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Instructor:	Hunter King	Email:	hking@uakron.edu
Time:	M & W 8:45 – 10am	Place:	GDYR 217

Course Information

Course Description:
This course provides an introduction to the interdisciplinary study of biological systems through the lens of the physical sciences. It will demonstrate how discovery-driven research between biology and physics can lead to biomimetic insight, even without the directed intent of application-based biomimicry. The content is crudely broken into three modules: The optics module will provide a background in the physical nature of light and demonstrate how the basic principles of ray and wave optics are utilized by organisms for (visual and non-visual) perception as well as communication (eg. luminescence and structural color). The interfaces module will demonstrate how surface tension and van der Waals forces are manipulated for traction, underwater adhesion, and prey capture. The fnal module will introduce the concept of emergence: how complex, collective properties and behaviors derive from simple elements with simple interactions. We will explore how organisms utilize emergence in geometry and mechanics to achieve their goals: in swarm motion and construction; in metamaterial synthesis; in design of passive mechanisms in biological structures.

Prerequisites: None

Objective:

Topic outline:

Week	Topic
1	Introductions: applied physics and natural selection
	Manipulation of