The Interdisciplinary Program in Biomedical Sciences (IDP) is committed to providing a broad and integrated education in biomedical science. This education is designed to serve the students well as they move on to pursue specialized research projects. During the first year, students take a core curriculum designed to provide a foundation in biochemistry, cell biology, genetics, immunology, microbiology, pharmacology, physiology, signaling, laboratory techniques, and biostatistics. Students also take 4-6 credits of elective courses and manuscript and grant writing courses to help better prepare them for their chosen field of interest. Finally, two professional development courses provide students the opportunity to gain experience in various professional scientific skills.

Students also explore their individual research interests through four laboratory rotations that emphasize experimental design and integration into a research team. Students are encouraged to take advantage of the diversity of opportunities in the six participating departments. Once a student selects a dissertation advisor, they become affiliated with one of the following graduate programs: Biochemistry; Biophysics; Cell and Developmental θ Tw 0Tw 0Tw

In addition to the general

lecture format, but discussion sections and data interpretation discussions are also included. Students are expected to gain fundamental knowledge in the areas of gene regulation, translational and posttranslational control and cellular architecture.

3 credits.

FBS III builds on the cell biology fundamentals introduced in the latter part of FBS I and II. This

. 1 credit.

Professional Development follows a multidisciplinary approach to promote individual career development in the biomedical sciences. The course includes lectures, discussion, sessions, seminars, and hands-on activities. Topics of particular emphasis are oral and written communication and rigor and ethics in scientific research.

1 credit.

This course will present a step-by-step approach to putting together a scientific paper. Students will be divided into small groups, and these groups will stay together for the

experimental design including critical control experiments. In addition, discussions include methods learned in the first-year curriculum that might have been applied but were not. From these analyses, students hone their critical thinking and communication skills.

1 credit.

Suitable for all students interested in developing critical thinking skills through literature examples of protein activity and its regulation. In this course, students and instructors use the

0.5 credit.

Graduate Neuroanatomy is a lab-based course intended to accompany MCW course Fundamentals of Neuroscience. The purpose of this course is to introduce 1st year PhD students to the anatomy of the human nervous system.

3 credits.

Advanced Cell Biology is an upper level, 3-credit hour cell biology elective course that focuses on a variety of advanced topics in contemporary Cell Biology. Students gain an in depth understanding of specific selected topics through the use of a variety of resources including webinars and podcasts, detailed in-class discussion of papers from the scientific literature and through preparation and presentation of a lecture on a cell biological topic directly relevant to the student's own research interests. Lectures by faculty are minimized.

1 credit.

This course is mainly a didactic based course that comprehensively reviews subjects important to metabolism. The topics covered range from carbohydrate metabolism to oxidative phosphorylation to lipid and amino acid metabolism. There is a strong focus of these topics in health and disease, especially as they related to the cardiovascular system, cancer, diabetes, and immune system function. The depth of coverage within each topic is not necessarily comprehensive, but there may be a few aspects of each topic that are highlighted by focusing on landmark studies or recent developments from published articles. In addition, the discussions include methods learned in the first-year curriculum that might have been applied but were not.

2 credits.

This course presents advanced concepts in cellular signaling by analyzing the molecular mechanisms responsible for the therapeutic benefit, unanticipated toxicity, and limited effectiveness of particularly well-known drugs that target specific signal transduction pathways. The topics are designed to promote an enhanced understanding of the complexities of multiple signaling pathways, and a sophisticated appreciation of how these pathways are integrated to produce cellular responses. The course has a translational emphasis by focusing on the multiple molecular actions of current FDA-approved drugs, as well as discontinued drugs that were removed from the market due to unanticipated toxicity or limited effectiveness. The lectures provide an advanced analysis of the molecular responses that led to the success or failure of these drugs, encouraging students to develop sophisticated analytical skills that allow them to define how different signaling pathways are integrated. Lectures presented by instructors provide an in-depth overview of different signaling pathways, and manuscript discussions promote additional advanced analysis that creatively engages the students.

1 credit.

Cognitive neuroscience examines human brain information processing at the level of large-scale neurobiological systems. Some examples include information processing that underlies learning and retrieving concepts, comprehending, and producing language, directing, and maintaining attention, and recognizing sensory objects. Each session in this course begins with a 1-hour contextual lecture, followed by review and discussion of two relevant landmark papers, sometimes with opposing views. Emphasis is placed on understanding the processing models central to each domain, the extent to which these models are supported by empirical evidence from neuroimaging, and the relevance of the field to a variety of human brain disorders.

3 credits.

This course will use a variety of didactic lecture, paper discussions, and hands on bioinformatics learning to provide students with fundamentals in genomics, transcriptomics, proteomics, genetic manipulation, epigenetics, protein modeling and molecular simulation. Theory, practical applications, and analysis methods will be taught.