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PIOL 301 Functions of the Human Body (5 Credit Hours)
This course explores major organ systems in an integrative fashion covering all aspects from physiology to metabolic biochemistry. Emphasis is placed on understanding key concepts of normal physiological and biochemical systems in healthy humans.

PIOL 401 Physiology (4 Credit Hours)
This course integrates the contents of two sections of the medical school (M1) course Function of the Human Body course (PIO L301); with additional meetings to present discuss papers at graduate level (2 paper presentations per graduate student). In the Fall semester, students will review cell physiology and autonomic neuroscience, and will learn cardiovascular and renal physiology in depth. The course topics will include introductory cell & neurophysiology, skeletal and smooth muscle, cardiac electrophysiology, EKG, cardiac muscle mechanics, circulation, special circulations, and renal physiology. In the Spring semester, students will learn pulmonary, acid-base balance, gastrointestinal, endocrine, and reproductive physiology. Instructor Consent Required.
Outcomes:
Students familiar with introductory physiology are expected to learn and understand cardiovascular, reproductive and endocrine systems in an integrative fashion in this course; Emphasis will be placed on understanding key concepts of normal physiological and biochemical systems in healthy humans; Selected aspects of pathophysiological processes will be discussed to illustrate how an understanding of normal function can be applied to clinical medicine.

PIOL 410 Intro to Research (1-3 Credit Hours)
This course provides an introduction to a wide variety of commonly used techniques in cell and molecular physiology research, with concomitant laboratory rotations to learn those techniques.

PIOL 412 Research (1-6 Credit Hours)
Independent research for thesis or dissertation under the supervision of a faculty research advisor. Credit varies based upon assigned effort and time spent in the laboratory. Students receive a letter grade from their research advisor.

PIOL 414 Graduate Colloquy (1-8 Credit Hours)
Special advanced topics course with variable credit. Paper discussion and instructor-led presentations.

PIOL 416 Research Seminar (1 Credit Hour)
Seminar presentation on PhD candidate's dissertation topics advance.

PIOL 417 Cellular Physiology (3 Credit Hours)
Pre-requisites: Restricted to Master of Physiology Program students
The major goal of the Cellular Physiology course is to define the molecular and cellular basis of systems Physiology and Pathophysiology. The course consists in distinct sessions of teaching, problem solving, and reviews.
Outcomes:
- Understand the relationships among molecular, cellular and systems physiology; - Understand membrane structure and function; - Understand distinct metabolic and signaling pathways

PIOL 420 Methods/Technical in Physiological Research (2 Credit Hours)
This course is intended for students seeking advanced knowledge of cutting-edge experimental approaches currently used in cardiovascular, metabolic, and neuroscience research. These topics will be discussed in both a technical/methodological sense, and in the context of the current scientific literature.

PIOL 421 Function of the Human Body I (4 Credit Hours)
This course will present the basic concepts and principles of human physiology. The course topics will include: introductory cell & neurophysiology, skeletal and smooth muscle, cardiac electrophysiology, EKG, cardiac muscle mechanics, circulation, special circulations and pulmonary physiology. The format will be lectures, simulations, small group problem sessions and scheduled reviews. Small group problem sessions will be held after each subject area and will focus on clinical application and integration of conceptual information presented in lectures. Small group sessions and reviews also will provide the student with the opportunity to obtain clarification from instructors of any outstanding questions and are designed to encourage active learning, as well as develop critical thinking and problem solving skills. Students will be evaluated by multiple choice and essay exams given after each of the 5 major topic areas. Course material will be geared toward non-thesis Masters students. Given that physiology is the basis of medicine, this course will prepare students with the basic science knowledge to successfully continue their professional development in future biomedical programs.
Outcomes:
Students will be able to describe the cellular mechanisms responsible for cardiac, skeletal and smooth muscle contraction and the factors that regulate their activity.

PIOL 422 Function of the Human Body II (4 Credit Hours)
Enrollment limited to Masters of Science in Physiology students. This course presents the basic concepts and principles of human physiology. The course will be presented over one semester and the topics include: renal, acid-base balance, gastrointestinal, endocrine, and reproductive physiology. The format will be lectures, small group problem sessions and scheduled reviews.
Outcomes:
Students will be able to explain the cellular mechanisms responsible for normal renal, acid-base, endocrine, gastrointestinal and reproductive physiology.

PIOL 423 Biochemical Physiology (3 Credit Hours)
Biochemical Physiology will give students knowledge of foundational processes that dictate cellular physiologic processes. Topics include the structure and properties of nucleic acids, amino acids, protein structure and folding, enzyme kinetics, metabolic pathways and intracellular signal transduction. The course will present the biochemical physiology.
Outcomes:
Student completing this course should: - Understand the biochemical mechanisms which underlie physiological processes; - Understand protein structure dynamics and how these structures are dictated by second
**Physiology (PIOL)**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PIOL 430</td>
<td>Basic Human Anatomy (2 Credit Hours)</td>
<td>2</td>
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<tr>
<td>PIOL 446</td>
<td>Cardiovascular Journal Club (1 Credit Hour)</td>
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<tr>
<td>PIOL 450</td>
<td>Fundamentals Of Neurophysiology (4 Credit Hours)</td>
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<tr>
<td>PIOL 461</td>
<td>Introduction to Human Pathophysiology (5 Credit Hours)</td>
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<tr>
<td>PIOL 468</td>
<td>Neurophysiology Journal Club (1 Credit Hour)</td>
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<tr>
<td>PIOL 470</td>
<td>Excitability &amp; Ion Transport (1-4 Credit Hours)</td>
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<tr>
<td>PIOL 472</td>
<td>Structure/Function Membrane Proteins (3 Credit Hours)</td>
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<tr>
<td>PIOL 500</td>
<td>Professional Development I (3 Credit Hours)</td>
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<tr>
<td>PIOL 501</td>
<td>Professional Development II (1 Credit Hour)</td>
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<td>PIOL 595</td>
<td>Thesis Supervision (0 Credit Hours)</td>
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<tr>
<td>PIOL 600</td>
<td>Dissertation Supervision (0 Credit Hours)</td>
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<tr>
<td>PIOL 605</td>
<td>Physiology Study (0 Credit Hours)</td>
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**Pre-requisites:**

- **PIOL 430:** Must be enrolled in the MSP program. Professional Development will meet once/month throughout the one-year MSP program. Students will receive bi-weekly, specific individualized one-on-one mentoring from their academic advisors and also meet with the course director for specific lectures on their AMCAS and AACOMAS applications for medical and DO schools. Students will continue to enhance their knowledge of the admissions process by having general lectures and individual sessions discussing their motivation, enhancing their self-awareness, writing their personal statements, their selection of appropriate medical schools, selection of activities (community and medical volunteering, health care exposure (shadowing, scribing, etc.), research for their application, overall discussions on writing their secondary statements, choice of letters of recommendation, etc. MSMP students only.  

**Outcomes:**

Students will be able to understand the curriculum and admission requirements of the various professional health programs and gain an understanding of the interview process.