

BSCI 1001.01 Human Health and Disease: Complex or Complicated?

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Guest Facilitators: Leonard Harris, PhD; David Wooten, MS; Christian Meyer; Darren Tyson, PhD; Carlos Lopez, PhD

R 2:35-3:55pm (ten weekly 75-min. sessions: 1/12-3/23)

Course Description

In this seminar students will be guided to explore the complexity of biology through alternate multiple lenses at once, with special emphasis on human health and disease. The course will focus on *concepts and intuitions* behind the different ways of thinking about complex biological systems. In the future of medicine, tomorrow's doctors and patients will need to understand these complexities to make informed decisions about their health and treatment.

Students will experience and directly participate in discerning multiple flavors and views of complexity through planned activities and facilitated discussion. The course will provide empirical knowledge of fundamental principles and analytical tools applicable to complex systems, and present innovative frameworks to overcome the challenges of quantifying the intrinsic complexity of life across multiple spatial and temporal scales. Several talks will specifically describe human health and disease in different contexts, with the goal of engaging students in fundamental challenges of finding "cures" for common diseases such as cancer and diabetes. At the end of the course, students will gain a first-hand understanding of multi-scale processes in biology and human health and acquire skills to apply critical, analytical, and systems-level thinking to complex problems. Finally, they will be able to appreciate whether the global, multidisciplinary approach of Systems Biology matches their personality.

Evaluation

- Contributions to discussion and attendance 20%
- Reflection papers—short writings in response to assigned readings 30%
- Final Project Presentation 25%
- Final Project Paper 25%