***Course number:*** **MMI 341**

***Course title:*** **Immunology**

***Time periods devoted to individual topics:***

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| Thursday Sep 7 | 1) **History and Basic Concepts of Immunity** (75 minutes plus 60-75 minutes discussing the issues concerning the course organization and exams) |
| Tuesday Sep 12 | 2) **Immunity Elements and Their Roles in Defense** (75 minutes) |
| Thursday Sep 14 | 3) **Innate Immunity, Part 1: defining various components, antimicrobial proteins, antimicrobial mechanisms employed by phagocytes, pattern recognition receptors, pathogen-associated molecular patterns** (75 minutes plus 60-75 minutes of discussing the issues related to the first 3 topics) |
| Tuesday Sep 19 | 4) **Innate Immunity, Part 2: components of the complement system, different pathways of complement activation, properties of complement activation products, mechanisms that regulate complement activation** (75 minutes) |
| Thursday Sep 21 | 5) **Innate Immunity, Part 3: "cellular players" of innate immune reactions, inflammasomes, cytokine responses of innate cells** (75 minutes plus 60-75 minutes of discussing the last 2 topics) |
| Tuesday Sep 26 | 6) **Basic Principles of Adaptive Immunity (BPAI) 1: Anatomy of Ig, TCR and MHC** (75 minutes) |
| Thursday Sep 28 | 7) **BPAI 2: Generation of Ab and TCR diversity** (75 minutes plus 60-75 minutes of discussing the last 2 topics) |
| **Tuesday Oct 3** | **Exam 1** |
| Thursday Oct 5 | 8) **BPAI 3: Antigen Presentation** (75 minutes plus 60-75 minutes of discussing the last topic) |
| Tuesday Oct 10 | 9) **Immune System Signaling** (75 minutes) |
| Thursday Oct 12 | 10) **Lymphocyte Development** (75 minutes plus 60-75 minutes of discussing the last 2 topics) |
| Tuesday Oct 17 | 11) **T Cell-Mediated Immunity** (75 minutes) |
| Thursday Oct 19 | 12) **The Humoral Immune Response** (75 minutes plus 60-75 minutes of discussing the last 2 topics) |
| Tuesday Oct 24 | 13) **Dynamics of Adaptive Immunity** (75 minutes) |
| Thursday Oct 26 | 14) **The Body's Defense Against Infection** (75 minutes plus 60-75 minutes of discussing the last 2 topics) |
| **Tuesday Oct 31** | **Exam 2** |
| Thursday Nov 2 | 15) **Failures of the Body Defenses** (75 minutes plus 60-75 minutes of discussing the last topic) |
| Tuesday Nov 7 | 16) **HIV and AIDS** (75 minutes) |
| Thursday Nov 9 | 17) **Over-reactions of the Immune System, Part 1: Type I Hypersensitivity** (75 minutes 60-75 minutes of discussing the last 2 topic) |
| Tuesday Nov 14 | 18) **Over-reactions of the Immune System, Part 2: Type II, III and IV Hypersensitivity** (75 minutes) |
| Thursday Nov 16 | 19) **Autoimmunity** (75 minutes plus 60-75 minutes of discussing the last 2 topics) |
| Tuesday Nov 21 | 20) **Vaccines and Vaccination Strategies** (75 minutes) |
| *Thursday Nov 23* | *Thanksgiving recess* |
| Tuesday Nov 28 | 21) **Transplantations** (75 minutes) |
| **Thursday Nov 30** | **Exam 3** |
| Tuesday Dec 5 | 22) **Cancer Immunology and Immunotherapy** (75 minutes) |
| Thursday Dec 7 | 23) **Immunology Techniques** (75 minutes plus discussing any desired topic) |
| **Tuesday Dec 12** | **Exam 4** |

### *Learning outcomes*

As a result of successfully completing this course, the student will be able to:
1) Demonstrate a fundamental working knowledge of the basic principles and concepts of immunology.

2) Explain how these principles and concepts are being applied to our knowledge of immune function, specifically a) differentiate between innate and adaptive immunity, b) explain the mechanisms and differences between primary and secondary responses and their relevance to immunizations, c) differentiate between humoral and cell-mediated immunity and d) identify the role of antigen presenting cells, lymphocytes, and phagocytic cells in immune responses and e) identify the main mechanisms of immune tolerance and autoimmunity.

3) Outline the key components of the innate and adaptive immune responses, describe which cell types and organs are involved in these responses and describe the basic structure of the cellular receptors and discuss their interactions during immune responses and associated signaling events.

4) Understand the principles governing vaccination and the mechanisms of protection against disease and how these mechanisms are exploited for therapeutic purposes.

5) Discuss current immunology news and issues.

### *Texts to be used*

In practice, this class includes lectures that present detailed information concerning all major immunology principles, concepts and mechanisms; comprehensive PowerPoint presentations are provided online at our Learn@UW site. Ideally, students should study the relevant PowerPoint presentation before each lecture and then the lectures (Tuesday and Thursday) and discussions (every Thursday) serve to clarify some of the more complex issues through both detailed verbal descriptions of each topic and question-answer interactive discussions. Reading any modern immunology textbook such as Roitt's Essential Immunology, 12$^{th}$ edition (http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP002261.html), Janeway's Immunobiology, 9$^{th}$ edition (https://www.amazon.com/Janeways-Immunobiology-Kenneth-Murphy/dp/0815345054), The Immune System, 4$^{th}$ edition (http://www.garlandscience.com/product/isbn/9780815344667) or Kuby Immunology, 8$^{th}$ edition (http://jiule.cn/files/k/kuby-immunology-8th-edition.pdf) can be helpful, but is not necessary.

### *Exam policy*

The 4 exams will be administered in our regular lecture room – *i.e.*, Agriculture Hall 125, http://av.fpm.wisc.edu/classrooms-ag-hall-125.htm – at 4 pm on **Oct 3, Oct 31, Nov 30, Dec 12**. All exams are open-book, cumulative (up-to-the-last-lecture/discussion) and of *'multiple-choice, true-false type'*, where *any* answer option may be true or false. The grading of all exams is identical – each correct (true or false) answer: *four points*; each incorrect (true or false) answer: *minus four points* (= penalty for guessing); no answer: *no point*. Also, various numbers of bonus points can be obtained during lectures and discussions, particularly during those given by our guest speakers. Additional bonus points may be awarded to the whole class in order to achieve consistent grading (comparable to previous 12 semesters) – *i.e.*, approximately 50% of MMI 341 students achieving an A grade.

The following grading system is used:

A – 341 and more cumulative points
AB – between 321 and 340 cumulative points
B – between 301 and 320 cumulative points
BC – between 281 and 300 cumulative points
C – between 241 and 280 cumulative points
D – between 201 and 240 cumulative points
F – 200 and less cumulative points

### *Instructional accommodations*

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center or the Associate Dean for Student Academic Affairs, to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

### *Addressing problems*

Please, bring any concerns regarding any MMI 341-related issue to my attention as soon as possible (608-334-0906). I am eager to help, but I can only do so if you bring matters of concern to my attention.

### Frequently asked questions

***Q: Are the lectures going to be posted?***
A: Yes. All MMI 341 lectures will be posted at Learn@UW. A lecture "draft" will be posted approximately one week ahead of time so that you can study the topic before each lecture is given. The final updated form of each lecture will be posted on the actual lecture day. Occasionally, the "draft" may be identical with the final version of the lecture.

***Q: What is the purpose of the 'penalty for guessing' (PFG)?***
A: To clarify the main purpose of PFG – let's imagine 2 hypothetical students, S1 and S2. S1 knows the correct answers for 80% of the given questions, whereas S2 knows only 60% of the correct answers – and *that* is a substantial difference in the level of their immunology knowledge and reasoning skills! S1 answers 80% of the questions correctly and chooses not to answer the rest (because of not knowing the correct answers), and receives 80% of the maximum points. S2 answers 60% of the questions correctly and because she/he knows that there are approximately the same numbers of true and false options in each exam – in the absence of PFG, she/he simply answers the remaining 40% of the given questions as either "all false" or "all true", which gives her/him additional approximately 20% of the maximum points, also ending with a total of 80% of the maximum points. *The PFG eliminates the effectiveness of this type of "all false" (or "all true") guessing.*

Thank you for your interest in immunology and best of luck in your academic and other pursuits!

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