Syllabus
Developmental Cell Biology and Systems Physiology (ANAT 6182)

COURSE DESCRIPTION:
In this course, students will attain knowledge about the fundamental processes of how a body develops and maintains itself as a functional organism. Students are introduced to developmental and stem cell biology; tissue inductions and patterning during organogenesis; and the formation of major organs and tissue systems. They will develop an understanding of how major organs and tissue systems work and integrate; how tissue structure relates to tissue function; how injury leads to dysfunction and its clinical signs; how organ function can be assessed; and how this information can potentially be used for tissue repair and regeneration.

LEARNING OBJECTIVES:
As a result of completing this course, students will be able to:
1. Synthesize the rapidly evolving knowledge on stem cells;
2. Apply cell fate signaling networks to developmental processes;
3. Describe the basic principles that govern the formation and function of major body organs and tissue systems;
4. Describe the underlying causes and mechanisms of endocrine, cardiovascular and neurodegenerative disorders;
5. Apply concepts on organ and tissue system formation to therapeutic applications.

CREDIT HOURS: 4

COURSE DIRECTORS: Dr. Robert Hawley and Dr. Narine Sarvazyan

PREREQUISITE: Permission of instructors

LECTURE CONTACT TIME/HOURS: Three two-hour long lectures per week

TIME AND CLASSROOM: M, T, W from 10:00 am to 12:00 non except when midterm exams are scheduled; Ross Hall 643

EXAMINATIONS AND GRADING:
The final grade will be based on four exams:
• Exam 1 (25%) will be on the material covered in weeks 1-2 (Developmental/Stem Cell Biology) and will consist of 48 multiple choice questions (8 questions/ 2 hr lecture); it will be in class exam on November 2, 2015;
• Exam 2 (25%) will be on the material covered in weeks 3-4 (Tissue Formation and Repair) and will consist of 48 multiple choice questions (8 questions/ 2 hr lecture); it will be in class exam on November 16, 2015;
• Exam 3 (25%) will be on the material covered in weeks 5-6 and will consist of 48 multiple choice questions (8 questions/ 2 hr lecture); it will be in class exam on December 1, 2015;
• Exam 4 (25%) will be on the material covered in weeks 7-8 and will consist of 48 multiple choice questions (8 questions/ 2 hr lecture); it will be in class exam on December 14, 2015;

REQUIRED TEXTS:
There are no required textbooks. Students will be provided handouts of all lectures, which will also be posted on Blackboard together with any relevant review articles.

CLASS POLICIES
Attendance policy: not mandatory, except where indicated
Late work: accepted with permission, penalty may be incurred if unduly late as determined by instructor
Religious Holidays: will be accommodated if requested [NOTE: for university policies on teaching, see http://www.gwu.edu/~academic/Teaching/main.htm]

ACADEMIC INTEGRITY
I personally support the GW Code of Academic Integrity. It states: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: http://www.gwu.edu/~ntegrity/code.html

SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM
DISABILITY SUPPORT SERVICES (DSS)
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- crisis and emergency mental health consultations
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http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices

SECURITY
In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.
FACULTY:

Dr. Matthew Colonnese, Dept. of Pharmacology and Physiology; Email: colonnese@email.gwu.edu

Dr. Joshua Corbin, CNMC Center for Neuroscience Research, Depts. of Pediatrics and Pharmacology and Physiology; Email: JCorbin@cnmcresearch.org

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Dr. Alex Tzatsos, Dept. of Anatomy and Regenerative Biology; Email: atzatsos@gwu.edu

Dr. Tracy Yarbrough, Dept. of Pharmacology and Physiology; Email: tlyarbrough@gwu.edu

LECTURE TOPICS AND SCHEDULE:

Part I: Weeks 1-4

Developmental/Stem Cell Biology

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 19</td>
<td>Embryonic stem cells</td>
<td>R. Hawley</td>
</tr>
<tr>
<td>Oct. 20</td>
<td>Induced pluripotent stem cells</td>
<td>R. Hawley</td>
</tr>
<tr>
<td>Oct. 21</td>
<td>Tissue-specific stem cells</td>
<td>R. Hawley</td>
</tr>
<tr>
<td>Oct. 26</td>
<td>Genetic control mechanisms</td>
<td>S. Moody</td>
</tr>
<tr>
<td>Oct. 27</td>
<td>Germ layer inductions</td>
<td>S. Moody</td>
</tr>
<tr>
<td>Oct. 28</td>
<td>Patterning and organogenesis</td>
<td>S. Moody</td>
</tr>
</tbody>
</table>
## Tissue Formation and Repair

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 2</td>
<td><strong>Exam 1 (8:15 am to 9:45 am)</strong></td>
<td>IN CLASS</td>
</tr>
<tr>
<td>Nov. 2</td>
<td>Hematopoietic system</td>
<td>R. Hawley</td>
</tr>
<tr>
<td>Nov. 3</td>
<td>Endocrine system</td>
<td>A. Tzatsos</td>
</tr>
<tr>
<td>Nov. 4</td>
<td>Cardiovascular system</td>
<td>T. McCaffrey</td>
</tr>
<tr>
<td>Nov. 9</td>
<td>Epithelial systems</td>
<td>M. Stepp</td>
</tr>
<tr>
<td>Nov. 10</td>
<td>Central nervous system</td>
<td>J. Corbin</td>
</tr>
<tr>
<td>Nov. 11</td>
<td>Immune system</td>
<td>D. Leitenberg</td>
</tr>
</tbody>
</table>

## Part II: Systems Physiology: Weeks 5-8

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Instructor</th>
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</thead>
<tbody>
<tr>
<td>Nov. 16</td>
<td><strong>Exam 2 (8:15 am to 9:45 am)</strong></td>
<td>IN CLASS</td>
</tr>
<tr>
<td>Nov. 16</td>
<td>Action potential and synaptic transmission</td>
<td>M. Colonnese</td>
</tr>
<tr>
<td>Nov. 17</td>
<td>ECG and autonomies</td>
<td>D. Mendelowitz</td>
</tr>
<tr>
<td>Nov. 18</td>
<td>Skeletal and smooth muscle</td>
<td>P. Marvar</td>
</tr>
<tr>
<td>Nov. 23</td>
<td>Hemodynamics</td>
<td>N. Sarvazyan</td>
</tr>
<tr>
<td>Nov. 24</td>
<td>Pulmonary physiology</td>
<td>S. Ceryak</td>
</tr>
<tr>
<td>Nov. 25</td>
<td>No class</td>
<td></td>
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<tr>
<td>Nov. 30</td>
<td>Heart</td>
<td>N. Sarvazyan</td>
</tr>
<tr>
<td><strong>Dec. 1</strong></td>
<td><strong>Exam 3 (8:15 am to 9:45 am)</strong></td>
<td>IN CLASS</td>
</tr>
<tr>
<td>Dec. 1</td>
<td>Renal physiology</td>
<td>N. Sarvazyan</td>
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<tr>
<td>Dec. 2</td>
<td>Sensory systems</td>
<td>A. LaMantia</td>
</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Instructor</td>
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<tr>
<td>Dec. 7</td>
<td>Endocrine physiology</td>
<td>T. Yarbrough</td>
</tr>
<tr>
<td>Dec. 8</td>
<td>Gastrointestinal physiology</td>
<td>S. Ceryak</td>
</tr>
<tr>
<td>Dec. 9</td>
<td>Reproduction</td>
<td>T. Yarbrough</td>
</tr>
<tr>
<td>Dec 14</td>
<td>Exam 4 (8:15 am to 9:45 am)</td>
<td>IN CLASS</td>
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</tbody>
</table>
Grading

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ANAT 6212 Syllabus
Developmental Cell Biology and Systems Physiology
Fall 2015

Faculty

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