REGISTRATION PROCESS:

To register, please email Dr. Michael Riggs (VSC/MIC Bldg. Rm. 302) after reviewing 1) this brief course description, and 2) recommended background courses (below). If you have any questions after reviewing this information please see or contact Dr. Riggs to clarify and he will then request that Kathryn Johansen, ACBS Program Coordinator, enroll you electronically. Please note that the lecture and laboratory are “one course” and cannot be taken separately!

INSTRUCTOR:

Michael W. Riggs, D.V.M., Ph.D.
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TIME/PLACE:
9:30 - 10:45 TTh (lecture); 11:00 - 1:45 Th (lab), VSC/MIC 129

BRIEF COURSE DESCRIPTION:

This course focuses on the fundamental mechanisms and lesions which are common to all mammalian species and which are manifested as various forms of disease. As such, it is a course in General Pathology which emphasizes how different types of disease develop. The course material is presented using a comparative approach that emphasizes the commonalities between disease processes in animal and human species rather than the exceptions, i.e. one health/one medicine. Successful integration of the concepts presented in this course provides the necessary foundation on which future competency in clinical, diagnostic, or experimental medicine (veterinary or human) can be built. Emphasis is placed on pathogenesis, pathophysiology, and morphologic changes at the macroscopic, microscopic, and molecular levels. In lecture, general mechanisms for major types of disease processes are stressed. The laboratory serves to illustrate and clarify material presented in lecture and allows practical, hands-on recognition of disease in organs and tissues at the gross and microscopic levels. Lesioned gross tissue specimens for evaluation in the laboratory will periodically include those obtained from a variety of actual case accessions received by the Arizona Veterinary Diagnostic Laboratory, a division of the College of Agriculture and Life Sciences. Course content is particularly well-tailored to pre-veterinary, pre-medical, and other pre-health related professions students, and provides more than ample preparation for general pathology taught in the veterinary and medical school professional curricula (as well as pharmacy, dentistry, nursing, and PA curricula). However, other undergraduate and post-baccalaureate students in the animal/human health science-related majors should find the course information useful in their professional development. Graduate level requirements will include preparation of a research proposal or review paper on a selected relevant topic chosen by the student and approved by the instructor, and review of course-related publications from the current literature for completion of several written outside assignments.
The course is divided into 5 major sections, each examining disease processes at the cellular, tissue, and body-as-a-whole levels:

- **Tissue Injury and Adaptation**: How tissues are injured by various insults, or alternatively, adapt to withstand insults and maintain homeostasis
- **Inflammation and Repair**: Key elements and events in orchestration of the host inflammatory response; key elements and events involved in the healing process for injured tissues
- **Diseases of the Circulatory System**: Disturbances in blood flow and other hemodynamic abnormalities that lead to a variety of circulatory disorders such as edema, shock, coagulation defects, and tissue death
- **Diseases of the Immune System**: Disease conditions that result from excessive or inappropriately directed immune responses, or alternatively, from deficient or defective immune responses (Note: coverage of Diseases of the Immune System will be limited and subject to availability of time since many students have taken MIC 419 Immunology)
- **Diseases of Cell Growth, focusing on Neoplasia**: Disorders in regulation of normal cell growth and development that result in a variety of lesions, with emphasis on those that culminate in cell transformation leading to benign and malignant tumor formation

**COURSE OBJECTIVES:**

1. Develop a working vocabulary for the language of pathology, and know how and when to use pathology-related terms correctly. Develop and refine oral and written communication skills as they relate to the language of pathology and medicine.
2. Understand, integrate, and be able to apply in a problem-solving fashion, the principle disease mechanisms presented in the course at the whole body, cellular, and molecular levels.
3. Begin to recognize and accurately describe lesions grossly, and to a lesser extent microscopically, and distinguish them from normal tissue findings. Be able to interpret and explain their pathogenesis by understanding the basic mechanisms through which essentially all disease develops. Appreciate the commonalities in pathology, regardless of species (animal, human).
4. Begin to relate lesions to major clinical signs and clinical reference laboratory data, in a general sense.
5. Given a lesion and corresponding patient history, begin learning how to formulate a morphologic diagnosis and differential diagnosis, and suggest a possible pathogenesis and etiology.

**RECOMMENDED BACKGROUND COURSES:**

Completion of six units of upper division VSC/ACBS and/or MIC courses for 423, and six units of graduate level courses in VSC/ACBS, IMB, or PCOL for 523, or instructor approval, is required for enrollment. The single most appropriate and important foundation courses for the study of principles of disease in this course are 1) normal anatomy and physiology (e.g. VSC/ACBS 400A and 400B: Animal Anatomy and Physiology, or a suitable alternate for more human health-oriented students, e.g. PSIO 201 and 202: Human Anatomy and Physiology, or equivalents), and 2) normal histology, i.e. microscopic anatomy of cells and tissues (e.g. VSC/ACBS 422L/422R: Applied Histology, OR an alternate, such as Biology 157: Basic Histology for Anatomy & Physiology – a 1 credit self-paced course offered online every fall and spring through Pima Community College, OR CMM 425A – a 4 credit course offered online each spring at UA). If your schedule allows, concurrent registration in the 1 credit self-paced online
The histology course through Pima is recommended, OR if your schedule allows, concurrent registration in the 4 credit online histology course through UA would be even better, OR you can easily get up to speed on your own (see below). The course introduction for Mechanisms of Disease will include a very brief one-lab review of normal histology for selected major organs since VSC/ACBS 422 Histology has not been offered in recent years. Thereafter we will examine only diseased tissues. If you don’t know what the normal tissue histologic appearance is, how can you tell if it’s diseased or otherwise abnormal?!

Please note that a basic understanding of normal structure and function will greatly facilitate successful integration of the information on disease to be presented in this course. For students lacking the above suggested background courses, some additional outside self-paced study before or during the first part of the semester will be necessary to get the most from this course. In such cases, references will be suggested as needed for review of the general topographic gross anatomy of major organs, the basic normal physiology of selected organ systems (i.e. how major organs normally function), and the normal microscopic anatomy of selected tissues/organs. Students need not review every detail, just general concepts in the above topics - e.g. for histology, just the general microscopic features, starting with those that allow you to simply identify what tissue it is you are looking at under the microscope!

As a first and highest priority, the focus of review of normal gross anatomy, physiology, and histology should be on the following selected tissues/organs which will be used to illustrate disease mechanisms during the course:

*** lung, liver, heart, kidney, skeletal muscle, small intestine, lymph node, skin, thyroid gland, pancreas, and spleen ***

These are the tissues/organs that will be used in >95% of the labs, only they will have lesions (i.e. be abnormal). Recognizing “abnormal” requires basic knowledge of “normal”! These same tissues/organs will be used over and over in each lab, but the types of lesions they contain will differ with each course section. Getting up to speed on normal for each of the above 11 tissues is entirely doable on your own, and even more so if you are able to take histology online.

GRADES:
Exams and outside assignments will be weighted as follows for determining the final course grade for undergraduate students registered at the 423 level:

| Exam I – February 25th | 31% |
| Exam II – April 7th | 31% |
| Final Exam – May 10th | 31% |
| Outside assignments (see schedule for due dates) | 7% |
| **100%** |

Exams, the research proposal or review, and outside assignments will be weighted as follows for determining the final course grade for graduate students registered at the 523 level:

| Exam I – February 25th | 25% |
| Exam II – April 7th | 25% |
| Final Exam – May 10th | 25% |
| Research Proposal/Review – due NLT May 6th | 20% |
| Outside assignments (see schedule for due dates) | 5% |
| **100%** |