BIOL F240: Beginnings in Microbiology  
Spring Semester, 2016  
Tuesday 6:00pm-9:00pm, Murie Building Rm 103/105 and Thursdays 6:00pm-9:00pm Murie 206  
4 credit hours

Instructor: Mr. Brandon T. Hassett, M.S.  
229 O’Neill Building  
Office phone: (907) 474-5011  
Email: bhassett@alaska.edu

Office hours: Tuesday 1:00-3:00 Room 229 O’Neill (or by appointment).

Course description: This course is designed to introduce beginning students to the discipline of microbiology. Topics include disease paradigms, basic taxonomy and life histories of relevant pathogens, mechanisms of immunity, clinical methodologies, general epidemiology, microbial metabolism, and the control of microbial agents. Students will be exposed to these core topics in sufficient detail to build a conceptual framework of microorganisms that can be applied immediately in a future career.

Course goals:  
- Acquire the language to become conversational in correspondences with medical and scientific professionals  
- Interpret basic findings from recent cutting-edge journals  
- Gain an understanding of the relationship between host, pathogen and environment to explain why all living organisms are not infected  
- Acquire/advance professional development skills through writing and presentations

General student learning objectives:  
- Explain the disease triangle  
- Explain the acquisition/evolution of antibiotic resistance  
- Explain contemporary (and developing) techniques for the control of microbes  
- Explain the disease cycle  
- Define a gene and explain the central dogmas of molecular biology  
- Explain genetic regulation in prokaryotes, eukaryotes and viruses  
- Understand how molecular biology is applied for clinical purposes

Instructional methods:  
- The course will meet for ~6 hours a week and will include 3 hours of lecture, plus an additional three hours of lab. Course material will be distributed through lecture slides (posted on Blackboard) and additional reading material (also posted on Blackboard).  
- Guest lectures from local medical professionals will supplement professorial instruction.  
- A final disease paper and presentation (on any topic of interest) will allow students to synthesize information acquired in class.
Course reading materials:
- Alcamo’s Fundamentals of Microbiology (2nd edition) is highly recommended for the course, though not required.

Assignments/Exams:
1. A brief summary of the previous lecture will be presented by a student at the beginning of each class. One-two students will present once during the semester.
2. A final paper (maximum 2 pages, plus references) will be turned in at the end of the semester on a disease of the student’s choice.
3. A 10 minute oral presentation will be delivered to the class on a disease of the student’s choice.
4. Active participation in discussion of assigned literature will be assessed.
5. Two exams will be proctored during the semester: one midterm and one final

Course schedule (tentative, subject to change)
- Week 1 – January 19th: No class or lab.
- Week 2 – January 26th: Introductions, course expectations, essentials of pathology and the tree of life
  - Lab: Microscopy
- Week 3 – February 2nd: The chemical building blocks of life and eukaryotic and prokaryotic cell structure
  - Lab: Gram staining
- Week 4 – February 9th: Genes, the central dogmas of molecular biology and basic microbial genetics
  - Lab: DNA replication and metabolism
- Week 5 – February 16th: Microbial metabolism
  - Lab: Population counts
- Week 6 – February 23rd: The viruses and virus-like agents
  - Lab: Oral and nasal
- Week 7 – March 1st: MIDTERM EXAMINATION
- Week 8 – March 8th: Microbial evolution and antibiotic resistance
  - Lab: Antimicrobial sensitivity test
- Week 9 – March 15th: Spring Break
  Week 10 – March 22nd: The disease cycle and control of microorganisms
  - Reading assignment before class
  - Lab: Methods of control
- Week 11 – March 29th: Innate immunity
  - Disease topics due
  - Lab: Gastrointestinal tract
- Week 12 – April 5th: Acquired immunity
  - Lab: Gastrointestinal tract
- Week 13 – April 12th: Metagenomics and other clinical methods, and paper discussion
  - Paper will be assigned two weeks before class
  - Lab: Gastrointestinal tract
Disease paper drafts due

- Week 14 – April 19th: Potential breakthroughs, guest lecturer and disease presentations
  - Lab: ELISA
- Week 15 – April 26th: Disease presentations
  - FINAL PAPER DUE
  - Lab: LAB PRACTICAL
- Week 16 – May 3rd: FINAL EXAM

Grading:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
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<tbody>
<tr>
<td>Attendance during final presentations</td>
<td>100</td>
</tr>
<tr>
<td>Draft paper</td>
<td>35</td>
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<tr>
<td>Paper topics</td>
<td>15</td>
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<tr>
<td>Final paper</td>
<td>50</td>
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<tr>
<td>Final presentation</td>
<td>50</td>
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<tr>
<td>Midterm exam</td>
<td>150</td>
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<tr>
<td>Final exam</td>
<td>150</td>
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<tr>
<td>Total lecture</td>
<td>550</td>
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<tr>
<td>Total lab</td>
<td>+200</td>
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<tr>
<td><strong>TOTAL COURSE POINTS</strong></td>
<td>750</td>
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Grading scale (% of total course points)

Final grades for the course will be based on the following scale. No curve will be used.

- A (90-100%)
- B (80-89%)
- C (70-79%)
- D (60-69%)
- F (<60%)

Course policies:

- **Attendance:** Attendance is not required for all lectures, but is expected. Attendance is required for paper discussions and during final presentations. Absences will be allowed only when previously arranged or in documented cases, per UAF guidelines.
- **Cell phones:** Please turn cell phones off during class.
- **Plagiarism:** Plagiarism will result in immediate failing of the assignment. Cheating on exams will result in immediate failing of the exam. All cases of plagiarism will be reported to UAF administration for further investigation. Plagiarism includes copying text directly from other sources and stealing ideas. To avoid plagiarism, use quotation marks around identical text and provide a citation. For paraphrased sentences, always provide a citation. For more information, please see <http://library.uaf.edu/ls101-plagiarism>.
- **Late work policy:** Late assignments (e.g. paper topics, drafts, final paper) will be penalized 10% per day they are late. Documented excuses are appropriate to avoid late penalties.

Support services: I strongly encourage students to seek help in understanding/interpreting data and assignments. If students do not feel comfortable asking questions in class, please contact me directly after class, with email, or schedule a time to meet. UAF libraries are a great resource for supplementary materials that are available at no cost. Additionally, UAF offers a number of support services, available at <http://www.uaf.edu/sss/>.
**Students with disabilities:** UAF is committed to equal opportunity for all students. Students with even minor disabilities, students who are the first in their families to attempt a four-year college degree, or students whose incomes are low, have opportunities for tutorial and other forms of support from the office of Disability Services or the office of Student Support Services. If you need classroom accommodations or other support, please meet with me during office hours as soon as possible to let me know; and please make an appointment with Mary K. Matthews at the Office of Disability Services at 474-7043 and Student Support Services at 474-2644, to enlist the appropriate support. I will collaborate to provide the appropriate accommodations and supports or services to assist you in meeting the goals of the course.