2. Fuel selector - switch tanks (NOTE: Up to 10 seconds to restore power)
3. Electric fuel pump - ON
4. Mixture - RICH
5. Carburetor heat - ON
6. Engine gauges - Check for cause
7. Ascertain fuel selector position
8. Ignition - switch to "L" - "R" - both CHECK
9. Throttle and mixture - different settings
10. Try another fuel tank - (NOTE: up to 10 seconds may be required if fuel lines empty)
11. "Our Father", etc. - MAKE SURE WELL LEARNED

Best angle of glide 83 mph IAS. Glide ratio approx. 1.6 miles per 1,000 feet - no wind.

EMERGENCY LANDING

ALL LANDINGS INTO THE WIND IF POSSIBLE

WHEN COMMITTED TO LANDING

1. Ignition switch - OFF
2. Master switch - OFF
3. Mixture - Idle cut-off
4. Fuel selector - OFF
5. Seat belts - TIGHT
6. Flaps - when desired - full flaps on final full stall landing
PA-28-140/180 CHECKLIST

EMERGENCY

FIRE: KNOW YOUR PROCEDURE IN ADVANCE!!!

1. Source of fire - check
   A. Electrical fire - smoke in cabin
      1. Master switch - OFF
      2. Vents - OPEN
      3. Cabin Heat - OFF
      4. Land as soon as practical
   B. Engine fire
      1. In case of engine fire in flight:
         A. Fuel selector - OFF
         B. Heater - OFF
         C. Defroster - OFF
         D. Mixture - idle cut-off
         E. Throttle - close
         F. Dive to blow out fire (if altitude permits)
         G. Proceed with emergency landing
      2. In case of fire on the ground:
         A. If engine has not started:
            1. Keep turning engine with starter
            2. Fuel selector valve - OFF
            3. Mixture - idle cut-off
         B. If engine has started:
            1. Continue running
            2. Fuel selector valve - OFF
            3. Mixture - idle cut-off

Abandon Aircraft - use available extinguisher

LOSS OF OIL PRESSURE - Turn to nearest landing area.
1. Maintain altitude - prepare for emergency landing
2. Don't change power settings unnecessarily
3. Note oil temperature - if normal could be gauge malfunction - if high and rising, an emergency landing is considered eminent.

LOSS OF FUEL PRESSURE
1. Electric fuel pump - ON
2. Mixture - RICH
3. Fuel selector - check on full tank
4. Land as soon as practical

HIGH OIL TEMPERATURE
1. Land - at appropriate airport
ALTERNATOR FAILURE
DETECTION - "0" reading on ammeter with electrical equipment on.
1. Reduce electrical load - unnecessary equipment OFF
2. Alternator circuit breakers - CHECK
3. "ALT" switch - OFF (for 30 seconds), then on
IF POWER IS NOT RESTORED
4. "ALT" switch - OFF
5. Maintain minimum electrical load - turn master switch off for "0" load in day time.
6. Land as soon as practical
ENGINE ROUGHNESS
1. Mixture - adjust for maximum smoothness
2. Electric fuel pump - ON
3. Fuel selector - change to other tank
4. Engine gauges - check for cause
5. Magneto switch - "L" then "R", then back to both. If operation is satisfactory on either magneto, proceed on that magneto at reduced power, with mixture full rich to a landing at first available airport.
If roughness persists, prepare for a precautionary landing at pilot's discretion.
OPEN DOOR IN FLIGHT
An open door will not affect normal flight characteristics, and a normal landing can be made with door open. Do not try to close door at low altitudes.
TO CLOSE DOOR IN FLIGHT
1. Slow aircraft to 100 mph IAS
2. Cabin vents - close
3. Storm window - open
4. Push door further open and then close rapidly (Note: a slip in the direction of the open door will assist in latching procedure).
CHAPTER 1 – INTRODUCTION TO THE AIRPLANE

STUDENT EXERCISE
THE AIRPLANE

Instructions: Complete this exercise using chapter 1, section A, of the text for reference.

Place a letter identifying the airplane part next to the identifying names below:

1. _______ carburetor air intake
2. _______ cowling
3. _______ right flap
4. _______ flashing beacon
5. _______ fuselage
6. _______ stabilator
7. _______ left aileron
8. _______ left fuel tank cap
9. _______ red position light
10. _______ main landing gear
11. _______ left flap
12. _______ nose landing gear
13. _______ pitot tube
14. _______ propeller
15. _______ propeller spinner
16. _______ right aileron
17. _______ right fuel tank cap
18. _______ green position light
19. _______ rudder
20. _______ static air vent
21. _______ white position light
22. _______ trim tab
23. _______ vertical stabilizer
24. _______ wing
Lesson 4:
Science of Flight: *Bernoullis' Principle *Newton's Laws *Lift *Controls *Axis *Four Forces *Stall
Read chapter II, up to page 42, load factors:

Objectives:
At the conclusion of this lesson, the student should be able to:
*Define science of lift
*Define stall, controls, axis, and four forces

Completion Standards:
*The lesson will be considered successful when the student can demonstrate the control surfaces on the aircraft.
Remaining information will be evaluated in Stage I test.

Format:
*Give quiz
*Hand out control and axis handout
*Show control movements on aircraft
*Lecture on stalls, four forces, and principles of flight
Quiz (10 items)

*Bernoullis' Principle
*Newton's third law
*Chamber
*Chord
*Angle of attack
*Stall
*Flight controls and axis
*Adverse yaw
*(4)Forces
*Horizontal, vertical component of lift

Additional items to be covered:
*Dihedral
*Angle of incidence
*Yoke
*Empennage
Information Sheet

Aircraft Familiarization

Axes and Fundamental Motions
Lesson 5
Lesson 5
Science of Flight:
Continued, finish reading chapter II in text
*Load factors *trimtabs *stability *Torque *Flaps *"P" factor
*Wake turbulence *Aircraft documents

Objectives:
At the conclusion of this lesson, the student should be able to:
1. Load factors
2. Trim tabs
3. Stability
4. Torque
5. Flaps
6. "P" factor
7. Wake turbulence
8. Aircraft documents

Completion Standards:
*The success of this lesson will be determined by the passing of Stage I test.

Format:
*Give quiz
*Bring into the class a yoke and propeller
Lecture on:

1. Load factors
2. Trim tabs
3. Stability
4. Torque
5. Flaps
6. "P" Factor
7. Wake turbulence
8. Aircraft documents
IG 5.3

AERO 122, 142

Class Lesson 5 Quiz
STAGE I

Quiz (10 items)

*Load factors
*Aircraft documents
*Trim tabs
*Stability
*Ground effect
*Wake turbulence
*Torque
*"P" factor
*Spin
*Flaps

ADDITIONAL INFORMATION TO BE COVERED

*Taxi controls
*Stall warning devices
*Slipstream effects
Lesson 6

Review/Test:  *Review for Stage I test
   Stage I test

Objectives:
At the completion of this lesson, the student should be able to:
*Evaluate information previously given

Completion Standards:
*A test score of 70% would be considered a minimum score

Format:
*Conduct review
*Question/answer period
*Administer test
*Grade test
*Return test
*Review test
Test Day

Stage I (No quiz)
AERO 142/122

Private Pilot Ground School
Stage Test I

Name: ___________________________ Date: ___________________________

Instructions:
1. Write your name and date at the top.
2. Answer only the easy questions... first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
6. If you elect to take a break, do so quietly.
7. When finished you may leave, after you have reviewed your Test Results.

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I. STAGE II OBJECTIVE: (12 hours) The objective of Stage II is to introduce the student to various different powerplant systems and components. It will also explain the functions and characteristics of the flight and engine instruments.

II. STAGE II COMPLETION STANDARDS: The student will successfully complete Stage II by obtaining a written test score of 70% or better.
Lesson 7
Lesson 7

Powerplant: *Fuel *Oil *Air *Ignitions *Props *Carburetor/Injection

Objective:
At the completion of this lesson, the student should be able to:
*Identify/explain aircraft powerplant operations/systems
*Determine which grade oil fuel to use
*Denote differences in carburetor/injection
*Determine who can do maintenance on aircraft

Completion Standard:
*Student will be able to identify aircraft engine components
*Determine who can do what maintenance
*Receive a passing score on STAGE II written test

Format:
*Give quiz
*Powerplant tour of facility to show:
1. props
2. fuel
3. carburetor

*Lecture on:
1. air intake/cooling
2. injection
AERO 122, 142

Class Lesson 7 Plan Continued
STAGE II

*Show with simulator flight instruments

*Lecture on all instruments
QUIZ (10 items)

*Mechanic's license
*Inspection
*(2) Fuel grades
*Carburetor/injection
*Dual ignition
*Detonation
*Leaning an engine
*Electrical systems
*(2) Kinds of propellers
*Starting an engine

ADDITIONAL ITEMS TO BE COVERED
*Manifold pressure
*RPM
*Hand propping
*Cowl flaps
*Air worthiness directives (AD notes)
AERO 122, 142

Lesson 8
Lesson 8

Flight Instruments: *Pitot/static *Airspeeds *Altitudes
*Characteristics

Read chapter IV up to compass page 111:

OBJECTIVE:
At the conclusion of this lesson, the student should be able to:

*Identify pitot/static instruments
*Adjust/interpolate instruments
*Define different airspeeds/altitudes

COMPLETION STANDARDS:
*The student will be able to determine flight altitudes from flight simulators
*Pass Stage II test with a passing score

FORMAT:
*Give quiz
*Lecture pitot/static instruments
*Demonstrate with flight simulator the flight instruments and adjustments
QUIZ (10 Items)

*(3) Pitot static instruments

*Differential pressure instrument

*IAS – Indicated airspeed

*CAS – Calibrated airspeed

*TAS – True airspeed

*Knowllsman window

*I. Alt. – Indicated altitude

*T. Alt. – True altitude

*Pres. Alt. – Pressure altitude

*Absolute altitude

ABSOLUTE ITEMS TO BE COVERED

*Instrument errors

*Density altitude

*Standard day

*"V" speeds

*Color-coded areas airspeed indicator
1. Indicated Air Speed is equal to the airspeed indicator reading, as installed in the airplane, without correction for airspeed indicator position error, observed airspeed instrument reading.

2. CAS (Calibrated Air Speed) is equal to the airspeed indicator reading corrected for position and instrument error.

3. TAS (True Air Speed) is equal to CAS at sea level in standard atmosphere, corrected for position and instrument error, and for adiabatic compressibility, corrected for total pressure at indicated air speed equal to true airspeed indicator reading.

4. VNE (Never Exceed Speed) is equal to 1.075 of V_{NE}.

5. VNO (Never Exceed Speed) is equal to 0.90 of V_{NO}.

6. VYSP (The Design Maneuvering Speed, speed below which structure is good for 300 ft/sec gusts) is equal to the airspeed indicator reading, below which structure is good for 300 ft/sec gusts.

7. VYCR (The Design Cruising Speed, speed used in calculation of structural strength) is equal to the airspeed indicator reading, below which structure is good for 3000 ft/sec gusts.

8. VY (The Design Diving Speed) is chosen by designer at which aircraft must be flown to ascertain that no adverse flight conditions exist at this speed.

9. VYMS (The Maximum Speed With the Wing Flaps in a Prescribed Extended Position) is equal to the airspeed indicator reading, above which the aircraft is not capable of sustained flight.

10. VYMS (The Maximum Speed) is equal to the airspeed indicator reading, above which the aircraft is not capable of sustained flight.

(Definitions for use in FAA Academy Training Courses)
10. $V_{LE}$

The Landing Gear-Extended Speed. Maximum speed for safe flight with landing gear extended.

11. $V_{LO}$

Landing Gear Operating Speed. Maximum speed for safe operation of landing gear.

12. $V_{MC}$

Minimum Control Speed. (Minimum flight speed at which multi-engine aircraft is satisfactorily controllable, when the critical engine is suddenly made inoperative with remaining engines at TO power.)

13. $V_{NO}$

Normal Operating Limit Speed. Maximum speed for normal operation. (Upper limit of green arc and lower limit of yellow arc on airspeed indicator)

14. $V_{SO}$

The power-off stalling speed (or, if unobtainable, the minimum steady flight speed) in the landing configuration.

15. $V_{SL}$

The power-off stalling speed (or, if unobtainable, the minimum steady flight speed) in a specified configuration.

16. $V_X$

Speed for best angle of climb.

17. $V_Y$

Speed for best rate of climb.

18. $V_{1*}$

The Critical Engine-Failure Speed. (The critical speed for decision as to whether to abort takeoff or continue, when an engine fails.)

19. $V_{2*}$

Emergency Take-off Climb Speed. ($V_2$ is the speed at which the performance data, used in dispatching, are known to be obtainable.)

* $V_1$ and $V_2$ are applicable only to aircraft certificated under FAR 25 or for aircraft modified to transport category status.
Lesson 9

Flight Instruments: *Gyros *Limitations *Variation *Deviation
*Compass

Read remaining Chapter IV:

OBJECTIVE: By the end of this lesson, the student will be able to:

*Interpret/adjust gyro instruments
*Interpret compass headings and determine inherent errors

COMPLETION STANDARDS

*The student will be able to adjust, interpret, and understand inherent errors in the flight instruments
*Interpret and determine proper engine procedures/instruments
*Pass Stage II written test with a passing score

FORMAT:

*Give quiz

*Lecture/demonstrate gyros principles

*Demonstrate gyro instruments with flight simulator
QUIZ (10 Items)

*Gyro principles
*Power to gyros
*(3) gyro instruments
*Direction gyro-usage (D.G.)
*Artificial horizon - usage
*Turr Co - coordinator - interpretation
*Variation
*Deviation
*Basic "T" formation

ADDITIONAL ITEMS TO BE COVERED
*Slip/skid
*A.N.D.S.
*Lead/lag errors
*Quality verses quantity
Lesson 10
STAGE II

Lesson 10

Review Test: Review for STAGE II test STAGE II test

OBJECTIVE: At the completion of this lesson the student should be able to:

*Evaluate and be tested successfully on chapters III and IV

COMPLETION STANDARDS:

*A test score of 70% would be considered minimum

FORMAT:

*Conduct review

*Question/answer period

*Administer test

*Grade test

*Return test

*Review test
AERO 122, 142

Class Lesson 10 Test
STAGE II

TEST DAY STAGE II

(No Quiz)
AERO 142/122
Private Pilot Ground School
Stage Test II

Name: ___________________________ Date: ____________

Instructions: 1. Write your name and date at the top.
2. Answer only the easy questions... first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
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STAGE III

I. STAGE III Objective: (12 hours) The objective of STAGE III is to introduce, explain, calculate and determine safe operating procedures for both weight and balance and performance.

II. STAGE I Completion Standard: The student will successfully complete STAGE III by obtaining a written test score of 70% or better.
AERO 122, 142 Class Lesson 11 Plan
STAGE III

Lesson 11

Weight/Balance: *Computations *Limitations *Read Chapter V from text *Adverse affects *Mathematics

OBJECTIVE:
At the completion of this lesson, the student will be able to:

*Compute weight/balance
*Identify unsafe conditions
*Interpret different tables/graphs for weight/balance determination

COMPLETION STANDARDS:
*The student will be able to determine weight/balance information
*Recognize adverse loading characteristics
*Identify safety limitations
*Receive passing score on STAGE III test

FORMAT:
*Give quiz
*Introduction of terms utilized in weight/balance
*Review basic mathematics
*Work out sample problems from log books of aircraft at the facility
QUIZ (10 Items)

*Gas weight
*Oil weight
*Empty weight
*Useful load
*Gross weight
*Datum line
*Arm
*Moment
*Center of gravity
*Center of gravity envelope

ADDITIONAL INFORMATION TO BE COVERED
*Center of pressure
*Stability characteristics
*Safe, acceptable operations
1. **Moments:** Compute the moment for each weight according to distance from the datum line. "X" (20 lbs.) represents the total weight of the oar.

   **POSITIVE MOMENTS (Weight x arm = moment):**
   - B. ______ x ______ = ______ pound-inches
   - C. ______ x ______ = ______ pound-inches
   - D. ______ x ______ = ______ pound-inches
   - E. ______ x ______ = ______ pound-inches
   - X. ______ x ______ = ______ pound-inches

   **TOTAL** ______ pound-inches

2. **Negative Moments**
   - A. ______ x ______ = ______ pound-inches

3. **Net Moment** = ______ pound-inches (positive minus negative)

4. **Total Weight** = ______ (include weight of bar)

5. **Center of Gravity (CG)** = ______ inches from datum line.
AERO 122, 142

Lesson 12
Lesson 12

Weight/Balance Continued: Review different methods of computation
Review Chapter V from text

OBJECTIVE:
By the end of the lesson, the student will be able to:
* Determine weight/balance information from several different methods of computations

COMPLETION STANDARDS:
* The instructor will pick ten questions from Private Pilot Test Book and assign them to students to do and review satisfactorily
* Receive a passing score on STAGE III test

FORMAT:
* Give quiz
* Review all previous information
* Introduce different methods of computation
* Administer ten sample questions from Private Pilot Test Booklet
* Review results from questions
Lesson 12 Quiz
STAGE III

QUIZ (10 Items)

*The ten quiz items will be picked by the instructor from weight/balance questions from the Private Pilot Test Booklet.

ADDITIONAL INFORMATION TO BE COVERED:

*Computation method

*Graph method

*Tables method
WEIGHT & BALANCE

(Notes)

Airplane loaded forward of the C.G. range—undesirable characteristics:
A. Excessive loads on nose wheel (tendency to nose over on tailwheel type airplanes)
B. Decreased performance
C. Higher stall speeds
D. Higher stick forces

A NOSE HEAVY AIRPLANE IS TOO STABLE!!!

Airplane loaded aft of the C.G. range—undesirable characteristics:
A. Decreased static & dynamic stability. Under some conditions the airplane may be impossible to control.
B. Violent stall characteristics. (tendency to flat spin)
C. Very light stick forces. (easy to over-stress the airplane inadvertently)

A TAIL HEAVY AIRPLANE IS VERY UNSTABLE!!!
AERO 122, 142

Lesson 13
Lesson 13

Performance: *Computations *Variables *Charts *Graphs
  *Density Altitude

Read Chapter VI in text

OBJECTIVE:

At the conclusion of this lesson, the student should be able to:

*Understand the effects of temperature and condensation on performance
*Apply variables to charts/graphs
*Determine accurately performance criteria
*Determine density altitude

COMPLETION STANDARD:

*The lesson will be considered completed when the student can work out various problems from the Private Pilot Test booklet
*Receive a passing score on STAGE III written test

FORMAT:

*Handout performance charts
*Lecture on performance characteristics
*Explain density altitude
*Work together on performance charts/graphs from Private Pilot Test booklet
*Give quiz and review
AERO 122, 142

Class Lesson 13 Quiz
STAGE III

QUIZ (10 Items)

*After lecture is completed, instructor will choose ten performance questions from the Private Pilot Test booklet.

*At the completion of the quiz, problems would be worked out together as a group.
EXAMPLE: 40 knot wind at 30° angle.
A 30° angle between wind and runway.
B 40 knots total wind velocity.
C 35 knot headwind component.
D 20 knot crosswind component.

Crosswind Component Graph.
**LANDING DISTANCE**

**ASSOCIATED CONDITIONS:**
- **Power:** Retarded to maintain 900 ft on final approach
- **Flaps:** Down
- **Landing Gear:** Down
- **Runway:** Paved, level, dry surface
- **Approach Speed:** IAS as tabulated
- **Braking:** Maximum

**EXAMPLE**
- **OAT:** 25°C (77°F)
- **Pressure Altitude:** 3965 ft
- **Weight:** 2814 lbs
- **Wind Component:** 90 knots (headwind)
- **Ground Roll:** 1080 ft
- **Total over 50 ft obstacle:** 1700 ft
- **Approach Speed:** 68 knots (78 MPH)

**Airplane Landing Distance Graph.**

**TABLE:**

<table>
<thead>
<tr>
<th>Weight (Pounds)</th>
<th>Speed at 50 ft (Knots)</th>
<th>Speed at 50 ft (MPH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2950</td>
<td>70</td>
<td>80</td>
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<tr>
<td>2800</td>
<td>68</td>
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<td>2600</td>
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<td>72</td>
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<tr>
<td>2200</td>
<td>60</td>
<td>69</td>
</tr>
</tbody>
</table>

**FIGURE 28:** Airplane Landing Distance Graph.
**LANDING DISTANCE**

<table>
<thead>
<tr>
<th>GROSS WEIGHT LBS.</th>
<th>APPROACH SPEEDIAS, MPH</th>
<th>AT SEA LEVEL &amp; 59° F.</th>
<th>AT 2500 FT. &amp; 50° F.</th>
<th>AT 5000 FT. &amp; 41° F.</th>
<th>AT 7500 FT. &amp; 32° F.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>GROUND ROLL</td>
<td>TOTAL TO CLEAR 50 FT. OBS</td>
<td>GROUND ROLL</td>
<td>TOTAL TO CLEAR 50 FT. OBS</td>
</tr>
<tr>
<td>1600</td>
<td>60</td>
<td>445</td>
<td>1075</td>
<td>470</td>
<td>1135</td>
</tr>
</tbody>
</table>

**NOTES:**
1. Decrease the distances shown by 10% for each 4 knots of headwind.
2. Increase the distance by 10% for each 80°F temperature increase above standard.
3. For operation on a dry, grass runway, increase distances (both "ground roll" and "total to clear 50 ft. obstacle") by 20% of the "total to clear 50 ft. obstacle" figure.

Airplane Landing Distance Table.
AERO 122, 142

Lesson 14
AERO 122, 142

Class Lesson 14 Plan
STAGE III

Lesson 14

Review/Test: *Review for STAGE III test

STAGE III test

OBJECTIVE:
At the completion of this lesson, the student should be able to:
*Evaluate information previously given

COMPLETION STANDARD:
*A test score of at least 70% would be considered a minimum score.

FORMAT:
*Conduct review
*Question/answer period
*Administer test
*Grade test
*Return test
*Review test
AERO 122, 142

Class Lesson 14 Test
STAGE III

TEST DAY

STAGE III (No quiz)
AERO 142/122

Private Pilot Ground School
Stage Test III

Name: ___________________________ Date: ___________________________

Instructions: 1. Write your name and date at the top.
   2. Answer only the easy questions... first.
   3. Mark your answers on this sheet first.
   4. Make any notes about the question on this sheet.
   5. Transfer your answers to the Scantron sheet after you are all done.
   6. If you elect to take a break, do so quietly.
   7. When finished you may leave, after you have reviewed your Test Results.

<table>
<thead>
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<th>ITEM NO.</th>
<th>QUESTION NO.</th>
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<td>25</td>
<td>1680</td>
<td>50</td>
<td>1708</td>
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</tbody>
</table>
I. STAGE IV OBJECTIVE: (12 hours) The objective of STAGE IV is to introduce and explain the airport environment. This includes markings, lights, communications, airspace, and special use airspace. This stage will also introduce and explain how to extract information from publications.

II. STAGE IV COMPLETION STANDARD: The student will successfully complete STAGE IV by obtaining a minimum score of 70% or better on written stage check.
AERO 122, 142                                      Class Lesson 15 Plan
                                                    STAGE IV

Lesson 15

Airports/Airspace: Airport markings *Traffic patterns
*Lighting *Wind indicators *Basic communications *Control
zones *Airport traffic area *Control areas

Read Chapter VII up to Airspace, page 201:

OBJECTIVE:

By the end of this lesson, the student will be able to:

* Determine airport/runway markings
* Identify wind indicators and traffic patterns
* Communicate basically/light signals
* Identify/explain:
  1. Control zones
  2. Airport traffic areas
  3. Unicom/multicom
  4. Airport terminal information service
  5. Light signals
  6. Special VFR clearance
  7. Transition areas
  8. Continental control area
  9. Positive control area

COMPLETION STANDARD:

* The lesson will be considered completed when the student
  can identify and explain control areas and communication
  frequencies from a chart.

* Pass STAGE IV test with a minimum score of 70% or more.
Lesson 15

FORMAT:

*Give quiz

*Lecture on traffic patterns/logs

*Lecture on wind/runway definitions

*Pass out and explain traffic pattern handout

*Pass out airspace handout and explain

*Refer to chart in text and point out various communications and control arms

*Refer to legend and chart for clarification
AERO 122, 142
Class Lesson 15 Quiz
STAGE IV

QUIZ (10 items)

*Segmented circle
*(2) Wind indicators
*Draw traffic pattern and logs
*VASI
*Unicom/multicom
*Airport traffic area
*ATIS
*Continental control area/positive control area
*Control cones
*Runway lights/light signals

ADDITIONAL ITEMS TO BE COVERED:
*2 Bar/3 Bar VASI
*PAPI light system
*3 Color light system
*Runway numbering
*Special airport detecting systems
Lesson 16

Special Airspace: *All lights  *Special use airspace  
*Grenich time *VHF/UHF L.M.H. frequencies

OBJECTIVES:

At the conclusion of this lesson, the student should be able to:

*Recognize different airport lighting

*Identify/explain special use airspace to include:

1. ARSA
2. TCA
3. TRSA

*Identify/explain differences in VHF/UHF frequencies to low, medium, and high frequencies

COMPLETION STANDARDS:

*The student will be able to distinguish special use airspace from a chart

*The student will know all airport lighting

*The student will identify the difference in frequencies

FORMAT:

*Give quiz

*Introduce a chart and explain different airspaces and communications

*Lecture on usage of transponders and codes

*Relate to Grenich time for position
QUIZ (10 items)

*(3) Types of control areas
*Military training route
*VHF/UHF frequencies/low, medium, high
*Grenich time
*Approach lights
*Runway lights
*Noise abatement areas
*Terminal control areas
*Beacon colors
*Terminal radar service area

ADDITIONAL ITEMS TO BE COVERED
*Airport radar service area
*Transponders
FSS COMMUNICATIONS

In order for the pilot to obtain the services of the Flight Service Station, he must first establish communications. Flight Service Station frequencies can be found on Sectional and World Aeronautical Charts, as well as in the Airman's Information Manual. When contacting a Flight Service Station the pilot should remember a few items of courtesy and use proper communications technique.

1. Select the proper frequency for the service desired: Flight Watch frequency for weather information ONLY, Airport Advisory frequency for Airport Advisories, and the Discrete frequency for routine communications.

2. Monitor the frequency before transmitting.

3. On initial contact use the complete aircraft identification.

4. Advise the FSS specialist on which frequency you expect a response.

5. Give the specialist a chance to answer before repeating the call, changing frequencies, or proceeding with your message.

6. Avoid calling the FSS at 15 minutes past the hour, during the scheduled weather broadcast.

<table>
<thead>
<tr>
<th>HEAVY LINE BOX</th>
<th>indicates Flight Service Station. Normally 122.2 and 121.5 are available. Triangles in corners of the box indicate Enroute Flight Advisory Service 122.0.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>122.1R 122.5</strong></td>
<td><strong>LOS ANGELES</strong> 113.6 Ch 83 LAX</td>
</tr>
<tr>
<td><strong>122.1R (Duplex) FSS has Receiver Only. Pilot must transmit on 122.1 and listen on the VOR 113.6.</strong></td>
<td><strong>122.6 (Simplex) FSS discrete frequency.</strong> When contacting Flight Watch always advise them of your position on initial contact.</td>
</tr>
</tbody>
</table>
LIMITED REMOTE COMMUNICATIONS OUTLET
and NAVAID. (Duplex) "Santa Catalina"
is the name of the LHC0 and NAVAID.
Square, in lower right corner, indicates Transcribed Weather Broadcast
(TWBR) available on the VOR frequency.
Los Angeles is the controlling Flight Service Station.

SANTA CATALINA
109.4 Ch 31 SXC
[LOS ANGELES]

NAVCOs of this type usually have receivers at the site (e.g. 122.1R);
however, when FSS receivers are located close by, a receiver is not
always provided at the NAVAID site. The pilot must transmit on a Los
Angeles FSS frequency such as 122.1 and receive on the VOR 109.4.

LIMITED REMOTE COMMUNICATIONS OUTLET
and NAVAID. (Duplex) "Gorman" is the name of the LHC0 and NAVAID. Bakers-
Field is the controlling Flight Service Station.

GORMAN
116.1 Ch 108 GMN
[BAKERSFIELD]

122.1R (Duplex) FSS has Receiver
Only. Pilot must transmit on 122.1
and listen on the VOR 116.1.

SIMPLEX - The pilot transmits and receives on the same frequency.

LIMITED REMOTE COMMUNICATIONS OUTLET
(Simplex) "Winnebucca" is the name of the LHC0 with simplex frequency
of 122.3. Lovelock is the controlling Flight Service Station.

WINNEBUCCA LRCO
LOVELOCK

122.3

NAVCO ONLY with NO FSS communications. The underlined frequency
(108.4) indicates no voice available through the VOR.

GORMAN advLrt^r'' ' Watch always116.1 Ch ios GMN=- itla^cstu^c' Position on In-
NAVAID 	NLY withi NO j.'ibSLBAKER"SFIElS] ions "— r -* comiiunica­underlined ITeouenrv

LAKE HUGHES
108.4 Ch 21 LHS

When contacting Flight Watch always advise them of your position on in-
itial contact.

NAVCO ADVISORY
SERVICE. (Simplex) Flight Watch is
on a common frequency of 122.0.

OAKLAND
FLIGHT WATCH

122.1R (Duplex) PSS has Receiver
Only. Pilot must transmit on 122.1
and listen on the VOR 116.1.

SIMPLEX - The pilot transmits and receives on the same frequency.

DUPLEX - The pilot transmits on one frequency and receives on a different
frequency.

The above are examples ONLY, not to be used for communications or naviga-

The above are examples ONLY, not to be used for communications or naviga-
Lesson 17

Flight Publications: *Regulatory/non-regulatory publications *Aeronautical charts *Airman's information manual *Exam-O-Grams *NOTAMS

OBJECTIVE:
At the completion of this lesson, the student should be able to:
*Extract information from the Airman's Information Manual
*Obtain information from regulatory and non-regulatory publications
*Utilize different aeronautical charts

COMPLETION STANDARD:
*Student will know where to find information and be able to obtain it
*Receive a passing score on STAGE IV written test

FORMAT:
*Give quiz
*Show samples of regulatory and non-regulatory publications and explain
*Show samples of different aeronautical charts and explain
*Extract information from text to help utilize the Airman's Information Manual

*NOTE: If instructor has no samples of publications or charts, examples are in text.
AERO 122, 142  Class Lesson 17 Quiz
STAGE IV

QUIZ (10 Items)

*Airworthiness directives - A.D.
*Advisory circulars - A.C.
*Exam-0-grams
*Notices to airman - MOTAMS
*Airman's Information Manual - AIM
*Airport Facility Directory
*(2) Charts
*Graphic notices
*National Transportation Safety Board
*Alerts/Safety Standards Pamphlets

ADDITIONAL INFORMATION TO BE COVERED:
*NOTAM (D); (L)
*FDC MOTAMS
*Advisory Circular checklist
AERO 122, 142

Lesson 18
Lesson 18

Review/Test: *Review for STAGE IV test

STAGE IV Test

OBJECTIVE:

At the completion of this lesson, the student should be able to:

* Evaluate information from publications and charts

COMPLETION STANDARD:

*A test score of at least 70% would be considered minimum.

FORMAT:

* Conduct review
* Question/answer period
* Administer test
* Grade test
* Return test
* Review test
AERO 122, 142
Class Lesson 18 Test
STAGE IV
TEST DAY STAGE IV
(No Quiz)
# Private Pilot Ground School

## Stage Test IV

**Instructions:**

1. Write your name and date at the top.
2. Answer only the easy questions... first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
6. If you elect to take a break, do so quietly.
7. When finished you may leave, after you have reviewed your Test Results.

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>QUESTION NO.</th>
<th>ITEM NO.</th>
<th>QUESTION NO.</th>
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</table>
I. STAGE V OBJECTIVE: (3 hours) The objective of STAGE V is to evaluate learning retention from previous stages.

II. STAGE V COMPLETION STANDARD: The student will successfully complete STAGE V by obtaining a score of 70% or better on written stage test.
Lesson 19

MID-TERM: *All previous material covered

OBJECTIVE:
By the end of this lesson, the student will be able to:
*Determine if all previously learned material has been retained.

COMPLETION STANDARD:
*A minimum score of 70% is considered passing.

FORMAT:
*Conduct review
*Question/answer period
*Administer test
*Grade test
*Return test
*Review test
TEST DAY: STAGE V (Mid-term)

No Quiz
AERO 142/122
Private Pilot Ground School
Stage Test V
Mid Term

Name: ___________________________ Date: ______________________

Instructions: 1. Write your name and date at the top.
2. Answer only the easy questions... first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
6. If you elect to take a break, do so quietly.
7. When finished you may leave, after you have reviewed your Test Results.

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<td>25</td>
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</table>
STAGE VI

I. STAGE VI OBJECTIVE: (12 hours) The objective of STAGE VI is to teach the basics of weather and what the primary elements are. This stage will also teach students how to interpolate, identify, and make decisions regarding weather criteria, charts, and forecasts.

II. STAGE VI COMPLETION STANDARD: The student will successfully complete STAGE VI by obtaining a score of 70% or better on the written stage test.
Lesson 20

Basic Weather: *Pressure systems *Ceiling *Clouds *Fog *Ice *Fronts *Airmass *Wind shear *Dew point *Coriolis force

OBJECTIVE:
By the end of the lesson, the student will be able to:

*Know what causes weather
*Know the effects and differences in:
1. Pressure systems
2. Clouds
3. Fog
4. Ice
5. Fronts
6. Airmasses

COMPLETION STANDARD:
*The lesson will be considered complete when the student can identify and explain basic weather aspects
*Pass STAGE VI with a minimum score of 70%

FORMAT:
*Give quiz
*Lecture on what causes weather
*Lecture on all related properties of weather
AERO 122, 142  
Class Lesson 20 Quiz  
STAGE VI  

Quiz (10 Items)  

*Causes of weather  
*Dew point  
*Low pressure systems  
*High pressure systems  
*Ceiling  
*(2) Fogs  
*(2) Ice  
*Wind shear  
*(2) Clouds  
*Airmass/fronts  

ADDITIONAL INFORMATION TO BE COVERED:  
*Lapse rates  
*Sublimation  
*Inversion layers  
*Thunderstorms  
*Onshore/offshore winds  
*Prevailary winds  
*Stability  
*Cloud-base formula  
*Radiation  
*Standard day
Lesson 21

WEATHER SERVICES: *Reports *Forecasts *Charts *Flight Service Station

Read Chapter IX from information

TEXT:

OBJECTIVE:

By the end of this lesson, the student will be able to:

*Read weather charts, forecasts

*Know how to obtain weather information

*Know what a flight service station can do for weather information

COMPLETION STANDARD:

*The student will be able to read, interpret, and understand weather charts, forecasts, and relating information

*Receive a minimum score of 70% on STAGE VI written test

FORMAT:

*Review basic weather

*Give quiz

*Show samples of weather reports/forecasts

*Give out weather key

*Read reports/forecasts together

*Call on telephone and receive a weather briefing
*How do you obtain a weather briefing

*Transcribed weather enroute broadcast (TWEB)

*Enroute Flight Advisory Service (EFAS)

*Pilot reports (PIREPS)

*Notices to airman (NOTAMS)

*Sigmet/airmet

*Convective outlook

*Pilots automatic weather answering service (PATWAS)

*Runway visual range (RVR)

*(2) Types of weather charts

ADDITIONAL INFORMATION TO BE COVERED:

*Terminal chart

*Aero chart

*Depiction chart

*Prognostive chart

*Radar summary chart

*Winds aloft chart

*Surface aviation chart
KEY TO AVIATION WEATHER OBSERVATIONS

LOCATION IDENTIFICATION TYPE AND TIME OF REPORT
NAEC 214 NAEC 214 MDC 1412

KEY AND CEILING
BASELINE: The numbers 1 to 9 indicate altitude in hundreds of feet above mean sea level. The number 0 indicates mean sea level. 100 is more than 10,000 feet. V is the ceiling or visibility. 0 indicates ceiling 10,000 feet or more.

VISIBILITY: Figures preceding contractions are in statute miles and figures following contractions are in feet. The figures are in three groups, separated by colons.

WEATHER AND OBSTRUCTION TO VISION
Slight: 2/10 to 5/10 sky cover.
Light: 6/10 to 9/10 sky cover.
Moderate: 1/2 to 12/12 sky cover.
Heavy: 13/12 to complete sky cover.

DEAD LEVEL PRESSURE: In inches of mercury. Figures following contractions are at a standard pressure of 29.92 inches of mercury.

US DEPARTMENT OF COMMERCE - NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION - NATIONAL WEATHER SERVICE

KEY TO AVIATION WEATHER FORECASTS

Terminal Forecast

GENERAL: Figures preceding contractions are in statute miles and figures following contractions are in feet. The figures are in three groups, separated by colons.

WEATHER AND OBSTRUCTION TO VISION
Slight: 2/10 to 5/10 sky cover.
Light: 6/10 to 9/10 sky cover.
Moderate: 1/2 to 12/12 sky cover.
Heavy: 13/12 to complete sky cover.

DEAD LEVEL PRESSURE: In inches of mercury. Figures following contractions are at a standard pressure of 29.92 inches of mercury.

US DEPARTMENT OF COMMERCE - NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION - NATIONAL WEATHER SERVICE
Lesson 22

Review Weather: *All aspects, terms, definitions, charts, forecasts.

Review chapters VIII and IX

OBJECTIVE:

By the end of this lesson, the student will be able to:

*Explain, determine, and predict weather criteria

COMPLETION STANDARD:

*The student will be able to extract information from various charts/forecasts

*Pass STAGE VI written test with a minimum of 70%

FORMAT:

*Show weather tapes. Tapes are located at SBVC Film Library. Volume 4, A and B. An Invitation to Fly Private Course.

*Instructor will pick ten questions from Private Pilot Test Guide Booklet

*Give quiz

*Review quiz and tapes
Class Lesson 22 Quiz

Quiz (10 Items)

*The instructor will pick ten questions from the Private Pilot Test Booklet.
Lesson 23

Review/Test: *Review for STAGE VI test.

STAGE VI Test

OBJECTIVE:

At the completion of this lesson, the student will be able to:

*Evaluate previously given information

COMPLETION STANDARD:

*A test score of at least 70% would be considered minimum.

FORMAT:

*Conduct review

*Question/answer period

*Administer test

*Grade test

*Return test

*Review test
AERO 122, 142

Class Lesson 23 Test

STAGE VI

TEST DAY STAGE VII

No Quiz
**Name:** ___________________________  **Date:** ___________________________

**Instructions:**
1. Write your name and date at the top.
2. Answer only the easy questions...first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
6. If you elect to take a break, do so quietly.
7. When finished you may leave, after you have reviewed your Test Results.

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</table>
I. STAGE VII OBJECTIVE: (3 hours) The objective of STAGE VII is to locate, identify, interpret, and explain the FARs applicable to a Private Pilot. Teach student how to use flight computer, plotter, navigate with reference to pilotage dead reckoning and radio navigation.

II. STAGE VII COMPLETION STANDARD: The student will be continually tested throughout the course on FARs. Passing FAR questions on stage tests will be considered satisfactory. Passing STAGE VII written test with a minimum grade of 70% or more.
Lesson 24
Regulations: *Parts 61, 91, 830 of FARs
Read Chapter XI
In text:
OBJECTIVE:
By the end of this lesson, the student will be able to:
*Locate, identify, and explain various FARs

COMPLETION STANDARD:
*The student has been introduced to FARs continually through the course.
*New FARs will be identified and explained.

FORMAT:
*Give out (3) page hand-out FARs.
*Use text, and look up various FARs from handout.
*Lecture and explain all applicable FARs.
*Review

NOTE: (No stage test on STAGE VII)
NOTE: No quiz on regulations (optional)
BE PREPARED TO GIVE A DEFINITION OF EACH OF THE FOLLOWING FAR’S.

**FAR**  **TOPIC**

61.17 TEMPORARY CERTIFICATES

61.19 DURATION OF CERTIFICATES

61.23 DURATION OF MEDICAL CERTIFICATES

61.51 PILOT LOGBOOKS

61.57 RECENT FLIGHT EXPERIENCE

61.60 CHANGE OF ADDRESS

61.118 PRIVATE PILOT PRIVILEGES AND LIMITATIONS

61.139 COMMERCIAL PILOT PRIVILEGES AND LIMITATIONS

91.3 RESPONSIBILITY AND AUTHORITY OF PILOT IN COMMAND

91.5 PREFLIGHT ACTION (REO’D)

91.9 CARELESS OR RECKLESS OPERATION

91.11 LIQUOR AND DRUGS

91.13 DROPPING OBJECTS

91.14 FASTENING OF SEAT BELTS

91.19 PORTABLE ELECTRONIC DEVICES (COMM)

91.21 FLIGHT INSTRUCTION; SIMULATED INSTRUMENT FLIGHT
FAR TOPIC

91.24 ATC TRANSPONDER EQUIPMENT
91.27 CIVIL AIRCRAFT: CERTIFICATIONS REQUIRED
91.29 CIVIL AIRCRAFT AIRWORTHINESS
91.31 CIVIL AIRCRAFT OPERATING LIMITATIONS AND MARKING
91.32 SUPPLEMENTAL OXYGEN
91.39 RESTRICTED CATEGORY CIVIL AIRCRAFT (COMM)
91.40 LIMITED CATEGORY CIVIL AIRCRAFT (COMM)
91.41 PROVISIONALLY CERTIFICATED CIVIL AIRCRAFT (COMM)
91.42 EXPERIMENTAL AIRCRAFT
91.52 EMERGENCY LOCATOR TRANSMITTER
91.65 OPERATING NEAR OTHER AIRCRAFT
91.67 RIGHT OF WAY RULES
91.70 AIRCRAFT SPEED
91.71 ACROMATIC FLIGHT
91.73 AIRCRAFT LIGHTS
Lesson 25
Lesson 25

Flight Computer: *Computation side of flight computer
(Computation Side)

Read Chapter XII
Pages 458-472

OBJECTIVE:

By the end of this lesson, the student will be able to:

*Utilize the computation side of the computer to compute:
  1. True airspeed
  2. Time and distance
  3. Fuel calculations
  4. Conversions
  5. Off course corrections
  6. True altitude
  7. Density altitude

COMPLETION STANDARD:

*The lesson will be complete when student can utilize the computer to answer sample problems from handouts

*Pass STAGE VII with a minimum score of 70%

FORMAT:

*Give out (3) page hand-out of sample problems
*Explain with large classroom computer procedures
*Instructor will pick 10 problems for quiz
*Review problems/and or questions
Quiz (10 Items)

The instructor will pick (10) problems from handouts for the quiz. This will be done after lecture and demonstrations on the usage of the flight computer.

ADDITIONAL ITEMS TO BE COVERED:

* Electronic calculators
* FAA approved calculators
### TIME SPEED DISTANCE PROBLEMS

If you know the speed, set the on it immediately. Your answer will be opposite either TIME or DISTANCE.

If you know both TIME and DISTANCE, place them together. Your SPEED answer will be at the

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<td>speed 139</td>
<td>time</td>
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<tr>
<td>2. speed 105</td>
<td>distance 78</td>
<td>time</td>
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<tr>
<td>3. distance 38</td>
<td>speed 111</td>
<td>time</td>
</tr>
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<td>4. speed 159</td>
<td>distance 138</td>
<td>time</td>
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<tr>
<td>5. distance 128</td>
<td>speed 98</td>
<td>time</td>
</tr>
<tr>
<td>6. speed 105</td>
<td>distance 3.5</td>
<td>time</td>
</tr>
<tr>
<td>7. speed 88</td>
<td>distance 212</td>
<td>time</td>
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<td>8. distance 216</td>
<td>speed 113</td>
<td>time</td>
</tr>
<tr>
<td>9. speed 126</td>
<td>distance 174</td>
<td>time</td>
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<td>10. speed 85</td>
<td>time :51</td>
<td>distance</td>
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<td>11. time 2:13</td>
<td>speed 128</td>
<td>distance</td>
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<tr>
<td>12. speed 147</td>
<td>time :28</td>
<td>distance</td>
</tr>
<tr>
<td>13. time 1:02</td>
<td>speed 107</td>
<td>distance</td>
</tr>
<tr>
<td>14. speed 126</td>
<td>time :06</td>
<td>distance</td>
</tr>
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<td>15. time 4:10</td>
<td>speed 93</td>
<td>distance</td>
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<td>16. speed 102</td>
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<td>18. distance 73</td>
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<td>speed</td>
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<td>19. time :58</td>
<td>distance 136</td>
<td>speed</td>
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<td>20. distance 208</td>
<td>time 1:06</td>
<td>speed</td>
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<td>21. time 1:13</td>
<td>distance 155</td>
<td>speed</td>
</tr>
<tr>
<td>22. distance 11</td>
<td>time :05</td>
<td>speed</td>
</tr>
<tr>
<td>23. distance 46</td>
<td>time 29</td>
<td>speed</td>
</tr>
<tr>
<td>24. time 1:48</td>
<td>distance 183</td>
<td>speed</td>
</tr>
<tr>
<td>25. distance 93</td>
<td>time :52</td>
<td>speed</td>
</tr>
</tbody>
</table>
**GAS PROBLEMS**

If you know the gallons per hour, set the \( \Delta \) on the outer gallon scale immediately. Your answer will be opposite the engine time or gallons.

If you do not know the gallons per hour, place your engine time next to the gallons used. The \( \Delta \) will then indicate the gallons per hour.

<table>
<thead>
<tr>
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<th>GIVEN</th>
<th>FIND</th>
<th>ANSWER</th>
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</thead>
<tbody>
<tr>
<td>1. gal per hr.</td>
<td>17 gallons</td>
<td>39 time</td>
<td></td>
</tr>
<tr>
<td>2. gallons</td>
<td>29</td>
<td>gal per hr.</td>
<td>16.4 time</td>
</tr>
<tr>
<td>3. gal per hr.</td>
<td>16.5 gallons</td>
<td>58 time</td>
<td></td>
</tr>
<tr>
<td>4. gal per hr.</td>
<td>26</td>
<td>gallons</td>
<td>126 time</td>
</tr>
<tr>
<td>5. gal per hr.</td>
<td>23</td>
<td>gallons</td>
<td>49 time</td>
</tr>
<tr>
<td>6. gallons</td>
<td>38</td>
<td>gal per hr.</td>
<td>10.8 time</td>
</tr>
<tr>
<td>7. gal per hr.</td>
<td>13.4</td>
<td>gallons</td>
<td>34 time</td>
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<tr>
<td>8. gallons</td>
<td>37</td>
<td>gal per hr.</td>
<td>13 time</td>
</tr>
<tr>
<td>9. gal per hr.</td>
<td>13</td>
<td>gallons</td>
<td>47 time</td>
</tr>
<tr>
<td>10. gal per hr.</td>
<td>9.3</td>
<td>time</td>
<td>1:27 gallons</td>
</tr>
<tr>
<td>11. time</td>
<td>1:34</td>
<td>gal per hr.</td>
<td>7.8 gallons</td>
</tr>
<tr>
<td>12. gal per hr.</td>
<td>9.8</td>
<td>time</td>
<td>3:22 gallons</td>
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<td>13. gal per hr.</td>
<td>31.0</td>
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<td>3:14 gallons</td>
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<td>15. time</td>
<td>3:47</td>
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<td>9.4 gallons</td>
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<td>4:2</td>
<td>gal per hr.</td>
<td>33 gallons</td>
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<td>17. time</td>
<td>2:13</td>
<td>gallons</td>
<td>32 gal per hr.</td>
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<tr>
<td>18. gallons</td>
<td>52</td>
<td>time</td>
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<td>19. time</td>
<td>3:55</td>
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<td>48 gal per hr.</td>
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<td>20. time</td>
<td>2:58</td>
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</tr>
<tr>
<td>21. gallons</td>
<td>43.5</td>
<td>time</td>
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</tr>
<tr>
<td>22. gallons</td>
<td>29</td>
<td>time</td>
<td>2:11 gal per hr.</td>
</tr>
<tr>
<td>23. gallons</td>
<td>43</td>
<td>time</td>
<td>2:13 gal per hr.</td>
</tr>
<tr>
<td>24. gallons</td>
<td>36</td>
<td>time</td>
<td>2:57 gal per hr.</td>
</tr>
</tbody>
</table>
**TRUE AIR SPEED PROBLEMS**

Use the AIR SPEED CORRECTION scale of your computer and place AIR TEMPERATURE alongside ALTITUDE number.

Use the minute numbers on the TIME scale as your (IAS) indicated air speed.

The true air speed answers (TAS) will appear on the outside stationary scale, alongside the indicated air speed.

If temperature is given in FAHRENHEIT, use conversion scale and change it to CENTIGRADE.

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<thead>
<tr>
<th></th>
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<th>TAS</th>
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<td>-5 C</td>
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Lesson 26

Flight Computer: *Review Computation side (wind face side) *Work wind face side
Read Chapter XII
Pages 472-474

OBJECTIVE:

By the end of this lesson, the student will be able to:

*Compute:

1. Ground speeds
2. Wind correction angles
3. True headings

COMPLETION STANDARD:

*The student will be able to successfully work out sample problems from hand-out.

*Pass STAGE VII written test with a minimum score of 70%.

FORMAT:

*Review computation side

*Introduce wind side of computer with large in-class computer.

*Distribute hand-out and work sample problems.

*Pick (10) sample problems from all hand-outs given for quiz.

*Review quiz.
AERO 122, 142

Class Lesson 26 Quiz
STAGE VII

Quiz (10 Items)

The instructor will pick (10) problems from all hand-out computer problems for quiz. This will be done after review of computation side and lecture and demonstration of wind face side.

ADDITIONAL ITEMS TO BE COVERED:

*Electronic computers
*FAA approved calculators
**GROUND SPEED-TRUE HEADING PROBLEMS**

1. Turn protractor ring to (WD) wind direction.
2. Write pencil cross vertically above center round mark. Its distance from round mark is based on wind speed.
3. Turn protractor ring to (TC) true course.
4. Slide board on pencil cross is on air speed line.
5. Position of round mark indicates (GS) ground speed.
6. Amount pencil cross is to right or left of center vertical line indicates wind correction crab angle.
   - Apply crab to TC and get (TH) true heading. If cross is on right, add crab to TC and get TH. If cross is on left, subtract from TC.

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Lesson 27

Basic Navigation: *Plotter *Computer *Variation *Deviation *Latitude and longitude *Time zones and flight plans

Read Chapter XII from text.

OBJECTIVE:

By the end of this lesson, the student will be:

*Use latitude and longitude lines

*Plot courses

*Utilize plotter and computer operations

*Determine wind effects

*Know how to file a flight plan

COMPLETION STANDARDS:

*The student will be able to plot a cross-country utilizing all aspects introduced.

*Pass the written stage test with a minimum score of 70% or better.

FORMAT:

*Give quiz

*Hand out flight plan and lecture

*Lecture on proper cross-country procedures

*Explain latitude and longitude

*Explain usage of plotter

*From chart in text, work out sample cross-countries
Quiz (10 Items)

*(3) Different types of navigation
*Latitude
*Longitude
*Time zones
*Grenich time (Zulu time)

*(2) Charts and scale
*Bracketing

*(3) Flight plan information
*Variation
*Deviation

ADDITIONAL ITEMS TO BE COVERED:
*Different types of plotters
*Reviewing computer
*Studying chart legends
*Plotting a cross country
| U.S. DEPARTMENT OF TRANSPORTATION |
| FEDERAL AVIATION ADMINISTRATION |

**FLIGHT PLAN**

<table>
<thead>
<tr>
<th>1. TYPE</th>
<th>2. AIRCRAFT IDENTIFICATION</th>
<th>3. AIRCRAFT TYPE/ SPECIAL EQUIPMENT</th>
<th>4. TRUE AIRSPEED</th>
<th>5. DEPARTURE POINT</th>
<th>6. DEPARTURE TIME</th>
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<th>14. PILOT'S NAME, ADDRESS &amp; TELEPHONE NUMBER &amp; AIRCRAFT HOME BASE</th>
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<th>15. NUMBER ABOARD</th>
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<th>16. COLOR OF AIRCRAFT</th>
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CIVIL AIRCRAFT PILOTS: FAR Part 91 requires you file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penalty not to exceed $1,000 for each violation (Section 901) of the Federal Aviation Act of 1958, as amended. Filing of a VFR flight plan is recommended as a good operating practice. See also Part B9 for requirements concerning DVFR flight plans.
# FLIGHT PLANNER

**INFORMATION THAT YOU ENTER ON THIS FORM IS FOR PILOTS USE ONLY**

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<td>VIA</td>
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**FLIGHT PLAN**

| | DEPARTURE PT. | ROUTE |
| | | |

**DEPARTURE Pt.**

| | | | |

**ROUTE**

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**ESTIMATED**

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**ACTUAL**

| | | | |

**TIME EN ROUTE**

| | | | |

**FUEL MANAGEMENT**

| | | | |

**CLEARANCES/RADIO FREQUENCIES**

| | | | |

| | | | |

**SPECIAL EQUIPMENT**

| | | | |

| | | | |

**TIME ON FUEL**

| | | | |

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**CLOSE VFR FLIGHT PLAN WITH FSS ON ARRIVAL**

**A COOPERATIVE PROJECT BY THE FEDERAL AVIATION ADMINISTRATION**

**FLIGHT PRE-FLIGHT PROGRAM**

**AIRPLANE MANUFACTURERS ASSOCIATION**

**USE OF FAA FORM 7722**

**1501**

**FAX**

**EMERGENCY**

**0**
Lesson 28
Radio Navigation: *VOR *NDB *RMI *Testing equipment
Read chapter XIII

OBJECTIVE:
By the end of this lesson, the student will be able to:
*Utilize, operate, test, and differentiate between different radio navigational equipment.

COMPLETION STANDARD:
*The student will apply cross-country operations utilizing radio navigation.
*Pass the written test score on STAGE VII with a minimum score of 70%.

FORMAT:
*Give quiz
*Lecture on different types of radio navigation
*Lecture on pros and cons of each
*Lay out sample cross country using radio navigation from charting text.
Quiz (10 Items)

*(1) Advantage/disadvantage of VHF/UHF versus low, medium, and high frequencies.

*Omni/bearing

*Radial

*Parts of a VOR

*MDB

*ADF

*RMI

*DME

*Test a VOR (VOT)

*(2) Transponder for known codes

OTHER INFORMATION TO BE COVERED:

*Way point

*VOR/vortec

*Radar vectors

*R. NAV.
Lesson 29

Composite Navigations: *Combination of basic Nav. and radio Nav.

Read Chapter XIV in text:

OBJECTIVE:

By the end of this lesson, the student will be able to:

*Plot cross-country operations utilizing a combination of both basic and radio navigation.

STANDARD OBJECTIVE:

*Student will be resourceful and utilize all methods available for cross-country operations.

*Pass the written test on STAGE VII with a 70% minimum score.

FORMAT:

*Review cross country operations

*Divide into groups and hand out cross-country to be accomplished (quiz).

*Review the cross-country.

*Monitor a simulator on a cross-country trip.
Each group of students will be evaluated on their performance on the sample cross-country operation handout.

NOTE: Instructor may want to utilize a different cross-country of their choice.
PRIVATE AND COMMERCIAL PILOT
SAMPLE CROSS-COUNTRY

DIRECTIONS: Your mission is to plan a flight from Fresno to the marvelous San Francisco airport (possibly to catch a flight to Japan). The stipulated conditions of weather, aircraft, and Notams should (or may) affect your choice of routes and equipment. It may also determine whether you can make it. Do as much of the planning as possible on another sheet of paper since there is little room on the bottom of this. Note: "this is an exercise in cross-country planning, not a test. Ask me if you have any problems or questions".

AIRCRAFT: Lizard Licker 215, CAS= 130kt. GPH= 8.2 Fuel= 32 usable Fixed gear, fixed pitch propellor.

Weather: SFO 1442 8SCT 20SCT 450VC 3EX 132/58/55/3218/987 VIRGA ALQD FAT 1448 20SCT 580VC 4H 133/64/60/3128/978
PD 30 60 90 120
SFO 2825 2938 3145 8110
FAT 2515 2619 2725 2740

NOTAM: SFO rwy 10R-28L closed
PXN OTS

Flight Log

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Fuel remaining = _______ Flight time (remaining) = _______

SFO Wind at 12,000 = ______ direction ______ speed

What Sectional chart do you use? ______ (name)

What is the highest elevation along the route? ______
Lesson 30

Review/Test *Review for STAGE VII test:

STAGE VII test

OBJECTIVE:
At the completion of this lesson, the student should be able to:
*Evaluate information previously given

COMPLETION STANDARD:
*A test score of at least 70% is considered to be minimum

FORMAT:
*Conduct review
*Question/answer period
*Administer test
*Grade test
*Return test
*Review test
AERO 122, 142

Class Lesson 30 Test
STAGE VII

Test Day: STAGE VII
No Quiz
AERO 142/122

Private Pilot Ground School
Stage Test VII

Name: __________________________
Date: __________________________

Instructions: 1. Write your name and date at the top.
2. Answer only the easy questions... first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
6. If you elect to take a break, do so quietly.
7. When finished you may leave, after you have reviewed your Test Results.

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AERO 122, 142  

STAGE VIII

I. STAGE VIII OBJECTIVE: (3 hours) The objective of STAGE VIII is to introduce, explain, and give solutions to medical aspects and to emergency procedures.

II. STAGE VIII COMPLETION STANDARD: The stage will be completed satisfactorily by oral quizzing in the classroom. This quiz will be at the instructor's option. No test on this stage of training. Information will be evaluated on final exam.
AERO 122, 142

Lesson 31
Lesson 31

(A) (B)
Medical Factors/Emergencies: *Medical aspects of flight.
*Symptoms *Corrections
*Emergency procedures
*Emergency notification

Read Chapters XV and XVI in text.

OBJECTIVE:

By the end of the class, the student will be able to:

(A)*Recognize different medical symptoms.
*Know what corrective action to take.
*Be more knowledgeable about their own body.

(B)*Teach emergency systems, operations, communications, and how to avoid an emergency.

COMPLETION STANDARD:

(A)*The student will know the effects and symptoms of various medical conditions and know what to do.

(B)*The student will know what to do in case of an emergency and the proper procedures involved along with it.

FORMAT:

*Quiz will be administered for both A and B.
*Review
*Emergency operations used by the instructor.
*Oral quiz
CLASS LESSON 31 QUIZ
STAGE VIII

Quiz (10 Items)

*Vertigo
*Hypoxia
*Hyperventilation
*Carbon monoxide
*(3) Causes of fear/anxiety
*(4) "C"
*D.F. steer
*Flight following
*Emergency information where?
*Emergency transponder and radio frequency

OTHER ITEMS TO BE COVERED:
*Scanning
*Valsalva technique
*Flicker vertigo
*Preflight
*Fly the aircraft
*Take charge
*Follow check list
*Know your aircraft
*Know yourself

FORMAT:
*Administer quiz
*Review quiz and lecture on remaining items.
I. STAGE IX OBJECTIVE: (6 hours) The objective of STAGE IX is to administer a sample FAA exam in a testing environment.

II. STAGE IX COMPLETION STANDARD: To obtain a minimum of 70% on the practice tests.
AERO 122, 142

Lesson 32, 33
Lesson 32 and 33
Sample FAA Test: *Review *Sample Test

OBJECTIVE:
By the end of the class, the student will be able to:
* Determine any weak areas.
* Be able to review individually
* Review with class

COMPLETION STANDARD:
*A score of 70% or more on the stage test would be considered minimum.

FORMAT:
* Review
* Question/answer
* Administer test
* Grade test
* Return test
* Review
* Give additional tests to take home
AERO 122, 142
Class Lesson 32 and 33 Test
STAGE IX

NO Quiz - Sample FAA test
AERO 142/122
Private Pilot Ground School
Final Test I

Name:________________________  Date:____________________

Instructions:
1. Write your name and date at the top.
2. Answer only the easy questions... first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
6. If you elect to take a break, do so quietly.
7. When finished you may leave, after you have reviewed your Test Results.

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AERO 142/122
Private Pilot Ground School
Final Test II

Name: ___________________________ Date: ______________________

Instructions: 1. Write your name and date at the top.
2. Answer only the easy questions... first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
6. If you elect to take a break, do so quietly.
7. When finished you may leave, after you have reviewed your Test Results.

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AERO 142/122
Private Pilot Ground School
Final Test III

Instructions: 1. Write your name and date at the top.
2. Answer only the easy questions... first.
3. Mark your answers on this sheet first.
4. Make any notes about the question on this sheet.
5. Transfer your answers to the Scantron sheet after you are all done.
6. If you elect to take a break, do so quietly.
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**AERO 142/122**

**Private Pilot Ground School**

**Final Test IV**

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**Instructions:**
1. Write your name and date at the top.
2. Answer only the easy questions... first.
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**Private Pilot Ground School**  
**Final Test VI**

**Instructions:**  
1. Write your name and date at the top.  
2. Answer only the easy questions first.  
3. Mark your answers on this sheet first.  
4. Make any notes about the question on this sheet.  
5. Transfer your answers to the Scantron sheet after you are all done.  
6. If you elect to take a break, do so quietly.  
7. When finished you may leave, after you have reviewed your Test Results.

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AERO 122, 142

STAGE X

I. STAGE X OBJECTIVE: (4 hours) The objective of STAGE X is to see whether or not the student has retained, satisfactorily, the necessary information to pass the FAA written test for Private Pilot Airplane.

II. COMPLETION STANDARD: Will be a minimum of 70% on the FAA written test.

NOTE: Student will supply calculator, plotter, computer. Test, scrap paper, pencils, plastic overlays will be supplied by the examiner.

NOTE: Bring pictured identification.
AERO 122, 142  Class Lesson 34 Plan
STAGE X

Help if requested in preparation for the FAA Private Pilot written test (airplane). This will primarily be administered and monitored by an FAA written test examiner.
IG 34.2

AERO 122, 142

Class Lesson 34 Test
STAGE X

NO QUIZ - FAA TEST