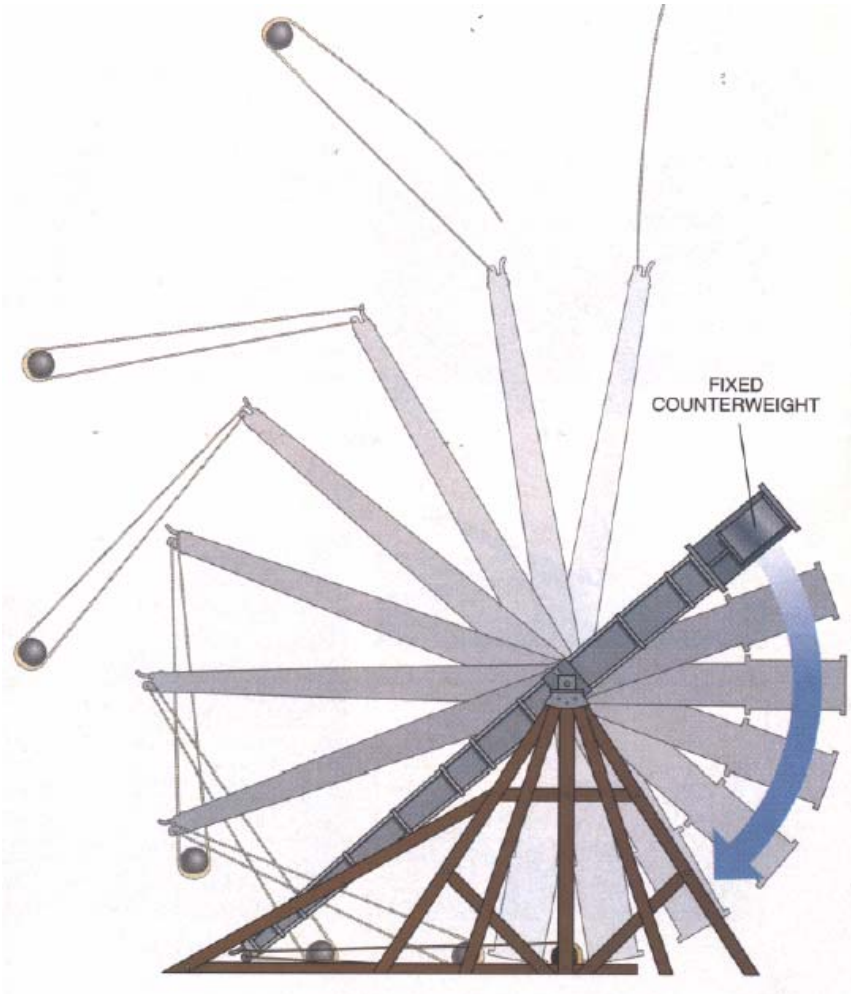
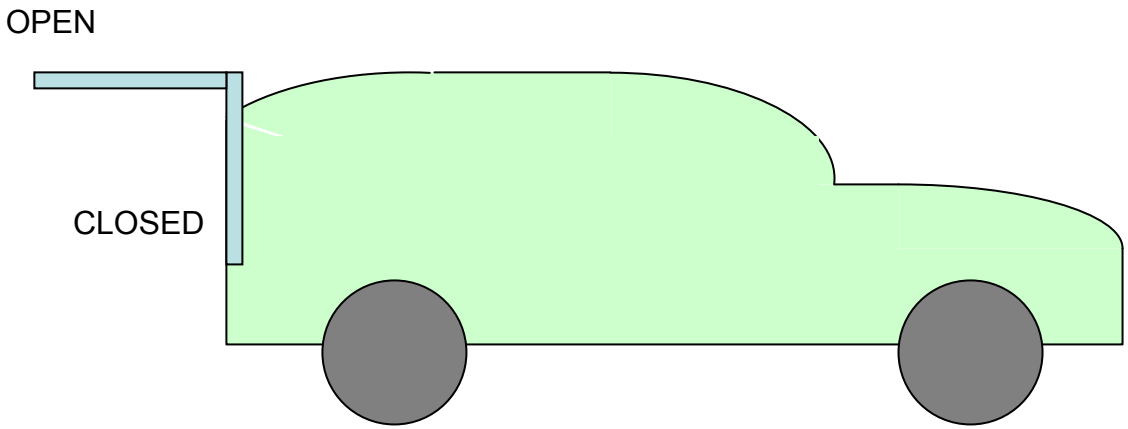
Three Projects

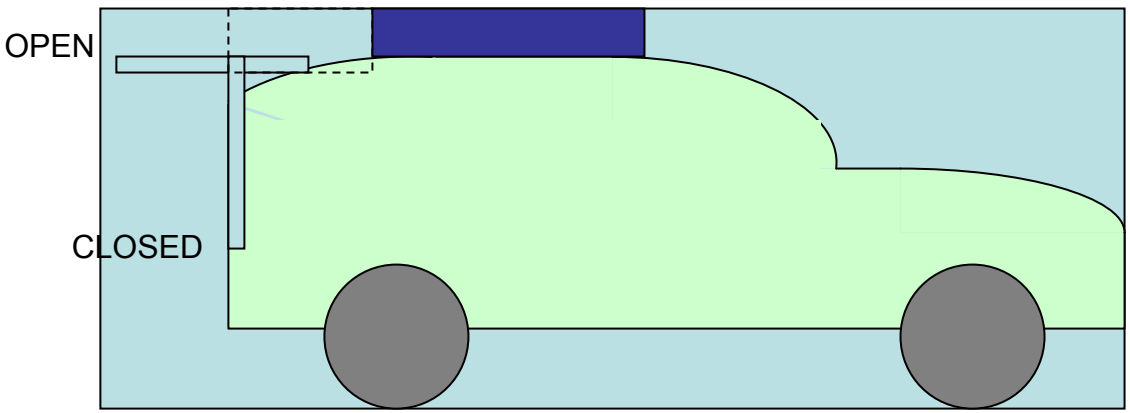
- Simulation
  - Last year's project: Guidance system for a cruise missile
  - Analysis, computer program
- Linkage design
  - Last year's project: Mechanism for a mini-van door
  - Design, analysis and prototype
- Trebuchet
  - Designing a launching mechanism using principles of dynamics
  - Write a computer program for analysis
  - Build a prototype to validate model, design





PROBLEM

DOOR IN OLD DESIGN
SWINGS OUT



NEED

DOOR IN NEW DESIGN
SWINGS OUT 40% LESS

Exercise Machine

Trebuchet

http://en.wikipedia.org/wiki/Trebuchet

Trebuchet projects from 2006

Homework, Midterms, Quizzes, Final

Weekly work

- HW assigned weekly
  - Due every Friday
  - Early bird points for Wed submissions
  - Graded HW returned following Wed
- Quizzes to make sure you stay on top of things
- Worst grades forgotten
- No late work (incentive for early completion)

Midterms and Finals

- Comprehensive
- Closed book, but cheat sheet allowed
- Performance will strongly correlate with good performance in weekly work

Class Participation

- Interaction in class;

  and/or

- Email questions or items of discussion to me
  - "Top" emails will be addressed in class the following week
  - Items must be
    - Address questions related to dynamics
    - Topical
    - Preferably not simply questions about material covered in the class

Schedule

Week		Days	Lecture	Recitation	Reading	Homework	Project Work	Lab work (247)
1		M	Introduction, kinematics of particles		1.1-1.5			
		W	Introduction to computing, matlab, kinematics of particles		2.1, 2.2			
		F		Matlab recitation				
2		M	MLK Day - no class					
		W	Kinematics of particles, state space notation, some kinetics, Project I		2.3, 3.1, App A	**HW 1**	Project I Matlab	
		F		Matlab recitation				
3		M	Kiematics of particles, path coordinates		2.4			
		W	Degrees of freedom, mechanisms, machines, linkages		2.5, Notes	**HW 2**		
		F		Matlab recitation				
4		M	Linkage analysis		Notes			
		W	thesis of linkages, **Quiz 1 (not announced)**		Notes	**HW 3**	**Project I due**	
				Problem Solving				
5	5-Feb	M	articles, FBDs and IRDs, Project II		3.1-3.3		Project II Synthesis and analysis of linkages	
	7-Feb	W	lysis of mechanisms		3.1-3.3	**HW 4**		
	9-Feb			Problem Solving				
6	12-Feb	M	lysis of mechanisms, linear momentum		3.4			
	14-Feb	W	ntum, conservation laws		3.5	**HW 5**		
			ew	Problem Solving				
		M						
		W	Impact		3.7-3.8			
		F		Problem Solving			**Project II due**	Project II presentation
		M	Work and energy, power, efficiency		4.1-4.3			
		W	Work and energy, momentum, angular momentum		5.1-5.3	**HW 6**		
		F	No recitation					
		M						
		W						
		F						
9	12-Mar	M	ut a fixed point: Kinetics, work and energy, catapults		6.1, 7.2			
	14-Mar	W	f rigid bodies (relative motion of rigid body), **Quiz 2 (not announced)**		7.2, 7.5	**HW 7**		
	16-Mar			Problem Solving			Project III Design optimization of a trebuchet	
10	19-Mar	M	ous centers and velocity analyis, acceleration analysis		6.2, 6.3			
	21-Mar	W	ion, rotating frames		6.3, 6.4	**HW 8**		
	23-Mar			Problem Solving				
		M	vilinear translation		7.1			
		W	Kinetics: Rotation about a fixed point (revisited), general motion		7.2, 7.3	**HW 9**		
		F	Midterm review	Problem Solving				
		M	**Midterm II**					
		W	Kinetics of general motion (continued), linear and angular momentum		7.3, 7.4			
		F		Problem Solving				
		M	of 2D rigid bodies		7.5			
		W	ordinates, angular Velocity of 3D rigid bodies		8.1	**HW 10**		
	13-Apr		monstration, pizza				**Project III due**	Project III presentation
14	16-Apr	M	city and angular acceleration in 3 dimensions, **Quiz 3 (not announced)**		8.2-8.3			
	18-Apr	W	on in 3 dimensions		8.3-8.4	**HW 11**		
	20-Apr			Problem Solving				

Kinematics

Kinetics Particle

Kinetics System of Particles

Kinematics Revisited

Kinetics Rigid Bodies

3-D kinematics

Website

http://www.seas.upenn.edu/~meam211

Check regularly

- Weekly homework
- FAQ
- Reading assignments
- All notes/handouts/slides
- Project materials
- Contact information

All emails directed to meam211@seas.upenn.edu

Logistics

- Lectures: Mon, Wed
  - Slides online
- Recitation mandatory: Friday (2 sections)
- First three recitations will be in computer labs
- HW: Due Fri (early bird points for Wed submission)
- Quizzes
  - 3 quizzes (unannounced!)
- Projects 2 and 3
  - Group project
  - Same groups as MEAM 247!
  - Fabrication counts as MEAM 247 lab
- Project 1
  - Group members can collaborate
  - Individual reports

By Friday

List of group members with email addresses to TA with signatures; or

Email to meam211@seas with all group members cc'ed