F=ma Quarter (11-week) schedule: Lectures, homeworks, MIPSI

Week	1^{st} meeting of week	2^{nd} meeting of week
09/22	MIPSI. Computation with babyboot.	Vector +, ∗, -, •, ×, $\vec{\mathbf{v}}^2$, angles
09/29	Hw 1. Basis independent vectors **(due)** Hw 2. Vector computation + - • × **(due)**	**Computation:** Math, evaluating expressions, solving linear/nonlinear algebraic equations. 3D microphone problem. Saving/running .m and .al files. Graphing.
10/06	Hw 4. Vector bases: Rotation matrices I **(due)** Hw 5. Vector differentiation **(due)**	Vector computation and geometry (+ - • × magnitude), position vectors, rotation matrices. Measurements of distance, area, volume, angles.
10/13	Hw 6. Angular velocity/acceleration **(due)** **Direct feedback** homework grading - sign up for in/after-class time-slot to meet with an instructor.	**Computation:** Symbolic differentiation, computer solutions to nonlinear ODEs. Plotting for precessing gyro and torque-free satellite.
10/20	Hw 7. Points: Velocity/acceleration I **(due)** **Carmichael**: Inverse kinematics for human neuromuscular biomechanics $\vec{\mathbf{r}} \Rightarrow \theta$, $\vec{\mathbf{v}} \Rightarrow \vec{\boldsymbol{\omega}}$. **Ashley**: $\vec{\mathbf{F}} = m\vec{\mathbf{a}}$ for orbiting particle (Hw 9.6).	**Midterm** Room TBD
10/27	Hw 9. Particle linear/angular momentum, kinetic energy, $\vec{\mathbf{F}} = m\vec{\mathbf{a}}$. Projectile motion of baseball (with/without air-resistance). FBD, vibration/resonance of mass/spring systems. **Lizzie**: Rolling & human hamster wheel $v = \omega r$. Gears.	SI/US unit conversions for mass, etc. Concepts: Moments/products of inertia. Packing the inertia dyadic suitcase. Dyadics and dot-products.
11/03	Hw 8.1-8.4 rolling. Hw 10 Mass/inertia I **due**. **Katelyn**: **Moment of inertia batons lab**	Rigid body formulas: Angular momentum and kinetic energy.
11/10	Hw 11. Rigid bodies: Momentum, energy, motion **Rattleback Lab.** Center of mass concepts and demos.	Road-maps for translating multi-body systems. Picking systems and drawing their FBDs.
11/17	Hw 14. Translation: Laws of motion **(due)** **MIPSI project consulting:** Submit question, model, system picture, identifier table, team photo.	Road-maps for translating and rotating multi-body systems. Picking systems and drawing their FBDs. Aircraft trim solution and phugoid mode.
11/24	**Thanksgiving Week** (Complete homework and continue MIPSI)	
12/01	Hw 15. Systems: Road maps/DAlembert's method Road maps. **Tim**: Helicopter dynamics & control.	**Simulation Project: MIPSI** Submit 1 power-point slide with: question, picture of system, team photo, answer to question.
12/11	**Hw 17. MIPSI Project - Team Simulation Report**. Course evaluations. **Final exam Thursday Dec. 11. 3:30-6:30. Bulding 420-41.**	
Sat. Dec. 13 - Tues. Jan. 6 Winter break. Grades in Axess.