

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>NEW/CHANGE PROGRAM REQUEST</b> <b>Graduate Programs</b>		UGPC Approval _____ UFS Approval _____ Banner Posted _____ Catalog _____
	Department Biomedical Science College Medicine		
<b>Program Name</b> Genomics and Predictive Health Certificate		<input checked="" type="checkbox"/> <b>New Program</b> <input type="checkbox"/> <b>Change Program</b>	<b>Effective Date</b> (TERM & YEAR) Spring 2020
<b>Please explain the requested change(s) and offer rationale below or on an attachment</b> <p>Proposal: A Certificate in Genomics and Predictive Health offered by the College of Medicine Biomedical Science Department.</p> <p>Please review attachment</p>			
<b>Faculty Contact/Email/Phone</b> Dr. Marc Kantorow mkantoro@health.fau.edu 561-297-2910		<b>Consult and list departments that may be affected by the change(s) and attach documentation</b> N/A	
<b>Approved by</b>		<b>Date</b>	
Department Chair <i>Janet D. Robinson</i>		8/20/19	
College Curriculum Chair <i>Marc Kantorow</i>		8/20/19	
College Dean <i>[Signature]</i> Acting Dean		8/21/19	
UGPC Chair <i>[Signature]</i>			
UGC Chair <i>[Signature]</i>		9/11/19	
Graduate College Dean <i>[Signature]</i>		9-12-19	
UFS President _____			
Provost _____			

Email this form and attachments to [UGPC@fau.edu](mailto:UGPC@fau.edu) one week before the UGPC meeting so that materials may be viewed on the UGPC website prior to the meeting.

GRADUATE COLLEGE

AUG 22 2019

Received

## Genomics and Predictive Health Certificate

The Genomics and Predictive Health Certificate is part of strategic initiatives of the Charles E. Schmidt College of Biomedical Science to expand research, learning and training opportunities in predictive health. This certificate will provide new opportunities to MS biomedical Science and other graduate students at FAU in this emerging area through completion of an integrated set of genetics, genomics and predictive health courses.

### Background

Precision medicine is defined as an “approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person”. Its promise derives from the recent explosion in “big data health” that reflects the variety and volume of information that is increasingly available. By using machine learning approaches to analyze the trends and patterns in the data, we are able to generate new hypotheses regarding the causal bases of diseases resulting in targeted treatments for individual patients.

Predictive health goes one step further by leveraging the power of genomics and “big data” to not only treat, but to predict and prevent diseases.

In order to fully realize the potential of genomics and predictive health, we must fundamentally change the way we do research by updating the infrastructure, engaging patients and community stakeholders, sharing data and samples, and forming collaborative networks that bring together experts from the medicine, computer engineering, and behavioral science fields.

In parallel, we must adapt the way we teach next generation of health professionals and scientists (e.g., research scientist physicians, nurses, pharmacists, or genetic counselors) by ensuring they have the requisite skills to interpret and incorporate this new knowledge into a patient care model that emphasizes prevention, diagnosis and treatment tailored towards individuals.

The commitment of FAU to this field is clearly reflected by the recent evolution of the Charles E. Schmidt College of Medicine Biomedical Science. The ongoing growth of the biomedical science community in Palm Beach County makes this an ideal time to create new opportunities for FAU, and to engage its students and faculty to take on a leading role in the genomics and predictive health arena.

### Strengths at FAU

The College of Medicine currently has 20 faculty engaged in various areas of Genetics, Genomics and Predictive Health in research and instruction. Collectively, these faculty have over 19 million dollars in NIH-funded genetics, genomics and related-grant support. These faculty form the core of the certificate program and they have

GRADUATE COLLEGE

SEP 16 2019

Received



substantial experience teaching graduate students through a Master's program offered by the College, and through participation in the Integrative Biology Biomedical Science PhD program with the College of Science. FAU is already engaging national and international partners in predictive health. Formalizing a program with this specialization will strengthen these alliances and create new opportunities for interaction and development of graduate education programs.

## **Need**

Currently, there is only one Predictive Health program exists in the entire State of Florida. Predictive Health is the link is to advance discovery in genetics and genomics and other "omic" sciences; to accelerate translational research and implementation of these discoveries into more effective and safe individualized health care; and to enhance the training and education of current and future generations of health professionals, scientists and consumers in personalized and genomic medicine.

The College of Medicine is poised to become a leader in this new scientific and healthcare frontier through ongoing NIH funded research programs and cutting edge educational opportunities designed to produce the next generation of scientific and medical "thought leaders" in this dynamic area. This certificate proposal is well alighted with the [College of Medicine Strategic Plan](#).

## **Resources**

All of the required resources including staff, faculty, courses, and infrastructure are currently in place and no new resources are needed to implement this certificate program. The program will benefit from resources provided by new faculty and outside partners as the College of Medicine and program grow in the future.

## **Consultations**

The FAU Genomics and Predictive Health Certificate does not overlap with other programs at FAU. There were no current relevant departments, centers, and colleges that offer this type of program and the College of Medicine are confident this unique program will succeed since there is only one program in Florida that currently offer a similar program.

## **Approved by:**

Dr. Janet Robishaw

Senior Associate Dean for Research and Chair, Department of Biomedical Science

Dr. Marc Kantorow

Professor and Assistant Dean for Graduate Programs

Dr. Phillip Boiselle

Dean, Charles E. Schmidt College of Medicine

# FAU Genomics and Predictive Health Certificate

## General Information (catalog)

The Genomics and Predictive Health Certificate is offered to provide master's and Ph.D. students an integrated background in the field of genomics and predictive health. The certificate program covers advancements in the field of personalized medicine, DNA sequencing technologies and commercial applications of genetics research. A minimum of 12 graduate credits hours of coursework to provide core experiences in the various Predictive Health domains (Disease Discovery, Customized Therapies, Prevention). Although the program is centered on the Charles E. Schmidt College of Medicine, faculty from other colleges and institutions contribute to the program's success, and students are welcomed from many departments, centers and colleges throughout the University.

Genomics and Predictive Health is a broad and interdisciplinary field focused on understanding and improving human health. It incorporates diverse areas of specialized investigation that share this common goal, including anatomy, biochemistry, cell biology, clinical sciences, cognitive sciences, development, genetics, immunology, medical sciences, microbiology, molecular biology, pathology, pharmacology, psychology, and others.

## Admission Requirements

Admission to and completion of this program is overseen by the Graduate Program Office in the College of Medicine. For admission, the applicant must satisfy the following criteria:

1. Enrollment in an FAU master's or Ph.D. training program in any FAU graduate program including but not limited to: Biomedical Science, Biology, Biochemistry, Complex Systems and Brain Sciences, Integrative Biology, Psychology and Bioengineering. Students must have approval of their graduate program to enroll and must remain in good standing with their graduate program to continue in this certificate.
2. Meet with the Office of Graduate Programs advisor to discuss program goals and requirements and obtain permission to enroll.

## Program Requirements

The Certificate Program requirements are designed to be tailored to the individual student with previous coursework and future goals in mind (12 - credit Certificate).

1. Complete the following Required Courses (9 credits):

Human Genetics – 3 credits

Integrating Genomics into Predictive Health -3 credits

Predictive Health Seminar Series - 3.0 credit (1-credit per semester on a continuous basis)

2. Complete one of the following three electives:

Emerging Applications in Oncology and Pharmacogenomics-3 credits

Communicating in the Age of Predictive Health -3 credits

Implementing Learning Health Systems -3 credits

**Course Descriptions (\*not for final catalog descriptions):**

**Human Genetics (3 credits)**

Designed to provide students with a functional understanding of the field of human genetics as it applies to progressive research and medicine. Emphasizes the integrated understanding and application of Genetic Analysis, Diagnosis and Mechanisms in human disease.

**Integrating Genomics into Predictive Health (3 credits)**

Genomic sequencing is transforming clinical care and preventive health. Beyond the technical challenges, effective implementation of genomics into predictive health will require widespread changes, ranging from patient acceptance, professional education, evidence based clinical utility and cost containment, to public policy development. This required capstone course provides the fundamental knowledge of these topics, using a combination of didactic instruction, digital learning, problem based simulation, and clinical exposure. (Textbook: Precision Medicine: A Guide to Genomics and Clinical Practice, Jeannette J McCarthy and Bryce A. Mendelsohn)

**Predictive Health Seminar Series (1 credit)**

This interprofessional seminar series provides the opportunity to learn from “thought leaders” that are creating healthcare teams of the future. Upon completion of this required course, students complete a project selected from topics discussed during each semester.

**Emerging Applications in Oncology and Pharmacogenomics (3 credits)**

Genomics guided treatment is providing the correct drug choice, avoiding unnecessary delays and adverse effects, and improving quality of life for patients. This elective course will explore emerging strategies that leverage germline and somatic DNA information to improve both clinical and therapeutic decision making, using blended learning modalities.

**Communicating in the Age of Predictive Health (3 credits)**

Genomics education is needed to empower health professionals and patients to lead healthy lives. This elective course will explore different print and media modalities to personalize education across the healthcare continuum. Upon completion of this course, students submit an innovative educational product.

**Implementing Learning Health Systems (3 credits)**

A Learning Health System (LHS) embeds research into the clinical operation to rapidly improve the outcomes of individuals, populations, and health care organizations. This elective course will provide an introduction to the infrastructure and core competencies needed to conduct research

within LHSs. During the course, students tour a LHS and work together to develop a patient centered research project.