Statics - TAM 210 & TAM 211

Fall 2018

TAM 210/211 Staff Team

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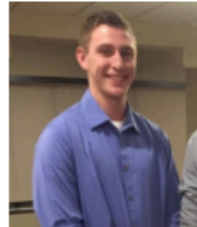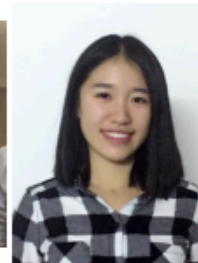Jonah Taylor

Course Assistants

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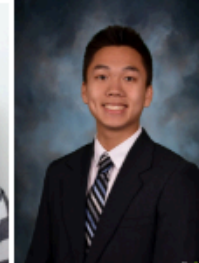
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Course websites

TAM 210/11: Statics

Home | Policies | Info | People | Schedule | References

Welcome to the official course website for TAM 210/11 at UIUC this Fall 2018.

NOTE: This page is always under construction!! Feel free to peruse, wander, and learn a bit about what's coming up this Fall, but dates/times/assignments etc. are subject to change. If you have any questions, feel free to drop us a line at the discussion forum on Piazza (see link below).

As well as the pages on this website, this course uses:

- Online homework via PrairieLearn
- Discussion forum on Piazza
- Gradebook on Compass
- Computerized Testing Facility exam reservation
- Computerized Testing Facility instructions
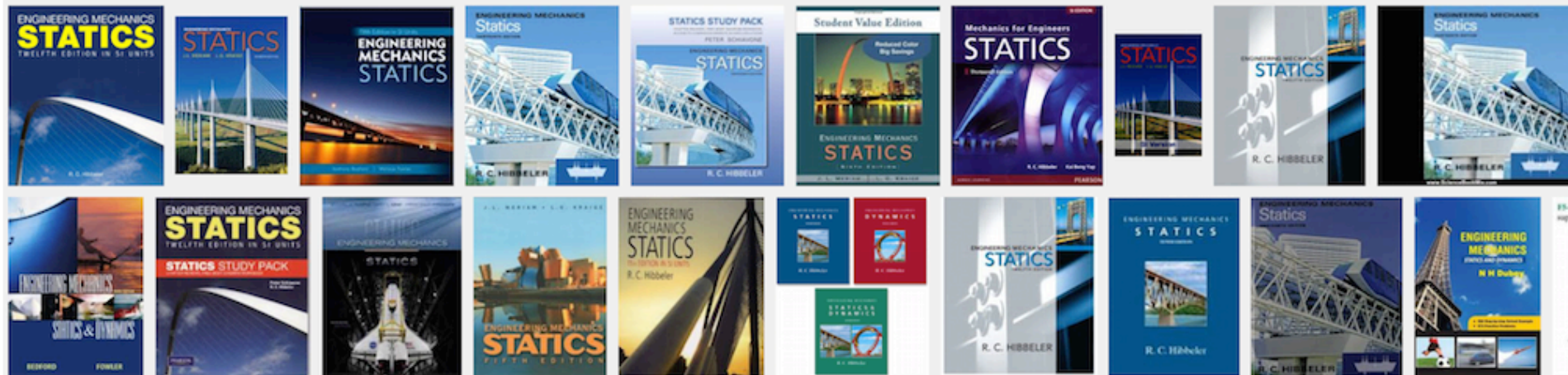
Course Communications

Piazza: https://piazza.com/class/jl5otqlzrwn2s3

ALL communication in the course will be via piazza

- Open discussion of questions from class: if there's something you don't understand, chances are other people don't, and someone else may have the answer.
- Regularly checked by instructors, TAs and CAs.

Grade distribution

Grading: As noted under Polices (Gradebook), all assessment scores are stored on Compass2g. Note that we are only using this website for grade reporting. The total score for the course is computed with the following weights:

TAM 210/211

PrairieLearn homework	10%	Written assignments	15%
Discussion group activity	10%	CBTF quizzes	40%
Written exam	25%		

Final grades: The total score s corresponds to final grades as follows.

$97\% \leq s < 100\%$	A+	$92\% \leq s < 97\%$	A	$89\% \leq s < 92\%$	A-
$86\% \leq s < 89\%$	B+	$82\% \leq s < 86\%$	B	$79\% \leq s < 82\%$	B-
$76\% \leq s < 79\%$	C+	$72\% \leq s < 76\%$	C	$69\% \leq s < 72\%$	C-
$66\% \leq s < 69\%$	D+	$59\% \leq s < 66\%$	D	$55\% \leq s < 59\%$	D-
$s < 55\%$	F				

Grade distribution

Grades: on Compass2g

- Any errors in grade reporting on Compass must be reported within 2 weeks of the due date or by the last day of class, whichever is earlier.
- Missing grade for discussion section or a written assignment, contact one of the TAs in your section (personally or via Piazza).
- Missing grade from online homework, an exam, or i>clicker, contact the instructor (via Piazza).

Discussion group activity – 10%

- Work in groups of 3-4 students

- Goals:
  - **Gain experience in team-work**
  - **Apply engineering concepts learned in lecture to real-world problems or hands-on activities**

- **Be prompt: if you are more than 5 minutes late, you will receive a 0** ☹

- You need to attend the discussion in which you are registered, otherwise, your assignment will not be graded

dubishere.com

Online Homework (PL) – 10%

- Instant feedback
- Infinite number of attempts
- **First required HW is due this Friday August 31**

Written Assignments – 15%

- Student will submit an **individual written report using compass**
- Goal:
  - **Practice the communication of engineering concepts in writing**
  - The reports will be graded based on approximately:
    - 40% presentation, neatness, correct use of symbols, quality of drawings and diagrams, and clarity of explanation
    - 60%: Correct interpretation of the problem and correct final answers.

Quizzes – 40%

- Helps you assess your understanding of the material in real time
- No personal calculators
- Sign up for a quiz time online
- **Concept Inventory: Pre-test**
  Wed-Sat (8/29-8/31)
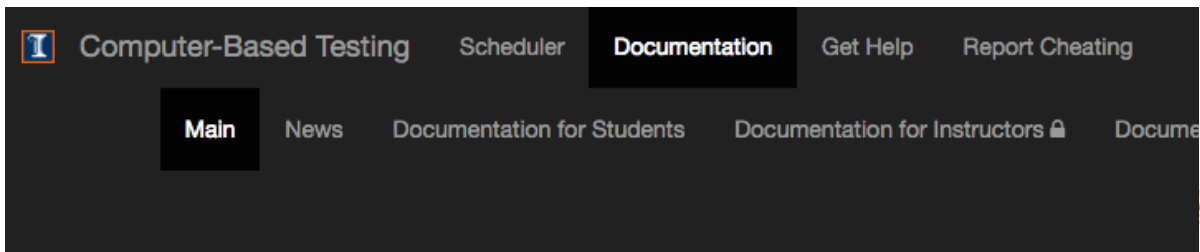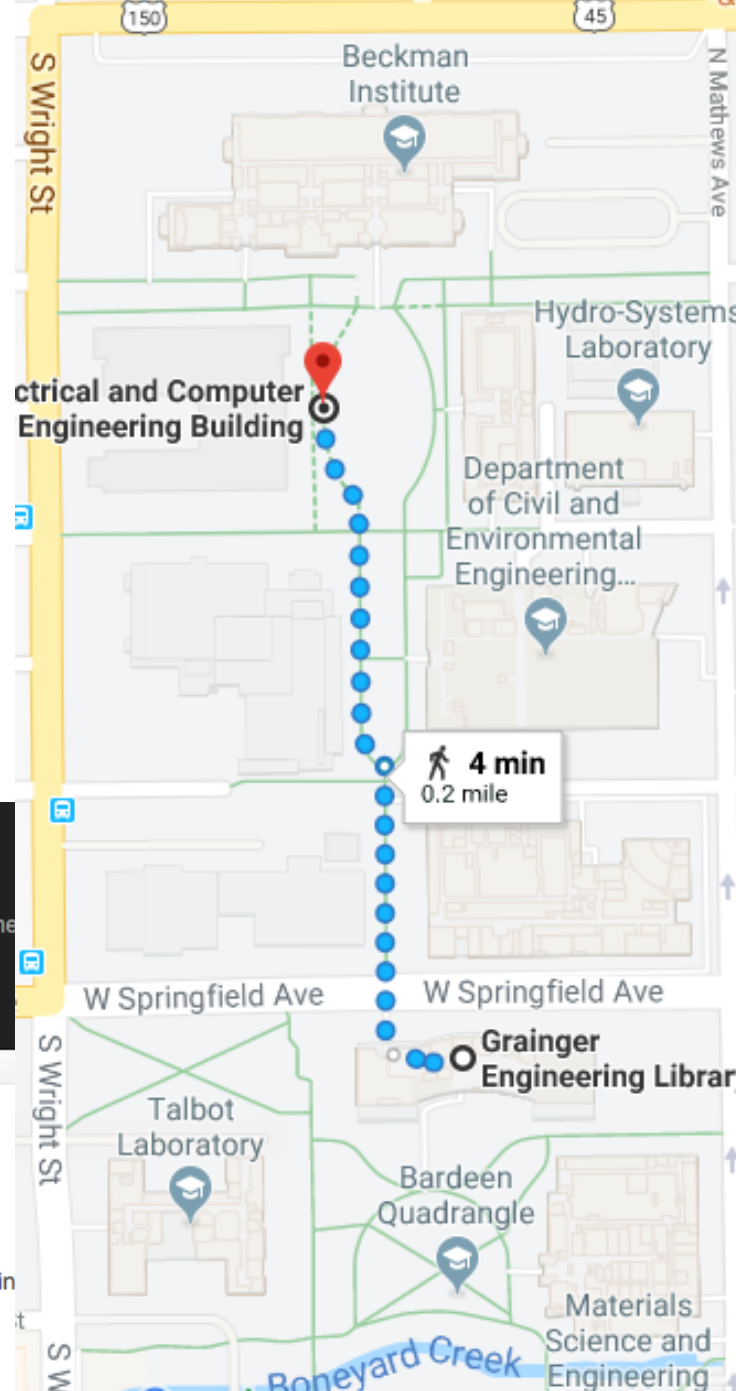
Written Exam – 25%

- Location – CBTF
- Time – TBD (12th week)

Conflict exams will be scheduled for students with legitimate (documented) scheduled conflicts. These are usually on the same day but earlier than the regular exam. You should contact the instructor via Piazza to schedule a conflict exam no later than one week prior to the exam date.

Support for Students

- Piazza (everyday, reasonable working hours)
- Office hours (429 Grainger) – TBD
- MATLAB clinic
  - Wednesday, August 29
    - 5:00 PM - 6:30 PM
    - 6:30 PM - 8:00 PM
  - Thursday, August 30
    - 5:00 PM - 6:30 PM
    - 6:30 PM - 8:00 PM
  - Friday, August 31
    - 5:00 PM - 6:30 PM
- Homework 0 – vector math (use MATLAB/Mathematica/Octave)
- Course website has a Matlab help document

Paths to Success

- Lots of opportunities for points, don't lose the little ones

- A tenant of this class to be successful is:

PRACTICE, PRACTICE, PRACTICE

As of 2011, Yo-Yo Ma had practiced approximately 50,000 hours (according to Malcom Gladwell)
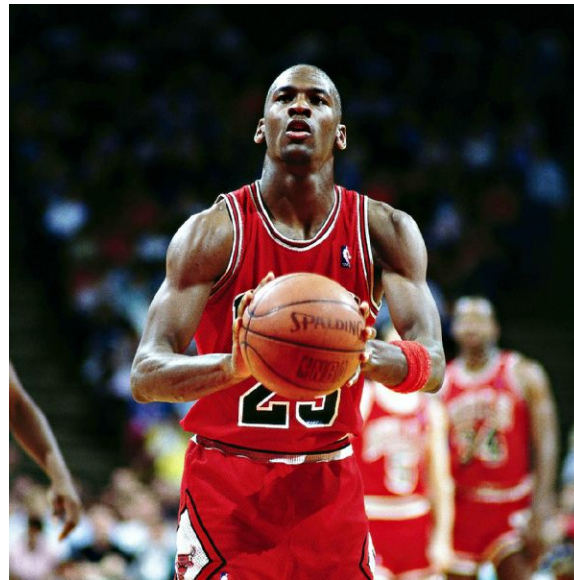
"I'm not out there sweating for three hours every day just to find out what it feels like to sweat."

"I've Missed More than 9,000 Shots in My Career"

http://www.harvardclubofsandiego.com/images/article_images/148.jpg

Make the most from all the resources...

- We don't have many hours together – Attend!
- Use technology - bring your tablets, laptops, etc.
- Russian technology - Bring paper and pencil/pen
- Participate (in lecture, discussion session, Piazza)
  - Ask questions
  - Be prepared to answer questions
  - "I don't know" is ok too!

Chapter 1: General Principles

What is "statics"?
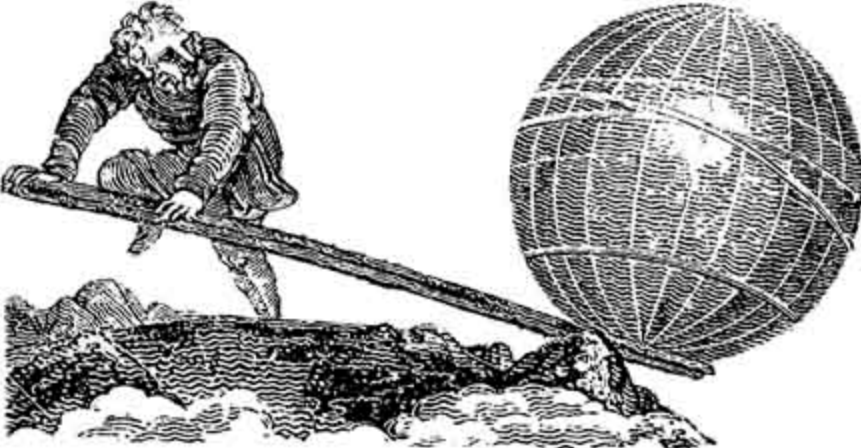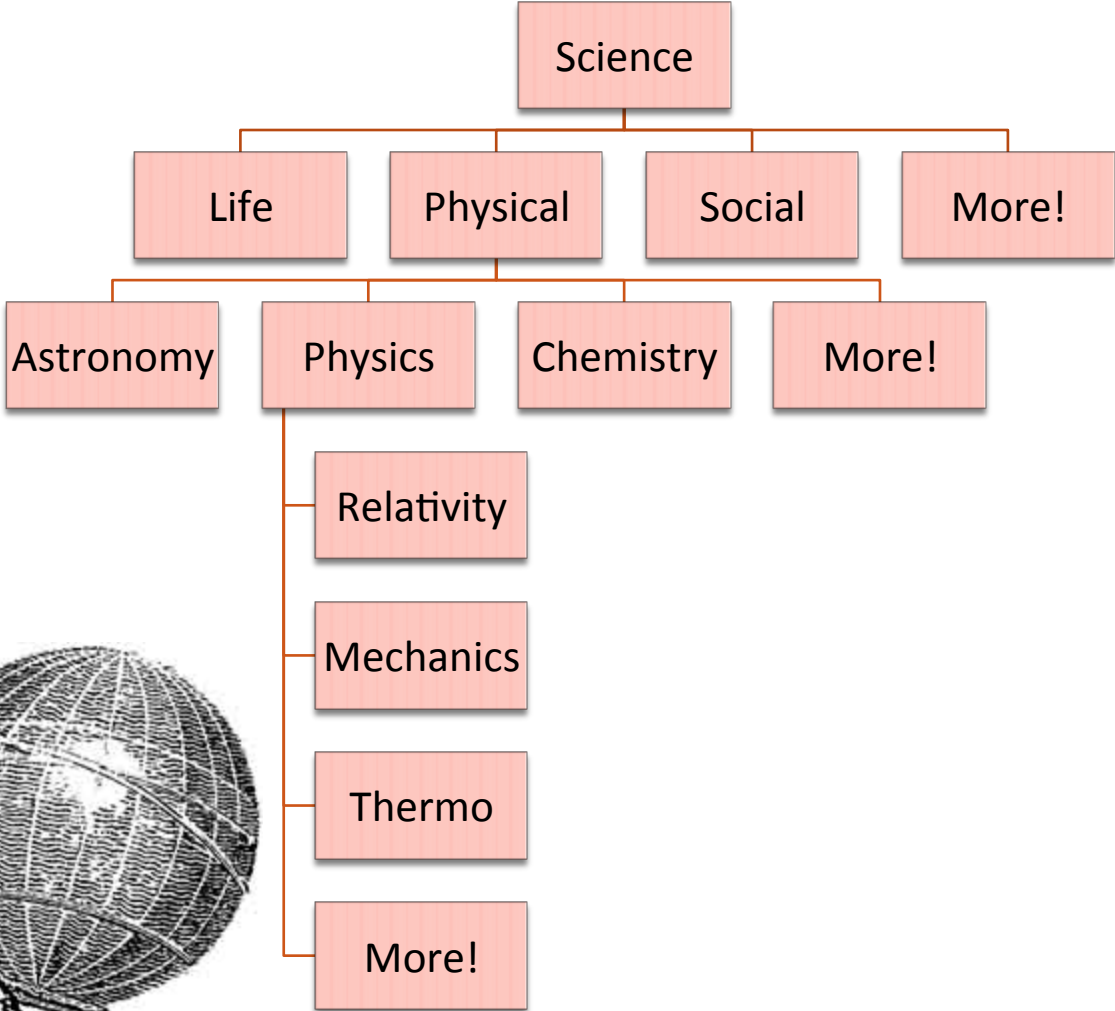
Mechanics

Mechanics is a branch of the physical sciences that is concerned with the **state of rest or motion of bodies that are subjected to the action of forces**

Rigid Bodies

Statics

Linkage example

Dynamics

Deformable Bodies

Solid Mechanics

Fluids

Compressible and incompressible

Statics in Life

More than 2,000 ft.
Eventual height is secret

1,776 ft.
Plans call for windmills to provide 20% of the building's power

1,670 ft.
The world's tallest building today

1,614 ft.
It will have the highest outdoor observation deck in the world

1,483 ft.
The towers have 32,000 windows and are each 88 stories high

1,450 ft.,
The tallest building in the U.S. (spires count; antennas do not)

1,381 ft.
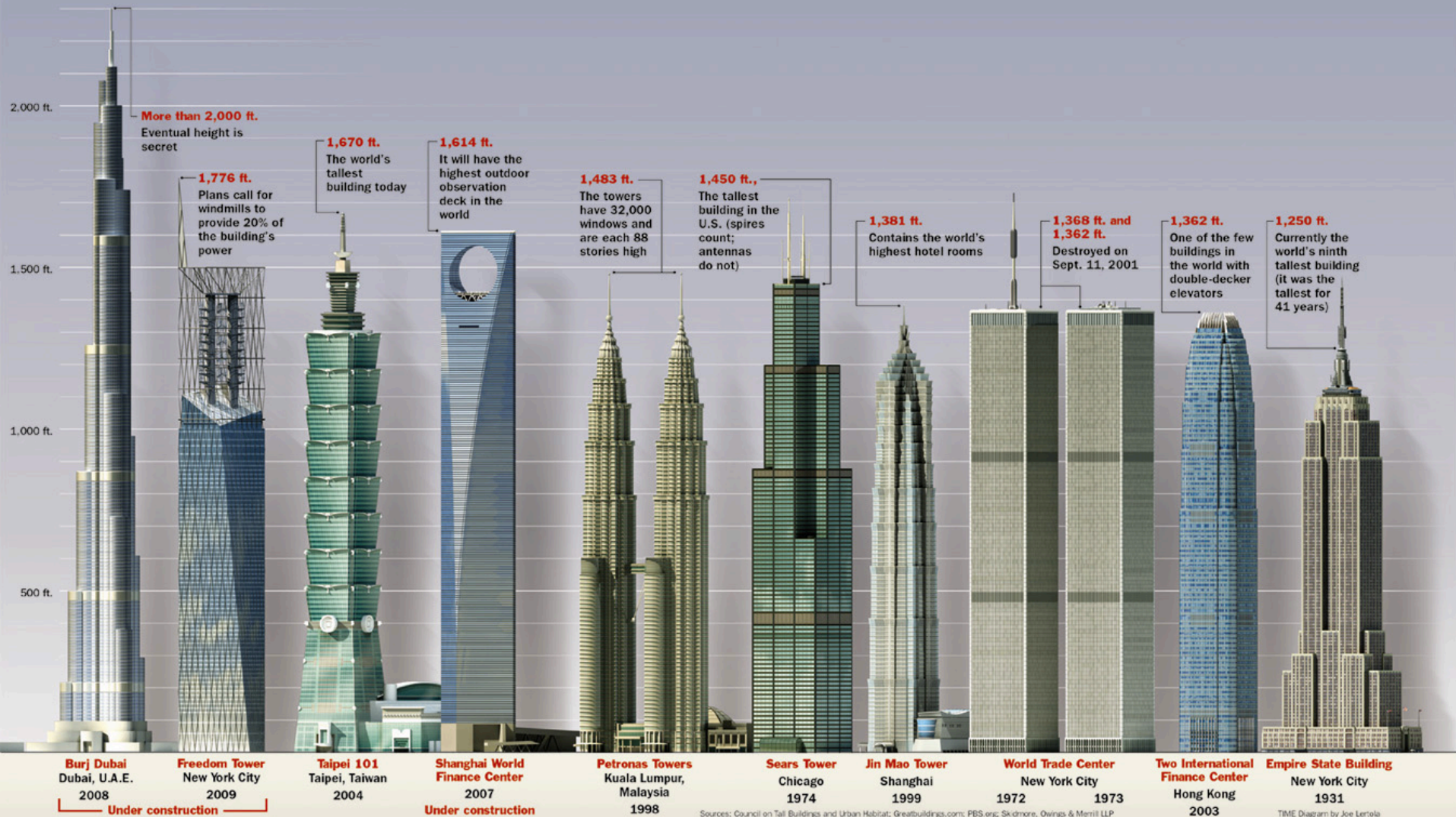Contains the world's highest hotel rooms

1,368 ft. and 1,362 ft.
Destroyed on Sept. 11, 2001

1,362 ft.
One of the few buildings in the world with double-decker elevators

1,250 ft.
Currently the world's ninth tallest building (it was the tallest for 41 years)

2,000 ft.
1,500 ft.
1,000 ft.
500 ft.

Burj Dubai
Dubai, U.A.E.
2008
Under construction

Freedom Tower
New York City
2009

Taipei 101
Taipei, Taiwan
2004

Shanghai World Finance Center
2007
Under construction

Petronas Towers
Kuala Lumpur, Malaysia
1998

Sears Tower
Chicago
1974

Jin Mao Tower
Shanghai
1999

World Trade Center
New York City
1972   1973

Two International Finance Center
Hong Kong
2003

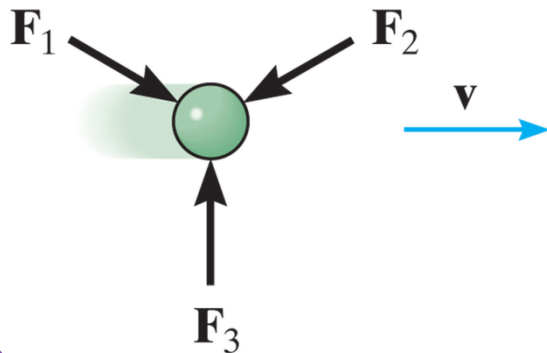**Empire State Building**
New York City
1931

Sources: Council on Tall Buildings and Urban Habitat; Greatbuildings.com; PBS.org; Skidmore, Owings & Merrill LLP

TIME Diagram by Joe Lertola
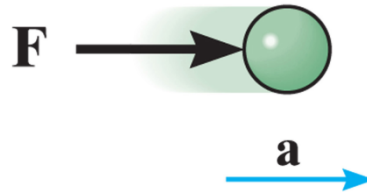
Newton's laws of motion

First law:
Particle at rest (or moving in a straight line with constant velocity) stays that way unless another force comes in.

Second law: a particle acted upon by an unbalanced force **F** experiences an acceleration **a** that is proportional to the particle mass m:

$$F = ma$$

Third law: the mutual forces of action and reaction between two particles are ____equal____, ____opposite____ and ____collinear____.