Please note: Each college and department may have their own requirements, in addition to those stated in the Syllabus Guidelines.

BSC 6882 Integrated Mathematical Oncology 1

Course Prerequisites: N/A

CRN, Section 001, Credit Hours 3

College of Arts and Sciences, CMMB

COURSE SYLLABUS

Instructor Name:	Heiko Enderling, PhD	Semester/Term & Year:	Fall 2018
		Class Meeting Days:	Tue, Thurs
		Class Meeting Time:	2:00 – 3:30 pm
		Class Meeting Location:	SRB-4 Collaboratorium
		Lab Meeting Location:	N/A
		Delivery Method:	

I. Welcome!

II. University Course Description

This course is a broad introduction to phenomenological mathematical modeling of cancer biology specifically focused on and how tumors grow and respond to therapy, bridging multiple scales in space and time.

III. Course Purpose

The IMO1 Integrated Mathematical Oncology course is an advanced mathematical modeling course that teaches how to build phenomenological models for cancer biology. Topics will include cellular automaton models, agent based models, differential equations, partial differential equations, data visualization and data fitting. Biological topics include tissue homeostasis, cell cycle progression, cell transformation and oncogenesis, tumor viruses, extracellular environment and cell invasion. Students are expected to have completed basic courses in calculus and computer programming. Multiple faculty members teach this course jointly.

IV. Course Objectives

The primary objective of this course is to provide an understanding of how to choose the right modeling approach for a given biological problem. Students will gain an understanding of how to select the appropriate approach, how to develop the models, how to analyze model dynamics, and how to visualize model solutions. Students will supplement the lecture information and primary research paper reading by implementing appropriate model systems from the primary assigned text book.

V. Student Learning Outcomes

At the conclusion of the course, students will demonstrate the ability to build mathematical and computational models related to cancer biology across multiple spatial and temporal scales.