SYLLABUS
Human Microscopic Anatomy (ANAT 6150)

DESCRIPTION:
ANAT 6150 is a graduate course for certificate level designed to provide knowledge about the normal histological structure of cells, tissues and organs of the human body with a strong emphasis on the clinical relevance. Because there is an inseparable relationship between structure and function, emphasis is placed on structural-functional correlates at both the light and electron microscopic levels. Descriptions of alterations in normal histology through disease or injury provide an understanding of the etiology of various diseases, including cancer. Histological terms and concepts are taught for the purpose of identification and precise communication. Students will also have access to virtual histological slides tailored to the content of the lectures, such that students will become fluent in identifying structures and their functional relationship with specific organs.

LEARNING OBJECTIVES:
1) Describe the basic structure of a cell, including the function of membranes and organelles.
2) Describe how the type and histological arrangement of the cells present within tissues and organs of each major body system relate to the function of those tissues and organs.
3) Recognize how histological structure and function relate to the etiology of various disease states.
4) Write an in-depth review article on a topic in molecular histopathology.

CREDIT HOURS: 3

PREREQUISITE: Introductory Biology for Science or non-Science Majors. Enrollment in the Graduate Certificate in Anatomical and Translational Sciences or permission of the Director of the Graduate Certificate.

LECTURE CONTACT TIME/HOURS: two 1-hour 15-minute lectures per week, scheduled on Tuesdays and Thursdays; Room TBD

LABORATORY SESSIONS: Virtual laboratory sessions correlating with the weekly lecture contents will be available for students, both as a virtual slide collection and with a faculty developed online atlas and manual. Access to the virtual slide collection

Access these slides from any computer by going to gwu.slidehosting.com and logging in with the shared student credentials:
Username: GWSMHS
Password (case sensitive): Ross

To setup your iPad app:
1. Open Aperio ePath Viewer.
2. Click the Add Site button at the bottom left side of the screen.
3. Type in gwu.slidehosting.com and press return to verify the site appears.
4. Click the + button next to the site address.
5. Type a name for the Bookmark (i.e. GWU SlideHosting).
6. Press the Save button on the right.
7. Click OK and the new Website appears at the bottom of the list.
METHOD OF ASSESSMENT: Three multiple choice and short answer written exams, each worth 25% of the final grade, and one written assignment (review article on a specific topic) worth 25% of the final grade due at the end of the semester. For the review article, students will choose a topic of their interest, which has to be approved by the course director. The focus of the review article should be on the histological differences between normal and disease states, and link the histological alterations with the corresponding molecular changes. The review article should also include one paragraph to outline the histological techniques employed. Complete instructions regarding the structure and length of the review article will be posted on blackboard.

FACULTY:

1) Alexandros Tzatsos M.D., Ph.D. Course Director
   Asst. Professor of Anatomy & Regenerative Biology
   226E Ross Hall GWU SMHS 2300 I St NW
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2) Rosalyn Jurjus, M.D., Ph.D. Assistant Course Director
   Asst. Professor of Anatomy & Regenerative Biology
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3) Janette M. Krum, Ph.D.
   Assoc. Professor of Anatomy & Regenerative Biology
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   e-mail: jmkrum@gwu.edu

4) Kurt E. Johnson, Ph.D.
   Professor of Anatomy & Regenerative Biology
   214 Ross Hall GWU SMHS 2300 I St NW
   e-mail: kurtj@email.gwu.edu

5) Anastas Popratiloff, M.D., Ph.D.
   Assoc. Professor of Anatomy & Regenerative Biology
   Center for Microscopy and Image Analysis, 120/121 Ross Hall
   GWU SMHS 2300 I St NW
   email: anastas@gwu.edu

REQUIRED TEXTBOOK:

ISBN: 978-0781772006. This book presents in-depth coverage of the microanatomical, physiological, and clinical aspects of human cells, tissues and organs and is used in the medical microscopic anatomy course. It examines the relationship between basic science and microscopic anatomy and describes potential clinical disorders arising out of cell biological problems, as covered in the course. It has student consult online access to enhance student’s knowledge.
READING LIST: Appropriate Reference Articles (TBD)

CLASS POLICIES
Attendance policy: mandatory
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)
Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: http://gwired.gwu.edu/dss/

UNIVERSITY COUNSELING CENTER (UCC) 202-994-5300
The University Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include:
- crisis and emergency mental health consultations
- confidential assessment, counseling services (individual and small group), and referrals
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.

2015 Class Schedule for Human Microscopic Anatomy (ANAT 6150)
9:45 – 11:00 a.m. Tues. & Thurs. in Ross Hall 105

<table>
<thead>
<tr>
<th>Session and Date</th>
<th>Topics for Discussion</th>
<th>Readings &amp; Assignments Due the Day of Class</th>
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</table>
| Week 1: Tues. 9/1| Introduction to the course- Dr Jurjus  
Principles of Microscopy and Tissue Processing – Dr. Krum  
Biology of Cell Membranes – Dr. Popratiloff | Review relevant assigned readings (textbook chapter or handout) |
| Thurs. 9/3       |                        |                                           |
| Week 2: Tues. 9/8| Cell Organelles I - Dr. Popratiloff | Review relevant assigned readings |


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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Instructor</th>
<th>Study Material</th>
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<tbody>
<tr>
<td>Thurs. 9/10</td>
<td>Cell Organelles II - Dr. Popratiloff</td>
<td>(textbook chapter or handout)</td>
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<td>Week 3: Tues. 9/15</td>
<td>Epithelium – Dr. Krum</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 9/17</td>
<td>Connective Tissue – Dr. Krum</td>
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<td>Week 4: Tues. 9/22</td>
<td>Muscle Tissue – Dr. Johnson</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 9/24</td>
<td>Nervous Tissue – Dr. Jurjus</td>
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<td>Week 5: Tues. 9/29</td>
<td>EXAM I</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 10/1</td>
<td>Blood &amp; Bone Marrow – Dr. Jurjus</td>
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<td>Week 6: Tues. 10/6</td>
<td>Bone &amp; Cartilage – Dr. Johnson</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 10/8</td>
<td>Vascular System – Dr. Popratiloff</td>
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<td>Week 7: Tues. 10/13</td>
<td>Lymphoid System – Dr. Jurjus</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 10/15</td>
<td>Lower Respiratory System – Dr. Johnson</td>
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<td>Week 8: Tues. 10/20</td>
<td>Skin – Dr. Jurjus</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 10/22</td>
<td>Esophagus &amp; Stomach – Dr. Krum</td>
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<td>Week 9: Tues. 10/27</td>
<td>Small &amp; Large Intestines – Dr. Krum</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<tr>
<td>Thurs. 10/29</td>
<td>EXAM II</td>
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<td>Week 10: Tues. 11/3</td>
<td>Liver, Gall Bladder, Pancreas – Dr. Krum</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 11/5</td>
<td>Renal System – Dr. Johnson</td>
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<td>Week 11: Tues. 11/10</td>
<td>Pituitary &amp; Pineal Glands – Dr. Popratiloff</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 11/12</td>
<td>Adrenal, Thyroid and Parathyroid Glands – Dr. Johnson</td>
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<td>Week 12: Tues. 11/17</td>
<td>Female Reproductive System – Dr. Jurjus</td>
<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Thurs. 11/19</td>
<td>Male Reproductive System – Dr. Popratiloff</td>
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<td>Week 13: Tues. 11/24</td>
<td>Eye – Dr. Jurjus</td>
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<td>Thurs. 11/26</td>
<td>Thanksgiving</td>
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<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Week 14: Tues. 12/1</td>
<td>Upper Respiratory System/Upper G.I. System – Dr. Popratiloff</td>
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<td>Thurs. 12/3</td>
<td>Ear – Dr. Johnson</td>
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<td>Review relevant assigned readings (textbook chapter or handout)</td>
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<td>Week 15: Tues. 12/8</td>
<td>Review TBD</td>
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<td>Review article on a topic in molecular histopathology DUE</td>
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<td>FINAL- EXAM III TBD</td>
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For several lectures, additional materials will be posted on the blackboard to help students to understand differences between normal histology and disease and link with the corresponding molecular changes.

**LECTURE TOPICS WITH CLINICAL CORRELATIONS:**

1. Principles of Microscopy and Tissue Processing
2. Biology of Cell Membranes *(Clinical Correlation: Cystic fibrosis)*
3. Cell Organelles I *(Clinical Correlation: Lysosomal storage diseases)*
5. Epithelium
6. Connective Tissue *(Clinical Correlation: Ehlers-Danlos syndromes)*
7. Bone and Cartilage *(Clinical Correlation: Osteogenesis imperfecta)*
8. Muscle *(Clinical Correlation: Myasthenia gravis)*
9. Nervous Tissue *(Clinical Correlation: Multiple sclerosis)*
10. Blood and Bone Marrow *(Clinical Correlation: Leukemias)*
12. Skin *(Clinical Correlation: Epidermolysis bullosa)*
13. Lymphatic System *(Clinical Correlation: Anaphylaxis)*
14. Lower Respiratory System *(Clinical Correlation: COPD)*
15. Esophagus and Stomach *(Clinical Correlation: Ulcers)*
16. Small and Large Intestines *(Clinical Correlation: Celiac disease)*
17. Liver, Gall Bladder and Pancreas *(Clinical Correlation: Alcoholic liver disease)*
18. Renal System *(Clinical Correlation: Kidney stones)*
19. Pituitary and Pineal Glands *(Clinical Correlation: Pituitary adenoma)*
20. Adrenal, Thyroid and Parathyroid Glands *(Clinical Correlation: Grave’s disease)*
21. Female Reproductive System *(Clinical Correlation: Polycystic ovarian syndrome)*
22. Male Reproductive System *(Clinical Correlation: Prostatic carcinoma)*
23. Eye *(Clinical Correlation: Macular degeneration)*
24. Ear *(Clinical Correlation: Cochlear implants)*
25. Upper Respiratory System/Upper G. I. System