AE 310 AEROSPACE STRUCTURAL ANALYSIS (3 credits)  
SPRING 2010  
Mondays and Wednesdays, 2:00 – 3:15 p.m.  
Engineering Building, Room E 328

SYLLABUS & CLASS POLICY

Catalog description: Methods of static structural analysis of problems encountered in the flight of aerospace vehicles. Prerequisites: Civ E 301 or ME 304 (or equivalent mechanics of materials course). Completion or concurrent registration in ME 240 (Intro to Materials Science) recommended.

Instructor: Dr. Satchi Venkataraman, Associate Professor of Aerospace Engineering, Room 309 Engineering Building, (619) 594 6660, satchi@mail.sdsu.edu

Office hours: Mondays 11:00 am – 12:00 pm;  
Tuesdays 4:00 – 5:00 pm; and  
Wednesdays 9:00 – 10:00 am.  
At other times by appointment only.

Website: http://blackboard.sdsu.edu. The university blackboard web site will be used for disseminating course announcements and supplementary materials. Blackboard accounts use the same information as the SDSU e-services Web Portal access.

Objectives Teach fundamentals of structural analysis and design with emphasis on aerospace applications. Develop communication and teamwork skills.


Course Topics: The following topics will be covered in the course.
1. Introduction – aircraft structures and materials
2. Introduction to theory of elasticity
3. Torsion, bending, and shear response of slender beam like structures
4. Analysis and design of thin-walled pressure vessels
5. Failure criteria for isotropic materials
6. Elastic buckling of beams and plate

Grading: Grades will be determined using these weights:
1. Homework Assignments 20%
2. Two in class exams during the term 50%,
3. Final Exam and Project 30%
4. Bonus points for in class surprise quizzes (up to 10%)

Grades are based on an absolute scale (e.g., A=91+, B+=86+, B=81+, C+=76+, C=71+, D+=66+, D=61+).
The letter grade assignment will follow the following definition provided in the SDSU student catalog under university policies:
A - outstanding achievement; available only for the highest accomplishment;
B - praiseworthy performance; definitely above average;
C - average; awarded for satisfactory performance;
D - minimally passing; less than the typical undergraduate achievement;
F – failing;
Plus and minus designations will be used to indicate intermediate performance.

Lecture sessions We will have two seventy five minutes lectures every week.
Attendance is mandatory. More than three unexcused absences can lead to grade penalty.
Students are expected to come to class on time, turn off their cell phones before the start of class and not bring or food during lectures.

Student participation in class is encouraged to maximize the learning opportunity. Active participation in class lectures and coming prepared to lectures will maximize your learning in the class room and minimize the time you will have to invest outside the class room in studying for this course. Class participation will be used in deciding borderline grades.

Be courteous to the fellow students and the instructor during classroom discussions.

The use of laptop is allowed in the classrooms for the only purpose of taking notes. Any other laptop use (e.g. checking emails or searching the web) must be postponed until the class ends. Disregard for these rules or other disruptive behavior can lead to the following sanctions: expulsion, disciplinary sanctions, grade penalty.
Rules for Homework Assignments

Homework assignments help students absorb methodology and concepts taught in the course and prepare them for the exams. Homework assignments will be judged on clarity. The criterion you should apply to judge clarity is the following: Five years from now, you should be able to pick up the homework, understand exactly what was done, and be able to verify its correctness with a minimum investment of time without having access to the textbook.

Homework problems have to be solved by each student individually. Collaboration on homework is not allowed unless specifically allowed by the instructor when the homework is assigned.

Homework assignments must be submitted at the beginning of the lecture on the due date. If there is no lecture on the due date, then homework must be submitted by close of business (5:00 p.m.). Late homework will not be accepted for grading.

Home work assignments must be completed on engineering computation paper. Be legible and neat and. Assignment submitted will not be graded if they are not neat, legible and easy to follow.

Each problem in the assignment must start on a new page. Write only on one side of the paper. Reproduce the problem statement and any figure accompanying the problem statement.

Draw neatly all necessary figures and free body diagrams needed for your computations.

Homework assignments are also intended to develop written communication skills. Explain your solution process and progression of the ideas in solving assigned problems in narrative form (briefly).

The best homework assignment will receive 20% extra bonus grades and posted as an example for other students.

Final Project: The final project will analyze a transport aircraft wing box structure and compute stress, deflection and stability margins using the analytical methods learned in this course. The accompanying project reports must include a detailed documentation of your analysis calculations, assumptions made, any limitations or restrictions of the models used for analysis and recommendations for further improvement. The reports will use the AIAA Journal paper format (template provided).

In-Term Exams: In-class exams will be closed book and notes (unless announced otherwise).

Final Exam: The final exam will be comprehensive and will be closed book and closed notes.
Accommodations for Students with Disabilities

Students with disabilities who need support services are encouraged to notify the instructor as soon as possible. This can be done confidentially via email or by phone (see instructor contact information).

Academic honesty: All students admitted to SDSU are expected to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. Academic honesty requires that you acknowledge any source of information that you have used for materials submitted for credit.

Plagiarism: Plagiarism consists of passing off as yours the work that belongs to someone else. You will guilty of plagiarism if you present someone else’s work as your own, even with the other person’s consent. Any plagiarism will be immediately reported to the SDSU Judicial Procedures Office and result in expulsion form the course.

Miscellaneous Only University approved excuses for absences will be accepted. Each student will be responsible for knowledge of all scheduling and announcements made in class, via blackboard or email.