

ME 498 & IB 496: Special Topics-Bioinspired Design

Dr. Aimy Wissa (MechSE) and Dr. Marianne Alleyne (Entomology)

Course Overview:

ME 498/IB496 offers a unique **interdisciplinary advanced design experience** in the field of biomimetics and bioinspiration. During the course we will cover four main focus areas: locomotion, sensing, materials, and complex systems. For each topic, we will discuss the state of the art on engineering side and the solutions in nature that can augment the current engineering systems. We will also discuss engineering solutions that may better the current methods and approaches for observing and studying nature. By the end of the course you should be able to work in interdisciplinary teams to understand the following design concepts and apply them to bioinspired design:



- Participate in team-work that will value and rely on expertise of **both Biologists and Engineers.**
- Ideation and creative thinking methods
- Prototyping using different tools
- Learning and applying various methods for design synthesis
- Understanding the difference between critical function and critical experience prototypes
- Design, build, and test a prototype that either solves an engineering challenge using observation from nature or improves current nature study tools using innovative engineering technology.

Course Outline

Weeks 1	Bio-inspiration Background and Motivation
Weeks 2	The Design Process
Weeks 3	Brainstorming and creative thinking methods
Week 4	Problem-driven and solution-based Design
Week 5 and 6	Analogical Design Tools
Week 7 through 10	Areas of Interest Discussion (Discussion about the state of the art in sensing, locomotion, materials and complex systems)
Week 11	Critical function/experience prototype
Week 12	Bench Marking and Need Finding
Week 13-15	Final Project Design Reviews and Evaluations

BIOINSPIRED DESIGN **Spring 2017**

Mechanical Engineering 498
Integrative Biology 496

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Design Topics: Materials, Complex Systems, Locomotion, and Sensing
MWF (Time: TBD)
Learn more at: <http://bamlab.mechse.illinois.edu/teaching>