"Scientists discover the world that exists; engineers create the world that never was."  T. von Kármán

CLASS HOURS:  MWF 12:40PM-01:30PM CHEN 102
CLASS WEBSITE:  http://aeweb.tamu.edu/aero310/

INSTRUCTORS:  Tamás Kalmár-Nagy, Kevin Hernández Pardo and Sandip Kumar
(Please address us as Dr. T, Dr. Hernández and Sandip, respectively).

CONTACT INFORMATION:  743B HRBB
kalmarnagy@tamu.edu, kevinhp@tamu.edu, to.sandip@gmail.com
http://aero.tamu.edu/faculty/kalmarnagy

Our personal goal is to see every single student succeed in this class.

OFFICE HOURS:  Dr. Kalmár-Nagy: Wednesdays 1:30-2:30pm (in 743B HRBB). As a faculty member with other student mentoring, research, proposal-writing and travel commitments, I am juggling many responsibilities. At times, I may be able to talk with you in my office without an appointment. Please ask if this is a good time and do not take it personally if I am busy. If you can not make it to my office hours, please email me well in advance, and we’ll find time for an appointment. I enjoy teaching and I'd be happy to talk with you about your areas of interest, help brainstorm topics for your project, etc.

COURSE DESCRIPTION:  This course is about HOW and WHY bodies move (kinematics and dynamics, respectively). We learn 3-D Newtonian mechanics emphasizing the use of vector equations and Free Body Diagrams. We also focus on the linear theory of free and forced vibrations and dynamic response of single and multi-degree of freedom systems; natural frequencies and modes, and frequency response of first and second order systems.  This is material that you will use daily throughout your studies and in your engineering job. We hope you will find this class interesting, exciting, and valuable.

LEARNING OBJECTIVES:
At the end of this course, students shall be able to perform the following tasks:

1. Use particle kinematics to determine positions, velocities and accelerations with components expressed in arbitrary coordinate reference frames using the transport theorem.
2. Derive the governing dynamic equations for particles and bodies.
3. Determine the linear system response for single and multi-degree of freedom systems.

This course is designed to give junior level students in Aerospace Engineering the ability to analyze problems in system dynamics/vibrations in a straightforward and logical manner. Emphasis is placed on basic principles to derive, solve, and analyze the describing differential equations of motion. We are committed to make this an engaging and fun class, while maintaining high academic standards. We will do my best to help you succeed in this course, but the ultimate responsibility to LEARN AND PRACTICE the material is on you!

QUESTIONS IN CLASS:  We strongly encourage you to ask questions in class to clarify a concept. Framing questions is part of the learning process. If answering would take too much time, we will indicate so, but we will be happy to answer the question after class.
TEXTBOOKS (on reserve in the Evans Library):
- Dynamics: Analysis and Design of Systems in Motion
  Benson H. Tongue, Sheri D. Sheppard
- Principles of Vibration.
  Benson H. Tongue
  ISBN: 978-0-195-14246-4

COURSE PREREQUISITES: AERO 320, AERO 214, MATH 308, ETIQ 101

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QUIZZES:
Quizzes will be 50-minute closed book exams. In order to be ready for one, you must have read the assigned material, actively participated in class, and have done and understood the homework and the examples in the book. Tentative dates:
- Quiz 1: February 2, Wednesday.
- Quiz 2: February 23, Wednesday.
- Quiz 3: March 11, Friday.
- Quiz 4: April 4, Monday.
- Quiz 5: April 18, Monday.

GRADING POLICY: Standard TAMU grading system.

\[ A >= 90\%, \quad 80\% <= B < 90\%, \quad 70\% <= C < 80\%, \quad 60\% <= D < 70\%, \quad F < 60\%. \]

Course grade will be based on your assignments, 5 quizzes, a final comprehensive exam, and Project score.

| 10 HW* | 10*5 pts |
| 5 Quizzes | 5*10 pts |
| Final exam (May 9, Monday 10:30 a.m.– 12:30 p.m.) | 1*50 pts |
| Project (optional) | (25) pts |
| Total | 150 pts |

*Homework is collected at the beginning of class on the due date.
EXTRA CREDIT: Many times throughout the course, we will mention bonus problems in class. The deadline to turn these in is one week after the lecture they were announced. You can also earn extra credit by solving extra homework problems and turning these in with your regular homework. Mark these pages as “Bonus Problem(s)”. The pedagogical purpose of giving few extra points is to encourage you to practice 310 material. The amount of bonus points is 1 point/hour work.

GRADING PHILOSOPHY:
The problems in this class and the textbook usually have a unique answer (this is usually not so for open-ended design problems). My grading philosophy is:
1) An engineer obtains a solution to a problem based on physical understanding of the problem (clear diagrams, coordinate systems are crucial) and the solution is supported through careful engineering analysis (including clearly stating assumptions),
2) An engineer should always try to have a “gut-feeling” for the solution, i.e., he/she should know when the solution is obviously (or probably) wrong (because of math or other errors).
In engineering problems we deal with dimensional quantities. Units are essential!! No engineering work is correct without proper use (i.e. carrying) of units.

RE-GRADING POLICY:
If you think your homework or quiz/midterm was unfairly graded, you have 1 week in which to submit your paper to me for re-grading after it has been returned to you. Please include an explanation of what you consider to be relevant information. No paper will be re-graded after this ONE-WEEK period.

ATTENDANCE AND ASSIGNMENTS:
We strongly recommend you to attend all classes and BE ON TIME. If you need to miss a class, we would appreciate if you sent us an email well in advance. It remains your responsibility to obtain class notes from your classmates. You are also responsible for reading and studying the text material that was covered in a particular lecture. This is your responsibility whether we remind you or not.

BEHAVIOR IN CLASS:
No laptops, cellphones, texting, iPod-ing, crossword puzzles. SU-DO-N’T-KU!
Please do not sleep in class. If you are so tired that you can’t keep your eyes open, please stay home and rest (propping eyes open with toothpicks has proven to be unhealthy). Please help to keep our classrooms clean, even if you did not create the mess.

HOMEWORK:
1) Homework is to be turned in at the beginning of the class on the due date.
2) Homework must be complete with all steps shown. You may use computer software (Matlab et al.) but you must describe what you did and show computer output if computer software was utilized.
3) Make sure your work is neat (it reflects on you) and staple the pages together.
4) Your final answer must be easily identifiable (either boxed, highlighted, underlined, separate from other work, etc.) and must appear with appropriate units.
5) Self-grading: learning how to evaluate yourself (and others) will be an important aspect in your career. To encourage you to do this, homework assignments will be self-graded (we will hand out the solutions). As a control, one problem on every assignment will be graded and depending on the relative difference between the control grade and your self-grade, the whole assignment may be graded by us.
6) IMPORTANT: Your name must appear on the top right corner of the first page, together with the following signed Honor Pledge (whichever is appropriate)
“On my honor, as an Aggie, I have neither given nor received/used unauthorized aid on this academic work.”/“On my honor, as an Aggie, I have given or received aid on this academic work from the following people: NAMES. I attest that I wrote up this assignment independently”
Not giving credit is considered scholastic dishonesty. PLEASE TAKE THIS SERIOUSLY, WE DO.
TEAMING:
Working on homework together is fine. However, you can NOT just copy assignments from each other. You have to INDEPENDENTLY write up the solution and you MUST unambiguously show the name(s) of the other person(s) you worked with.

PROJECTS:
The project should be on something that you are interested in and can be related to the course material. A short (half-page) project title and description is due on March 21st (hardcopy in class, word file in email before class). Late projects will be evaluated on a 15 point scale. Team projects are allowed. I will be glad to provide feedback on project proposals before the deadline. Project reports and presentations are due on the 3rd of May. Project presentations to the class will be on the 4th of May.

ACADEMIC INTEGRITY:
Students should uphold the Honor Code (http://www.tamu.edu/aggiehonor), to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Remember, if you cheat the system, you cheat yourself as well.

ACCOMMODATION FOR STUDENTS WITH DISABILITIES:
The Americans with Disabilities Act 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 that you have a disability requiring accommodation, please contact the Department of Student Life, Services for Students with Disabilities, Cain Hall (979-845-1637, http://studentlife.tamu.edu/ssd). Any student needing accommodation due to disability, either in the classroom or during exams should let us know privately during the first week of the semester.

ACCOMMODATION FOR RELIGIOUS OBSERVANCE:
Texas HB256 (9/1/03): “An institution of higher education shall excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused.” An effort will be made to accommodate students’ needs for religious observance. Students should contact me during the first week of class in order to make arrangements. Please do not switch between religions during the term.

FEEDBACK:
At any time during the term we will appreciate your constructive feedback to improve the classes.