2020: Pharmacokinetics and physiologically based pharmacokinetics modeling and simulation: principle and applications [MATH891.00X]

**MATH 891.00X, GNET / BCB 891.00X**

**Time:** Jan 21 – April 3, Tue 3-5:10 pm  
**Location:** (TBD)  
**Instructors:** Yanguang (Carter) Cao, Greg Forest, and Anne Talkington (TA)

The primary objectives of this course include:

* Gain an understanding of the basic concept and principles of pharmacokinetics
* Learn about the basics of pharmacokinetics and pharmacodynamics analysis
* Learn about the foundations of physiologically based pharmacokinetic models
* Understand the process and rules of building a physiologically based pharmacokinetic model for a variety of therapeutic modalities (small molecules, protein drugs, and nanoparticles)
* Hands-on analysis of pharmacokinetics and physiologically based pharmacokinetics
* 2-3 assignments for analyzing real world patient pharmacokinetic data
* Grading: In-class participation and homework assignments

**1/21/20 – Lecture 1 (Cao)**

* Lecture: pharmacokinetic and pharmacodynamics: history, foundation, principles

**1/28/20 – Lecture 2 (Cao)**

* Lecture: Physiologically based pharmacokinetic model: concept and methodology
* Case study

**2/4/20 – Lecture 3 (Cao)**

* Lecture: Physiologically based pharmacokinetic model: concept and methodology: small molecules
* Homework review and in-class exercise

**2/11/20 – Lecture 4 (Cao)**

* Lecture: Physiologically based pharmacokinetic model: concept and methodology: protein drugs
* Homework review and in-class exercise

**2/18/20 – Lecture 5 (Cao and Talkington)**

* Lecture: Physiologically based pharmacokinetic model: concept and methodology: nanoparticles
* Homework review and in-class exercise

**2/25/20 – Lecture 6 (Cao)**

* Lecture: Minimal physiologically based pharmacokinetic models
* Homework review and in-class exercise

**3/3/20 – Lecture 7 (Cao)**

* Lecture: Allometry and human predictions
* Homework review and in-class exercise