

Mr. Card, AMT 60, Spring 2023 Syllabus

Course description and policies

Note: Each test will normally include the material listed between the prior exam and the current exam. Quizzes may be given at any time. Quiz questions will be selected from the reading assignment or from current worksheets.

Material Covered:

Reciprocating Engines

TOPIC	TEXT
Aircraft Engine Requirements	Powerplant Text Book, Chapt 1 General Requirements, pages 1-1 to 1-3
Reciprocating Engine Design and Types Radial Engines, Inline Engines, V-type Engines and Opposed Engines	Types of Engines, pages 1-4 to 1-5 Design and Construction, pages 1-5 to 1-7
Engine Components; Crankcase, Crankshaft, Bearings, Connecting Rods, Pistons, Piston Rings, Piston Pins, Cylinders, Valves, Valve	Major Components, pages 1-8 to 1-24
Operating Mechanisms, Valve Clearance Energy Transformation, Cycles, Four-Stroke Cycle, Two-Stroke Cycle, Diesel	Operating Principles, pages 1-24 to 1-28 Diesel, pages 1-28
Work Power, Indicated Horsepower, Friction Horsepower, Brake horsepower, Piston Displacement, Engine Efficiency, Factors Effecting Power, Distribution of Power	Power and Efficiency, pages 1-28 to 1-37

Engine Maintenance and Operation

TOPIC	TEXT
Definitions over Overhauls Overhaul Process Dissassembly Inspection Methods Cleaning NDT Dimension Inspection Reassembly Installation and Testing Instrument Indications Operation Starting Pre-oiling Ground Checks Operational Faults Trouble Shooting	Powerplant Text Book, Vol. II, Chapt 10 Overhaul, pages 10-1 to 10-20 Installation and Testing, pages 10-20 to 10-25 Operation, pages 10-25 to 10-30 Operational Issues, pages 10-30 to 10-36 Trouble shooting, pages 10-36 to 10-40, 10-44 Cylinder R&R, pages 10-42 to 10-43

Light Sport Engines

TOPIC	TEXT
LSA design issues, Maintenance and Insp Authorized Personnel and applicable FARs	Powerplant Text Book, Vol. II, Chapt 11 LSA Engine Requirements, Maintenance and Inspections, page 11-1 to 11-4
Design types	Types of LSA and Experimental Engines, pages 11- 4 to 11-6
Common LSA Rotax, Maintenance Oddities	Rotax 912/914 pages 11-7 to 11-10, 11-16 to 11-26
HKS 2 cylinder engine	HKS 700T pages 11-10
Jabiru 2200 & 3300 engine	Jabiru pages 11-10 to 11-12
Aeromax Corvaair Conversion	Aeromax 100 pages 11-12
Volkswagen Conversion	VW direct drive Engines pages 11-13 to 11-15
TCM 0-200 LSA	Teledyne Continental 0-200D
Lycoming	Avco Lycoming 0-233

Engine Removal and Replacement

TOPIC	TEXT
Negative events causing teardown	Powerplant Text Book, Vol II, Chapt 8, Rationale for Engine Teardown pages 8-1 to 8-3
Removal and Replacement methods	Procedures for Engine R&R pages 8-3 to 8-15

Engine Inspection

TOPIC	TEXT
Engine Inspections	FAA-H-8083-30-ATB, General Text Book, 12-9, 12-21, 12-36

Ignition and Starting-Powerplant-Recip

TOPIC	TEXT
Ignition Systems	FAA-H-8083-32-ATB, Powerplant Text Book
Spark Plugs	4-1 to 4-20
Maintenance	4-21
Engine/Ignition Timing	4-22 to 4-30
Magneto OH and Maintenance	4-30 to 4-39
Spark Plug	

Class Information: AMT 60, Spring 2023, Nine-Week Course, 8 units, Meets in AE5
Instructor: Mr. Card
Office Hours: Monday, Tuesday, Wednesday, & Friday 7:00-8:00 am, 2:00-2:30
School Phone: 638-3641 ext 3474
Class Hours: Daily, 8:00 am to 2:20
Lecture: 8:00 am - 10:50 am
Break: 10:50 am - 11:30 am
Lab: 11:30 am-2:20 pm

Important Dates

Holidays:
(no classes) January 20 – Martin Luther King Jr Holiday
February 17 – Lincoln Day observance
February 20 – Washington Day Observance
April 3 – 6 - Easter Break
April 7 – Good Friday

Last Day to Drop
With Refund: January 20
Last Day to Drop
To avoid a “W” January 27

Final Exam Date: March 10

Required Textbooks: These books are free to download in .pdf format here. <http://www.faa.gov/library/manuals/aircraft/>

U.S. Department of Transportation, Federal Aviation Administration. Airframe & Powerplant Mechanics General Handbook, FAA-H-8083-30A ed. ISBN: 978-1619546929 , Tabernash CO Aircraft Technical Book Company, 2018

U.S. Department of Transportation, Federal Aviation Administration. Airframe & Powerplant Mechanics Airframe, Vol 1, FAA-H-8083-31A ed. ISBN: 978-1619548268, Tabernash,CO Aircraft Technical Book Company, 2018

U.S. Department of Transportation Federal Aviation Administration. Airframe & Powerplant Mechanics Airframe, Vol 2, FAA-H-8083-31A ed. ISBN: 978-1619548312, Tabernash, CO: Aircraft Technical Book Company, 2018

U.S. Department of Transportation Federal Aviation Administration. Airframe & Powerplant Mechanics Powerplant, Vol 1/ Vol 2, FAA-H-8083-32A ed. ISBN: 978-1619548367, Tabernash, CO: Aircraft Technical Book Company, 2018

U.S. Dept. of Transportation, Federal Aviation Administration.. Advisory Circular AC43.13-1B/2B, Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair, ISBN: 9780977489695, Aircraft Technical Book Co., 2009

U.S Dept. of Transportation from Title 14 of the Code of Federal Regulation (14 CFR). FAR/AMT, 2019 ed. Jeppesen Sanderson Inc., 2018 ISBN: 9781619546721

Recommended Textbooks; Aircraft Technical Book Company. Airframe & Powerplant Mechanics General Test Guide, 1st. ed. Tabernash, CO: Aircraft Technical Book Company, 2018 ISBN: 9781941144626

Aircraft Technical Book Company. Airframe & Powerplant Mechanics Airframe Test Guide, 1st. ed. Tabernash, CO: Aircraft Technical Book Company, 2019 ISBN: 9781941144657

Aircraft Technical Book Company. Airframe & Powerplant Mechanics Powerplant Test Guide, 1st. ed. Tabernash, CO: Aircraft Technical Book Company, 2019 ISBN: 9781941144664

Wild, T., Leasure, M.. Aviation Maintenance Technician General Workbook, ed. Tabernash, CO: Aircraft Technical Book Company, 2018 ISBN: 9781941144633

Sterkenburg, R.. Airframe & Powerplant Mechanics Airframe Workbook, ed. Tabernash, CO: Aircraft Technical Book Company, 2012 ISBN: 9780983865841

Wild, T.. Airframe & Powerplant Mechanics Powerplant Workbook, ed. Tabernash, CO: Aircraft Technical Book Company, 2012 ISBN: 9780983865858

Course Objectives:

1. Inspect, check, service, and repair reciprocating aircraft engines.
2. Install, check, and service aircraft ignition systems
3. Inspect, check, and service aircraft engine induction and cooling systems.

Course Content:

This course prepares students with the skills and technical knowledge they need to perform maintenance on aircraft in the aviation maintenance industry. The content of this course is a variety of airframe maintenance subjects required by the Federal Aviation Administration as part of the Aviation Maintenance Technology Program. Topics covered will include: aircraft landing gear systems, hydraulic and pneumatic power systems, aircraft instrument systems, communication and navigation systems, aircraft electrical systems, position and warning systems, and ice and rain control systems.

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

AMT-60 SLO1: Inspect, troubleshoot, and repair aircraft reciprocating engines.

AMT-60 SLO2: Service, inspect, and repair aircraft reciprocating engine induction and cooling systems.

AMT-60 SLO3: Inspect, service, and repair aircraft reciprocating engine ignition systems.

Canceled Class Notification: If an AMT class has to be cancelled, a cancellation notice will be placed on the classroom door. In addition, the cancelled class will be posted on the Reedley College website and you will be notified through either email or Canvas..

Student Handbook: The official Reedley College Student Handbook is a great resource that contains lots of valuable information a student may need during their time here at Reedley College. You can view this handbook online or download it as a .pdf file from the Reedley College website. The address is:

https://www.reedleycollege.edu/documents/about/2016rcstudenthandbookmay05_2016.pdf

Final Exam: A three-hour comprehensive final exam worth 20% of your total grade will be given at the end of the semester. The Final Exam is closed-book in that students may not refer to any document during the test. All answers must come from memory. You are required to take the final exam, however the final exam will not affect your FAA grade.

Required Textbooks: These books are free to download in .pdf format here. <http://www.faa.gov/library/manuals/aircraft/>

1. U.S. Department of Transportation, Federal Aviation Administration. *Airframe & Powerplant Mechanics Airframe volume 1 and 2 Handbook* (FAA-H-8083-31A-ATB) ISBN: 9781941144763, CO: Aircraft Technical Book Company, 2018
2. U.S. Dept. of Transportation, Federal Aviation Administration. *Advisory Circular AC43.13-1B/2B, Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair*, ISBN: 9780977489695, Aircraft Technical Book Co., 2009

Recommended Textbooks: Aviation Mechanic Handbook (Part# - ASA-MHB-6) ISBN: 9781619544949

Instructor Meetings: You may need to meet with your instructor during the semester for various reasons. Instructors hold office hours for this purpose and welcome you to meet with them at that time. Your instructor's office hours are posted outside of the office on the door and on Canvas. Be aware that this can be a busy time and you may have to schedule an appointment. The meetings will be held via Zoom video conferencing application.

Student Education Plan: A Student Education Plan (SEP) is a plan detailing the coursework that is required to meet Reedley

College certificate, graduation, or transfer requirements. An SEP must be completed by a Reedley College counselor. It will note the classes you have completed and the classes you still need to take. The SEP should include courses you have taken at other schools. You will be encouraged to complete an SEP sometime during this semester if you have not already completed one.

Personal Supplies: You are responsible for your own personal protective equipment (PPE). **Safety glasses and hearing protection will be required in the Aeronautics building lab.** Safety glasses will be worn at all times during the lab sessions. You will be required to wear hearing protection while operating or in close proximity to equipment that elevates the sound level. Closed toe shoes are required in the Aeronautics lab. A pair of light work gloves is also recommended for occasional use. If you do not have your personal protective equipment with you, you will not be allowed to participate in the lab. We all occasionally forget to wear our PPE (I know I do), so please help each other out and remind each other if you see someone not wearing theirs (including the instructors).

Uniform Shirts:

You will be given an opportunity to purchase uniform shirts during the first week of class. Students are required to wear the Aeronautics program uniform shirts to class each day. If you fail to wear the correct uniform, you will be asked to leave the class and you will be marked absent until you return to class with the uniform on.

Locker Room: Each of the restroom facilities within the Aeronautics building has lockers for use by AMT students. You may use a locker to store PPE, books, projects, etc. You must provide your own lock and you will need to write down your full name, student number, and locker number on the locker assignment sheet kept by the instructor. Any locks found on lockers that have not been assigned will be cut and the contents of that locker will be disposed of. By the end of finals week for each semester, you will need to have your locker emptied and your lock removed. Any locks remaining on lockers will be cut and the contents of that locker will be disposed of.

Grading Policy: The AMT program is both a community college and a FAA approved curriculum at the same site, therefore, two grading systems are used. The grade required by the FAA is determined for each of the FAA subjects completed throughout the semester. These scores are calculated independently of each other but they will be combined at the end of each semester and added to your final exam score as the Reedley College grade for that semester. The subject area scores will account for 80% of the semester grade and the final exam will account for the remaining 20%.

FAA subject scores: A percent score will be used to compute all graded work where possible. Lecture scores will be based on a combination of quiz and test scores, class assignments, and homework assignments. Lab projects will be graded on many factors including: safety practices, job completion, time management, following directions, and the care of equipment and tools. The instructor will also evaluate your professional approach to each project. When each subject is completed, we will combine all lecture and lab scores in that subject and convert it to a percent score. You must score no less than 70% in BOTH lecture and lab. Then, the instructor will administer a subject area final exam. This exam will contain written as well as oral and practical problems. You must earn a passing score of 70% or greater on the subject area final exam to pass that FAA subject area. Wherever possible, lecture and lab scores will be weighted equally.

Important Note: Each one of the 45 FAA subject area scores must be at or above 70% when completed to receive credit toward the Airframe and Powerplant Certificate. The College grade has no bearing upon meeting the FAA guidelines.

FAA Subject Grading System: (sample calculations)

Lecture	Points Earned	Points Possible	Lecture Percentage
Quiz 1	11	15	
Exam 1	25	30	
Assignment 1	+ <u>15</u>	+ <u>15</u>	
	51	60	85.0%
Lab	Points Earned	Points Possible	Lab Percentage
Project 1	18	20	
Project 2	16	20	
Project 3	+ <u>15</u>	+ <u>20</u>	
	49	60	81.7%

To arrive at the FAA subject score, add the lecture and lab sub totals together, and divide by two. This will result in an 83% FAA subject score. All percentages are rounded off to the nearest whole number.

Lecture Percentage	85.0%			FAA Subject Score
Lab Percentage	+ <u>81.7%</u>	<u>166.7%</u>		
	166.7%	2	= 83.35%	83%

The semester final exam score is not factored in, nor has any bearing on this FAA score.

To calculate the semester grade for Reedley College, each completed subject score explained above is then "weighted" in proportion to the number of hours of instruction it contains. These weighted scores are then combined with the final exam score, which is always 20% of the final grade. This score is the semester college grade. The college grade is an average of all work completed in the course during that semester, including the final exam.

College Grading System: (sample calculations)

Subject Totals	Hours per Subject	Weight Factor
Subject 1 85%	10	0.2
Subject 2 90%	25	0.5
Subject 3 80%	<u>15</u>	<u>0.3</u>
Sub total:	50	1.0

To arrive at the College grade, multiply each subject total by the weight factor (determined by subject length), then add the products together. For example:

Subject 1: (85%) subject total (X) weight factor (0.2) = 17.0%	
Subject 2: (90%) subject total (X) weight factor (0.5) = 45.0%	
Subject 3: (80%) subject total (X) weight factor (0.3) = <u>24.0%</u>	
Total :	86.0%
Final Exam Score	98.0%

Multiply the "weighted" total by 80%, then add the final exam score weighted at 20% for the "College" total score.

$$\text{Formula: } (86\% \times 80\%) \quad \text{plus} \quad (98\% \times 20\%) = \mathbf{88.4\%}$$

Letter Grade scale is as follows: 100%-90% = A, 89%-80% = B, 79%-70% = C, 69%-60%=D, 59% and below = F.

Attendance Policy: Students are expected to meet in the assigned area for roll call no later than 8:00 am each day. **If a student misses 15 hours or more in any semester, that student will be dropped from that AMT course.** If a student misses a test due to an absence, the test must be taken the first day the student returns to class. If a quiz or in class assignment is missed, you will not be allowed to make it up unless you provide a doctor's note. If you arrive late, you must inform the instructor of your arrival immediately so the attendance record can be corrected. A missed time report will be kept for each student by their instructor. All time missed will be logged by your instructor in increments of 1/10th of an hour. Any time missed, and subsequently made up, will be recorded on this form by the instructor. The missed time report forms will be accessible for student verification. Time that has been "made-up" is still counted toward the 15 hour maximum per semester. All time missed due to absences or late arrival must be "made-up" prior to the end of the semester. You will not be allowed to begin the next AMT course until you have corrected your attendance record.

1. At the time of absence or late arrival the instructor will mark the student absent, enter the date, indicate whether the time missed was lecture or lab, and identify the subject(s) missed. **It is the responsibility of each student to verify that absences due to late arrival have been changed to actual time missed.** If not corrected, each absence becomes 6 hours time lost. Verification shall be done on the same day of the late arrival.

2. Students must report any time missed on the Time Make-up Form and submit it to the appropriate instructor at the end of the class session. **It is the student's responsibility to complete the time make-up form.** After the time is made-up, the instructor will enter the date the work was completed and initial. All work must be made up in order to qualify for the Certificate of Completion needed to take your FAA certification tests to become a licensed A&P Mechanic.

Student Parking: Reedley College parking permits are required for all vehicles on the Reedley College campus. Students will park only in designated parking areas. Parking is not allowed anywhere near the Aeronautics Building. You may purchase a parking permit from the cashier in the Student Services building for each semester you attend class. Parking permits cost \$30 each. You must display the parking permit in your front windshield or hang it from your rear view mirror. Any violation of the above rules may result in a ticket.

Behavioral Standards: Please do not enter the classroom while another class is in progress. Please respect other persons and their

property. Any disrespect to others may result in disciplinary action. Disruptive behavior, inappropriate language, or anything that could be viewed as sexual harassment is not acceptable. The “Student Conduct Standards” outlines behavioral expectations, and explains the process for responding to allegations of student misconduct. Students who do not comply with the “Student Conduct Standards” are subject to the College disciplinary actions. The Student Conduct Standards can be found at: <https://www.reedleycollege.edu/about/about-us/policies-and-procedures/student%20conduct%20standards.html>

No food or drink is allowed in the AMT classrooms or laboratory except in designated areas. The use of any form of tobacco is forbidden on campus. Vaporizers or “vapes” are also forbidden. Always maintain an attitude of safety in the lab. Always receive proper training before operating equipment that you do not know how to use. You are not allowed to use any power tools or equipment unless you have been instructed to do so by your instructor.

Academic Dishonesty: Students at Reedley College are entitled to the best education that the college can make available to them. Students, their instructors, and their classmates, share the responsibility to ensure that this education is honestly attained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences.

§ 65.18 Written tests: Cheating or other unauthorized conduct.

(a) Except as authorized by the [Administrator](#), no [person](#) may -

(1) Copy, or intentionally remove, a written test under this part;

(2) Give to another, or receive from another, any part or copy of that test;

(3) Give help on that test to, or receive help on that test from, any [person](#) during the period that test is being given;

(4) Take any part of that test in behalf of another [person](#);

(5) Use any material or aid during the period that test is being given; or

(6) Intentionally cause, assist, or participate in any act prohibited by this paragraph.

(b) No [person](#) who commits an act prohibited by [paragraph \(a\)](#) of this section is eligible for any airman or ground instructor certificate or [rating](#) under this chapter for a **period of 1 year after the date of that act**. In addition, the commission of that act is a basis for suspending or revoking any airman or ground instructor certificate or [rating](#) held by that [person](#).

Plagiarism is a specific form of cheating: the use of another’s words or ideas without identifying them as such or giving credit to the source. Plagiarism may include, but is not limited to, failing to provide complete citations and references for all work that draws on the ideas, words, or work of others, failing to identify the contributors to work done in collaboration, submitting duplicate work to be evaluated in different courses without the knowledge and consent of the instructors involved, or failing to observe computer security systems and software copyrights. Incidents of cheating and plagiarism may result in any of a variety of sanctions and penalties, which may range from a failing grade on a particular examination, paper, project, or assignment in question to a failing grade in the course, at the discretion of the instructor and depending on the severity and frequency of the incidents.

Technological Gadgets: Mobile electronic devices such as MP3 players and mobile phones must be silenced and put away during class. There is an exception for tablets and laptops, but these devices are only allowed to be used in class during lecture and discussion for note taking. Computer use for note taking must be approved by the instructor and proof of those notes will be periodically checked by your instructor. If this privilege is abused or computer use becomes distracting, I will suspend this privilege. Mobile phone conversations, including texting, are distracting in the classroom setting and are not allowed. Please wait until break to use your phones.

Special Needs Requests: If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.