**Integrated Mathematical Oncology**

**Doctor of Philosophy (Ph.D.) Degree**

**DEGREE INFORMATION**

**Priority Admission Application Deadlines:**

**Fall:**

Domestic: December 15

International applicant deadlines:

<http://www.grad.usf.edu/majors>

**Minimum Total Hours:** 96

**Level:** Doctoral

**CIP Code:** 26.0911

**Dept. Code:** BIO

 **Major/College Codes:** CNB AS

**Approved:** 2001

**CONTACT INFORMATION**

**College:** Arts and Sciences

**Department:** Cell Biology, Microbiology, and Molecular Biology (CMMB)

**Contact Information:** [www.grad.usf.edu](http://www.grad.usf.edu/)

The Integrated Mathematical Oncology Major consists of focused training in mathematical modeling. Students will also receive interdisciplinary training in the broader field of cancer biology through coursework and immersion in the Moffitt Cancer Center’s research endeavors. Cancer patient and experimental data have been growing at an exponential rate during the last decade and now incorporates a range of biological scales (molecular, cellular, tissue, organ) and diverse techniques (gene expression, histological staining, imaging), however, these data are severely underutilized in current clinical decision processes. Appropriate quantitative models are essential to understand the complex dynamics of the evolving non-linear system that is cancer.

This Major will provide students a unique foundation of knowledge and practical experience in the rapidly advancing arena of mathematical oncology. Students will also train alongside individuals studying other areas of cancer biology, providing a broad base of understanding of cancer and increasing the potential for interdisciplinary research. Graduates of this major will be positioned to enter the technological workforce ready to discover and implement quantitative models and model analysis in experimental and clinical areas that will have a key impact on cancer patient therapy.

The Major is a joint endeavor between the Moffitt Cancer Center and the University of South Florida. Moffitt Cancer Center is located on the campus of the University of South Florida and is a leading institution of basic research, clinical research, and patient treatment with a focused mission “to contribute to the prevention and cure of cancer.” The Moffitt Cancer Center is officially designated as a Comprehensive Cancer Center by the National Cancer Institute of the National Institutes of Health.

**ADMISSION INFORMATION**

Must meet University Admission and English Proficiency requirements, as well as requirements for admission to the major, listed below.

Extensive background in field of mathematics, engineering, physics, or computer science

GRE required for full consideration

GPA of at least 3.00 or greater

Advanced coursework and research experience preferred

**CURRICULUM REQUIREMENTS**

All students are required to successfully complete the required Core Courses and the required Elective hours. Dissertation Committees may require students to take additional course work if needed to correct deficiencies. In special circumstances the Cancer Biology Education Committee can waive course requirements, if the student has recently completed identical coursework elsewhere. Students are required to achieve a minimum GPA of B in all Core courses and the required elective course, and maintain an overall GPA of 3.00 (B) in order to remain in good standing.

**Total Minimum Hours: 96 credit hours**

Required Core Courses – 12 hours

Other Required Courses – 9 hours

Electives – 3 hours

Additional Requirements – 14 hours

Dissertation - 24 hours

Other Requirements – 34 hours

**Required Core Courses 12 hours**

PCB 6230 Basics of Molecular Oncology 3

PCB 6932 Bioethics for Cancer Researchers 1

PCB 6930 Current Topics in Oncology 8

**Other Required Courses 9 hours**

BCS 6939 Selected Topics in Cancer Biology and the Immune System 2

BCS 6939 Selected Topics in IMO1 Basics of Mathematical Modeling for Cancer 3

BCS 6939 Selected Topics in IMO2 Data Driven Mathematical Oncology 4

**Electives 3 hours**

PCB 6521 Cancer Genetics 3

PCB 6205 Cancer Genomics and Drug Discovery 3

BCS 6939 Selected Topics in Cancer Drug Discovery 3

BCS 6939 Selected Topics in Cancer Immunotherapy 4

**Additional Requirements: 14 hours**

PCB 6910 Cancer Laboratory Rotations 1-3

BSC 7911 Directed Research 4-8

PCB 6931 Selected Topics in Advances in Tumor Immunology and Cancer Research 4-12

**Dissertation 24 hours**

BSC 7980 Dissertation

Prior to the dissertation defense, students must have an original first-author research report accepted for publication in a peer reviewed scientific journal**.**

**Other Requirements 34 hours**

Remaining credit hours required to meet the 96 hour minimum for graduation will consist of additional Dissertation hours (BSC7980), Selected Topics in Cancer (BCS6939), and/or Program approved electives.

**Qualifying Exam**

The required qualifying exam consists of a written research proposal and an oral defense of the proposal by the student.

**COURSES -**  See <http://www.ugs.usf.edu/course-inventory/>