

AE 2220 – Dynamics

FALL

Course description: Motion of particles and mass center of bodies, kinematics and kinetics of rigid bodies in plane motion, work-energy and impulse-momentum methods, 3-D dynamics of rigid bodies.

- Motion of **Particles**
 - Kinematics: Rectilinear/curvilinear motion, Cylindrical/natural coordinates
 - Kinetics: Newton's second law, Momentum, Impulse, *Satellite/planet motion, Rockets*
- Motion of **Rigid Bodies in 2D**
 - Kinematics: Translation, Rotation, Relative-motion, Angular velocity
 - Kinetics: Euler's second law, Center of mass, Moment of inertia, *Rolling & slipping*
- Motion of **Rigid Bodies in 3D**
 - Kinematics: Orientation angles (*yaw, pitch, roll*)
 - Kinetics: Euler's dynamical equations

Prerequisite: COE 2001 – Statics, MATH 2552 – Differential Equations (co-requisite)

Grading distribution

Graded work	Weight
~12 Homeworks	30%
3 projects (coding)	30%
Midterm	15%
Final	25%
Total	100%

1. **Homework** will be conducted on Canvas and will be graded automatically. You will have three attempts in total and will be scored based on the highest scored attempt. Note that the numerical values in the problem are randomly generated, so you will get different numbers for different attempts. It is highly recommend to write a short code for each problem. If you are not satisfied with your score. At the last attempt, you have an option to submit a detailed procedure of the failed questions in pdf. You may type down (better) or write down your detailed procedure of solving the problem for partial credits.

2. **Projects** will be code-based, and you are expected to submit a typed report of your findings. You will be working as a team. Your team will be automatically assigned. In total there will be 3 projects, you will have at least two weeks to work on each of them. Project 2 will be around the end of September, and Project 3 will be around Thanksgiving. Detailed description of projects will be posted later in Assignments.

3. **Late submission** of any assignment will be penalized by deducting 10% of the grade for every day after the due date. Assignments will remain open for a week after the due date.

4. The **midterm** will consist of a 24-hour take-home exam. The **final exam** will be in-person on TBD, you will be expected to bring cheat sheets and a laptop with MATLAB installed. ODS students will be allowed extra time for exams.

Reference book

R. C. Hibberler, *Engineering Mechanics: Dynamics* (14th Ed).

Lectures: TBD

Online access: [TBD](#)

Recitation Section: TBD

Online Access: TBD

Undergraduate Teaching Assistant: TBD

Office Hours: TBD ([Online](#))

E-Mail: TBD

Instructor: Prof. Bolei Deng

Office Hours: TBD (In person)

Office Location: Weber 219

E-Mail: bolei.deng@gatech.edu

Graduate Teaching Assistant: TBD

Office Hours: TBD

Online Access: TBD

E-Mail: TBD

Georgia Tech School of Aerospace Engineering Values



1. **Honesty:** The School of Aerospace Engineering values honesty and integrity of all members of our community. An important element of this value is the academic honor code. Georgia Tech Honor Challenge Statement: I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community. Honor Code: http://policylibrary.gatech.edu/student-affairs/academic-honor-code#Article_I:Honor_Agreement
2. **Well Being:** The School of Aerospace Engineering values the complete well-being of all members of its community, which includes professional, physical, spiritual, emotional, and social dimensions. There are numerous resources to support the health and well-being of all members of our community: <https://gatech.instructure.com/courses/108574>

Mental Health Resources:

Emergencies: Can either Call 911 or call Campus Police at 404.894.2500, <http://www.police.gatech.edu/>

Center for Assessment, Referral, & Ed. (CARE): <https://care.gatech.edu/> 404.894.3498 (Counselor On-Call)

Counseling Center: <https://counseling.gatech.edu/> 404.894.2575

Stamps Health Services: <https://health.gatech.edu/> 404.894.1420

Student Life and Dean of Students: <https://studentlife.gatech.edu/content/get-help-now> 404.894.6367

Victim-Survivor Support (VOICE): <https://healthinitiatives.gatech.edu/well-being/voice> 404-385-4464/(or 4451)

National Suicide Prevention Lifeline: 1.800.273.TALK (8255)

Georgia Crisis and Access Line: 1.800.715.4225

3. **Social Justice:** The School of Aerospace Engineering values social justice for all members of the Georgia Tech community and the larger society. Social justice means that everyone's human rights are respected and protected. We stand committed in the fight against racism, discrimination, racial bias, and racial injustice. Our shared vision is one of social justice, opportunity, community, and equity. We believe that the diversity and contributions from all of our members are essential and make us who we are. We believe that our impact must reach beyond the classroom, research labs, our campus, and the technology we create, but must also improve the human condition where injustice lives. We will continue to work to understand, value, and celebrate all people and create an inclusive educational and work environment that welcomes all. As a matter of policy, Georgia Tech is committed to equal opportunity, a culture of inclusion, and an environment free from discrimination and harassment in its educational programs and employment. Georgia Tech prohibits discrimination, including discriminatory harassment, on the basis of race, ethnicity, ancestry, color, religion, sex (including pregnancy), sexual orientation, gender identity, national origin, age, disability, genetics, or veteran status in its programs, activities, employment, and admissions.

<http://policylibrary.gatech.edu/equal-opportunity-nondiscrimination-and-anti-harassment-policy>