Instructor:  Dr. Thomas W. Strganac, P.E.    phone: 979-845-1694      email: strag@tamu.edu
Office: HRBB 743 C      office hours: MTWRF 2-5 or by appointment

I may be able to answer concise questions by e-mail (depends on the extent of reply required).
I welcome office visits but please arrive prepared to discuss your efforts.

Teaching Assistant: none for summer term (so I get to know you even better … )

Class Location / Time:  HRBB 204   Lectures: MWF 12:00 – 1:15 pm   Recitations: T 12:00 – 1:15 pm

Textbook and Required Material:
• Introduction to Flight by J. Anderson, 7th edition
• Statics by J. L. Miriam and L. G. Kraige, 7th Edition
• Course Folder located at \aus.aero-ad.tamu.edu\Class Notes within “Aero 201\Strganac”

We have great textbooks which will prove to be excellent resources. In addition, the authors provide excellent
histories of our heritage. For example, Professor Anderson provides an outstanding background of aerospace history
throughout the textbook. To appreciate your heritage, please read Chapter 1 and the "Historical Notes" sections
found in each chapter. As an Aerospace Engineer, you should find this material of great interest.

Prerequisites: Admitted to major degree sequence in aerospace engineering and completion of CBK courses with
a grade of C or better; MATH 251 or MATH 253 or registration therein. Refer to catalog- http://catalog.tamu.edu/

Course Description: Standard atmosphere; basic aerodynamic theory; isentropic flow; airfoil and wing
descriptions; distributed load systems; static equilibrium; analysis of statically determinate trusses and structures;
free body diagrams; wing structures; experiential introduction to aerospace engineering.

Learning Outcomes: At the end of this course students, students will be able to:
• Calculate pressure-density-temperature of air as a function of altitude (standard atmosphere),
• Apply Newton’s Laws and conservation (of mass, momentum and energy) principles to the develop
basic equations for aerodynamics and flight mechanics,
• Describe flow separation, compressible flow, Reynold’s number, Mach number, Boundary layer,
• Explain basic concepts including compressible vs. incompressible flow and viscous flow,
• Describe elements of an airfoil, calculate lift, drag and moment on an airfoil and wing,
• Derive and use basic airplane equations of motion, including the relationship between lift, drag, thrust and
weight, and performance characteristics such as power requirements, range, endurance, and ceiling,
• Calculate components of vectors and resultant of vectors in 2D,
• Calculate equivalent system of forces and moments,
• Satisfy equilibrium equations in 2D and 3D,
• Calculate internal forces in planar truss systems, selected frames and machines,
• Calculate center of mass, gravity, volume of monolithic and composite bodies,

Method of Evaluation:

<table>
<thead>
<tr>
<th>Component</th>
<th>Dates</th>
<th>Time</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam</td>
<td>Friday 7/3/15</td>
<td>12 - 1:15p</td>
<td>25 %</td>
</tr>
<tr>
<td>Final Examination</td>
<td>Tuesday 8/11/15</td>
<td>1 - 3p</td>
<td>25 %</td>
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<tr>
<td>Homework</td>
<td></td>
<td></td>
<td>5 %</td>
</tr>
<tr>
<td>Quizzes</td>
<td></td>
<td></td>
<td>25 %</td>
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<tr>
<td>Projects</td>
<td></td>
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<td>15 %</td>
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<tr>
<td>Attendance</td>
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<tr>
<td>Total</td>
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<td>100 %</td>
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Grading Scale:  A 90-100%    B 80-89%    C 70-79%    D 60-69%    F < 60%
Homework:
- There will be Homework assignments twice per week. Assignments will be due “next lecture + 1” ...
- Monday assignments are due Monday, Wednesday due Monday, Friday due Wednesday.
- Solutions will be provided. The Homework will be checked for effort, but not graded in detail.
- Homework is to be completed independently.
- Homework assignments are due at the beginning of class due.
- Late assignments will not be accepted without penalty, except for University approved excused absences.

Quizzes:
- 30 minute quizzes will be given every week, except exam weeks, usually on the Tuesday class.
- All quizzes will be graded.
- There will be no consideration for makeup quiz except for official university excused absences.
- Many problems in the quiz will be from Homework / Projects. However, new problems, similar to homework problems will also be given.

Major Exams (Midterm and Final):
- Closed book and closed notes, no calculator.
- No consideration for makeup exams will be given except for official university excused absences.

Attendance Policy:
- Students are expected to attend class – daily attendance will be noted / credited.
- See http://student-rules.tamu.edu/rule07 regarding attendance and Excused Absences.

Course Topics:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Ch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introductory Fundamentals (units, terms ...)</td>
<td>Ch1F, Ch2F &amp; Ch1S</td>
</tr>
<tr>
<td>2</td>
<td>Hydrostatic Equation and Standard Atmosphere, Basic Aerodynamics</td>
<td>Ch3F, Ch4F</td>
</tr>
<tr>
<td>3</td>
<td>Basic Aerodynamics</td>
<td>Ch4F</td>
</tr>
<tr>
<td>4</td>
<td>Airfoils and Wings</td>
<td>Ch5F</td>
</tr>
<tr>
<td>5</td>
<td>Force Systems (Forces, Moments &amp; Couples; 2-D and 3-D Force Systems; Vector Mechanics)</td>
<td>Ch1S</td>
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<tr>
<td></td>
<td><strong>Midterm exam</strong>  Friday, July 3, 12:00 – 1:15pm</td>
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<tr>
<td>6</td>
<td>Force and Couple Systems, Equilibrium (2-D, FBDs; Equilibrium Conditions; 3-D)</td>
<td>Ch2S, Ch3S</td>
</tr>
<tr>
<td>7</td>
<td>Structures (Plane Trusses; Method of Joints; Methods of Sections)</td>
<td>Ch4S</td>
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<tr>
<td>8</td>
<td>Structures (Frames and Machines)</td>
<td>Ch4S</td>
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<tr>
<td>9</td>
<td>Distributed Forces (Center of Mass; Centroid), Ch5S</td>
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<tr>
<td>10</td>
<td>Airplane Performance, Ch6F</td>
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<td></td>
<td><strong>Final Exam</strong>  Tuesday, August 11, 1:00 – 3:00 pm</td>
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‘F’ = Flight text by Anderson  ‘S’ = Statics text by Miriam & Kraige

Aggie Code of Honor:
An Aggie does not lie, cheat, or steal or tolerate those who do. Any form of cheating, plagiarism, and/or academic dishonesty may result in an "F" grade and/or other disciplinary action. http://aggiehonor.tamu.edu

Notice:
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit: http://disability.tamu.edu.
ABET Outcomes
Contributions to Professional Component:
1. Required course in mechanics and aerodynamics area. Prepares students for junior-level courses.
2. Builds the foundation for core subjects.
3. Part of the required engineering topics portion of the curriculum. Helps prepare students for engineering practice.
4. Prepares student to have basic knowledge of aerodynamic modeling and response of aerospace systems.

<table>
<thead>
<tr>
<th>Program Outcomes</th>
<th>Assessment Method</th>
<th>ABET Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculate pressure, density and temperature of standard atmosphere,</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
<tr>
<td>Derive and use continuity, momentum and energy equations,</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
<tr>
<td>Calculate airspeed from Pitot systems,</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
<tr>
<td>Calculate speed of sound, Mach number and Reynolds number,</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
<tr>
<td>Calculate lift, drag, and pitching moment</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
<tr>
<td>Use basic airplane equations of motion to find performance characteristics such</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
<tr>
<td>as power requirements, range, endurance, and ceiling,</td>
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<tr>
<td>Describe the control surfaces on a wing and the effect of wing tip vortices on</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
<tr>
<td>Calculate components of forces and moments, and force resultants</td>
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</tr>
<tr>
<td>Derive equilibrium conditions in 2D and use them to identify internal forces of</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
<tr>
<td>statically determinate structures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calculate center of mass, gravity, volume</td>
<td>Homework, quiz, and exam.</td>
<td>3(a), 3(e)</td>
</tr>
</tbody>
</table>

Plagiarism:
As commonly defined, plagiarism consists of passing off as one’s own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of that person. Plagiarism is the worst of academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you use the work of another person of persons in your reports or presentations, then reference the person so that due credit may be given. If you are not sure about whether a particular action could be considered plagiarism on your part, then ask the instructor.

Copyrights:
The handouts used in this course are copyrighted. By "handouts" we mean all materials generated for this class, which include but are not limited to syllabi, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless the author expressly grants permission.

Prepared By: Dr. Thomas W. Strganac, June 1, 2015
Homework

Homework is essential to the learning process. Your conscientious study efforts are rewarded by success on tests as you recognize concepts, problems, processes and formulae from your studies.

As you have probably learned, AERO students are expected to **budget at least 3 hours on outside study per lecture hour**. As an engineer, you are expected to maintain self-initiative and discipline. Accordingly, you are expected to schedule proper time for study. Most AERO assignments take much time, patience, effort and deliberation. Homework must not be initiated the day before it is due.

Solutions will be posted on the AERO 201 course folder. These solutions should be used to verify your efforts – not used to solve the problem. I encourage people to discuss their efforts with others but you must expend your personal time & energy to understand the essence of homework and course material. Simply reading a posted solution or using another’s solution will be of little use to you – you must put forth the effort to understand.

The textbook has excellent homework and example problems – indeed, they have been worked by many others before you, BUT they are new to you. These must be worked/studied by you especially since they will prove to help unlock the mystery in a full solution that you might experience at times.

Test (including quiz and exam) Policy

Tests are **“closed book – closed notes”**. An equation sheet is provided to minimize memorizations – but students must know the appropriate use and application of equations, as well as underlying development and assumptions.

Tests are scheduled in advance so plan accordingly. **Late (make-up) tests are NOT given.**

Unless unavoidable by unexpected genuine emergencies*, you must see me IN ADVANCE for valid schedule conflicts associated with university approved excused absences. I allow a student to take a test early if planned (for example, if a student has an official field trip scheduled for test time, I allow the student to test immediately prior to departure).

If a test is missed due to an absence arising from a verifiable and approved emergency*, then I will work with the student to find an alternative. Then, if the student wishes, a make-up test will be provided following the exam period for the semester. In this situation, every option is given to the student to receive the best grade possible.

Otherwise, if a test is missed, then a zero is assigned.

*see university student rules regarding attendance.

Grade disputes

I grade all tests personally, and this allows me to get to know you. Let your test ‘talk’ to me, proving your knowledge.

Nonetheless, misunderstandings and mistakes by me happen from time-to-time. To objectively consider such cases, I have a written appeal process required for grading disputes on tests. This written process allows facts to be presented without emotion. You are asked to present your concerns in writing with specific details. The appeal must include a full and correct solution to the problem. You are asked to recommend a new grade. I will consider the appeal and I will reply accordingly.

“No Calculator Rule” on tests or exam

Engineers are expected to think and formulate solutions. Although number crunching is comforting, I know you can use a calculator. Our test time is limited and my tests are intended to measure your thinking processes. Thus, calculators are not allowed on tests or exam. Although numbers may be provided, I am interested only in the solution process in variable form, **you should not complete simple math operations** such as multiplication and division (it is a waste of your test time).