Syllabus and Course Outline AeroStem 2022-2023

Course Name **: AOPA 10**
Teacher Name **: Mr. J. Morse**
Teacher Contact information:
Email : jmorse@aerostem.org
Room : 201

Welcome to AOPA Class!

We will be studying everything aviation related in preparations for your future in aviation.

Core Subject Description:

This subject is designed to provide a general background for the understanding of the science Aviation / UAS. This course develops an appreciation of the beauty of life from beginning with the intention of a 12th grade certification is so desired.

General Standards:

The learner demonstrates an understanding of basic concepts as deepened by other disciplines. The learner is able to analyze/solve problems critically, think innovatively / creatively, and make informed decisions to enhance the integrity.

Materials:

If there is any difficulty obtaining these materials, please let your teacher know as soon as possible.

- 2" binder (durable please)
- District/Personal Laptop
- Lined Paper
- Dividers
- Blue or Black Pens and Pencils
- Folder MEAD 5-star
- Markers and colored pencils
- Gluesticks
- Ruler and protractor.

Grading Procedures:

Formative assignments are graded as "Formative" or "Participation". Flight and Space notes and other forms of written work, including Engineering Notebook (ISN) activities which are done in class are considered "Formative" will be graded as Complete, Incomplete, No Evidence, or Re-done as described by the given scale.

Isometric Drawing and designs in the Engineering Notebook will be "Participation", and graded by the rubric on the following page.

This class will use the following codes to help communicate with you regarding your homework and group work progress.

C - Complete. Assignment was completed and turned in on time. The work provided demonstrates thoughtful assessment of the material and question. **Full Credit.**
I - Incomplete. Assignment was turned in, however, questions were incomplete or some were incorrect. **Half Credit.**
NE - No Evidence. Assignment was not turned in, was less than half complete or most answers were incorrect. **No Credit.**
RD - Re-Done. Student revised or completed a similar assignment to improve their grade. **Average Credit**.

Summative assessments demonstrate a student's mastery of the standards.

Unit exams, and quizzes will be assigned percentage grades.
Large projects, research papers, classroom presentations, or video submissions will be assessed using rubrics.
Short written answers will be graded using the C,I, NE, RD, Scale.

Students are encouraged to retake or revise assessments if they struggled to demonstrate the mastery expected. This has to take place within the same Learning Period.

Quarter grades will be calculated from cumulative points per quarter from weighted categories. Semester grades will be calculated with each quarter being 40% and the final being the remaining 20%. Letter grades are assigned based on the scale listed below:

A = 90% - 100%	Quarter 1	= 40%	Assessments	= 35%
B = 80% - 89%	Quarter 2	= 40%	Class works & HW	= 30%
C = 70% - 79%	Final Exam	= 20%	Labs/Simulations	= 20%
D = 60% - 69%			Participation	= 15%
F = 50% - 59%	**Total**	**= 100**		
			Total	**= 100%**

Checking your Grades:

It is **expected** that students and parents regularly access Power School and Google Classroom to check grades. Also, students are expected to access their grades at least once a week and report on their progress grade through a grade check.

Classroom Expectations:

- **A. Classroom Routine**
- 1. Enter the Class Room Quietly. Go to your seat and begin to work on the warm up (Warm ups are handed in weekly).
- 2. During Roll Please Say "Here".
- 3. The instructor will take this time to check on homework completion.
- 4. Announcements.
- 5. Lecture Time -- please do not talk and take notes.
- 6. Have all materials needed READY for the day!

Policies Classroom Policies:

1. **Dress Code:** Please refer to the dress code in the handbook. No hats or Hoodies in Class.
2. **Environment:** No distracting noises, gestures, or talking. Only those things appropriate for school are acceptable, No Phones at anytime in class, no chewing gum in class, and do not through anything in the classroom.
3. **Language:** Please follow school rules for appropriate language use, no inappropriate language will be tolerated. .
4. **Active Participation** in class is expected from each student is expected.
5. **Raise Your Hand**: If you have questions, or need something please raise your hand and ask the teacher.
6. **Technology in the Classroom**: Only those sites, WebPages, or programs that are part of the class work are acceptable.
7. **Laptop Policies**: The teacher may mute or stop the video, lock out a site, or close a tab of any student who is not meeting expectations, this way the student may remain in the class.
8. **During Classes**, everyone is expected to respect the speaker may it be your teacher or fellow students. Avoid distracting the class any means possible to avoid sanctions.
9. **Lab Procedures**: From time to time there will be Lab assignments. It is imperative for the safety of all that ALL SAFETY regulations are obeyed to during lab times, no horseplay or other un sanctioned activities will be tolerated.
10. **Tools and Equipment**: All tools and equipment are to utilized only with the proper safety precautions: If you break it the

total price of the tool or equipment will be charged to you.

Absences and Make-up Work:

- It is the student's responsibility to obtain any missed work and notes in cases of excused absences.
- If a long-term assignment has been assigned before the absence, the due date stands.
- Make-up work must be received within the number of days (s) of the excused absence and according to the time of the assignment or it will be treated as late work.
- Students will not receive any credit for work from an unexcused absence. It is important to be present every day in class.

Late Work:

Due dates are posted several times and you are responsible for knowing these. If an assignment is not handed in when asked for or due, it is considered late.

- If late: You will not be reminded to turn in late work.
- Late work will be accepted at teacher discretion.
- Any late work accepted by the teacher will have a 5% deduction per day from the final grade.

Note This Class has Monday Work!!

August 8-12

Class Introduction and Orientation

1. Teacher Introduction
2. Classroom and Learning Rules
3. Grading System
4. White Board and Cabinets Orientation
5. Chrome Books Sites we will use.
6. Classroom Contracts

August 16-19

Unit 1 - Getting to Know Aircraft

Pre-Course Exam
Section A – Introduction Lesson 1 You Can Fly!
Lesson 1 You Can Fly!
Section B - Categories and Classes of Aircraft
Lesson 1 Classifying Aircraft
Lesson 2 Classifying UAS

August 23-26

Section C – Design Considerations for Aircraft
Lesson 1 Aircraft Roles and Mission-1
Lesson 1 Aircraft Roles and Mission-2
Unit 1 Exam
Unit 2: How Aircraft Are Made
Section A – Identifying Parts of the Aircraft
Lesson 1 Manned Aircraft Components-1

August 30-Sept 2

Monday - Lesson 1 Manned Aircraft Components-2
Lesson 1 Manned Aircraft Components-3
Lesson 2 Unmanned Aircraft Components
Section B – Aircraft Construction
Lesson 1 Aircraft Structural Materials-1
Lesson 1 Aircraft Structural Materials-2

Sept 6-9

Monday - Lesson 2 Aircraft Safety Features-1
Lesson 2 Aircraft Safety Features-2
Lesson 3 Unmanned Aircraft Materials
****** Unit 2 Exam ******
Unit 3: Understanding Air
Section A – Characteristics of Air
Lesson 1 Air is a Fluid-1

Sept 13-16

Monday - Lesson 1 Air is a Fluid-2
Lesson 2 Air Density-1
Lesson 2 Air Density-2
Lesson 2 Air Density-3
Section B – Aeronautical Applications of Air Density
Lesson 1 Density Altitude-1

Sept 20-23 --Grades Go In

Monday - Lesson 1 Density Altitude-2
Lesson 1 Density Altitude-3
Section B – Aeronautical Applications of Air Density
Lesson 1 Density Altitude-1
Lesson 1 Density Altitude-2
Lesson 1 Density Altitude-3

Break Sept 26-30

Oct 4-7

Unit 3 Exam Review
Unit 3 Exam
Unit 4: Forces of Flight
Section A – The Aircraft in Motion
Lesson 1 Understanding Motion-1
Lesson 1 Understanding Motion-1

Oct 11-14

Monday - Lesson 2 Four Forces-1
Lesson 2 Four Forces-2
Lesson 3 Vectors of Flight
Section B – Lift
Lesson 1 Theories of Lift-1
Lesson 1 Theories of Lift-2

Oct 18-21

Monday - Lesson 2 Airfoils and Lift Production-1
Lesson 2 Airfoils and Lift Production-2
Lesson 3 Calculating Lift-1
Lesson 3 Calculating Lift-2
Lesson 4 Aerodynamic Stalls-1

Oct 24-28

Monday - Lesson 4 Aerodynamic Stalls-2
Lesson 4 Aerodynamic Stalls-3
Section C - Weight
Lesson 1 Aircraft Weight and Balance-1
Lesson 1 Aircraft Weight and Balance-2
Lesson 1 Aircraft Weight and Balance-3

Nov 1-4

Monday - Lesson 1 Aircraft Weight and Balance-4
Lesson 1 Aircraft Weight and Balance-5
Section D - Thrust
Lesson 1 In Thrust We Trust-1
Lesson 1 In Thrust We Trust-2
Lesson 1 In Thrust We Trust-3

Nov 8-10 No School 11th

Section E - Drag
Lesson 1 What a Drag!-1
Lesson 1 What a Drag!-2
Lesson 1 What a Drag!-3
Unit 4 Exam

Nov 15-18

Unit 5: Aircraft Stability and Control
Section A – Types of Stability
Monday - Lesson 1 Stability in Aircraft Design-1
Lesson 1 Stability in Aircraft Design-2
Lesson 1 Stability in Aircraft Design-3
Lesson 2 Rotorcraft Lift and Stability-1
Lesson 2 Rotorcraft Lift and Stability-2

Note This Class has Monday Work!!

*****Thanks Giving Break Nove 20-24*****

Nov 28-Dec 2
Section B – Aircraft Flight Controls
Monday - Lesson 1 Primary Flight Controls-1
Lesson 1 Primary Flight Controls-2
Lesson 2 Secondary Flight Controls
Lesson 3 Flight Controls for Unmanned Aircraft
Section C – Structural Loads Encountered in Flight
Lesson 1 Turns and Turning Flight

Dec 6-9
Monday - Lesson 2 Load Limits in Aircraft Design-1
Lesson 2 Load Limits in Aircraft Design-2
Unit 5 Exam
Unit 6: Career Skills
Section A – Career Preparation
Lesson 1 Job Application Practice
Lesson 2 Resume Development

Dec 13-16
Lesson 3 Building/Revising Your Career Portfolio-1
Lesson 3 Building/Revising Your Career Portfolio-2
Post-Course Exam Review
Post-Course Exam

*******Grades Go In*******

*****Winter Break Dec 19- Jan 6******

SECOND SEMESTER

Jan 10-13
Unit 7: Propulsion
Pre-Course Exam
Section A – Pistons
Lesson 1 Reciprocating Engines-1
Lesson 1 Reciprocating Engines-2
Lesson 1 Reciprocating Engines-3

Jan 17-20
Lesson 1 Reciprocating Engines-4
Lesson 1 Reciprocating Engines-5
Lesson 2 Propellers-1
Lesson 2 Propellers-2

Jan 24-27
Lesson 3 The Power Cycle - Intake Systems-1
Lesson 3 The Power Cycle - Intake Systems-2
Lesson 3 The Power Cycle - Intake Systems-3
Lesson 4 The Power Cycle - Combustion and Exhaust-1

Jan 31 - Feb 3
Lesson 4 The Power Cycle - Combustion and Exhaust-2
Lesson 4 The Power Cycle - Combustion and Exhaust-3
Lesson 4 The Power Cycle - Combustion and Exhaust-4
Lesson 5 Turbochargers and Superchargers

Feb 7-10
Section B – Jets
Lesson 1 Turbine Engines-1
Lesson 1 Turbine Engines-2
Section C – Powering UAS
Lesson 1 UAS Engines and Fuel-1
Lesson 1 UAS Engines and Fuel-2
Unit 7 Exam

Feb 14-17 ---Grades Go In
Unit 8: Airframe Systems
Section A – Primary Airframe Systems
Lesson 1 Fuel Systems-1
Lesson 1 Fuel Systems-2
Lesson 1 Fuel Systems-3
Lesson 1 Fuel Systems-4

*****No School Feb 20-24*****

Feb 28-Mar 3
Lesson 2 Electrical Systems-1
Lesson 2 Electrical Systems-2
Lesson 3 Hydraulics and Landing Gear-1
Lesson 3 Hydraulics and Landing Gear-2

Mar 7-10
Lesson 3 Hydraulics and Landing Gear-3
Section B – High Altitude and Weather Systems
Lesson 1 Pressurization and Oxygen Systems-1
Lesson 1 Pressurization and Oxygen Systems-2
Lesson 2 Anti-Icing Systems-1

Mar 14-17
Lesson 2 Anti-Icing Systems-2
Lesson 2 Anti-Icing Systems-3
Unit 8 Exam
Unit 9: Avionics and Flight Instruments
Section A – Pitot-Static System
Lesson 1 Altimeter and VSI-1

Mar 21-24
Lesson 1 Altimeter and VSI-2
Lesson 1 Altimeter and VSI-3
Lesson 2 Airspeed Indicator-1
Lesson 2 Airspeed Indicator-2
Lesson 2 The Magnetic Compass-2

Mar 28-31
Lesson 3 Pitot-Static Failures
Section B – Gyros and Compasses
Lesson 1 Gyroscopic Instruments-1
Lesson 1 Gyroscopic Instruments-2
Lesson 1 Gyroscopic Instruments-3

Note This Class has Monday Work!!

April 4-6 no school on 7th
Lesson 1 Gyroscopic Instruments-4
Lesson 2 The Magnetic Compass-1
Section C – Electronic Instruments
Lesson 1 Electronic Flight Displays
Unit 9 Exam

April 18-21
Unit 10: Required Documentation
Section A – Aircraft Documents
Lesson 1 AFM/POH
Lesson 2 Registration and Airworthiness Certificates
Lesson 3 Inspections-1
Lesson 3 Inspections-2

NO School **April 11 -14 Easter**

April 25-28
Lesson 3 Inspections-3
Section B – Maintenance Documents
Lesson 1 Preventive Maintenance and Airworthiness Directives
Section C – Pilot Responsibilities
Lesson 1 Acting as Pilot In Command-1
Lesson 1 Acting as Pilot In Command-2

May 2-5
Unit 10 Exam
Unit 11: End of Semester Project and Career Development
Section A – End of Semester Project
Lesson 1 Design an Airplane-1
May 9-12
Lesson 1 Design an Airplane-1
Lesson 1 Design an Airplane-1
Lesson 1 Design an Airplane-1
Lesson 1 Design an Airplane-1

May 16-19
Lesson 1 Design an Airplane-1
Lesson 1 Design an Airplane-1
Section B – Growing Your Skills
Lesson 1 Mentoring

May 23-26
Lesson 2 Work-Based Learning Experiences-1
Lesson 2 Work-Based Learning Experiences-2
Post-Course Exam
Reflection

May 30 - June 2
MAP Testing