CONCEPTS OF INFECTIOUS DISEASES
BIOL 462/662 (3 credits)

COURSE SYLLABUS

Andrea Ferrante, M.D.
University of Alaska Fairbanks
Spring Semester 2017

Classes: Monday/Wednesday/Friday 09:15 – 10:15, Murie 103/105
Course Information
• Concepts of Infectious Diseases, BIOL 462/662 (3)
• Meeting Times: Monday/Wednesday/Friday 09:15 – 10:15, Murie 105
• Prerequisites: Undergraduate - UAF level BIOL F261 Minimum Grade of C, or Undergraduate - UAF level BIOL F360 Minimum Grade of C, or Undergraduate - UAF level BIOL F342 Minimum Grade of C; or permission of instructor.

Instructor
Andrea Ferrante, M.D., Assistant Professor of Immunology
• Office: Murie 223A
• Laboratory: Murie 218
• Phone: 474-5916 (office)
• E-mail: aferrante@alaska.edu
• Mailbox: Irving I Room 211
• Office hours: Tuesday 02:30 – 04:30 pm or by appointment

Course Readings/Materials

Required readings:
• Lecture notes will be posted on Blackboard
• Research papers for the journal club will be posted on Blackboard

Suggested texts available:
• Mandell, Douglas, and Bennett. Principles and Practice of Infectious Diseases: 2-Volume Set, VIII ed. Elsevier Saunders
• Chapman, Betts, Penn. A Practical Approach to Infectious Diseases. Lippincott Williams & Wilkins
• Procop & Pritt. Pathology of Infectious Diseases, 1st Edition, Elsevier Saunders

Blackboard Page: Information from the lecture will be provided on UAF’s Blackboard system following the lecture as PDF lecture notes. These tools do not serve as a replacement for attendance at lecture.

E-mail Notifications: On occasion, students will be contacted via email. I will assume that students will check their UAF email address (or preferred mail) on a regular basis.


Course Goals and Student Learning Outcomes
This course will cover infectious disease biology and introductory clinics using examples of diverse pathogens and exploring the concepts of their biology and the implication of these principles on pathology, epidemiology and social impacts of infectious diseases.
We will cover viral and bacterial pathogens primarily, with a marginal reference to fungal diseases in the context of opportunistic infections. We will cover the general principles that will enable you to better understand the biological principles governing the interaction between pathogens and their hosts and thereby the impact of infectious agents on human health, food production and wildlife.

The course will put emphasis on understanding and applying the concepts that are covered, rather then on memorization of facts. This understanding will allow the student to explore the biology and implications of pathogens in independent studies. The course format will therefore be highly interactive with the expectation that the students participate in the lectures and independently explore certain concepts discussed in class.

At the end of the course, students are expected to be able to discuss basic concepts of current infectious disease research. Knowledge of these concepts will enable the students to better understand the impact of pathogen biology on epidemiology and pathology of infectious disease

Policies

Grading
Grades will be based on the percentage of total points earned out of the total possible points based on the scale below. You will notice that the cut-off point for A- is not 90% but 88%. The comparable is true for the B-, C- and D- cutoffs. The reason for this is that under the plus/minus grade system, a C earns 2.0 in terms of GPA calculation. A C- earns only 1.7 on terms of GPA calculation, and does not count as successful completion of the course. You must earn a C or higher for the course to count. I think that if you have earned a 70% in this course, you have earned a C and 2.0 in terms of GPA credit, so I have set up the grading scale accordingly.

Missed assignments and exams: times for assignments and exams will be designated well in advance. Completion of assignments and exams at the designated time will be the responsibility of the student. Accommodations will only be made for legitimate and documented contingencies. If you have a conflict with exam dates, please come talk to me at the beginning of the semester.

<table>
<thead>
<tr>
<th>Grade</th>
<th>% of Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>97.0 - 100.0</td>
</tr>
<tr>
<td>A</td>
<td>90.0 - 96.9</td>
</tr>
<tr>
<td>A-</td>
<td>88.0 - 89.9</td>
</tr>
<tr>
<td>B+</td>
<td>86.0 - 87.9</td>
</tr>
<tr>
<td>B</td>
<td>80.0 - 85.9</td>
</tr>
<tr>
<td>B-</td>
<td>78.0 - 79.9</td>
</tr>
<tr>
<td>C+</td>
<td>76.0 - 77.9</td>
</tr>
<tr>
<td>C</td>
<td>70.0 - 75.9</td>
</tr>
<tr>
<td>C-</td>
<td>68.0 - 69.9</td>
</tr>
<tr>
<td>D+</td>
<td>66.0 - 67.9</td>
</tr>
<tr>
<td>D</td>
<td>60.0 - 65.9</td>
</tr>
<tr>
<td>D-</td>
<td>58.0 - 59.9</td>
</tr>
<tr>
<td>F</td>
<td>0.0 - 57.9</td>
</tr>
</tbody>
</table>
The point breakdown for this course is approximately as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>% of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture attendance/participation</td>
<td>5</td>
</tr>
<tr>
<td>In-class quizzes (10)</td>
<td>20</td>
</tr>
<tr>
<td>Journal club</td>
<td>17.5</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>17.5</td>
</tr>
<tr>
<td>Final written test</td>
<td>20</td>
</tr>
<tr>
<td>Oral exam</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Lectures**
Active attendance of lecture is expected. Exams will be based on material covered in lecture, assigned readings and discussed articles. Furthermore, announcements of upcoming assignments or any changes to the class schedule will be made at the beginning of class, and every student is responsible for that information. During lectures, I will be doing educational activities that will count for points (research article discussion). I will make a subjective assessment of each student’s class participation, and assign a grade (5% of the final grade) during final evaluation. Tardiness, absenteeism, inattentiveness and unfamiliarity with course material will all negatively impact this subjective assessment. **If you know that you will miss a lecture due to an excused absence (e.g. you are participating in a UAF sanctioned event, you become ill, you are participating in a military-required activity) you must inform me of the absence ahead of time in order for the points to be excused for that lecture. Of course these will not negatively impact the subjective assessment of class participation.**

**Exams**
You are expected to take all exams at the scheduled time. Check the exam schedule carefully and plan your appointments and travel around the course schedule.

**There will be eleven short in-class tests,** including multiple choice or multiple answers. These tests will be delivered at the conclusion of one module on the day of the Journal Club after paper discussion, and they will focus on the clinical cases assigned for that module. **Those who lead the journal club will not take the test, thus ten tests will be counted towards final grade for each student.**

**Final written exam** will contain various types of questions, including multiple choice, matching, fill in the blank and short answer. **The final exams (written and oral)** will be cumulative on both lecture contents and clinical cases.

- **Scheduled absences:** for absences caused by a conflict with a University-sanctioned activity (for example, participation in a competition with a UAF athlete), you must notify me in advance of the exam. You will be expected to take the exam before your absence. Other types of scheduled absences are generally not accepted: you are expected to schedule around exams. In particular, make sure that your schedule your flight home or vacation for after finals. I will **not** grant requests for early final exams.
- **Unscheduled (emergency) absences:** if an emergency arises the day of the exam that makes you unable to attend the exam, you must inform me before the start of the exam.
by e-mail or phone (leave a message if you cannot reach me). If the nature of the emergency makes it impossible for you to contact me in advance, contact me as soon as possible afterwards. You should expect to provide documentation of emergency.

- Contact me to arrange make-up exams, in case of absence at the scheduled time.

**Journal Club**

Journal clubs are educational discussions that can improve reading habits, knowledge of basic and translational research, and help contextualize what is discussed during lectures. The articles will include, but will not be limited to, topics concerning infectious diseases, virology, bacteriology, immunology, vaccinology. During the semester, each of you will lead the discussion of an article proposed by the instructor. This experience fulfills several goals of the study curriculum for an Oral Intensive Course such that, at its conclusion, each student will be able to:

- Conduct structured critical appraisal of the literature
- Recognize and understand basic study design.
- Gain familiarity with research approaches adopted to study the pathological basis of infectious diseases.
- Explain how epidemiological studies (case-control, longitudinal, etc.) are conducted in the context of infectious diseases
- Hone skills related to oral presentations

**The students presenting on the day of the JC will not take the short quiz.**

**Expectations**

Presenting student: for each module one or two articles are indicated, that need to be read before the day of presentation; these articles are recent reports concerning the case studies indicated for that module. One of you will be leading the discussion. I will organize a calendar on a Google sheet for you to sign up.

**Responsibilities:** Once you have read and reviewed the article, each one of you should have a general understanding of the main question asked by the specific study, how it was addressed, and what conclusions the authors can draw from the results. You should have a list of questions to ask during the discussion.

The students leading the discussion will develop a power point presentation and produce a final critique (oral). You should also be able to attempt to address other students’ questions.

Everyone is welcome to stop by my office before the paper is presented to talk about it. The presenting student is strongly encouraged to do so one or two days in advance by appointment or on Tuesday afternoon.

**Process:** as you are working on the presentation, you need to integrate the information from the case studies textbook, especially to provide sufficient background to your colleagues to understand the article. As you go through the paper, you should approach it critically, trying to ask the following question and seeking for answers:

- Issues addressed by the article—What is the research question? Why does it matter?
- How does it fit with what already is known? How can it help solve important problems?
- Design of the study and methods—Is the study design appropriate for the question and what already is known about the question? What kinds of methods are used?
- How information was interpreted?
• Main findings—Does this study advance current knowledge, is the main question(s) finding an answer?
• How transportable are the findings to other settings or systems?
• Implications—How can the information be used at the translational level?
• Next steps/new questions—What are the next steps in interpreting or applying the findings? What new questions arise and how might they be best answered?

Final Presentations
As part of your final grade, you are asked to prepare a 15-minute presentation (+ 5 minutes for questions) of a topic concerning the world of infectious diseases. You have the broadest choice of topic: you can discuss a book you have read concerning an infectious disease, a movie or a TV show you watched, a commentary you have read in a science journal relative to emerging infectious diseases or a column in the New York Times criticizing NIH policy of funding HIV research. Anything can be object of your presentation, as long as it constitutes a liaison between what we have discussed about infectious diseases and lay people’s perception of them, or their broader impact on people’s lives.

Once you have selected the topic of your presentation, be so considerate to share it with me, along with the rationale for your choice, and I will come back to you with my comments. Please, also share your presentation at least 48 hours before the day of your talk, so that I can provide my review. Also for these presentations I will prepare a sign-up Google sheet.

Scoring Rubric for Oral Presentations

Content and Scientific Merit (12.5 points)

Introduction:
• Defines rationale for the topic choice, background and correlation with the course objectives.
• States the main aspect of the work presented, and is able to identify the scientific merit.

Body:
• Presenter has a scientifically valid argument.
• Addresses audience at an appropriate level (rigorous, but generally understandable).
• Offers evidence of proof/disproof.
• Describes methodology.
• The talk is logical.

Conclusion:
• Summarizes major points of talk.
• Summarizes potential weaknesses (if any) in the work.
• Provides you with a “take-home” message.

Speaking Style/Delivery (3 points)
• Speaks clearly and at an understandable pace.
• Maintains eye contact with audience.
• Well rehearsed (either extemporaneous or scripted presentation).
• Limited use of filler words (“umm,” “like,” etc.).
• Speaker uses body language appropriately.
• Speaker is within time limits.
• Speaker is able to answer questions professionally.

Audio/Visual (2 points)
• Graphs/figures are clear and understandable.
• The text is readable and clear.
• Audio/Visual components support the main points of the talk.
• Appropriate referencing of data that is/was not generated by presenter

Academic honesty
Academic dishonesty will not be tolerated. You are expected to be familiar with the UAF Student Code of Conduct (available online in the UAF Catalog) and to follow it at all times. The use of any reference materials (notes, books, other people, etc.) or assistance of any type on exams is academic dishonesty. Obtaining an extension on work or delaying an exam through false pretenses is also academic dishonesty. Providing someone with the answer to homework assignments, taking answers from someone else on homework, doing homework for someone else, or allowing someone else to do your homework is academic dishonesty. Although you may work with a partner or partners depending on the nature of the project, your contribution to a collective assignment must be your individual work, clearly indicated and acknowledged by your peers. Any instances of these or any types of academic dishonesty will result in a grade zero on the work involved (this may include all the work in the category, for example, if the academic dishonesty involves a written exam, all the written exam scores may be changed to zeros), forwarding the incident to appropriate University personnel, and may result in an F in the course and/or expulsion from the University. If you are in doubt as to whether something constitutes academic dishonesty, ask your instructor.

Plagiarism is the overt or covert use of other people’s work or ideas without acknowledgement of the source. It is a type of academic dishonesty. Plagiarism includes using ideas or data from a classmate or colleague without permission and acknowledgment, including information from journal articles (either in their entirety or with minor changes) in your writing without citing the author, using sentences from published sources without quoting them, or copying parts of a website into your essay. You cannot use someone’s ideas without citing the originator; you cannot use someone’s words without quoting the writer. Any deviation from this will be regarded as plagiarism. When you plagiarize you are stealing the currency that science (and many other endeavors) uses: knowledge.

A few simple rules to prevent plagiarism:
1. When in doubt about whether you should cite or acknowledge someone, do so.
2. If you are unsure of how to cite someone’s writings or ideas, ask one of the instructors for help. Reference librarians are also good source of information for help with citations.

Disabilities
All students, including those with disabilities, are welcome in this course, and I am committed to providing equal access to this course for all students. If you have a disability (including learning disabilities) please inform me during the first week of class so that I can accommodate your specific needs. If you have already done so, you will also need to contact UAF’s Office of Disabilities Services (474-5655). Everyone should have the opportunity to participate fully in the course and to complete assignments and exams to the best of their ability. If accommodations are needed to enable you to do so, I will gladly work with you to provide them.
When you need help
Infectious Diseases is a fascinating discipline, but may not be of easy understanding. I will not know if you are having difficulties with the course material unless you tell me. I want to help you; my primary role in this course is to help you understand host-pathogen interaction. I would love to see everyone succeed in the course. Ultimately, however, how well you do in the class is not up to me; it is up to you. You have to gain the understanding for yourself. If there is anything I can do to help you with that, PLEASE ASK! If you have any questions or you are finding that you are struggling with a particular topic, assignment or question, there are several things you can do:

• If you have any question during lecture, ask! Don’t let me plow on ahead if you are lost.
• Talk to me after lecture or during office hours, or make an appointment to talk to me.
• Talk to a classmate. Setting up study groups can be very helpful.
• If it is a brief question, e-mail me.

Ask for help right away! I am happy to answer your questions and help you succeed.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction and overview over course and historic perspective</td>
</tr>
<tr>
<td>2</td>
<td>Introduction into general Virology</td>
</tr>
<tr>
<td>3</td>
<td>Introduction into general Bacteriology</td>
</tr>
<tr>
<td>4</td>
<td>Introduction into Immunology</td>
</tr>
<tr>
<td>5</td>
<td>Coevolution of host pathogens and Immunevasion</td>
</tr>
<tr>
<td>6</td>
<td>Opportunistic infections</td>
</tr>
<tr>
<td>7</td>
<td>Vaccination</td>
</tr>
<tr>
<td>8</td>
<td>Replication efficiency - Examples of ID eradication</td>
</tr>
<tr>
<td>9</td>
<td>Viral genetics</td>
</tr>
<tr>
<td>10</td>
<td>Cell tropism of viruses and viral emergence</td>
</tr>
<tr>
<td>11</td>
<td>Viral latency and Viruses and tumors</td>
</tr>
<tr>
<td>12</td>
<td>Strategies of intracellular bacteria And Bacterial toxins</td>
</tr>
<tr>
<td>13</td>
<td>Antibiotic resistance and biofilms</td>
</tr>
<tr>
<td>14</td>
<td>Student presentations</td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Final Exam (Written)</td>
</tr>
</tbody>
</table>