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

Instructor: Joanna Green, M.S.
234 West Ridge Research Building
Office phone: (907) 474-1187
Email: joanna.green@alaska.edu

Office hours: 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
• Gain an understanding of the relationship between host, pathogen and environment, One Health Paradigm
• Acquire/advance professional development skills through writing and presentations

General student learning objectives:
• Understand the role of microbes in biomedicine and One Health
• 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
• Explain differences between 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 and discussion, plus an additional 3 hours of lab. Course material will be distributed through lecture slides (posted on Blackboard) and additional material (also posted on Blackboard).
• Guest lectures will supplement professorial instruction.
• A final disease/vaccine paper will allow students to synthesize information acquired in class.
Independent lab projects will apply skills learnt in earlier lab sessions and practice in presenting methods and results

Course reading materials:
- Body Systems Edition Fundamentals of Microbiology (3rd edition) is highly recommended for the course, though not required.

Assignments/Exams:
1. Active appropriate participation will be assessed at all times (discussion, questions, attendance, interactions, etc).

Lecture Section:
2. 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.
3. A final paper (maximum 2 pages, plus references) will be turned in at the end of the semester on microbial-mediated disease/vaccine of the student’s choice.
4. All guest lecturers are to be followed by a short summary due 1 week after the visit.
5. Two exams will be proctored during the semester: one midterm and one final

Lab Section:
1. There will be a short quiz posted on Blackboard for each lab due before noon the day of the lab.
2. Laboratory Notebooks will be collected and graded three times, with then option
3. 20 minute oral presentation will be delivered to the class on each group’s Independent Project

Course schedule (tentative, subject to change)

Part 1: Characterization of Microbial Organisms (Text Book Ch 2-8, 11-14)
- Week 1 – August 30th: No class or lab.
- Week 2 – September 6th: Introductions, Course expectations, What are microbes, The Tree of Life
  o Lab 1: Safety & Microscopy
- Week 3 – September 13th: Basic Biochemistry, Cell Structures & General Classifications/Morphology
  o Lab 2: Staining Techniques (take sampling kit home)
- Week 4 – September 20th: Pathology & Microbial Interactions
  o Lecture: Class Discussion: Indoor Microbiomes, First Notebook Check
  o Lab 3: Culturing Techniques (bring inoculated plate from week before)
- Week 5 – September 27th: Microbial metabolism & General Microbe Life Strategies
  o Lab 4: Medical Microbiology
- Week 6 – October 4th: Viruses and Virus-like Agents
  o Lecture: Midterm Review
  o Lab 5: Physiological Testing
- Week 7 – October 11th: MIDTERM EXAMINATION
  o Lab 6: Veterinary Sciences
  o Lab: Second Notebook Check

Part 2: Microbial Interactions & Evolution (Text Book Ch 9, 10, 14-24)
- Week 8 – October 18th: Microbial Evolution & Antibiotic Resistance
• Independent lab project idea and supplies list required
  • Lab 7: Antibiestic Sensitivity & Differential/Selective Media
• Week 9 – October 25th: The Disease Cycle & Control of Microorganisms
  • Lecture Case Study “2 Vaccinate”
  • Lab 8: Independent Lab
• Week 10 – November 1st: Immunity & Microbial Genetics
  • Lecture: How to research for projects
  • Disease/Vaccine topics due
  • Lab 9: Independent Lab

**Part 3: Applied Microbiology (Text Book Ch 25 & 26)**
• Week 11 – November 8th: Environmental Microbiology
  • Lab 10: Independent Lab
• Week 12 – November 15th: Advanced Clinical Methods
  • Lab 11: Independent Lab
• Week 13 – November 22nd: Thanksgiving (No Class or Lab)
  • Disease/Vaccine paper drafts due

**Part 4: Semester Wrap-up/Presentations**
• Week 14 – November 29th: Final Exam Review Session
  • Final Notebook Check
  • Lab 12: Clean-up & Reviews
• Week 15 – December 6th
  • FINAL PAPER DUE
  • LAB PRESENTATIONS (during lecture time period)
  • Lab 13: Clean-up & Reviews
• Week 16 – December 13th: FINAL EXAM

**Grading:**

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<th>Component</th>
<th>Points</th>
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<tr>
<td>Attendance and class participation</td>
<td>150</td>
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<tr>
<td>Lecture Summary</td>
<td>25</td>
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<tr>
<td>Guest Lecturer Notes/Questions</td>
<td>25</td>
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<tr>
<td>Draft paper</td>
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<td>Paper topic</td>
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<td>Final paper</td>
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<tr>
<td>Midterm exam</td>
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<tr>
<td>Final exam</td>
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<tr>
<td>Total lecture</td>
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<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Laboratory Quizzes</td>
<td>75</td>
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<tr>
<td>First Laboratory Notebook Check</td>
<td>25</td>
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<td>Midterm Laboratory Notebook Check</td>
<td>75</td>
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<td>Final Laboratory Notebook Check</td>
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<tr>
<td>Independent Project Presentation</td>
<td>125</td>
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<tr>
<td>Independent Project Group Peer Grading</td>
<td>75</td>
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<tr>
<td>Total lab</td>
<td>500</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](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/](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.