SECTION 20

# MORSANI COLLEGE OF MEDICINE

## *Changes to Note*

The follow curricular changes for the Morsani College of Medicine were approved by the USF Graduate Council on the date noted.

**Programs**

| | | |
|---|---|---|
| Athletic Training MS | Change Admission Requirements | 1/12/15 |
| Medical Sciences MSMS | Change Program – IMS Concentration | 5/18/15 |
| Medical Sciences Ph.D. | Change Admission Deadlines, requirements | 2/2/15 |
| Rehabilitation Sciences Ph.D. | Change admission language for clarification | n/a |

**New Graduate Certificate**

| | |
|---|---|
| Scholarly Excellence, Leadership Experiences and Collaborative Training | 1/12/15 |

**Graduate Certificate Changes**

| | | |
|---|---|---|
| Medicine and Gender | Change Courses | 1/12/15 |

University of South Florida
Morsani College of Medicine
12901 Bruce B. Downs Blvd. MDC40
Tampa, FL 33612-4799

**Web address:** www.health.usf.edu/medicine/graduatestudies
**Email:** biomed@health.usf.edu
**Phone:** 813-974-4181
**Fax:** 813-974-4317

**College Dean**: Charles J. Lockwood, MD, MHCM
**Associate Dean:** Michael Barber, D. Phil
**Associate Dean:** W. Sandy Quillen, Ph.D.

**Accreditation:**
The Commission on Colleges of the Southern Association of College and Schools

**Mission Statement**:
The Morsani College of Medicine Graduate Faculty consist of scientists who conduct research in many fields of science basic to understanding disease processes and to the development of improved methods of diagnosis, treatment and prevention of disease. Students receive their research training in up-to-date methods of scientific investigation and gain experience in modern well-equipped laboratories. The faculty is dedicated to providing high quality education in an environment conducive to scholarly activity and scientific achievement.

Candidates for the Ph.D. in Medical Science enter into an interdisciplinary program enabling them to major in any one of the six concentrations that are offered. Collaboration among laboratory scientists of all disciplines is encouraged. The programs of study allow students to tailor their programs to individual needs and interests. Thanks to faculty research awards, students have a multitude of opportunities to participate in cutting-edge research projects. Medical Science Ph.D. graduates go on to become deeply involved in research sponsored by academic, industrial and government institutions

The master's degree in Medical Sciences (M.S.M.S.) can be completed in as little as one year and has been designed to assist students who are seeking admissions into doctoral programs (Ph.D. or M.D.). Successful graduates of the Medical Science master's program can improve their chances for admissions into professional programs by further developing their foundational knowledge of biomedical science. Currently, the Medical Sciences master's degree program boasts a ninety percent success rate for adequately preparing students for entry into doctoral or professional programs. Financial Aid - A limited number of assistantships, fellowships, and tuition waivers are available for doctoral students.

**Major Research Areas:**
Allergy, Immunology and Infectious Diseases Cancer Biology, Cardiovascular Research, Neuroscience Research

**Degrees, Programs, Concentrations:**

Master of Science (M.S.)
Athletic Training (ATR)

Master of Science in Bioinformatics and Computational Biology (M.S.B.C.B.)
Bioinformatics and Computational Biology (BCB)

Master of Science in Biotechnology (M.S.B.)
Biotechnology (MSB)

Master of Science in Health Informatics (M.S.H.I.)
- Health Informatics (HIF)

Master of Science in Medical Sciences (M.S.M.S.)
- Medical Sciences (MSG)
  - Aging and Neuroscience (ANS)
  - Athletic Training (ATL)
  - Anatomy (ANA)
  - Biochemistry and Molecular Biology (BMB)
  - Clinical and Translational Research (CTR)
  - Health Informatics (HIN)
  - Health Science (HSC)
  - Interdisciplinary Medical Sciences (IMS)
  - Medical Microbiology and Immunology (MDI)
  - Metabolic and Nutritional Medicine (MNM)
  - Molecular Medicine (MLM)
  - Women's Health (WSH)

Doctor of Philosophy (Ph.D.)
- Medical Sciences (MSG)
  - Allergy, Immunology and Infectious Disease (AII)
  - Anatomy (ANA)
  - Biochemistry and Molecular Biology (BMB)
  - Clinical and Translational Research (CTR)
  - Microbiology and Immunology (MMI)
  - Molecular Medicine (MLM)
  - Molecular Pharmacology and Physiology (MPY)
  - Neuroscience (NEU)
  - Pathology and Cell Biology (PCB)
  - Pathology and Laboratory Medicine (PLM)
  - Pharmacology and Therapeutics (PAT)
  - Physiology and Biophysics (PAB)
- **Rehabilitation Sciences (RHS) NEW**
  - Chronic Disease (CHD)
  - Neuromusculoskeletal Disability (NMD)
  - Veteran's Health/Reintegration (VHR)

Doctor of Medicine (M.D.)*
- Medicine

Doctor of Physical Therapy (D.P.T.)*
- Physical Therapy

**professional programs, offered through the Morsani College of Medicine – USF Medical School*

**Dual Programs:**

Biomedical Engineering (Ph.D.) and Medicine (M.D.) Dual Degree*
Biotechnology (MS) and Entrepreneurship in Applied Technologies (M.A.)
Medical Sciences (Ph.D.)/Medicine (M.D.) Combined Program
Physical Therapy (D.P.T.) and Public Health (M.P.H.)
**refer to the USF Medical School or the College of Engineering for information.*

**Graduate Certificates Offered:**

Aging and Neuroscience
Biochemistry & Molecular Biology
Bioinformatics
Biotechnology
Brain Fitness and Memory Management
Cardiovascular Engineering
Clinical Investigation
Health Informatics
Health Sciences
Integrative Health Coaching
Integrative Oncology
Integrative Weight Management
Medical Biochemistry, Microbiology and Immunology
Medicine and Gender
Metabolic Cardiology
Metabolic Endocrinology
Metabolic and Nutritional Medicine
Molecular Medicine
Pharmacy Sciences
Scholarly Excellence, Leadership Experiences and Collaborative Training

For the most up to date listing, see:
http://www.usf.edu/innovative-education/programs/graduate-certificates/

## COLLEGE REQUIREMENTS

Refer to College for information.

# *About the Catalog*

The University of South Florida Graduate Catalog is organized with the degree programs offered listed in the section of the College that offers them. For example, the Master of Science degree with a "program" (also known as major) in Biology is listed in the College of Arts and Sciences section. Some colleges offer areas of specialization, or "concentrations" within a degree program.

## PROGRAMS

**MEDICAL SCIENCES PROGRAM** ← **Green denotes Program (or Major)**

**Doctor of Philosophy (Ph.D.) Degree** ← **Black denotes degree**

**DEGREE INFORMATION**

## CONCENTRATIONS

Concentration Requirements are listed separately under each Program.

The Program and Concentration are listed on the official transcript. Other areas, such as application tracks, are not listed on the transcript.

Example:
**Doctor of Philosophy in Medical Sciences**
**with a Concentration in Anatomy**

# ATHLETIC TRAINING PROGRAM

## Master of Science (M.S.) Degree

## DEGREE INFORMATION

**Program Admission Deadlines:**
Domestic Students:

| | |
|---|---|
| Fall | No Admission |
| Spring | No Admission |
| Summer | February 15 |

International Students living outside the U.S.
Deadline for immigration documents, etc.:

| | |
|---|---|
| Fall | No Admission |
| Spring | No Admission |
| Summer | October 1 |

| | |
|---|---|
| **Minimum Total Hours:** | 60 |
| **Program Level:** | Master's |
| **CIP Code:** | 51.0913 |
| **Dept Code:** | OSM |
| **Program (Major/College):** | ATR/MD |
| **Concentrations** | None |

**CONTACT INFORMATION**

College: Medicine
Department: Orthopedics and Sports Medicine

Contact Information: www.grad.usf.edu

USF Athletic Training Admissions Office – Professional Program
Attn: Angela Moore
13220 USF Laurel Drive, MDF 5th Floor, MDC106,
Tampa, FL 33612

## PROGRAM INFORMATION

The Master of Science in Athletic Training (M.S. in A.T.) program is built around 60 credit hours of required coursework to satisfy the eligibility requirements for the students to sit for the National Athletic Trainers' Association Board of Certification examination.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools

**Major Research Areas:**
Athletic Training, Rehabilitation, Biomechanics, Prevention of Sudden Death in Athletics

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below

**Program Admission Requirements**

- A bachelor's degree from a regionally accredited university
- Minimum of 3.00 GPA or equivalent in undergraduate coursework
- Completion of GRE on record
- Meet the technical standards for admission or show potential for accomplished tasks
- Three (3) letters of Recommendation
- Personal statement in 1000 words or less describe primary career goals, what has most directly influenced your choice to become an Athletic Trainer, your attributes related to the field of Athletic Training and why you should be selected in the Athletic Training program.
- Interview (on campus preferred) with the Athletic Training faculty and staff

**Prerequisite Courses**

- Anatomy and Physiology (2 semesters)
- Medical Terminology
- Biomechanics/Kinesiology (Recommended)
- Nutrition
- Psychology
- Exercise Physiology
- Chemistry
- Physics
- Biology
- Statistics
- Biomechanics/Kinesiology (Recommended)
- Technical Writing (recommended)

## DEGREE PROGRAM REQUIREMENTS

**Total Minimum Hours:** **60 credit hours**

**Core Requirements**

| | | |
|---|---|---|
| ATR 5102C | Athletic Training Techniques | 3 |
| ATR 5125 | Anatomical Basis of Clinical Practice in Sports Medicine | 3 |
| ATR 5217C | Physical Examination I | 4 |
| ATR 5218C | Physical Examination II | 4 |
| ATR 5252C | Health and Wellness Promotion across the Lifespan III | 1 |
| ATR 5340C | Therapeutic Interventions I | 4 |
| ATR 5341C | Therapeutic Interventions II | 4 |
| ATR 5342C | Therapeutic Interventions III | 1 |
| ATR 5350C | Health and Wellness Promotion across the Lifespan I | 3 |
| ATR 5351C | Health and Wellness Promotion across the Lifespan II | 1 |
| ATR 5432 | Medical Conditions | 3 |
| ATR 5534 | Documentation in Athletic Training | 1 |
| ATR 5610 | Evidence Based Medicine in Athletic Training | 2 |
| ATR 5812 | Clinical Experience in Athletic Training I | 3 |
| ATR 5822 | Clinical Experience in Athletic Training II | 3 |
| ATR 6104 | Preventing Sudden Death in Sport I | 2 |
| ATR 6105 | Preventing Sudden Death in Sport II | 2 |
| ATR 6223 | Advanced Athletic Training | 3 |
| ATR 6517 | Professional Practice | 4 |
| ATR 6610 | Research in Athletic Training | 3 |
| ATR 6832 | Clinical Experience in Athletic Training III | 3 |
| ATR 6842 | Clinical Experience IV | 3 |

*Students are required to complete between 200-300 clinical hours per semester at various assigned clinical sites around the Tampa area. In accordance to accreditation standards, these clinical experiences must be tied directly to academic credit.

**Many students will take advantage of the summer between the 1st and 2nd years to obtain clinical internships in both local and out of town entities.

**Non-Thesis**
No thesis is required.

**Comprehensive Exam: Capstone requirement**
The degree will be a non-thesis option, but will require a capstone project for each student, that will be completed in his or her last semester during the Research in Athletic Training course. The capstone project will be in lieu of a comprehensive examination. The project could consist of items such as a comprehensive literature review, development of an injury

prevention program, systematic review, development of a policies and procedures manual, etc. The Athletic Training faculty will approve the contents of individual projects during the Research in Athletic Training course (ATR 6610).

**Other Information:**

Graduation Requirements - Students will complete all 60 hours of didactic coursework with a minimum GPA of 3.00. Students will complete at least 1000 hours of clinical education under an approved Preceptor.

Sequence:

| | |
|---|---|
| **Year 1** | **(40)** |
| **Summer** | |
| AT Techniques | 3 |
| Anat Basis of Clin Prac | 3 |
| Documentation in AT | 1 |
| **Fall** | |
| Physical Exam I | 4 |
| Therapeutic Inter I | 4 |
| Evidence Based Med | 2 |
| Health and Wellness I | 3 |
| Clinical Exp 1 | 3 |
| **Spring** | |
| Medical Conditions | 3 |
| Therapeutic Inter II | 4 |
| Health and Wellness II | 1 |
| Physical Exam II | 4 |
| Prev Sudden Death I | 2 |
| Clinical Exp II | 3 |
| **Year 2** | **(20)** |
| **Summer** | |
| Open time for clinical internships | |
| **Fall** | |
| Health and Wellness III | 1 |
| Prev Sudden Death II | 2 |
| Professional Practice | 4 |
| Therapeutic Inter III | 1 |
| Clinical Exp III | 3 |
| **Spring** | |
| Advanced AT | 3 |
| Research in AT | 3 |
| Clinical Exp IV | 3 |

**COURSES**

See http://www.ugs.usf.edu/course-inventory/

# BIOINFORMATICS AND COMPUTATIONAL BIOLOGY PROGRAM

## Master of Bioinformatics and Computational Biology (M.S.B.C.B.) Degree

## DEGREE INFORMATION

**Program Admission Deadlines:**

**Fall:**

| | |
|---|---|
| Domestic: | June 1 |
| International (outside US) | May 1 |
| International (inside US) | June 1 |

**Spring:**

| | |
|---|---|
| Domestic | October 15 |
| International (outside US) | September 15 |
| International (inside US) | October 15 |

**Summer:**

| | |
|---|---|
| Domestic | March 1 |
| International (outside US) | January 15 |
| International (inside US) | February 15 |

| | |
|---|---|
| **Minimum Total Hours:** | 36 |
| **Program Level:** | Masters |
| **CIP Code:** | 26.1103 |
| **Dept Code:** | MED |
| **Program (Major/College):** | BCB MD |
| **Approved:** | 2003 |

## CONTACT INFORMATION

| | |
|---|---|
| **College:** | Medicine |
| **Department:** | Molecular Medicine |
| **Contact Information:** | www.grad.usf.edu |

**Other Resources:**
http://gradaffairs.health.usf.edu/Bioinformatics.html

## PROGRAM INFORMATION

The Master's Program in Bioinformatics and Computational Biology at the University of South Florida represents a multi-college partnership and a truly interdisciplinary collaboration. Participating departments include the Departments of Biochemistry & Molecular Biology in the Morsani College of Medicine, Mathematics in the College of Arts and Sciences, Computer Sciences and Engineering and the Division of Biomedical Engineering in the College of Engineering, Epidemiology and Biostatistics in the College of Public Health and Information Systems and Decision Sciences in the College of Business Administration. The program is designed to meet the increasing demand for trained people in this emerging area, which crosses the traditional fields of biological, mathematical and computer sciences. The program, therefore, builds on and complements the current strengths of the university.

The goal of the Master's Program in Bioinformatics and Computational Biology is to provide students enrolled in the program with high quality training and education that will prepare them for careers in science, industry, health care and education. The curriculum has been designed accordingly and provides the theoretical background, the practical training and, with the internships, the "real life" experience, which will equip students with the essential tools for a successful career in the field of Bioinformatics and Computational Biology.

The Master's Program in Bioinformatics & Computational Biology is designed for 36 credit hours to be obtained during one to two years of study. Core courses will provide the foundation and basics before advanced work, including electives, and a Master's thesis or internship will be pursued. The curriculum is flexible and will be tailored to the individual student's background, interests and career goals. However, electives must be selected from at least two of the participating departments to assure breadth of training.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools.

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

**Program Admission Requirements**

- A bachelor's degree or equivalent from a regionally accredited university
- Minimum overall grade-point average of 3.00 out of a possible 4.00 with a minimum grade-point average of 3.00 in the sciences
- Graduate Record Examination*
- Completed pre-requisites in:
    - Calculus I-III
    - Linear algebra
    - Biostatistics
    - At least "C" and "Maple" or "Mathematica" or "MATH-CAD"
    - General biology (1 year)
    - Organic chemistry (1 year)

*The GRE may be waived in special circumstances where the applicant can demonstrate substantial bioinformatics experience. This experience includes (but is not limited to) 2-3 years of research experience in academic or industrial settings working on bioinformatics analysis of biological data, or software development (preferentially in biological or bioinformatics fields), or participation in research projects leading to published papers. The decision on the waiving of GRE will be at the Program Director's discretion.

## DEGREE PROGRAM REQUIREMENTS

**Total Minimum Program Hours: 36**

Core Requirements – 28
Electives – 8

**Prerequisites:**
Calculus I-III, linear algebra, biostatistics, at least "C" and "Maple" or "Mathematica" or "MATH-CAD", one year of general biology and one year of organic chemistry.

**CORE REQUIREMENTS**

| **Required courses:** | | **28** |
|---|---|---|
| GMS 7930 | Principles of Molecular Medicine Sec I & II | 4 |
| GMS 7930 | Python Programming | 3 |
| BCH 6886 | Fundamentals of Structural Bioinformatics | 4 |
| GMS 7930 | Applied Bioinformatics | 3 |
| BSC 6932 | Computational Biology | 3 |
| GMS 6901 | Research Ethics | 1 |
| PHC 6050 | Biostatistics I | |
| BSC 6942 | Bioinformatics Internship | 4 |
| MAT 4930/5932 | Combinatorics/Graph Theory | 3 |

Students who can demonstrate significant prior training in any required course can, at any time during their studies, with written approval of the Graduate Program Director, replace the course with a program elective course.

**ELECTIVES** 8
Students select from the lists below, or other course as approved by Graduate Program Director.

**SEQUENCE**
Required Courses:

**FALL**
GMS 7930 Basic Principles of Molecular Medicine Sec I & II 4cr
MAT 4930/5932 Combinatorics/Graph Theory 3 cr
GMS 6091 Research Ethics 1cr

**SPRING**
BCH 6886 Fundamentals of Structural Bioinformatics 4 cr
PHC 6050 Biostatistics I 3cr
BSC 6932 Computational Biology 3 cr

**SUMMER**
GMS 7930 Applied Bioinformatics 3 cr
GMS 7930 Python Programming 3 cr
BCH 6952 Bioinformatics Internship (all semesters) 4 cr – 6 cr

**Electives**

**Science/COM:**

| | | |
|---|---|---|
| BCH 6135 | Methods In Molecular Biology | 4 |
| GMS 6114 | Vaccines and Applied Immunology | 2 |
| GMS 6194 | Biotechnology Forum–R&D in Florida's Biotech Companies | 1 |
| GMS 6933 | Case Studies: Intellectual Property in Biotechnology | 2 |
| GMS 6141 | Basic Medical Microbiology/Immunology | 3 |
| CIS 6930 | Advanced Data Structures | 3 |
| MAT 6932 | Sel. Topics in Bioinformatics & Comp. Biology | 3 |
| GMS 7930 | Selected Topics | 3 |
| GMS 7939 | Graduate Seminar | 1 |
| GMS 6847 | Translational Biotechnology | 3 |
| GMS 7910 | Directed Research | 1-4 |
| GMS 6101 | Molecular and Cellular Immunology | 3 |
| BHC 6746 | Structural Biology | 3 |
| BCH 6227 | Molecular Basis of Disease | 4 |
| GMS 6103 | Found-Med Microbiology and Immunology | 4 |
| GMS 6107 | Advances in Virology | 2 |

**Management Information Systems/COBA:**

| | | |
|---|---|---|
| ISM 6124 | Advanced Systems Analysis and Design | 3 |
| ISM 6218 | Advanced Database Management | 3 |
| ISM 6225 | Distributed Information Systems | 3 |
| ISM 6930 | Data Warehousing and Data Mining | 3 |
| ISM 6930 | Information Technology in Medical Care | 3 |

**Computer Science and Engineering/Biomedical Engineering/CE:**

| | | |
|---|---|---|
| COT 6405 | Introduction to the Theory of Algorithms | 3 |
| CEN 6016 | Software Engineering | 3 |
| CAP 5625 | Introduction to Artificial Intelligence | 3 |
| CAP 6638 | Pattern Recognition | 3 |
| CAP 5400 | Digital Image Processing | 3 |
| ESB/CIS 6930 | Bioinformatics in Biomedical Engineering | 3 |

**Mathematics/CAS:**

| | | |
|---|---|---|
| STA 5326 | Mathematical Statistics | 3 |
| MAD 5305 | Graph Theory | 3 |

| | | |
|---|---|---|
| MAD 4504 | Theory of Computation | 3 |
| STA 5166 | Computational Statistics | 3 |
| MAT 6939 | Graduate Seminar | 2 |

**Epidemiology & Biostatistics/CPH:**

| | | |
|---|---|---|
| PHC 6051 | Biostatistics II | 3 |
| PHC 6053 | Categorical Data Analysis | 3 |
| PHC 6054 | Design of Experimental Studies for Health Researchers | 3 |
| PHC 6057 | Biostatistical Inference I | 3 |

**Comprehensive Exam**

As an alternative to a Master's Comprehensive Exam, Bioinformatics Master's students will have to complete a practical internship and theoretical assignment, which will both require the successful application of the knowledge they have acquired during their formal training. Required are:

- An internship with a written and an oral internship report and
- A review paper providing an overview of recent advancements in an area of bioinformatics of the student's choice.

**Thesis**

| | |
|---|---|
| Complete M.S. Thesis Project or Internship | 4-6 |

**Students must maintain an overall average of 3.00 ("B").**

## COURSES

See http://ugs.usf.edu/course-inventory

# BIOTECHNOLOGY PROGRAM

## Master of Science in Biotechnology (M.S.B.) Degree

## DEGREE INFORMATION

**Program Admission Deadlines:**

**Fall:**

| | |
|---|---|
| Domestic | June 1 |
| International (outside US) | March 1 |
| International (inside US) | June 1 |

**Spring:**

| | |
|---|---|
| Domestic | October 15 |
| International (outside US) | September 15 |
| International (inside US) | October 15 |

**Summer**

| | |
|---|---|
| Domestic | March 1 |
| International (outside US) | January 15 |
| Internation (inside US) | February 15 |

In select cases, late admission is possible.

| | |
|---|---|
| **Minimum Total Hours:** | 36 |
| **Program Level:** | Masters |
| **CIP Code:** | 26.1201 |
| **Dept Code:** | MED |
| **Program (Major/College):** | MSB MD |
| **Approved:** | 2007 |

## CONTACT INFORMATION

**College:** Medicine
**Department:** Molecular Medicine

**Contact Information:** www.grad.usf.edu
biotech@health.usf.edu

**Other Resources:**
**Website:**
http://gradaffairs.health.usf.edu/biotechnology.html

## PROGRAM INFORMATION

The USF Master's Program in Biotechnology represents a multi-college partnership and a truly interdisciplinary collaboration. Participating colleges include the Morsani College of Medicine, the College Of Engineering, the College Of Public Health, the College of Arts And Sciences and the College of Business Administration. The program is designed to meet the increasing demand for trained people in this exploding area, which crosses the traditional fields of biological, chemical, engineering, health and computer sciences. The curriculum has been designed accordingly and provides the theoretical background, the practical training and, with the internships, the "real life" experience, which will equip students with the essential tools for a successful career in the field of biotechnology. In 2008, the USF Biotechnology Master's Program was recognized by the Council of Graduate Schools as **Professional Science Master's Program**. Program graduates take jobs in the Biotechnology Industry or move on to a PhD Program, Medical School, Dental School, Veterinary School or Pharmacy School.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools.

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

### Program Admission Requirements

The USF Biotechnology Master's Program will be available for full -time and part-time enrollment. In order to be considered for admission to the Master's Program in Biotechnology, applicants must fulfill the following requirements:

**Administrative Pre-Requirements:**

- A bachelor's degree
- A minimum undergraduate GPA of 3.00 on a 4.00 scale
- A GRE test score
- Two letters of recommendation
- Statement of purpose, indicating how the program would suit the student's interests and serve his/her professional goals
- Complete transcripts of undergraduate work and any previous graduate work
- International students need an official transcript evaluation, see Office of Admissions
- A completed USF Application to Graduate Studies

**Program Pre Requirements:**
A good foundation in biochemistry, molecular biology and genetics, i.e. a bachelor's degree in either the biological or chemical sciences or at least one year of studies in those disciplines would be the optimal preparation for admission to the USF Master's Program in Biotechnology. However, the faculty of the USF Biotechnology Program is aware that not all applicants who are interested in pursuing this degree will have this formal background. Instead, some might have accumulated substantial knowledge in one of these disciplines during their work as laboratory technicians, engineering assistants or environmental or public health service providers. Those students would be ideally suited to start their graduate education with a Graduate Certificate in Biotechnology that is also offered by the Department of Molecular Medicine in the Morsani College of Medicine. http://www.usf.edu/innovative-education/programs/graduate-certificates/biotechnology.aspx

The Biotechnology Graduate Certificate Degree has less stringent entrance requirements a GRE is not required) but its successful completion will serve several purposes:

- it will provide the students with a certificate of advanced studies independent of prospective additional studies in the Biotechnology Master's Program,
- it will serve as a complete package of fulfilled pre requirements for admission into the Biotechnology Master's Program,
- 12 credit hours of the Biotechnology Certificate Program can be transferred into the Master's Program.

## DEGREE PROGRAM REQUIREMENTS

**Total Minimum Program Hours** **36 credit hours**

The Master's Program in Biotechnology is designed for 36 credit hours, which can be obtained in 3 semesters of study. The program will be available for full-time and part-time enrollment. Seven core courses will provide the foundation and basics before advanced work, including four electives and an internship, will be pursued. The curriculum is flexible and can be tailored to the individual student's background, interests and career goals.

The core courses include introductory courses in biochemistry, molecular and cellular biology, introduction to biotechnology, bioinformatics, biotechnology and bioethics, Translational Biotechnology and a seminar on current topics in biotechnology. Most of these courses are part of the current graduate curricula in the involved colleges. Student will have the option to choose four electives out of a total of 22 electives that are contributed by five participating colleges. The electives are organized in four different categories i.e. science, engineering, public health and business/law and the students will be free to select according to their interests and career plans.

Students must maintain an overall average of 3.00 ("B")

**CORE REQUIREMENTS**

| **Required Courses:** | | **31 hours** |
|---|---|---|
| GMS 7930 | Basic Principles in Molecular Medicine Sec I & II | 4cr |
| BCH 6135C | Methods in Molecular Biology | 4cr |
| BSC 6436 | Intro to Biotechnology | 3cr |
| EIN 6106 | Technology and Law | 3cr |

| | | |
|---|---|---|
| GMS 6847 | Translational Biotechnology | 3cr |
| BSC 6437 | Biotechnology and Bioethics | 3cr |
| BCH 6886 | Fundamentals of Structural Bioinformatics | 4cr |
| GMS 7930 | Biotech Forum | 1cr |
| GMS 6943 | Biotechnology Internship | 3cr |
| GMS 7930 | Python Programing | 3cr |

*Students who can demonstrate significant prior training in any required course, can at anytime during their studies, with written program approval, replace a course with an elective.*

**Electives:** **5 hours**
Students select from the lists below, or other course as approved by Graduate Program Director.

**SEQUENCE**
Required Courses:

| | | |
|---|---|---|
| **Fall Semester** | | **14** hours |
| GMS 7930 | Basic Principles in Molecular Medicine Set I & II | 4 |
| BSC6436 | Introduction to Biotechnology | 3 |
| BCH 6135C | Methods in Molecular Biology | 4 |
| EIN 6106 | Technology and Law | 3 |
| **Spring Semester** | | **11** hours |
| GMS 7930 | Biotech Forum | 1 |
| GMS 6847: | Translational Biotechnology | 3 |
| BSC 6437: | Biotechnology and Bioethics | 3 |
| BCH 6886 | Fundamentals of Structural Bioinformatics | 4 |
| **SUMMER** | | **6 hours** |
| GMS 7930 | Python Programming | 3 |
| GMS 6943 | Biotechnology Internship (all semesters) | 3 |

**Electives**

**Science:**

| | | |
|---|---|---|
| GMS 7930 | Stem Cells in Brain Repair | 3 |
| GMS 6513 | Principles of Pharmacology and Therapeutics | 3 |
| GMS 7930 | Aging and Neuroscience | 3 |
| GMS 6114 | Vaccines and Applied Immunology | 2 |
| GMS 7939 | Graduate Seminar | 1 |
| GMS 6141 | Basic Medical Microbiology/Immunology | 3 |
| GMS 6115 | Medical Parasitology and Mycology | 3 |
| GMS 6110 | Microbial Pathogenesis and Host parasite interactions | 3 |
| BCH 6746 | Structural Biology | 3 |
| GMS 6103 | Foundations in Med Microbiology & Immunology | 4 |
| GMS 7930 | Applied Bioinformatics | 3 |
| BCH 6627 | Molecular Basis of Disease | 4 |
| GMS 6101 | Molecular Cellular Immunology | 3 |
| GMS 6012 | Basic Medical Genetics | 3 |
| GMS 6107 | Advances in Virology | 2 |
| GMS 7930 | FDA Regulations | 2 |
| GMS 7910 | Directed Research | 1-4 |

**Engineering**:

| | | |
|---|---|---|
| BME 6107 | Biomaterials I: Material Properties | 3 |
| BME 6108 | Biomaterials II: Biocompatibility | 3 |
| BME 6634 | Biotransport Phenomena | 3 |

| | | |
|---|---|---|
| ECH 6417 | Bioseparations | 3 |
| ECH 5740 | Theory and Design of Bioprocesses | 3 |
| BME 5040 | Pharmaceutical Engineering | 2 |
| ENV 6667 | Environmental Biotechnology | 3 |

**Public Health:**

| | | |
|---|---|---|
| PHC 6310 | Environmental Occupational Toxicology | 3 |
| PHC 6050 | Biostatistics I | 3 |
| PCH 6051 | Biostatistics II | 3 |
| PHC 6000 | Epidemiology | 3 |
| PHC 6017 | Design and Conduct of Clinical Trials | 3 |

**Business/Law:**

| | | |
|---|---|---|
| EIN 6186 | Strategic Market Assessment for New Technologies | 3 |
| ENT 6016 | New Venture Formation | 3 |
| ENT 6116 | Business Plan Development | 3 |
| ENT 6415 | Fundamentals of Venture Capital and Private Equity in Entrepreneurship | 3 |
| GMS 6095 | Principles of Intellectual Property | 3 |
| GMS 6933 | Case Studies: Intellectual Property in Biotechnology | 2 |

**Project or Thesis/Dissertation:**
As an alternative to a Master's Comprehensive Exam, biotechnology Master's students will have to complete a practical internship and theoretical assignment which will both require the successful application of the knowledge they have acquired during their formal training. Required are:

- an internship with a written and an oral internship report and
- a review paper providing an overview of recent advancements in an area of biotechnology of the student's choice.

## COURSES

For more information on individual courses, please see http://ugs.usf.edu/course-inventory or contact the program directly: biotech@health.usf.edu

# BIOTECHNOLOGY AND ENTREPRENEURSHIP IN APPLIED TECHNOLOGIES DUAL DEGREE PROGRAM

## Master of Science in Biotechnology (M.S.B.) Degree and Master of Science in Entrepreneurship in Applied Technologies (M.S.)

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## DEGREE INFORMATION

**Program Admission Deadlines:**

**Fall:**

| | |
|---|---|
| Domestic | June 1 |
| International in country | January 2 |

**Spring:**

| | |
|---|---|
| Domestic | October 1 |
| International in-country | February 1 |
| International out of country | June 1 |

| | |
|---|---|
| **Minimum Total Hours:** | 57 |
| **Program Level:** | Masters |
| **CIP Code:** | 26.1201 |
| **Dept Code:** | MED |
| **Program (Major/College):** | MSB MD |

## CONTACT INFORMATION

| | |
|---|---|
| **Colleges:** | Business and Medicine |
| **Department:** | Center for Entrepreneurship and Molecular Medicine |
| **Contact Information:** | www.grad.usf.edu |

## PROGRAM INFORMATION

The Dual Degree Program in Biotechnology and Entrepreneurship is the combination of two existing programs that allows students to obtain two Master's degrees in a concurrent rather than sequential effort. The time commitment will be about three years with a total of 57 credit hours. The combination of a Master's in Biotechnology with a Master's in Entrepreneurship educates students to understand the scientific process and its challenges and at the same time provides the training that will enable them to facilitate the translation of scientific data from mind to market. This combination makes graduate students outstandingly versatile and thereby lays an essential step-stone for their future success.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools. The Biotechnology Program has also been recognized as a "Professional Science Master's Program" by the U.S. Council of Graduate Schools.

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

### Program Admission Requirements

Students will have to apply individually to each program. Admission to one program does not automatically grant admission to the other program. Once the student has been admitted to both programs, he/she seeks permission from the program directors of both programs for dual crediting of 9 credit hours; the USF Office of Graduate Studies provides a form sheet for this process. For admission students must have:

- A bachelor's degree with a minimum undergraduate GPA of 3.0 on a 4.0 scale
- A minimum GRE test score of at least 500 verbal and at least 600 quantitative, can be waived in some cases

## DEGREE PROGRAM REQUIREMENTS

A total of 57 credits is required for graduation with a Dual Master's in Biotechnology and Entrepreneurship. Beyond the dual crediting of 9 credit hours, all graduation requirements of the individual programs apply.

**Course Requirements:**

| | | |
|---|---|---|
| GMS 6200 | Biochemistry and Molecular and Cellular Biology | 5 |
| BSC 6436 | Intro to Biotechnology | 3 |
| BCH 6888 | Bioinformatics | 3 |
| GMS 6095 | Principles of Intellectual Property | 3 |
| GMS 6847 | Translational Biotechnology | 3 |
| BCH 6070 | Biotechnology and Bioethics | 3 |
| Elective from Biotechnology Program | | 3 |
| | | |
| GMS 7939 | Graduate Seminar | 1 |
| EIN 6106 | Technology and Law | 3 |
| GEB 6115 | New Venture Formation | 3 |
| GEB 6930 | Fund of Venture Cap Priv Equity | 3 |
| EIN 6930 | New Product Development | 3 |
| GMS 6943 | Biotechnology Internship (140 contact hrs minimum) | 3 |
| GEB 6930 | Strategies in Entrepreneurship | 3 |
| EIN 6430 | Overview of Regulated Industries | 3 |
| GEB 6930 | Strategies in Market Assessment | 3 |
| GEB 645 | Social, Ethical, Legal Systems | 3 |
| GEB 6116 | Business Plan Development | 3 |
| GEB 6930 | Adv Topics in Entrepreneurship/Internship | 3 |
| GEM 7930 | Biomedical Ethics | 3 |
| GMS 6141 | Basic Medical Microbiology/Immunology | 3 |
| GMS 6115 | Medical Parasitology and Mycology | 3 |
| GMS 6110 | Microbial Pathogenesis and Host Parasite Interaction | 3 |

## COURSES

See http://ugs.usf.edu/course-inventory
For more information on individual courses, please see http://ugs.usf.edu/course-inventory or contact the program directly: biotech@health.usf.edu

# HEALTH INFORMATICS

## Master of Science in Health Informatics (M.S.H.I.) Degree

## DEGREE INFORMATION

**Program Admission Deadlines:**

| | |
|---|---|
| **Fall:** | February 15 |
| **Spring:** | October 15 |
| **Summer:** | February 15 |

| | |
|---|---|
| **Minimum Total Hours:** | 32 |
| **Program Level:** | Masters |
| **CIP Code:** | 51.2706 |
| **Dept Code:** | MED |
| **Program (Major/College):** | **HIF/**MD |
| **Approved:** | 2013 |

## CONTACT INFORMATION

| | |
|---|---|
| **College:** | Medicine |
| **Contact Information:** | www.grad.usf.edu |

## PROGRAM INFORMATION

The Master of Science in Health Informatics degree offers a curriculum which integrates the domains of information science, information resources management and health care organization and management.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools.

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

### Program Admission Requirements

- $65 non-refundable application fee
  The breakdown of this fee is as follows:
  - $30.00 USF's Application Fee
  - $35.00 Transcript Procurement Fee

- A bachelor's degree from a regionally accredited university in the biological, chemical, computer or management information sciences or other appropriate field, or the equivalent bachelors and/or graduate degrees from a foreign institution.
- Minimum overall grade-point average of 3.00 out of a possible 4.00 with a minimum grade point average of 3.00 in the sciences
- Transcripts from all colleges and universities attended
- Resume
- Two Letters of Recommendation
- While these are not required, GRE, MCAT or VAT standardized test scores or evidence of substantial health informatics experience can be submitted to enhance an application.
- An example is if a student has a GPA below 3.0 and wishes to prove he will be a positive addition to the school.

Note: F-1 student visa regulations allow students to enroll in only one 3-credit hour online/distance learning course per the official full-time equivalent for the degree level of study. Therefore, the F-1 visa is not appropriate for any degree program that is offered completing via distance learning or online courses. International students may pursue an online program from outside the US, n which case an I-20 is not required.

Applicants who do not require a visa who are from countries where English is not the official language must demonstrate proficiency in English* in one of the following ways

- By providing scores of 79 or higher on the Test of English as a Foreign Language (TOEFL iBT)
- By providing a score of 6.5 or higher on the International English Language Testing System (IELTS)
- By earning a score of 500 (or equivalent) on the GRE Verbal Exam
- By earning a baccalaureate or higher degree at a regionally accredited institution in the U.S.
- By earning a degree at a foreign institution where English is the language of instruction (must be documented on the transcript)

**Proof of Residency**

a. Applicants who are not U.S. citizens, but are residing in the U.S., must provide a copy of a U.S. Visa or permanent resident card.
   i. The following VISA types **are not eligible** to take classes in these programs:
      - F-1
      - F-2
      - B-1/B-2
      - C (transit visa only)
      - D
      - J-1 student
      - M-1
      - M-2
      - The other categories could be admitted - subject to review of ability to engage in study while in the US.
   ii. USF cannot issue an I-20 for a student visa to pursue this degree program. International applicants who do not require a visa and whose current visa status allows study can apply as well as students who intend to take the entire degree from outside the US. Please note the visa waiver program and the B1/B2 visa do not allow study in this type of program.

b. Applicants who were born outside of the U.S. but are now U.S. citizens are required to submit proof of citizenship (naturalization paperwork or a copy of a passport).

All foreign transcripts that are not in English must be accompanied by a certified English translation and a course-by-course credential evaluation from any National Association of Credential Evaluators, Inc (NACES) or the Association of International credential Evaluators, Inc. (AICE) approved agency certifying equivalency to the U.S. degree. Documents signed by a notary or other public official with no educational affiliation will not be accepted.

## DEGREE PROGRAM REQUIREMENTS

Total Minimum Program Hours — 32 credit hours

| **CORE REQUIREMENTS** | | | **26 hours** |
|---|---|---|---|
| HIM 6667 | Foundation in Management Information Systems | 3 | |
| HIM 6118 | Introduction to Health Informatics | 3 | |
| HIM 6350 | E-Medicine Business Models | 3 | |
| HIM 6114 | Integrated Electronic Medical Records | 3 | |
| HIM 6320 | Managerial Communications | 3 | |
| HIM 6017 | Legal Aspects of Health Information Systems | 3 | |
| HIM 6840 | Case Studies in Health Information Management | 3 | |
| ISM 6930 | Selected Topics: Health Data Management | 3 | |
| HIM 6018 | e-Healthcare Ethics | 2 | |

| **Electives** | | | **6 hours** |
|---|---|---|---|
| Two or more required: | | | |
| HIM 6137 | Pharmacy Informatics | 3 | |
| HIM 6943 | Health Informatics Internship | 3 | |
| HIM 6908 | Health Informatics Independent Study | 3 | |
| MHS 6645 | Mental Health Informatics | 3 | |

| | | |
|---|---|---|
| PHC 6934 | Selected Topics in Public Health: Medical Terminology | 3 |
| ISM 6930 | Selected Topics in MIS: Health Systems Analysis & Design | 3 |
| ISM 6930 | Selected Topics in MIS: Health Data Mining | 3 |
| PHC 6050 | Biostatistics I | 3 |
| BCH 6888 | Bioinformatics | 3 |

**Internship Project**
For students who select the Internship option, each student will be assigned a faculty director who will oversee the internship project. Students will formally present their projects which will be shared with all program participants.

A minimum of thirty-two (32) semester hours are required and entail a minimum of 480 contact hours

## COURSES

See http://ugs.usf.edu/course-inventory

# MEDICAL SCIENCES PROGRAM

## Master of Science in Medical Sciences (M.S.M.S.) Degree

## DEGREE INFORMATION

**Program Admission Deadlines:**
**Fall:** June 1

**Minimum Total Hours:** 30
**Program Level:** Masters
**CIP Code:** 26.9999
**Dept Code:** MED
**Program (Major/College):** MSG MD
**Approved:** 1983

**Concentrations:**
Aging and Neuroscience (ANS)
Anatomy (ANA)
Athletic Training (ATL)
Biochemistry and Molecular Biology (BMB)*
Clinical and Translational Research (CTR)
Health Science (HSC)
Health Informatics (HIN)
Interdisciplinary Medical Sciences (IMS)
Medical Microbiology and Immunology
Metabolic and Nutritional Medicine
Molecular Medicine (MLM)
Women's Health (WSH)
*closed for admissions; not accepting applications

## CONTACT INFORMATION

**College:** Medicine
**Department:** Medical Sciences

**Contact Information:** www.grad.usf.edu
**Website:**
http://health.usf.edu/medicine/graduatestudies/index.htm

## PROGRAM INFORMATION

The program is designed to provide students with advanced training in either Anatomy, Biochemistry, Medical Microbiology, or Pharmacology. Students successfully completing the program will have a foundation that will prepare them for a professional degree in biomedical science such as a M.D. or Ph.D. or qualify them to work as teachers or research assistants in academia or in the private sector. The program will provide a solid core of training in the latest findings, concepts, and experimental techniques. Students will be allowed to individualize their training through elective courses and will have the opportunity to conduct laboratory research. The program is intended for students who wish training beyond a baccalaureate degree but do not wish to commit to a Ph.D. program or do not meet the qualifications required for admissions into a M.D. or Ph.D. program.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools.

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

**Program Admission Requirements**

- A bachelor's degree or equivalent from a regionally accredited university
- Minimum overall grade-point average of 3.0 out of a possible 4.0 with a minimum grade-point average of 3.0 in the sciences*
- GRE or MCAT

- Completed pre-requisites in:
  - General biology (1 year)
  - General chemistry (1 year)
  - General physics (1 year)
  - Organic chemistry (1 year)
  - Quantitative analysis (1 course)
  - Mathematics including integral and differential calculus

**APPLICATION PROCEDURES**
Please refer to http://health.usf.edu/medicine/graduatestudies/mscus/apply_domestic.htm?wbc_purpose=Basic

## DEGREE PROGRAM REQUIREMENTS

Degree requirements are individualized according to the educational and research interests and goals.

**Total Minimum hours** **30**

### Core Requirements

**Core Course:** (2 hours minimum)

| | | |
|---|---|---|
| GMS 6871 | Health Sciences Ethics | 2 |

**Pre-Professional Track:** (30 hours minimum in addition to core requirement)

Students are required to complete the following, chosen in consultation with Program Advisor.

| | | |
|---|---|---|
| GMS 6605 | Basic Medical Anatomy | 3 |
| GMS 6630 | Basic Medical Histology | 3 |
| GMS 6201 | Basic Medical Biochemistry | 3 |
| GMS 6706 | Basic Medical Neuroscience | 3 |
| GMS 6012 | Basic Medical Genetics | 3 |
| GMS 6141 | Basic Medical Immunology & Microbiology | 3 |
| GMS 6433 | Clinical Correlations in Molecular Medicine | 3 |
| GMS 6440 | Basic Medical Physiology | 3 |
| GMS 6111 | Basic Medical Pathology | 3 |
| GMS 6505 | Basic Medical Pharmacology | 3 |

**Electives Course**

| | | |
|---|---|---|
| GMS 6000 | Medical Sciences Success Skills | 1-3 |

**Concentration Options:**
Students who prefer to take a Concentration instead of the Pre-Professional Track may choose from the following concentrations. Requirements for each are listed on the following pages:

Aging and Neuroscience (ANS)
Anatomy (ANA)
Athletic Training (ATL)
Clinical and Translational Research (CTR)
Health Informatics (HIN)
Health Science (HSC)
Interdisciplinary Medical Sciences (IMS)
Metabolic and Nutritional Medicine
Molecular Medicine (MLM)
Women's Health (WSH)

# CONCENTRATIONS

## AGING AND NEUROSCIENCE (ANS)

Neuroscience is one the fastest growing fields of biomedical sciences. There is an increasing demand for health care professionals and research scientists to meet the needs of the increasing number of the aging population affected with neurodegenerative diseases such as Alzheimer's disease. The Aging and Neuroscience concentration within the master's program in Medical Sciences has been developed in collaboration with the School of Aging Studies to integrate neuroscience as well as biomedical aging in one-year curriculum. The program is targeted for students interested in pursuing a medical, professional degree or further graduate education in biomedical sciences and in aging studies. The core curriculum focuses on basic and applied neuroscience, with emphasis on neurodegenerative diseases. Classes on research methods, stem cell biology, neuropharmacology and other basic biomedical sciences, as well as several classes offered by the school of Aging Studies are offered as electives. The students can elect to engage in a research component where they will be supervised by mentors from the USF research faculty or affiliated institutes. Program graduates can pursue further professional training in medicine and allied health sciences, continue their graduate education in neuroscience or aging studies, or work in the diverse health care fields, especially those catered to the aging population.

**Concentration Core Requirement:**

| | | |
|---|---|---|
| GMS6020 | Neuroscience (Interdisciplinary) | 4-6 |

**Required Courses:**

| | | |
|---|---|---|
| GMS7930 | Aging and Neuroscience (Neurosurgery) | 3 |
| GMS7930 | Neuroscience Seminar Series (Neurosurgery) | 1 |
| GEY 6613 | Physical Change and Aging (Aging Studies) | 3 |
| GMS7910 | Aging and Neuroscience Directed Research (neurosurgery) | 3-12 |

All students are required to have a minimum of 20 hours of didactic lectures, and a minimum of 6 hours of directed research. Only students who opt for a research paper must and can accumulate a minimum of 15 hours of directed research and laboratory rotations in their mentor/mentors' laboratories.

**Electives**

A minimum of 10 credit hours must be fulfilled by COM elective courses.

**Morsani College of Medicine Courses**

| | | |
|---|---|---|
| GMS6091 | Ethics and Skills in Research (Interdisciplinary) | 2 |
| GMS6404 | Systems Neurophysiology (Physiology) | 4 |
| GMS6602 | Neural Correlates of Behavior (Pathology and Cell Biology) | 3 |
| GMS6610 | Advanced Neuroanatomy (Pathology and Cell Biology) | 4 |
| GMS6200 | Biochemistry, Molecular & Cellular Biology (Molecular Medicine) | 5 |
| GMS7930 | Aging/Neuroscience Lab Rotations (Neurosurgery) | 3 |
| GMS6735 | Neuropharmacology (Pharmacology) | 3 |
| GMS7930 | Stem Cells in Brain Repair (Neurosurgery) | 3 |
| GMS7930 | Spec Topics in Alzheimer's Disease (Neurosurgery) | 1 |
| NUR6931 | Psychoneuroimmunology (Nursing) | 3 |
| PCH6050 | Biostatistics (Public Health) | 3 |

**School of Aging Elective Courses**

| | | |
|---|---|---|
| GEY6600 | Human Development | 3 |
| GEY5620 | Sociological Aspects of Aging | 3 |
| GEY6450 | Gerontological Research and Planning | 3 |
| GEY6614 | Psychopathology and Aging I | 3 |
| GEY6934 | Alzheimer's Diseases Management | 3 |
| GEY6616 | Mental Health assessment in Older Adults | 3 |

Graduate students must maintain an overall average of 3.0 (B) in all courses.

## ANATOMY

**Total Minimum Hours** 31

**Concentration Core Requirements:**

| | | |
|---|---|---|
| GMS6610 | Advanced Neuroanatomy | 4 |
| GMS6604 | Human Embryology | 3 |
| GMS6608 | Advanced Microscopic Anatomy | 4 |
| GMS6609 | Advanced Gross Anatomy | 6 |

**Required Courses**:

| | | |
|---|---|---|
| GMS6001 | Foundations in Biomedical Science | 6 |

**Electives** (8 credit hours):

| | | |
|---|---|---|
| GMS6091 | Responsible Conduct in Research | 1 |
| GMS6210 | Basic Medical Biochemistry (on-line course) | 3 |
| GMS6334 | Pathobiology of Human Cancer | 3 |
| GMS6601 | Methods in Microscopy | 3 |
| GMS6870 | Medical Ethics and Humanities | 3 |
| GMS 6671 | A Brief History of Anatomy and Pathology | |
| GMS7910 | Directed Research | 1-2 |
| GMS | Directed Research | 1-5 |
| GMS7910 | Directed Research | 2 |
| GMS7930 | History of Pathology and Cell Biology | 2 |
| GMS7930 | Theory of Cell Culture | 3 |
| PHC6050 | Biostatistics (on-line course) | 3 |

## ATHLETIC TRAINING (ATL) – 28 hours minimum

**Concentration Core Requirements:** **3 hours**

| | | |
|---|---|---|
| ATR 6236 | Pediatric Sports Medicine | 3 |

**Concentration Requirements** **30 hours:**

| | | |
|---|---|---|
| ATR 5605 | Youth Injury Epidemiology | 3 |
| ATR 5515 | Administration of Injury Prevention Programs | 3 |
| ATR 5508 | Contemporary Issues in Athletic Training | 3 |
| ATR 5319 | Rehabilitation Considerations for Children | 3 |
| ATR 6615 | Evidence Based Research & Writing | 3 |
| ATR 6920 | Athletic Training Professional Colloquium *(Includes 5 days on campus in Tampa)* | 3 |
| ATR 6446 | Medical Conditions of Adolescents | 3 |
| ATR 6516 | Ethical and Legal Issues in Healthcare | 1 |
| ATR 6617 | Capstone Project I | 3 |
| ATR 6618 | Capstone Project II | 3 |

## BIOCHEMISTRY AND MOLECULAR BIOLOGY

Contact program for information - **Closed for admissions; not accepting applications**

## CLINICAL AND TRANSLATIONAL RESEARCH (CTR)

**Admission Criteria**

This is a one-and-a-half to two-year program of both didactic coursework and mentored research. Admission criteria will be to the Scholars in Patient-Oriented Research (SPOR) Program and include the following:

- Must have a doctoral or first professional degree (M.D., D.O., Ph.D., D.D.S., Pharm.D., Dr.P.T., Doctorate of Nursing Practice, Ph.D. in Nursing, or equivalent degrees)
- GRE score will be waived and replaced by a requirement for documentation of a professional doctorate degree.
- NIH eligibility for the SPOR Program requires U.S. citizenship or status as a non-citizen national or lawfully admitted permanent resident of the U.S.
- Applicants will be required to complete a 2-step application process.
  - For Step 1 to enter the SPOR Program there is an online application.
  - Upon acceptance into the SPOR Program, Step 2 of the application process will consist of completing the standard application procedures to become a graduate degree-seeking student in the Master of Science in Medical Sciences degree program.

**Concentration Degree Requirements**

Minimum of 32 hours of credit, (23 hours core coursework, 6 hours directed research, and remaining 3 required hours in any combination of directed research and/or elective courses, as needed for each SPOR scholar's particular research focus. In addition, each SPOR scholar will be required to submit a first author manuscript based on his/her research project (not a review article) to a peer-reviewed journal, and that manuscript must be judged by an appointed sub-panel of the SPOR Program Executive Committee and Key Faculty to be potentially acceptable for publication. This latter requirement is in lieu of a thesis requirement.

| **Coursework:** | | | **23 hours** |
|---|---|---|---|
| GMS6875 | Ethical & Regulatory Aspects of Clinical Research | 2 | |
| GMS6840 | Cultural Influences & Diversity Issues in Clinical Research | 2 | |
| GMS6844 | Special Topics: Principles of Patient-Oriented Research | 1 | |
| PHC6050 | Biostatistics I | 3 | |
| PHC6000 | Epidemiology | 3 | |
| GMS6841 | Fundamentals of Translational and Team Research | 1 | |
| GMS6843 | Scientific Communication | 2 | |
| BCH6627 | Metabolic and Genetic Basis of Disease | 3 | |
| | or another Basic Science course for 3 credits with approval | | |
| GMS6905 | Grantsmanship I | 1 | |
| GMS6906 | Grantsmanship II | 1 | |
| PHC6020 | Design and Conduct of Clinical Trials | 3 | |
| GMS6921 | Colloquium on Building a Successful Academic Patient-Oriented Research Career | 1 | |
| Mentored Clinical and Translational Research/Directed Research | | 6 | |
| Electives/Mentored Clinical and Translational Research/Directed Research | | 3 | |

## HEALTH INFORMATICS (HIN)

**Concentration Core Requirements:**

| | | |
|---|---|---|
| GMS 7930 | Health Sciences Ethics | 2 |

**Required Courses:** (24 credits)

| | | |
|---|---|---|
| HIM 6XXX | Foundation in Management Information Systems | 3 |
| HIM 6118 | Introduction to Health Informatics | 3 |
| HIM 6350 | E-Medicine Business Models | 3 |
| HIM 6114 | Integrated Electronic Medical Records | 3 |
| HIM 6320 | Managerial Communications | 3 |
| HIM 6012 | Legal Aspects of Health Information Systems | 3 |
| HIM 6XXX | Case Studies in Health Information Management | 3 |

| | | |
|---|---|---|
| ISM 6127 | Decision Support Systems Analysis & Design | 3 |

**Electives:** (2 or more required, can be taken in any semester offered)

| | | |
|---|---|---|
| HIM 6XXX | Pharmacy Informatics | 3 |
| HIM 6XXX | Health Informatics Internship | 3 |
| GMS 6908 | Medical Sciences Independent Study | 3 |
| MHS 6645 | Mental Health Informatics | 3 |
| PHC 6934 | Medical Terminology | 3 |
| ISM 6123 | Systems Analysis & Design | 3 |
| ISM 7120 | Information Requirements Management | 3 |
| PHC 6050 | Biostatistics | 3 |
| BCH 6888 | Bioinformatics | 3 |

## HEALTH SCIENCE (HSC)

**100% ONLINE**. Health sciences, the study and research of the human body and health-related issues, are critical to our understanding of how humans function. The knowledge gained from these studies is vital to today's mission of improving health and preventing and curing diseases. In the new millennium, in which science truly complements the art of medicine, advances in the health sciences contribute to our understanding of the structure and function of molecules key to normal body function and the pathogenesis of disease and to design new approaches for diagnosis, treatment and prevention. Recent changes in research and scholarship in the biomedical sciences has directed attention to the development and training of students who are able cross the barriers of traditional disciplines and embrace the concepts of interdisciplinary approaches to biomedical problems. The Health Sciences concentration, within the Master's Program in Medical Sciences, has been developed to provide a new interdisciplinary and concentrated program of study that is designed for students interested in either future doctoral professional programs in the biomedical sciences. The program integrates an array of disciplines, including anatomy, biochemistry, histology, physiology, genetics, microbiology, immunology, pathology, pharmacology and ethics to provide a solid medically-relevant foundation. The rigorous program allows students to demonstrate their full academic ability for future graduate programs or medical school. The interdisciplinary program promotes the broad intellectual focus required of future graduate or professional students in the biomedical sciences or health-care related fields. The courses integrate modern distance teaching methods and are designed to improve their academic skills that are critical to their future professional development.

**Curriculum**

**Course Requirements**: 32 hours

| | | |
|---|---|---|
| GMS6605 | Basic Medical Anatomy | 3 |
| GMS6630 | Basic Medical Histology | 3 |
| GMS6201 | Basic Medical Biochemistry | 3 |
| GMS6706 | Basic Medical Neuroscience | 3 |
| GMS6012 | Basic Medical Genetics | 3 |
| GMS6141 | Basic Medical Immunology & Microbiology | 3 |
| MCB6433 | Clinical Correlations in Molecular Medicine | 3 |
| GMS6871 | Health Sciences Ethics | 2 |
| GMS6440 | Basic Medical Physiology | 3 |
| GMS6111 | Basic Human Medical Pathology | 3 |
| GMS6505 | Basic Medical Pharmacology | 3 |

## INTERDISCIPLINARY MEDICAL SCIENCES (IMS)

This concentration within the Master's degree in Medical Sciences program is designed to provide qualified students with advanced training in the sciences basic to the practice of medicine. Students successfully completing the program will have a foundation that fosters opportunities in the private sector, teaching, or the pursuit of further advanced degrees. A goal of this concentration is to provide promising medical school applicants an opportunity to develop the knowledge, skills, and attitudes that would enable them to have a career in the medical sciences. Students who perform well during this program could be considered for admission to medical, graduate, or other health professions programs. This concentration provides an opportunity for students interested in graduate work that has a broad medical base. Students will take courses that will provide the same level of depth, breadth and intensity as those taken by a first year medical student. This will allow successful participants to demonstrate their readiness for the rigors of a medical school curriculum. Alternatively, appropriate selection of elective courses will allow any student who completes the program to tailor their educational experience to best suit their future plans and aspirations.

**Admission Information:**
Applicants must hold a Bachelor's degree from an accredited institution at the time of entrance into the program. They must have completed at least 1 year each of General Chemistry, Organic Chemistry, General Biology and General Physics and have achieved a total score of at least 22 on the MCAT. Applicants who are deficient in one or more of these requirements, but otherwise meet the College-wide requirements for admission to the Master's Program may be considered on a case by case basis.

Total Minimum Hours for the MSMS with a concentration in IMS: 32 hours

| **Program Core Courses** | | | **2 hours** |
|---|---|---|---|
| GMS 6871 | Health Sciences Ethics | 2 credits | |

| **Required Concentration Courses:** | | | **30 hours** |
|---|---|---|---|
| GMS 6418 | Musculoskeletal System | 4credits | |
| GMS 6054 | Cancer Biology | 3 credits | |
| GMS 6004 | Introduction to Medical Sciences | 5credits | |
| GMS6707 | Medical Neuroscience | 6 credits | |
| GMS6411 | Cardiovascular and Pulmonary Systems | 6 credits | |
| GMS6419 | Excretory, Endocrine and Reproductive Systems | 6 credits | |

**Elective Courses**
Students may select elective courses with the approval of the Program Director).

| | | |
|---|---|---|
| GMS 6110 | Microbial Pathogenesis and Host Parasite Interactions | 3 credits |
| GMS 6115 | Medical Parasitology and Mycology | 3 credits |
| GMS6141 | Basic Medical Microbiology and Immunology | 3 credits |
| GMS7930 | Selected Topics | 1-3 credits |
| GMS6908 | Medical Sciences Independent Study | 1-3 credits |

Total minimum hours: 32

## MEDICAL MICROBIOLOGY AND IMMUNOLOGY

| **Core Course** | | **5** |
|---|---|---|
| GMS6200C | Biochemistry, Cell & Molecular Biology | 5 |

| **Required Courses** | | **17** |
|---|---|---|
| GMS6100C | Medical Microbiology | 3 |
| GMS7930 | Medical Parasitology and Mycology | 2 |
| GMS6101 | Molecular and Cell Immunology | 3 |
| GMS6107 | Adv in Virology | 2 |
| GMS6110 | Microbial Pathogenesis and Host-parasite Interactions | 3 |
| BCH6411 | Biomedical Genomics and Genetics | 4 |

**Electives** **11**

Select one course of the following (2 hrs minimum)

| | | |
|---|---|---|
| BCH6935 | Grant Writing and Scientific Communication | 2 |
| BSC6436 | Intro to Biotech | 3 |
| GMS6876 | Current Topics in Molecular Medicine | 1 |

Select one or more from the following (9 hrs minimum):

| | | |
|---|---|---|
| GMS7910 | Directed Research | 3-9 |
| GMS6114 | Vaccines and Applied Immunology | 2 |
| BCH6135C | Methods in Molecular Biology | 4 |
| BCH6420 | Clinical Correlations in Molecular Medicine | 3 |

Total minimum hours: 32

## METABOLIC AND NUTRITIONAL MEDICINE

**Total Minimum Hours** 32

**Program Core Courses (2 hours)**

| | | |
|---|---|---|
| GMS 6871 | Health Sciences Ethics | 2 |

**Required Courses**:

| | | |
|---|---|---|
| GMS6455 | Clinical Intensives in Metabolic and Nutritional Medicine | 3 |
| GMS6441 | Clinical Approach to Endocrinology | 3 |
| GMS6543 | Diabetes and Coronary Heart Disease | 3 |
| GMS6751 | Integrated Clinical Neurobiology | 3 |
| GMS6451 | Nutrition and Metabolism | 3 |
| GMS6454 | Functional Medicine and Infectious Disease | 3 |
| GMS6752 | Autoimmune Diseases and Cognitive Function | 3 |
| GMS6340 | Laboratory Fundamentals and Adjunct Cancer Therapies | 3 |

**Electives**:

| | | |
|---|---|---|
| GMS 6240 | Metabolic Approaches to Pediatrics | 3 |
| GMS 6550 | Introduction to IV Therapies | 3 |
| GMS 6310 | Toxic Metal and Functional Toxicology | 3 |
| GMS 6770 | A Metabolic Approach to Pain Management | 3 |
| GMS6753 | The Basics of Brain Fitness and Memory Management | 3 |
| GMS 6331 | Stem Cell Biology | 3 |
| GMS 6XXX | Integrated Bariatrics | 3 |
| GMS 7930 | Selected Topics | 3 |
| GMS 6908 | Medical Sciences Independent Study | 3 |
| GMS7910 | Directed Research | 3 |
| GMS 6053 | Cancer Prevention | 3 |
| GMS 6055 | Cancer Immunology | 3 |
| GMS 6408 | Cardiovascular Disease | 3 |
| GMS 6410 | Cardiovascular Health | 3 |
| GMS 6411 | Metabolic Cardiology | 3 |
| GMS 6709 | Neuropsychiatry | 3 |
| GMS 6715 | Lifestyle Coaching | 3 |
| GMS 6716 | Nutrition Counseling | 3 |
| GMS 6717 | Co-Active Coaching | 3 |
| GMS 6718 | Integrated Lifestyle Medicine | 3 |
| GMS 6720 | Sports Medicine and Nutrition | 3 |
| GMS 6755 | How the Brain Learns | 3 |
| GMS 6756 | Brain Fitness Therapies | 3 |

## MOLECULAR MEDICINE (MLM)

Considered the vanguard of the new millennium in which science truly complements the art of medicine, molecular medicine strives to understand the molecules key to normal body function and the pathogenesis of disease and to design molecular tools for diagnosis, treatment and prevention. Recent changes in research and scholarship in the biomedical sciences has directed attention to the development and training of students who are able to cross the barriers of traditional disciplines and embrace the concepts of interdisciplinary approaches to biomedical problems. The Molecular Medicine concentration, within the Master's Program in Medical Sciences, has been developed to provide a novel interdisciplinary and concentrated program of study that is designed for students interested in either future doctoral or professional programs in the biomedical sciences. The program integrates several disciplines, including biochemistry, molecular biology, genetics, genomics, microbiology, immunology, virology and biomedical ethics to provide a solid medically-relevant foundation. The rigorous program allows students to demonstrate their full academic ability for future graduate programs or medical school. The interdisciplinary program promotes the broad intellectual focus required of future graduate students in the biomedical sciences or health-care profession. The courses integrate modern teaching methods with extensive student participation designed to improve their oral and presentation skills that are critical to their future professional development.

| **Core requirements:** | | | **6 hours** |
|---|---|---|---|
| GMS6200C | Biochemistry, Molecular and Cellular Biology | 1 | |
| BCH6935 | Grant Writing and Scientific Communication | 2 | |
| GMS6100 | Medical Microbiology | 3 | |
| | | | |
| **Course Requirements:** | | | |
| BCH6411 | Biomedical Genomics and Genetics | 4 | |
| GMS6101 | Molecular and Cellular Immunology | 3-4 | |
| GMS6110 | Microbial Pathogenesis and Host-Parasite Interactions3 | | |
| GMS7930 | Clinical Correlations in Molecular Medicine | | |
| BCH6627 | Metabolic and Genetic Basis of Human Diseases | 3 | |
| GMS6114 | Vaccines and Applied Immunology | | |
| | | | |
| **Electives** | | | **3** |
| BCH6135C | Methods in Molecular Biology | 3 | |
| GMS6104 | Cellular Immunology | 3 | |
| GMS6107 | Advances in Virology | 3 | |
| BCH6746 | Proteomics and Structural Biology | 3 | |
| BCH6888 | Bioinformatics | 3 | |
| PHC6050 | Biostatistics I | 3 | |
| BCH6876 | Current Topics in Molecular Medicine | 3 | |
| | | | |
| **Total Minimum Hours:** | | | **32** |

## WOMEN'S HEALTH (WSH)

This innovative, interdisciplinary program, the first in Florida to provide an integrated approach to the subject area of holistic women's health, is designed to develop leaders in the field of women's health. The program, which has been constructed to prepare students for future educational or research endeavors in graduate or medical schools or health practice institutions, is designed to fulfill the M.S. M.S. Women's Health Concentration increasing demand for trained individuals in this emerging area, which focuses on gender-specific issues. The program is founded on the premise that future health-care providers, researchers and educators will require extensive interdisciplinary training in order to develop novel solutions to current biomedical problems in women's health. The interdisciplinary curriculum has been designed to provide the background training that will equip students with the essential tools for a successful career in the field of women's health.

The program requires a minimum of 32 credit hours, which can be completed in one year of accelerated and intense study. Core courses provide both foundation and advanced training while electives in such topics as reproductive women's cancers, endocrine mechanisms, clinical nutrition, the business side of medicine and biostatistics, provide students with additional educational opportunities.

**Admission Requirements**

- A bachelor's degree or equivalent from a regionally accredited university in the biological or chemical sciences
- Minimum overall grade-point average of 3.0 out of a possible 4.0 with a minimum grade point average of 3.0 in the sciences
- Graduate Record Examination (MCAT scores can be submitted in lieu of the GRE)

**Courses**

| | | |
|---|---|---|
| **Core Courses:** | | |
| GMS 6871 | Health Science Ethics | 2 |
| | | |
| GMS 6xxx | Medicine and Gender | 3 |
| GMS7930 | Women's Health Lab (1-2 Interd.) | 2-3 |
| Elective | | 2-3 hours |
| | | |
| GMS6334 | Pathobiology of Human Cancer | 3 |
| GMS 6452 | Clinical Nutrition | 3 |
| PHC6532 | Women's Health Issues | 3 |
| GMS7910 | Directed Research (Women's Health) | 3-6 hours Interdisciplinary |
| Elective | | 3 |
| | | |
| PCH 6050 | Biostatistics | 3 |
| GMS7910 | Directed Research (Women's Health) | 3-6 hours Interdisciplinary |
| **Elective** | | **5-6 hours** |

## COURSES

See http://ugs.usf.edu/course-inventory

# MEDICAL SCIENCES PROGRAM

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

## DEGREE INFORMATION

**Program Admission Deadlines:**
**Fall:** February 1

**Minimum Total Hours:** 90
**Program Level:** Doctoral
**CIP Code:** 26.9999
**Dept Code:** MED
**Program (Major/College):** MSG MD
**Approved:** 1974

**Concentrations:**

Allergy Immunology & Infectious Disease (AII)
Anatomy (ANA)
Biochemistry and Molecular Biology (BMB) *
Clinical and Translational Research (CTR)
Microbiology and Immunology (MMI) *
Molecular Medicine (MLM)
Molecular Pharmacology and Physiology (MPY)
Neuroscience (NEU)
Pathology and Cell Biology ((PCB)
Pathology and Laboratory Medicine (PLM)
Pharmacology and Therapeutics (PAT)
Physiology and Biophysics (PAB)
*Closed for admissions; not accepting applications

## CONTACT INFORMATION

**College:** Medicine
**Department:** Medical Sciences

**Contact Information:** www.grad.usf.edu

**Website:**
http://health.usf.edu/medicine/graduatestudies/index.htm

## PROGRAM INFORMATION

The program is designed to provide students with a broad knowledge in the basic medical sciences, while preparing them for careers as effective and knowledgeable teachers, as well as productive and versatile researchers. To meet these objectives, students take courses in the medical sciences and related areas, participate in seminars, and receive individual research training. Departmental advisory committees counsel the entering students in planning their first year curriculum. In addition to course work and participation in seminars, first year students are expected to become familiar with ongoing research in their chosen department; when possible, they are encouraged to work on a part-time basis as research assistants in their department. Once the student selects a major professor, a formal dissertation committee is appointed. The dissertation committee assists the student in planning the research and course of study, evaluates the student's progress, supervises the comprehensive examination, and conducts the final dissertation defense.

By the end of the second year, a student has usually completed sufficient course work and met the other research requirements to take the comprehensive qualifying examination. Successful completion of this examination leads to formal admission to candidacy for the Ph.D. degree. The final phase of the program emphasizes research and independent study and leads to a written dissertation. The Ph.D. degree is awarded upon successful completion and oral defense of the dissertation. Departments within the Morsani College of Medicine may have additional requirements that pertain to their respective training program. Contact the department for information.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools.

**Major Research Areas:**
Allergy, Immunology and Infectious Diseases Cancer Biology, Cardiovascular Research, Neuroscience & Neurodegenerative Diseases, Diabetes/Metabolic Disorders

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.

**Program Admission Requirements**

- A bachelor's degree or equivalent from a regionally accredited university
- Minimum overall grade-point average of 3.00 out of a possible 4.00 with a minimum grade-point average of 3.00 in the sciences
- GRE- Graduate Record Examination (preferred at the 70th percentile or above)
- Completed pre-requisites in:
  - General biology (1 year)
  - General chemistry (1 year)
  - General physics (1 year)
  - Organic chemistry (1 year)
- Three (3) letters of recommendation
- Personal Interview
- One-two page personal statement
- Research experience preferred

**Application Procedures**
Please refer to http://health.usf.edu/medicine/graduatestudies/phd/apply_phd.htm

## DEGREE PROGRAM REQUIREMENTS

Total Minimum Hours: 90 hours
*(including 24 minimum directed research hours)*

**All students are required to successfully complete the following didactic courses:**

| | | |
|---|---|---|
| GMS 6001 | Foundation in Biomedical Sciences | 6 |
| GMS 6091 | Responsible Conduct in Research | 1 |
| GMS 6094 | Experimental Design & Analysis | 3 |
| GMS 6002 | Success Skills for the Biomedical Science Researcher | 1 |
| BCH 6935 | Grant Writing & Scientific Communication | 2 |

**Students are also required to complete at least one semester of:**

| | | |
|---|---|---|
| GMS 6942 | Laboratory Rotations in Biomedical Sciences | 1-3 |

Each student shall complete a minimum of 24 credit hours of didactic course work (excluding journal clubs, seminars, laboratory rotations, directed research, etc.). In addition to the required courses listed above (13 credit hours), the student shall fulfill the 24 credit hour minimum by completing coursework in their chosen concentration. The student will work with his/her advisory and dissertation committees to choose appropriate courses from the course list for their chosen concentration.

**CONCENTRATIONS:**

**ALLERGY, IMMUNOLOGY & INFECTIOUS DISEASE**
Research and education in the Ph.D. in Medical Sciences Program, concentration in Allergy, Immunology & Infectious Disease is focused on interdisciplinary approaches to the study of how the immune system functions properly to rid the body of foreign pathogens and how the immune system can go awry in autoimmunity. The process by which microbes interact with the host to cause disease is also a focus of this program.

**ANATOMY**

**BIOCHEMISTRY AND MOLECULAR BIOLOGY - Closed for admissions; not accepting applications**

**CLINICAL AND TRANSLATIONAL RESEARCH**
Cardiovascular disease is the leading cause of death, in the United States Atherosclerotic coronary artery disease, valvular heart disease, diseases of the heart muscle, electrical disturbances of the heart rhythm, high blood pressure, stroke, and peripheral vascular disease all contribute to this morbidity. According to current estimates, coronary heart disease, high blood pressure, congestive heart failure and stoke affect nearly 58 million Americans. The USF Signature Interdisciplinary Program in Cardiovascular Research is a comprehensive program that brings together resources in heart care, research and education to fight against cardiovascular disease. Clinicians and researchers at USF are working to improve our knowledge of cardiovascular disease in order to develop new methods of prevention and treatment that will make a difference in the lives of patients with cardiovascular disorders.

**MEDICAL MICROBIOLOGY AND IMMUNOLOGY - Closed for admissions; not accepting applications**

**MOLECULAR MEDICINE**
Research and education in the Ph.D. in Medical Sciences Program, concentration in Molecular Medicine is focused on interdisciplinary approaches to the study of bacteriology, biochemistry, immunology, molecular biology and virology as it relates to human health and disease such as allergy and immune dysfunction, cancer, cardiovascular disorders, infectious diseases and inheritable defects. Training will include a unique interdisciplinary blend of didactic coursework, journal clubs, seminar series, as well as significant research experience.

**MOLECULAR PHARMACOLOGY & PHYSIOLOGY**
Research and education in the Ph.D. in Medical Sciences Program, concentration in Molecular Pharmacology and Physiology is focused on interdisciplinary approaches to the study of the nervous and cardiovascular systems and related disorders, including Alzheimer's disease and other neurodegenerative disorders, cardiovascular disease and stroke, diabetes, and neuropsychiatric disorders such as depression and drug addiction. Training will include a unique interdisciplinary blend of didactic coursework, journal clubs, seminar series, as well as significant research experience.

**NEUROSCIENCE**
Research and education in the Ph.D. in Medical Sciences Program, concentration in Neuroscience is focused on interdisciplinary approaches to the study of the nervous systems and related disorders, including Alzheimer's disease and other neurodegenerative disorders, stroke, and neuropsychiatric disorders such as depression and drug addiction. Areas of expertise include biochemistry and cellular and molecular neuroscience, neural systems and computational neuroscience, behavioral neuroscience, developmental neuroscience, neuroimmunology, and neuropsychopharmacology, among others. Students are encouraged to carry out research during their entire period of study. Training will include a unique interdisciplinary blend of didactic coursework, journal clubs, seminar series, as well as significant research experience. The interdisciplinary structure permits considerable flexibility in training; each student's training is tailored to meet individual requirements.

**PATHOLOGY & CELL BIOLOGY**
Research and education in the Ph.D. in Medical Sciences Program, concentration in Pathology & Cell Biology is focused on interdisciplinary approaches to the study of cancer, reproductive pathobiology, neurological disease & injury and related diseases, including cancer biology, angiogenesis and morphogenesis, gene discovery, neurobiology, cell biology and new educational technologies.

PATHOLOGY AND LABORATORY MEDICINE

PHARMACOLOGY AND THERAPEUTICS

PHYSIOLOGY AND BIOPHYSICS

**Electives**

Some of the electives include:

| | |
|---|---|
| BCH 6746 Structural Biology | 3 |
| GMS 6115 Medical Parasitology & Mycology | 3 |
| GMS 6708 Neuroimmunology | 3 |

**Dissertation**

## COURSES

See http://ugs.usf.edu/course-inventory

# MEDICINE / MEDICAL SCIENCES DUAL PROGRAM

## Doctor of Medicine (M.D.) / Doctor of Philosophy (Ph.D.) Dual Degree

## DEGREE INFORMATION

**Program Admission Deadlines:**
Contact the Morsani College of Medicine

**Minimum Total Hours:** 90
**Program Level:** Doctoral
**CIP Code:** 26.9999
**Dept Code:** MED
**Program (Major/College):** MED MD / MSG MD
**Concentrations:**
Allergy Immunology & Infectious Disease (AII)
Anatomy (ANA)
Biochemistry and Molecular Biology (BMB)*
Clinical and Translational Research (CTR)
Microbiology and Immunology (MMI)*
Molecular Medicine (MLM)
Molecular Pharmacology and Physiology (MPY)
Neuroscience (NEU)
Pathology and Cell Biology ((PCB)
Pathology and Laboratory Medicine (PLM)
Pharmacology and Therapeutics (PAT)
Physiology and Biophysics (PAB)
* Closed for admissions; not accepting applications

## CONTACT INFORMATION

**College:** Medicine
**Department:** Medicine/Medical Sciences

**Contact Information:** www.grad.usf.edu

## PROGRAM INFORMATION

The combined MD/PhD program is designed to provide well-qualified students who are interested in careers in translational medicine with a broad knowledge in the basic biomedical and clinical sciences that is integrated with the advanced experimental training that is critical for their development as productive and versatile researchers. To meet these objectives, student's complete courses in both the basic and clinical sciences, participate in patient-care activities and seminars, and receive individual research training in one of the many research concentrations available within the College. Program advisory committees counsel the entering students on planning their curriculum and selecting a research mentor. During the first two years, students complete the basic science course work and participation in research rotations that assist in the selection of a dissertation mentor. Following the successful completion of the second year of medical training and the selection of a major professor, a formal dissertation committee is appointed which assists the student in planning the research and course of study, evaluates the student's progress and supervises the comprehensive examination.

The successful completion of this examination leads to formal admission to candidacy for the PhD degree. The remainder of this phase of the program emphasizes research and independent study and leads to a written dissertation and its oral defense. Following the completion and defense of their PhD dissertation, students embark on the final two years of their medical training. The program culminates in the award of both MD and PhD degrees. Departments within the Morsani College of Medicine may have additional requirements that pertain to their respective portions of the training program. Contact the department for information.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools.

**Major Research Areas:**
See Morsani College of Medicine website.

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below. as well as requirements of the Morsani College of Medicine MD and PhD programs, listed below. Student applications must be submitted through AMCAS.

**Program Admission Requirements**

- A bachelor's degree or equivalent from a regionally accredited university
- Minimum overall grade-point average of 3.70 out of a possible 4.00 with a minimum grade-point average of 3.7 in the sciences
- Medical College Admissions Test score of 30 (The MCAT substitutes for the GRE).
- Completed pre-requisites in:
    - General biology (1 year)
    - General chemistry (1 year)
    - General physics (1 year)
    - Organic chemistry (1 year)
    - Quantitative analysis (1 course)
    - Mathematics including integral and differential calculus
- Three (3) letters of recommendation
- Interview
- One-two page personal essay

## DEGREE PROGRAM REQUIREMENTS

| | |
|---|---|
| Total Minimum Program Hours | 90 |

Contact programs for complete information. Degree requirements are individualized according to research interests and goals. Ninety credit hours minimum including 24 minimum directed research hours.

## COURSES

See http://ugs.usf.edu/course-inventory

# PHYSICAL THERAPY AND PUBLIC HEALTH PROGRAM

**Dual Degree Program**
**Doctor of Physical Therapy (D.P.T.) and Master of Public Health (M.P.H.) Degree**

## DEGREE INFORMATION

**Program Admission Deadlines:**
Rolling Admissions. One class admitted each August. Contact program for details.

**Minimum Total Hours:** Contact Programs
**Program Level:** Professional/Masters
**Program Status:** Active
**CIP Codes:** 51.2308/
**Dept Code:** PHT/
**Program (Major/College):** MPT MD

## CONTACT INFORMATION

**Colleges:** Medicine and Public Health
**Departments:** School of Physical Therapy and Rehabilitation Sciences and Public Health

**Contact Information:** www.grad.usf.edu

## PROGRAM INFORMATION

Physical therapists are health professionals with special expertise in the science of movement. They use this knowledge to provide preventive and therapeutic services and psychological support to people of all ages with movement dysfunction. Professional education includes study of basic sciences and the professional skills needed for client examination, evaluation, diagnosis, prognosis, intervention and outcomes. Students will participate in comprehensive clinical internships throughout the program. The School of Physical Therapy and Rehabilitation Sciences is a component of the Morsani College of Medicine and is a limited access first professional degree program with an annual enrollment of up to 36 students per year. Students complete the majority of their first year studies on a parallel path with the first year curriculum in medicine.

The Doctor of Physical Therapy is offered through the USF Medical School in the Morsani College of Medicine. For information regarding the DPT contact the School of Physical Therapy and Rehabilitation Sciences.

The Master of Public Health is offered through the USF College of Public Health. For information regarding the MPH contact the College of Public Health Graduate Studies office.

**Accreditation:**
Accredited by the Commission on Accreditation in Physical Therapy Education.

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below.
Contact programs for complete information.

**Program Admission Requirements**

- Have a bachelor's degree or equivalent from a regionally accredited university, and completion of prerequisite courses.
- Have earned a "B" (3.00 on a 4.00 scale) average or better in all work attempted while registered as an upper division student working for a baccalaureate degree; overall GPA of 3.00 and on all prerequisite coursework.
- Interview upon request of the School of Physical Therapy and Rehabilitation Sciences.

- Have at least 20 total hours of documented, observational, volunteer or other work experience in both hospital outpatient and inpatient physical therapy settings

- English competency. Applicants who have completed a degree in which English is not the primary language of instruction must present evidence of competency to pursue studies in the English language prior to being extended an offer of admission. Acceptable English language proficiency tests for applicants to the Doctor of Physical Therapy program are: TOEFL (Test of English as a Foreign Language) a minimum score of 600 (paper version); 230 (computer version).

- Have a written autobiographical statement of personal values and purpose for attending USF's DPT Degree Program.

## DEGREE PROGRAM REQUIREMENTS

**Contact programs for complete information.**

Students must complete 107 credit hours of professional coursework and meet the general graduate requirements of the School of Physical Therapy and Rehabilitation Sciences, the Morsani College of Medicine, and the College of Public Health for admission and graduation.

## COURSES

See http://ugs.usf.edu/course-inventory

# REHABILITATION SCIENCES PROGRAM

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

## DEGREE INFORMATION

**Program Admission Deadlines:**
Domestic Students:

| | |
|---|---|
| Fall | June 1 |
| Spring | November 15 |
| Summer | No Admission |

International Students living outside the U.S.
Deadline for immigration documents, etc.:

| | |
|---|---|
| Fall | January 1 |
| Spring | September 15 |
| Summer | No Admission |

**Minimum Total Hours:** 66
**Program Level:** Doctoral
**CIP Code:** 51.2314
**Dept Code:** SPTRS
**Program (Major/College):** RHS/MD

**Concentrations**
Veteran's Health/Reintegration (VHR)
Chronic Disease (CHD)
Neuromusculoskeletal Disability (NMD)

## CONTACT INFORMATION

College: Medicine
Department: School of Physical Therapy and Rehabilitation Sciences

Contact Information:
www.grad.usf.edu
http://health.usf.edu/medicine/dpt/

## PROGRAM INFORMATION

The Ph.D. in Rehabilitation Sciences degree program will prepare faculty researchers and leaders with content expertise in rehabilitation sciences who will contribute to the development of rehabilitation practice, research and education in an emerging 21st century health care environment. Graduates of the Ph.D. program in Rehabilitation Sciences are expected to demonstrate advanced knowledge and productivity relative to one area of concentration: Veteran's Health/Reintegration, Chronic Disease, or Neuromusculoskeletal Disability. Students will complete a core set of rehabilitation sciences courses, statistics/research methodology courses and then select an area of content expertise where independent research will be conducted.

**Accreditation:**
Accredited by the Commission on Colleges of the Southern Association of College and Schools

**Major Research Areas:**
Rehabilitation Science, Veteran's Health/Reintegration, Chronic Disease, Prosthetics, Neuromusculoskeletal Disability, Physical Therapy

## ADMISSION INFORMATION

Must meet University requirements (see Graduate Admissions) as well as requirements listed below

**Program Admission Requirements**

- At least a Master's degree or first-professional doctoral degree in a rehabilitation or rehabilitation sciences related discipline
- Minimum of 3.00 GPA or equivalent in prior graduate and/or professional degree studies
- GRE required, with preferred minimum scores of 70% V, Q, AW
- Interview to determine professional goals
- Three Letters of Recommendation
- Personal Statement – in 750 to 1000 words, state your professional plans and career objectives (Goal statement). Please include personal qualifications, qualities and professional development and how they have influenced your career path; reasons for this particular degree in relation to academic background, professional work experience, and career goals. Describe prior experiences and accomplishments in a rehabilitation or rehabilitation sciences related discipline.
- Curriculum Vitae
- The Test of English as a Foreign Language (TOEFL/iBT) with a score of 79 or higher or the International English Lang Testing System (IELTS) with a score of 6.5 will be required for international students from countries where English is not the official language, at the discretion of the Admissions Committee.

## DEGREE PROGRAM REQUIREMENTS

| | |
|---|---|
| **Total Minimum Hours:** | **66 credit hours (post-masters)** |
| **Core Requirements** | **15 hours** |
| RSD 6111 Introduction to Rehabilitation Science | 3 |
| RSD6112 Advanced Rehabilitation Science | 3 |
| RSD7930 Research Pro-seminar in Rehabilitation Science | 2 |
| RSD7300 Rehabilitation Ethics | 3 |
| RSD7910 Mentored Research Apprenticeship 1 and 2 | 1-2 |
| RSD 6921Colloquium in Rehabilitation Sciences 1 and 2 | 1-2 |
| **Statistics/Research Methods Core** | **15 hours** |
| PHC 6051 Biostatistics II | 3 |
| PHC 7936 Seminar in Health Care Outcomes Measurements | 3 |
| Students choose from the following for the remaining 9 hours: | |
| HSC 6054 Design & Analysis of Experiments for Health Researchers | 3 |
| GMS 6102 Experimental Design & Analysis | 3 |
| PHC 6020 Design and Conduct of Clinical Trials | 3 |
| PHC 6060 Biostatical Case Studies and Consulting | 3 |
| PHC 7709 Case Studies in Quantitative Analysis of Public Health Data | 3 |
| GMS 6840 Cultural and Diversity Issues in Clinical Research | 2 |
| GMS 6843 Scientific Communication | 2 |
| PHC 7054 Advanced Biostatistical Methods | 3 |
| PHC 7053 Generalized Linear Models | 3 |
| PSY 6217 Research Methods and Measurement | 3 |
| SYA 6437 SPSS and Social Research | 3 |
| PHT 6609 Critical Assessment of the Literature & Evidence-based Practice | 3 |
| **Concentrations** | **15 hours** |
| **Students select from the following Concentrations:** | |

### Veteran's Health/Reintegration (VHR)

Students in consultation with their committee will select courses for the Concentration.
Potential courses:

| | | | |
|---|---|---|---|
| RSD | 7933 | Special Topics in Veteran's Health/Reintegration | 3 |
| SOW | 6126 | Theoretical Perspectives on Physical Dysfunction | 2 |
| PET | 6388 | Physical Activity Health and Disease | 3 |
| PHT | 7540 | Principles in Patient/Client Management Seminar | 3 |
| GMS | 6771 | Aging and Neuroscience | 3 |
| MHS | 6210 | Wraparound Interventions and the System of Care | 3 |
| MHS | 6311 | Online Services in Counseling and Helping Professions | 3 |
| PHC | 6501 | Homelessness: Implications for Behavioral Healthcare | 3 |
| PHT | 8702 | Advanced Prosthetics and Orthotics | 3 |

### Chronic Disease (CHD)

Students in consultation with their committee will select courses for the Concentration.
Potential courses:

| | | | |
|---|---|---|---|
| RSD | 7931 | Special Topics in Chronic Disease | 3 |
| GEY | 7602 | PhD Seminar in Health and Aging | 3 |
| GEY | 7604 | Biomedical Aging | 3 |
| GEY | 7610 | Psychological Issues in Aging: Interdisciplinary Perspective | 3 |
| GEY | 7622 | PhD Seminar in Policy and the Elderly | 3 |
| GEY | 7623 | Social and Health Issues in Aging | 3 |
| GEY | 7649 | Population Aging | 3 |
| GMS | 6334 | Pathobiology of Human Cancer | 3 |
| SOW | 6126 | Theoretical Perspectives on Physical Dysfunction | 3 |
| PHC | 6410 | Social and Behavioral Sciences Applied to Health | 3 |
| PHC | 6522 | Nutrition in Health and Disease | 3 |
| PHC | 6931 | Advanced Seminar in Social and Behavioral Sciences Applied to Health | 3 |
| PET | 6388 | Physical Activity Health and Disease | 3 |
| GMS | 6500C | Core Physiology | 4-6 |
| PET | 6369 | Cardiorespiratory Aspects of Exercise Physiology | 3 |
| PHT | 7540 | Principles in Patient/Client Management Seminar | 3 |
| PHC | 6418 | Public Health and Aging | 3 |
| RCS | 5035 | Rehabilitation Counseling: Concept and Applications | 3 |
| RCS | 5080 | Medical Aspects of Disability | 3 |

### Neuromusculoskeletal Disability (NMD)

Students in consultation with their committee will select courses for the Concentration.
Potential Courses:

| | | | |
|---|---|---|---|
| RSD | 7932 | Special Topics in Neuromusculoskeletal Disability | 3 |
| GMS | 6440 | Basic Medical Physiology | 3 |
| GMS | 6431 | Cell Physiology | 4 |
| GMS | 6770 | A Metabolic Approach to Pain Management | 3 |
| HSC | 6556 | Pathobiology of Human Disease I | 3 |
| HSC | 6557 | Pathobiology of Human Disease II | 3 |
| PET | 6388 | Physical Activity Health and Disease | 3 |
| PET | 6084 | Body Composition: Assessment and Management | 3 |
| PET | 6098 | Topics in Strength and Conditioning | 3 |
| PET | 6339 | Neuromuscular Aspects of Exercise Physiology | 3 |
| PET | 6351 | Occupational Medicine for Health Professionals | 3 |
| PHT | 7450 | Principles in Patient/Client Management Seminar | 3 |
| PHT | 7264 | Neuromuscular Clinical Problem Solving | 3 |
| PHT | 7777 | Musculoskeletal Clinical Problem Solving | 3 |
| PHT | 8724 | Anatomical Basis of Physical Therapy and Rehabilitation | 3 |

**Electives** **3-12 hours**

Electives may be selected in consultation with student's committee.
Potential Courses:

| | | | |
|---|---|---|---|
| GMS | 6020 | Neuroscience | 5-6 |
| GMS | 6541 | Pharmacology for Health Professionals | 4 |
| GMS | 6706 | Basic Medical Neuroscience | 3 |
| GMS | 6843 | Scientific Communication | 2 |
| GMS | 6875 | Ethical and Regulatory Aspects of Clinical Research | 3 |
| GMS | 6890 | Medicine and the Arts | 3 |
| GMS | 6891 | Medicine and the Movies | 3 |
| GMS | 6840 | Cultural and Diversity Issues in Clinical Research | 2 |
| PHT | 7151 | Health Promotions and Wellness | 3 |
| RSD | 7xxx | Directed Readings in Rehabilitation Sciences | 3 |
| RSD | 7xxx | Teaching Practicum in Rehabilitation Sciences | 3 |

**Doctoral Qualifying Exam**

As soon as the substantial majority of the course work is completed, the student must pass a written qualifying examination covering the subject matter in the major and related fields. This examination may be supplemented by an oral examination.

**Dissertation** **12 hours**

| | | |
|---|---|---|
| RSD 7980 | Dissertation | 12 |

**Other Information:**

| | | Year 1 | | Year 2 | | Year 3 | | Year 4*** | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Course** | **Cr.** | **Course** | **Cr.** | **Course** | **Cr.** | **Course** | **Cr.** |
| **Semester** | **Fall** | Intro to Rehabilitation Sciences<br>Colloquium 1<br>Concentration<br>Statistics/Research Methodology | 3<br>1<br>3<br>3 | Research Proseminar in Rehabilitation Sciences<br>Mentored Research Apprenticeship<br>Statistics/Research Methodology<br>Concentration | 2<br>1<br>3<br>3 | Dissertation | 3 | Dissertation<br>Elective(s) | --- |
| | **Spring** | Advanced Rehabilitation Sciences<br>Colloquium 2<br>Concentration<br>Statistics/Research Methodology | 3<br>1<br>3<br>3 | Mentored Research Apprenticeship<br>Concentration<br>Statistics/Research Methodology<br>Elective(s)* | 1<br>3<br>3<br>3 | Dissertation | 6 | Dissertation | --- |
| | **Summer** | Rehabilitation Ethics<br>Concentration<br>Statistics/Research Methodology | 3<br>3<br>3 | Elective(s)<br>Comprehensive Examination<br>*****Accepted to Candidacy*** | 6 | Dissertation | 3 | Dissertation | --- |
| | | | 29 | | 25 | | 12 | | |

* A wide range of electives within the Rehabilitation Sciences program and from other departments on the USF and USF Health campuses are available to students. Student may select electives that complement their course work and provide knowledge and skills that they will find useful upon graduation.

** Once accepted into candidacy, a student may begin work on their dissertation.

***While some students may complete the PhD requirements in three years, others may require more time to complete all requirements. Fourth year credit hours and courses would be directed toward fulfilling requirement.

## COURSES

http://ugs.usf.edu/course-inventory