**BSC448 - Introductory Immunology (Spring 2018)**

M, W, F 12p – 12:50p

Science 374

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Office hours: T 3:30 - 5pm; W 1 - 2:30pm or by appointment. I make every effort to keep my scheduled office hours. Please be aware that sometimes I have conflicts with required meetings and cannot be present. If you need to meet it is best to e‐mail me ahead of time. **Please use above e‐mail account to contact me and NOT the MUOnline site.**

**UNIVERSITY POLICIES**: By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to [www.marshall.edu/academic-affairs/policies/](http://www.marshall.edu/academic-affairs/policies/). Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment

**COURSE DESCRIPTION:** Comprehensive study of the molecules, cells, and processes of the immune system. Also covered are diseases with an immunologic basis and technological applications of immunological principles. (PR BSC121. Recommended BSC322)

Topics will include development of the immune system, innate and specific immunity, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex reactions and antigen presentation, lymphocyte receptors (genetics, structure, selection), cell activation and effector functions, cytokines, phagocytic cell function, immune responses to infectious organisms, autoimmune diseases, and immune models.

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| **Course Student Learning Outcomes** | **How students will practice each outcome in this course** | **How student achievement of each outcome will be assessed in this course** |
| * Describe innate and adaptive immunity, the mechanisms of immune effector functions, and their associated cell populations | Reading case studies and primary literature; lectures | Class participation; Exams; Writing assignments |
| * Identify pathogen transmission and modifications of virulence in populations and immune consequence of exposure. | Case studies; Class discussion and primary literature. | Class participation; Exams; |
| * Demonstrate an understanding of structure and function relationships using analyses of disease and the immune system. | Lectures; Class discussion and assigned readings. | Class participation; Exams; Writing assignments |
| * Understand the nature of immune cell differentiation and activation by antigens. | Lectures; Preparing notes on readings; Responding to questions in class; Class discussion | Class participation; Exams |
| * Contrast defense mechanisms in living organisms and evaluating physical and physiological barriers to pathogens. | Lectures; Preparing notes on readings; Responding to questions in class; Class discussion | Class participation; Exams; Research Paper; |
| * Recognise immune-based diseases and pathogenesis of immunological diseases | Reading case studies; Responding to questions in class; Class discussion; Lectures | Class participation; Exams; Research Paper; web site analysis |
| * Show development written communication skills | Feedback on writing assignments. | Research Paper and web site analysis |

**REQUIRED READING:** Kuby Immunology 7ed. (2013) Owen, Punt & Stranford

\*\* Lecture notes and additional course readings and supplements will be posted on course website at **http://www.marshall.edu/muonline.** Students must access this site for additional information and updates throughout the semester.

**COURSE OBJECTIVES:** As a result of successfully completing this course, the student will be able to do the following:

* Demonstrate a comprehensive and practical understanding of basic immunological principles.
* Describe the various cells and organs involved in the immune system, including the role of each during an immune response.
* Differentiate between innate and adaptive immunity; humoural and cell mediated immunity including their specific components and effector mechanisms.
* Describe the immune response to infectious diseases, cancer, tissue transplants, and allergens.
* Explain the mechanisms and differences between primary and secondary responses and their relevance to immunizations.
* Discuss current immunology news and issues.

**ATTENDANCE POLICY: Attendance is mandatory**. Missing more than 3 unexcused sessions during the semester will result in the lowering by one letter grade of overall course score. You are responsible for any material missed by being absent. Absences due to illness, death in the immediate family, or institutional activities will be excused with the appropriate written notification to the instructor. See Marshall University Undergraduate Catalogue ‐ Academic Information for guidelines. Until final grades have been submitted you are expected to keep copies of all submitted and graded work (quizzes, papers etc).No makeup exams will be permitted without an official excuse sent by Dean of Students office. Form available at http://www.marshall.edu/student-affairs/excused-absence-form/

**WITHDRAWAL:** If you are not happy with your academic performance in this class please come see me. Students should keep the W date for this semester clearly in mind. Do not just stop attending. This will result in an F on your transcripts.

***ACADEMIC DISHONESTY IN ANY FORM WILL NOT BE TOLERATED***.

All written assignments, quizzes, and exams are to be independent efforts of each student. If you have any questions please ask.

**GRADING SCALE**: 100 ‐ 90 = A; 89 ‐ 80 = B; 79 ‐ 70 = C; 69 ‐ 60 = D, < 59= F

**ASSESSMENT OF STUDENT ACHIEVEMENT**

**Assignment Weighting**

Exams (4) 70

Research Paper 15

Report of Web sites10

Attendance and participation 5

**TOTAL possible points: 100**

**Writing Assignments**

**1. Reports of Web site:** There are many websites touting the efficacy of homeopathic or herbal treatments, surgical procedures, or FDA approved medications for immune dysfunction (e.g. chronic cerebrospinal venous insufficiency angioplasty (CCVI); bee venom; magnets; diet; colloidal silver; Airborne etc.). Analyse such a site for accuracy of immunological information. Your paper must include your opinion of the sites supported by facts and a strong conclusion. All papers must be received by the deadline of 5 p.m. Friday, March 30. You must submit electronically to locascio@marshall.edu (request delivery receipt). You will lose 10% total grade if received after 5 p.m. and an additional 10% for each day after.

**2. Research Paper**: Choose a topic related to immune function. This could be a disease process, development of immunity to a pathogen or explanation of immunotherapy. You must include a discussion from a cellular level. Please select your topic and have it approved by me prior to March 12.

All papers must be received by the deadline of 5 p.m. Friday, April 13. You must submit electronically to locascio@marshall.edu (request delivery receipt). You will lose 10% total grade if received after 5 p.m. and an additional 10% for each day after.

Paper length should be 5 double spaced typed pages (excluding reference page or illustrations) with 12pt. font and 1" margins. Citations can be in style of your choosing but must be consistent throughout paper.

I am interested in learning about your chosen subject and value your opinion. If you are only paraphrasing from selected sources this is an incomplete paper.

You will be graded on the substance of your writing as well as the correct usage of grammar, spelling, and organization.

**Grading Criteria for both writing assignments:**

**10 points. Objectives**

Clearly stated intent of paper. What will be learnt or reinforced from reading?

**10 points. Narrative**

Present background information necessary to understand topic.

**10 points. Analyses**

Identify the main issues that relate to your objectives. There is appropriate depth and accuracy of information.

**10 points. Format**

All writing is free of grammar and spelling errors. There is a clear and concise presentation of ideas with good organization.

**5 points. Resources**

Avoid using all internet sources and total reliance on Wikipedia. Include at least three peer reviewed sources.

**5 points. Timeliness**

Paper was received by deadline.

# CLASS SCHEDULE [Subject to Change]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **WEEK OF** | **TOPIC** | **READINGS** | **ASSIGNMENTS & ASSESSMENTS** |
|  | **8 JAN** | Introduction; Cells, Organs, and Microenvironments of the Immune System | Ch 1 & 2 |  |
| **15 JAN MARTIN LUTHER KING, JR. DAY – UNIVERSITY CLOSED** | | | | |
|  | **17 JAN** | Infectious Diseases and Vaccines | Ch 17 |  |
|  | **22 JAN** | Receptors and Signalling: B and T cell receptors ; Cytokines and Chemokines | Ch 3 & 4 |  |
|  | **29 JAN** | Innate Immunity | Ch 5 |  |
|  | **5 FEB** | The Complement System | Ch 6 | **Exam 1 Monday FEB 5** |
|  | **12 FEB** | The Organization and Expression of Lymphocytes Receptor Genes | Ch 7 |  |
|  | **19 FEB** | The Major Histocompatibility Complex and Antigen Presentation; T-Cell Development | Ch 8 & 9 |  |
|  | **26 FEB** | T-Cell Activation, Differentiation, and Memory B-Cell Development | Ch 11 & 10 |  |
|  | **5 MAR** | B-Cell Activation, Differentiation, and Memory Generation | Ch 12 | **Exam 2 Monday MAR 5** |
|  | **12 MAR** | Effector Responses: Cell and Antibody mediated Immunity | Ch 13 | **Paper topic approval deadline** |
| **16 MAR** Last day to drop course | | | | |
| **19 – 24 MAR SPRING BREAK** | | | | |
|  | **26 MAR** | Allergy, Hypersensitivities and Chronic Inflammation | Ch 15 | **Reports of Web site due Friday MAR 30** |
|  | **2 APR** | Tolerance, Autoimmunity, and Transplantation; Immunodeficiency Disorders | Ch 16 & 18 |  |
|  | **9 APR** | Cancer and the Immune System | Ch 19 | **Research Paper due Friday APR 13** |
|  | **16 APR** | Catch up |  | **Exam III Monday APR 16** |
|  | **23 APR** | Dead Week |  |  |
|  | **4 MAY** | Final Exam | Cumulative | **Final Exam 10:15 am - 12:15pm** |