

# Digital pedagogy in three parts: screencasting, course blog, remote guests

**Course: Bio-aerial Locomotion (ENG)**

**Lorena A Barba**

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Mechanical Engineering Department



# Bio-aerial Locomotion

- ▶ aims to motivate the subject of **bio-inspired engineering**
- seeking examples in the biological world of the desired function in the engineered creation
- ▶ we seek examples of aerial locomotion:  
*falling, parachuting, gliding and flying*



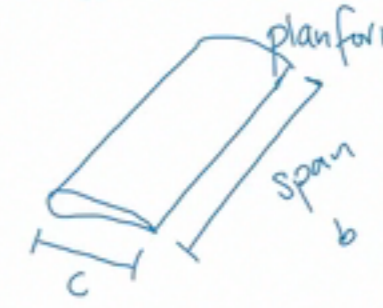
# Screencasting

- ▶ Simple slides
- ▶ digital inking
- ▶ screen recording

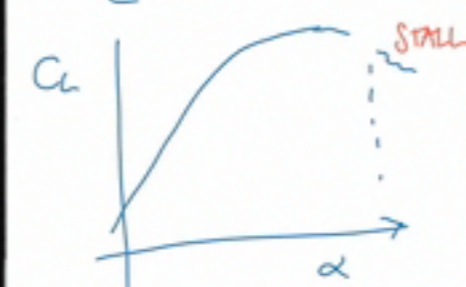
▶ Formula for *Lift* force:

$$L = \frac{1}{2} C_L \rho V^2 S$$

density of air  
Velocity  
(or A)  
planform area  
 $S = b c$



coefficient of lift



BU College of Engineering

EK 131/132 Lecture 4

# Screencasting **Embedded Media**



# Screencasting iTunes U

▶ <http://www.bu.edu/tech/comm/audiovideo/itunes-u/>

**Bio-aerial Locomotion (EK131/132)**  
by Prof Lorena A Barba

To listen to an audio podcast, mouse over the title and click Play. Open iTunes to download and subscribe to iTunes U collections.

**Description**  
"Introduction to Engineering" in BU is a sequence of two topical modules or minicourses (12 lectures) chosen from a selection of modules offered by participating engineering faculty. Each module prepares students with key concepts and/or techniques relevant to an applied area of engineering. This module aims to motivate the subject of bio-inspired engineering, characterized by seeking examples in the biological world of the desired function in the engineered creation. In particular, we seek examples of aerial locomotion in the increasingly sophisticated forms of: falling, parachuting, gliding and flying. The live course consists of extensive discussions with the students, which have been liberally edited from the class videos to make for a more streamlined viewing experience for iTunes U subscribers.

Name	Description	Released	Price
1 Lecture 1a - Introducti...	What is the course abo...	9/12/11	Free
2 Lecture 1b - Falling: "...	When falling, geckos a...	9/12/11	Free
3 Lecture 2a - Explainin...	Summary of results pr...	11/3/11	Free
4 Lecture 3a - Diversity I...	Parachuting and glidin...	11/4/11	Free
5 Lecture 3b - Graphic c...	In reptiles, gliding ada...	11/4/11	Free
6 Lecture 3 Guest Speak...	Prof. Steve Yanoviak, w...	9/24/11	Free
7 Lecture 4 Guest Speak...	Prof. Full answers ques...	11/5/11	Free
8 Lecture 4 - Gliding ani...	We review the different...	9/26/11	Free
9 Lecture 5a - Review m...	The live course posed ...	10/1/11	Free
10 Lecture 5b - Wing loa...	Wing loading is a funct...	10/2/11	Free
11 Lecture 6 (v.1) Guest s...	Ardian Jusufi takes so...	10/2/11	Free
12 Lecture 6 (v.2) Guest S...	Yonatan Munk's dissert...	11/28/11	Free
13 Lecture 6b - Deviation...	Deviations from the tre...	10/6/11	Free
14 Lecture 7a - Feature: t...	The swallow, martin an...	10/6/11	Free
15 Lecture 7b - Gliding p...	In swifts, extended win...	10/6/11	Free
16 Lecture 8a - Chrysope...	Discussion: What do yo...	10/7/11	Free
17 Lecture 8b - Aerodyna...	Continues the discussi...	10/8/11	Free
18 Lecture 9 Guest Speak...	Guest speaker Prof. Jak...	10/8/11	Free
19 Lecture 9b - Flapping ...	Flapping flight: a flapp...	10/8/11	Free
20 Lecture 10b - Flappin...	Flapping flight, contin...	12/7/11	Free
21 Lecture 10c - Wing tip...	Explanation of aircraft ...	12/7/11	Free
22 Lecture 11a-audio: Col...	Professor Robert Dudley	12/10/11	Free

**More from Boston University**

- Fluid Mechanics (2010) - ENG ...  
View in iTunes >
- Computational Fluid Dynamic...  
View in iTunes >

# Course blog

▶ <http://blogs.bu.edu/biolocomotion/>



## Bio-aerial Locomotion

An EK131/132 "Introduction to Engineering" module

[ABOUT](#) [AUTHORS](#)

### Authors

Professor Lorena A Barba, course instructor — Prof Barba teaches fluid mechanics (undergraduate) and computational fluid dynamics (graduate). Her courses can be found on iTunes U. She also does research in the area of computational fluid dynamics, numerical algorithms, and high-performance computing. Her posts in this blog are:

- ["Welcome to Bio-Aerial Locomotion"](#)
- ["Falling: The Tale of the Gecko"](#)
- ["The canopy ants: Prof Steve Yanoviak speaks in EK131"](#)
- ["Ant man Yonatan Munk joins the class"](#)

### EK 132 students (Fall 2011)

**Al Jawder, Saud** — ["Thought flying fish were just in mario games? Think again..."](#) — ["The Saker Falcon"](#)

**Burke, Bradley** — ["Flight Dynamics of Dragonflies"](#) — ["Flying Squid"](#)

**Chalifoux, Andrew** — ["Triassic Delta Wing Gliders"](#) — ["A Hive of Robotic Bees"](#)

**Charny, Samuel** — ["The Goshawk: The Peak of Aviation"](#) — ["Lines Blurred: Archaeopteryx Knocked From Perch of 'First Bird'"](#)

**Chiga, Bradley** — ["Pigeon Power, Dynamic Wings Improve Capabilities"](#) — ["Turbulence"](#)

**Corrigan, Aidan** — ["Variable-Geometry Wings"](#) — ["Why Can the Peregrine Falcon Fly So Fast?"](#)

**Coughlin, Solange** — ["Sky slitherers"](#) — ["The kestrel's wind-hover"](#)

SEARCH

FEBRUARY 2012

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#### BU LINKS

- [Blackboard at BU](#)
- [BU College of Engineering](#)
- [Course on iTunes U](#)
- [EK 131/132 Introduction to Engineering](#)
- [How busy is Ingalls now?](#)

#### TAGS

aquatic birds auto-rotation **bats** Bio-Aerial Locomotion bio-inspired engineering biomimetics **biomimicry** **birds** colugo drag dragonfly eagle evolution falling Festo fish **flapping flight flight flying** formation **gecko** geese **gliding** hovering **hummingbird insects** **lizard** micro-air vehicles morphing wings owl penguins pterosaurs robot samara sea creatures seed smartbird snakes soaring spiders squid **vortices** wakes Wings

# Course blog **Communications outcome**

▶ Introduction to Engineering outcomes

- *Ethics*
- *Communications*
- *Societal context*
- *Contemporary issues*



# Course blog **because I read this essay**

- ▶ ... subsequently “retracted” from the Internet!

SUNDAY, JULY 17, 2011

## Why I will never pursue cheating again

The post is temporarily removed. I will restore it after ensuring that there are no legal liabilities for myself or my employer.



Panos Ipeirotis



"By the end of the semester, 22 students admitted cheating, out of the 108 enrolled in the class. The process [was painful and extremely time consuming]"

Instead, "use assignments that are inherently not amenable to cheating: **public projects**, peer reviewing and competitions."

### Why I will never pursue cheating again

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Panos Ipeirotis

# Guest Speakers

1. **Prof. Steve Yanoviak**, University of Arkansas
2. Dr. Ardian Jusufi
3. Prof. Jake Socha
4. Prof. Robert Full
5. Dr. Yonatan Munk
6. Prof. Robert Dudley



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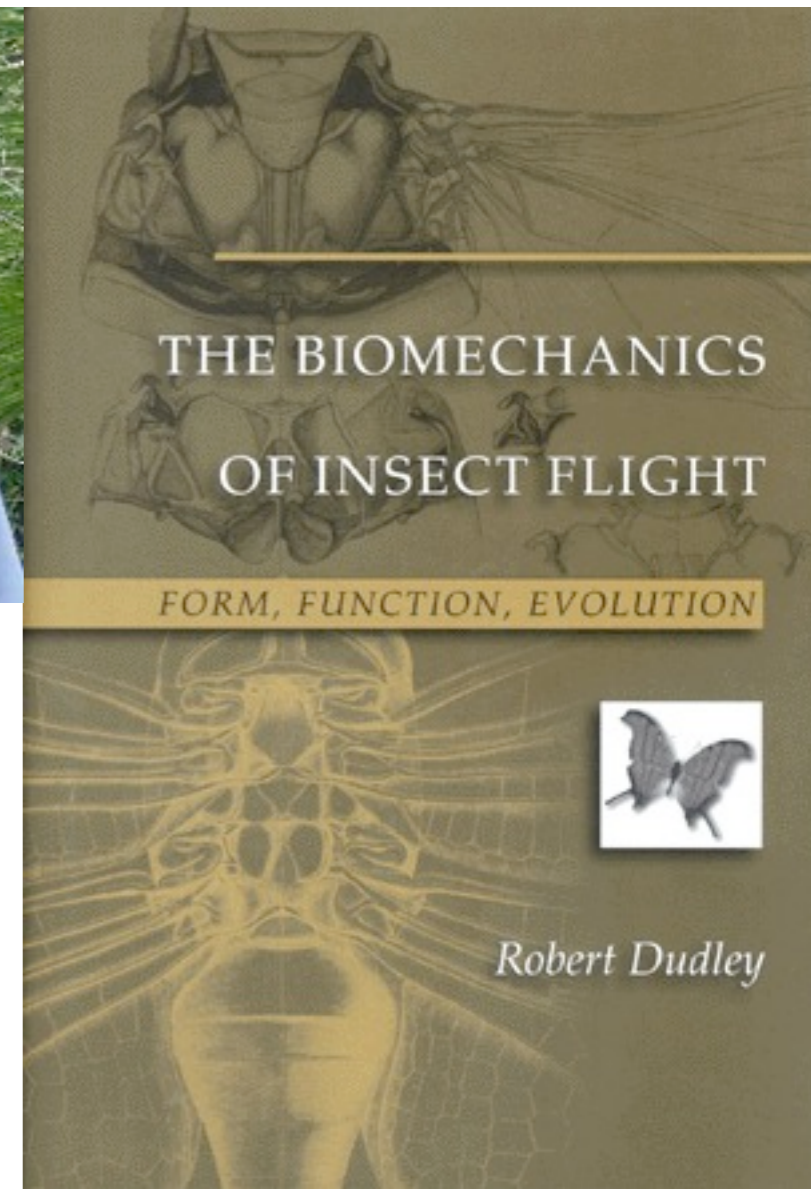
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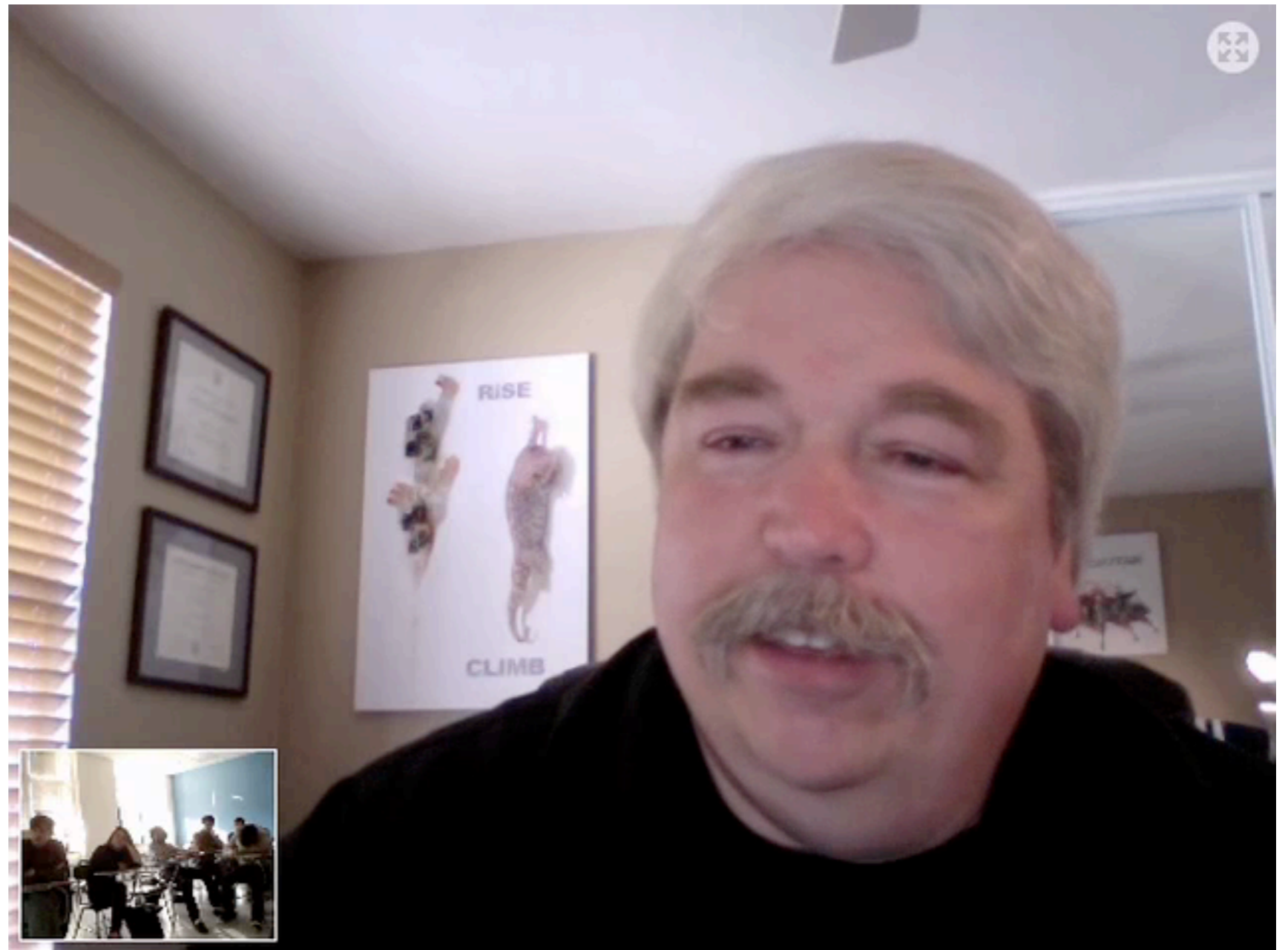
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- ▶ Prof. Robert Full, UC Berkeley



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