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The University Of Toledo

New Graduate Program Proposal

COLLEGE OF GRADUATE STUDIES

* denotes required fields

College*:

Dept/Academic Unit*:

--Select a Department--

Contact Person*: Phone: (xxx . xxx) Email:

Program Code*:

Program Name*:

Degree to be granted (if applicable):

Minimum number of credit hours for completion*:

Proposed effective term: (e.g. 201140 for 2011 Fall)

List all courses which comprise the certificate or degree and identify term offered (summer/fall/spring):

Identify delivery method (Online/in class/off campus):

Attach the OBOR new program proposal:

Additional Attachment

Program Approval:

Department Curriculum Authority:

Date



Department Chairperson:

Date



College Curriculum Authority or Chair:

Date



College Dean:

Date



Graduate Council:

Date



The University Of Toledo

NEW PROGRAM PROPOSAL FORM

Administrative Use Only			
Code: PROG	<input type="text"/>		
Date Received:	/	/	(mm/dd/yyyy)
Effective Date:	/	/	(mm/dd/yyyy)

* denotes required fields

Please list the proposed program structure. Attach additional pages as necessary.

College*: Dept/Academic Unit*:

Contact Person*: Phone: (XXX - XXXX) Email:

Program Name*: Minor Major (new major requires OBOR approval)

Degree to be granted (if applicable): Program Level: Undergraduate Graduate

Minimum number of credit hours for completion*:

Describe Program:

Attachment (If more than 5000 bytes are needed for the program description):

No file chosen

Department Curriculum Authority:



Date Month / Day / Year

Department Chairperson:



Date Month / Day / Year

College Curriculum Authority:



Date Month / Day / Year

College Dean:



Date Month / Day / Year

After college approval, submit the original signed form to the Faculty Senate (UH 3320) for undergraduate-level courses; for graduate-level courses submit


the original signed form to the Graduate School

(UH3240).

FS Acad. Programs or Graduate Council:

Office of the Provost :

Registrar's Office:



Date: 4 / 17 / 2022

Date: / /

Date: / /

**M.S. in Biomedical Science: Professional in Biomarkers and Diagnostics
Starting in Fall 2011**

Program Director: Dr. Keith Crist
(Contact: <http://www.utoledo.edu/med/grad/>)

I. Objectives

The primary objective of this program is to offer a Master of Science (MS) program in Biomedical Science with a concentration described as Professional in Biomarkers and Diagnostics (MSBS-PBD) as a terminal degree with immediate employment prospects in industry. The MSBS-PBD degree is a “job ready” degree. This will be achieved by a three pronged approach:

- To prepare master’s students with a strong foundation in the fundamentals of Biomarker discovery and development through focused course work.
- To complement their science education through course work in management, orienting them to realities of the business aspects of the pharmaceutical industry.
- To place them as interns in a large pharmaceutical-oriented company for four months to enhance their practical training and employability.

II. Targeted Students: The MSBS-PBD program will be targeted to students completing a B.S. in Chemistry or a Biological or Pharmaceutical Science.

III. Curriculum and Schedule:

Four Current Problems courses make up the Biomedical Science core. Proteins and Genes are each 2.5 credits; Membranes and Signal Transduction are each 3 credits. Biomarkers are potentially associated with any regulatory aspect of cellular function that is altered by the disease process. This core provides broad coverage organized to highlight areas that are currently hot topics in research.

The Bioinformatics core is comprised of 3 courses of 3 credits each, Fundamentals of Bioinformatics, Proteomics and Genomics; Intro to Bioinformatic computations; and ~~Advanced~~ Statistics to address analyses appropriate to the large data sets that result from expression analyses.

A survey course of Biomarkers and Personalized Medicine for 3 credits, a Readings course for 1 credit and the summer internship experience for 6 credits make up the Biomarker core. This will provide a survey of current topics in Biomarker discovery and their application to diagnostics and clinical management decisions. The summer internship will provide an intensive, supervised work experience within a company oriented to the pharmaceutical industry so that those who graduate will have a detailed understanding of the discovery and implementation process.

Three courses of 3 credits each make up the Business core. Performance Management, Leading with Power and Influence, and Leading and Developing Yourself are designed to help students analyze and develop their leadership strengths and competencies, and to practice core leadership skills, including performance management, interpersonal relationship-building, improving their social intelligence, and the appropriate use of power and influence.

Detailed course listing:

Current Problems and Research Applications in Protein Structure - BMSP 633 - 2.5 credits - The course will cover principles of protein structure/function relationships in proteins, protein folding, ligand-protein interactions and mechanism of enzyme-catalyzed reactions. Special emphasis will be given to the present-day research.

Current Problems and Research Applications in Genes/Genomics - BMSP 634 - 2.5 credits - This course provides an introduction to major areas of current research in genetics and molecular biology. Topics include gene structure and regulation, DNA replication, recombination, repair, mutation, and quantitative genetics.

Current Problems in Cell Membranes - BMSP 636 - 3 credits - This course will explore vital roles played by plasma and intracellular membranes in communication and homeostasis, and by membrane lipid/protein interactions in defining cytoarchitecture, protein sorting, excitability and synaptic transmission.

On Being a Scientist - INDI 602 - A series of one-hour lectures dealing with the ethics, regulations, and issues facing a modern, biomedical research scientist

Performance Management - HURM 6730 - This course is designed to provide practical working knowledge of the processes of setting expectations, monitoring performance, coaching and developing employees, and assessing and rewarding good performance in rapidly changing organizations

Fundamentals of Bioinformatics and Proteomics - BIPG 510 - credits 3 - This course introduces the student to the powerful tools developed to access and analyze biological sequence and structural information. The topics include sequence databases, sequence comparisons, database searches, phylogenetic analysis, protein structure, proteomics, RNA structure prediction, gene prediction and identification, genetic analysis of disease, and microarray studies of gene expression

Cell Biology and Signaling - BMSP 635 - 3 credits - The content of this course will encompass didactic lectures on current knowledge and methodological approaches in the area of fundamental cellular processes and cell communication

Leading with Power and Influence - MGMT 6160 - The primary focus of this course is the effective use of political and social influence in organizations. This course will develop the ability to recognize, analyze, and apply sources of power and influence beyond formal authority.

Leading and Developing Yourself - MGMT 6150 - The course explores how one's own leadership competencies can be developed and applied most effectively in a variety of situations.

Introduction to Bioinformatics Computations - BIPG 610 - The main goal of this course is to provide basic programming skills to biological and medical students who may lack a

background in computer sciences. Programming will be specifically taught using important biological examples, focusing in particular on the PERL language. Students will be made familiar with UNIX environments, including Linux and OSX.

Biomarkers and Personalized Medicine - BIPG 620 - Unit 1 of this survey course will explore the clinical need and methodological approaches to biomarker development and validation. Unit 2 will consider biomarker use for diagnostics and treatment in individualized medicine.

~~Advanced Statistics BIPG~~ Biostatistical Methods for Biomarkers - BIDI 500 - The course focuses on statistical methods for biomarkers to address various issues arising from studies assessing biomarkers in biomedical research and including associations with certain diseases or health conditions. The course presents both basic and advanced topics.

Readings in Biomarkers and Diagnostics BIDI 520 - Review of selected research topics related to Biomarkers and their application to diagnosis. Student discussion will be moderated through the Blackboard course management system by the course director.

Internship BIDI 510 - Supervised full time work experience in Biomarker discovery and validation in a pharmaceutical oriented company. Builds upon didactic course work.