1. Course information:

Title: Beginnings in Microbiology
Number: BIOL 240
Credits: 4
Prerequisites: One course In high school or college-level biology required
Location: online
Meeting times: online

2. Instructor:

Ursel Schuette, office: WRRB 232
Office Hours: by appointment
Phones: Office: 907-474-584
Email: uschuette@alaska.edu (best way to get a hold of me)

TA
Maggie Ragusa
Office hours: W & F 2:30 – 4:30 pm Murie 202
Email: mragusa2@alaska.edu

3. Course readings:

Required text:
Microbiology, Senior contributing authors: Nina Parker, Mark Schneegurt, Anh-Hue Thi Tu, Philip Lister, Brian M. Forster, produced by Rice University, freely available at https://openstax.org/details/books/microbiology

Additional required readings:
You will need to find articles discussing microbiology in the popular media

Supplemental Readings:
I have other more books to recommend if anyone wants additional reading in Microbiology.

4. Course description:

This course is designed to introduce students to the discipline of microbiology; the study of microorganisms including unicellular or cell-cluster microscopic organisms such as prokaryotes (bacteria and archaea), fungi, protists and viruses. 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 building a conceptual framework of microorganisms that can be applied in a future career.

Catalog description
Fundamentals of microbiology. Survey of the microbial world, interactions between microbes and host, microbial human diseases, the environmental and economic impact of microorganisms. Provides background in basic and applied microbiology with emphasis on the
role microorganisms play in human health and life. Offered at UAF Community and Technical College. Note: May not be used as biology elective credit for a major or minor in biological sciences.

Expected proficiencies
NA

5. Course goals:
- To learn basic microbial processes important in medicine and public health
- Gain an understanding of the relationship between microbial communities and environment
- To develop oral and written communication skills

6. Student learning outcomes
- Understanding the role of microbes in biomedicine
- Being able to explain the disease triangle
- Understand the acquisition/evolution of antibiotic resistance
- Understand contemporary (and developing) techniques for the control of microbes
- Understand the disease cycle
- Understand differences between prokaryotes, eukaryotes, and viruses
- Understand the application of molecular biology is applied for clinical purposes

7. Instructional methods:
The entire course will be taught online through Blackboard. Lecture and additional videos will be available through blackboard including assigned reading in texts. Student participation in class discussion is required of all students at least on a weekly basis. All reading assignments, quizzes and class discussions will be conducted online. Blackboard is used for class organization, reading assignments, source of supplemental reading, and online discussion as needed. PowerPoint slides will be made available through Blackboard prior to each class. As the class is taught online students are required to have online access and are able to see the PowerPoint presentations and videos. Students will complete microbiology laboratories through Hands-On Labs. Labs can be completed at a location of their choice such as their homes.

Quizzes
Seven quizzes will be given throughout the semester worth ~35% of the total points. Examination format will include multiple choice and true/false questions, and short answer questions, which will test your knowledge of the material presented in lecture, readings, and research. The 7 quizzes are designed to drive the student to the textbook. They are not timed and are able to be taken over and over again until the due date with only the highest grade being recorded. All quizzes are given online.

Assignments
Readings are assigned for each class on a weekly basis and three written assignments will be assigned throughout the semester. Expect approximately 3 hrs of reading for each hour of in-class time. See Blackboard for the weekly assignments.
In addition, there are three written assignments throughout the semester worth 11% of your grade.

**Discussions**
The class will contain an ongoing discussion throughout the semester on topics in microbiology in the news. Each student will be required to lead two discussions and to post 4 comments on other students topics. The discussion will be done on blackboard.

**Labs**
Students are required to purchase the lab kit SKU # LP-3562-MB-02 and either buy a microscope or check out one from UAF for the class. All supplies can be purchased from Hands-On Labs. To purchase the lab kit students create an account with Hands on Lab. This is also the account students can use to complete the different lab sections. This is the enrollment URL for Hands-On Labs URL:  [https://myhol.holscience.com/enroll/kxtm-bxty-mhzh-dffy](https://myhol.holscience.com/enroll/kxtm-bxty-mhzh-dffy). Once logged in click on the class and ‘purchase kit’. To purchase the microscope go to [http://holscience.com/](http://holscience.com/) login with C000369 and password: labpaq. Select SKU:21-0264-00-01,1500x microscope, which includes the oil immersion lens. For additional instructions from Hands-On Labs go to blackboard. If you want to purchase the microscope you have to do that in a different way. UAF has some microscopes that can be checked out through UAF. There are not enough microscopes for all students. So, this is on a first come first serve basis with NO EXCEPTIONS. An agreement needs to be signed with UAF and it is the student’s responsibility to return the microscope at the end of the semester. If the student fails to return the microscope the student’s account may be put on hold. To check out a microscope email the TA of the class mragusa2@alaska.edu, and the DATE and TIME on the email to Maggie is what counts as the first come first serve; NO EXCEPTIONS. Microscopes can be shipped to non-local. It is the students **to ship back** the microscope including shipping fees. If a student checks out a microscope with UAF it’s the students responsibility to purchase additional immersion oil if it’s not supplied with the microscope. The immersion oil can be purchased from Hands-On Labs ([https://yoursciencehub.com/labware/labware-equipment-1/immersion-oil-type-a-cargille-1-4-oz-013--02174?returnurl=%2fsearch%3fq%3dol%2bbimmersion](https://yoursciencehub.com/labware/labware-equipment-1/immersion-oil-type-a-cargille-1-4-oz-013--02174?returnurl=%2fsearch%3fq%3dol%2bbimmersion)). Instructions for obtaining lab supplies are also posted on blackboard.

Throughout this course, you will be using the online learning platform, HOL Cloud, to perform your laboratory experiments. HOL Cloud contains interactive course material as well as step-by-step instructions for performing your weekly experiments. An HOL Cloud access code is required to perform all lab experiments. The access code is included with the purchase of a lab kit. Instructions for using HOL Cloud are provided in your lab kit and, also, in your Blackboard course under the link "IMPORTANT" located on the left-hand menu. Please contact Hands-On Lab (866- 206-0773) if you encounter any problems.

- The laboratory component of this course has specific requirements, as the laboratory exercises will be performed in your home and in a virtual environment. First, it is important to maintain a clean, safe working environment; therefore, the following safety rules must be observed:

  1. Hand washing and other hygienic methods must be employed to ensure that there is no contamination to each other or to the specimens.
  2. Microscopes must be cleaned before they are put away.
  3. All waste must be disposed of in the appropriate receptacles in your home.
  4. The laboratory area in your home must be cleaned and all instruments returned to their appropriate storage containers.
You will complete **10 Laboratory Reports** for a total of approximately 39% of the total class points based upon exercises completed in the laboratory manual and will be graded on the Hands-on Labs website. Remember, YOU MUST purchase a lab kit and have access to a microscope, either by purchasing it or coming to the UAF campus for microscope access, to complete this course – failure to do so will be considered cheating and you will either be withdrawn from this course, or in the worst-case scenario, receive a failing grade. In order to pass this course, all labs must be completed with a combined average score of at least a 70. All lab reports will be submitted as a PDF.

**• Pictures** are required for the lab reports. In addition to the LabPaq kit, microscope, and oil lens, you will need a digital camera or cell phone with picture-taking capabilities. Lab reports will not be accepted without photos documenting completion of the labs. The camera will be used to take pictures of the results of your lab experiments, including photos of what you observe under the microscope. These photos are required as part of your lab reports. Many cameras will self-focus if the lens of the camera is simply held to the microscope eyepiece. You can just focus the microscope, move your head away and put the lens to the eyepiece and click. It might take a few attempts to get the picture focused. The picture then can be uploaded to the computer as a JPEG or a GIF and sent. You should not simply take the picture and send it. It will be way too large and may be kicked back to you. Saving it as a JPEG or GIF will allow you to resize it before you send it.

### 8. Course calendar:

Follows UAF schedule:

Topics of lectures and discussions follow (one week or two periods each).

**Detailed calendar by date will be posted at beginning of the semester:**

**Week 1 01/13/2020** Introduction to Microbiology and Microbes  
Read the following in [Microbiology OpenStax](https://openstax.org/subject/microbiology)  
Chapter 1. An Invisible World  
Chapter 2. How We See the Invisible World Course  
Assignment “A1 – Introduce yourself” due on Friday Jan 17th by 11:59 pm  
**Laboratory:** Order Labs and microscope if not checked out from UAF from Hands-On Labs

**Week 2 01/20/2020** - Cellular Structure, General Classification/Morphology  
Read the following in [Microbiology OpenStax](https://openstax.org/subject/microbiology)  
Chapter 3. The Cell  
Chapter 4. Prokaryotic Diversity  
Chapter 5. The Eukaryotes of Microbiology Course  
Weekly discussion: students who are leading post due on Monday Jan 20th 11:59pm.  
Remember 4 comments/ replies due throughout the semester  
**Lab 1:** Getting Started due Monday Jan 27th 11:59pm  
Quiz 1 Chapters 1 – 5 due Monday Jan 27th 11:59pm

**Week 3 01/27/2020** Viruses and Virus-like Agents  
Read the following in [Microbiology OpenStax](https://openstax.org/subject/microbiology)  
Chapter 6. Acellular Pathogens  
Weekly discussion: students who are leading post due on Monday Jan 27th 11:59pm.  
Remember 4 comments/ replies due throughout the semester
Lab 2: Getting Started and Laboratory Safety due Feb 3rd 11:59pm

Week 4 02/03/2020 Microbial Growth, Nutrition, and Metabolism
Read the following in Microbiology OpenStax
Chapter 7. Microbial Biochemistry
Chapter 8. Microbial Metabolism
Chapter 9. Microbial Growth Course
Weekly discussion: students who are leading post due on Monday Feb 3rd 11:59pm.
Remember 4 comments/replies due throughout the semester
Lab 3: Microbiology Laboratory Preparation due Monday Feb 10th 11:59pm
Quiz 2 Chapters 6 – 9 due Monday Feb 10th 11:59pm

Week 5 02/10/2020 Microbial Genetics
Read the following in Microbiology OpenStax
Chapter 10. Biochemistry of the Genome Course
Weekly discussion: students who are leading post due on Monday Feb 10th 11:59pm.
Remember 4 comments/replies due throughout the semester
Lab 4: Microscopy for Microbiology – Use and Function due Monday Feb 17th 11:59pm

Week 6 02/17/2020 Gene Transfer, Genetic Engineering and Genomics
Read the following in Microbiology OpenStax
Chapter 11. Mechanisms of Microbial Genetics
Chapter 12. Modern Applications of Microbial Genetics Course
Weekly discussion: students who are leading post due on Monday Feb 17th 11:59pm.
Remember 4 comments/replies due throughout the semester
Lab 5: Aseptic Technique and Culturing Microbes due Monday Feb 24th 11:59pm
Quiz 3 Chapters 10 – 12 due Monday Feb 24th 11:59pm

Week 7 02/24/2020 Controlling Microbial Growth, Chemotherapy and Antimicrobial Discovery
Read the following in Microbiology OpenStax
Chapter 13. Control of Microbial Growth Chapter
Chapter 14. Antimicrobial Drugs Course Weekly
Weekly discussion: students who are leading post due on Monday Feb 24th 11:59pm.
Remember 4 comments/replies due throughout the semester
Lab 6: Bacterial Morphology and Staining Techniques due Monday March 2nd 11:59pm

Week 8 03/02/2020 Microbial Pathogenicity
Read the following in Microbiology OpenStax
Chapter 15. Microbial Mechanisms of Pathogenicity
Chapter 16. Disease and Epidemiology Course Weekly
Weekly discussion: students who are leading post due on Monday March 2nd 11:59pm.
Lab 7: Bacterial Enumeration- Dilutions and Plate Counts due Monday March 16th 11:59pm
Quiz 4 Chapters 13 – 16 due Monday March 16th 11:59pm

SPRING BREAK 03/09/2020

Week 9 03/16/2020 Immunology
Read the following in Microbiology OpenStax
Chapter 17. Innate Nonspecific Host Defenses
Chapter 18. Adaptive Specific Host Defenses Course  
Weekly discussion: students who are leading post due on Monday March 16th 11:59pm.  
Remember 4 comments/ replies due throughout the semester  
Lab 8: Biochemical Testing for Microbial Identification – Methyl Red, Voges-Proskauer, and Catalase Testing due Monday March 23rd 11:59pm

**Week 10 03/23/2020 Infectious Diseases**  
Read the following in [Microbiology OpenStax](https://openstax.org/details/books/microbiology)  
Chapter 19. Diseases of the Immune System Course  
Chapter 20. Laboratory Analysis of the Immune Response Course  
Assignment “Infectious disease” due on Friday March 27th 11:59 pm  
Weekly discussion: students who are leading post due Monday March 23rd 11:59pm.  
Remember 4 comments/ replies due throughout the semester  
Quiz 5 Chapters 17 – 20 due Monday March 30th 11:59pm

**Week 11 03/30/2020 Infectious Diseases**  
Read the following in [Microbiology OpenStax](https://openstax.org/details/books/microbiology)  
Chapter 21. Skin and Eye Infections  
Chapter 22. Respiratory System Infections Course  
Weekly discussion: students who are leading post due on Monday March 30th 11:59pm.  
Remember 4 comments/ replies due throughout the semester  
Lab 9: Antibiotic Sensitivity-Kirby Bauer Diffusion due Monday Apr 6th 11:59pm

**Week 12 04/06/2020 Infectious Diseases**  
Read the following in [Microbiology OpenStax](https://openstax.org/details/books/microbiology)  
Chapter 23. Urogenital System Infections  
Chapter 24. Digestive System Infections Course  
Weekly discussion: students who are leading post due on Monday Apr 6th 11:59pm.  
Remember 4 comments/ replies due throughout the semester  
Lab 10: Food Safety due Monday Apr 13th 11:59pm  
Quiz 6 Chapters 21 – 24 due Monday Apr 13th 11:59pm.

**Week 13 04/13/2020 Infectious Diseases**  
Read the following in [Microbiology OpenStax](https://openstax.org/details/books/microbiology)  
Weekly discussion: students who are leading post due Monday Apr 13th 11:59 pm.  
Remember 4 comments/ replies due throughout the semester  
Chapter 25. Circulatory and Lymphatic System Infections  
Chapter 26. Nervous System Infections

**Week 14 04/20/2020 Infectious Diseases**  
Read the following in [Microbiology OpenStax](https://openstax.org/details/books/microbiology)  
Weekly discussion: students who are leading post due on Monday Apr 20th 11:59 pm.  
Remember 4 comments/ replies on other student’s posts due throughout the semester  
Quiz 7 Chapters 25 – 26 due Friday April 24th 11:59pm  
Assignment “Infectious disease outbreak, Collaborations across scientific fields” due on Friday April 24th by 11:59 pm

**Week 15 04/27/2020**  
**FINALS WEEK**
10. Course policies:

**Attendance:** Attendance is required on a weekly basis for the entire course. **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/is101-plagiarism. **Late work policy:** Late assignments will be penalized 10% per day they are late. Documented excuses are appropriate to avoid late penalties. **Make-up quizzes:** Quizzes can be taken over and over again and only the highest grade counts. The purpose of the quizzes are to drive you to the textbook and have you become familiar with the content. **Extra credit:** There is no extra credit.

10. Evaluation

There will be seven quizzes, 35 % of grade. Discussions and comments 2 leads on discussions and 4 comments/ replies, 16% of grade
There are three written assignments, 11 % of the grade
There are ten labs including lab reports they are 39 % of the grade

11. Explanation of NB/I/W grades

This course adheres to the UAF policy regarding the granting of NB Grades. The NB grade is for use only in situations in which the instructor has No Basis upon which to assign a grade. In general, the NB grade will not be granted.

Your instructor follows the University of Alaska Fairbanks Incomplete Grade Policy: “The letter “I” (Incomplete) is a temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of work in a course but for personal reasons beyond the student’s control, such as sickness, he has not been able to complete the course during the regular semester. Negligence or indifference are not acceptable reasons for an “I” grade.”

12. Academic Integrity

As described by UAF, scholastic dishonesty constitutes a violation of the university rules and regulations and is punishable according to the procedures outlined by UAF. Scholastic dishonesty includes, but is not limited to, cheating on an exam, plagiarism, and collusion. Cheating includes providing answers to or taking answers from another student. Plagiarism includes use of another author’s words or arguments without attribution. Collusion includes unauthorized collaboration with another person in preparing written work for fulfillment of any course requirement. Scholastic dishonesty is punishable by removal from the course and a grade of “F.” For more information go to Student Code of Conduct. http://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/
http://www.uaf.edu/deanofstudents/academic-integrity/

13. Support Services
Non-subject oriented assistance can be obtained through the SFOS Academic Coordinator’s office:

Carolyn Chapin, Academic Program Manager
Phone: 907.474.5548
email: carolyn.chapin@alaska.edu

UAF Academic Support Services supports students with academic advising, tutoring and academic support, disability services, computing and IT support. Contact the Registrar’s office for things like: enrollment, registration, petitions, transcripts, graduation and more.

Alternately, contact UAF Student Support Services for first-generation and those with disabilities or low income who may be eligible for additional student support.

UAF maintains an academic environment in which the freedom to teach, conduct research, learn and administer the university is protected. Students enjoy maximum benefit from this environment by accepting responsibilities commensurate with their role in the academic community. Visit UAF Student Policies.

**UAF Help Desk**
Go to [http://www.alaska.edu/oit/](http://www.alaska.edu/oit/) to see about current network outages and news.
Reach the Help Desk at:
- e-mail at helpdesk@alaska.edu
- fax: 907-450-8312
- phone: 450-8300 (in the Fairbanks area) or 1-800-478-8226 (outside of Fairbanks)
14. Disabilities Services

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials. I will work with the Office of Disabilities Services (208 Whitaker Bldg, 474-5655) to provide reasonable accommodation to students with disabilities. For more information, contact Disability Services at uaf-disabilityservices@alaska.edu, 474-5655 or by TTY at 474-1827. Also, inform me if you are color blind and I will adjust Blackboard postings to accommodate everyone.

15. Notice of Nondiscrimination

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: www.alaska.edu/titleIXcompliance/nondiscrimination.

The University of Alaska Board of Regents have clearly stated in BOR policy that discrimination, harassment and violence will not be tolerated on any campus of the University of Alaska. If you believe you are experiencing discrimination or any form of harassment, including sexual harassment/misconduct/assault, you are encouraged to report that behavior. If you disclose sexual harassment or sexual violence to faculty members or university employees, they must notify the UAF Title IX coordinator about the basic facts of the incident. Your choices for disclosure include:

1. You may confidentially disclose and access confidential counseling by contacting the UAF Health and Counseling Center at 474-7043.
2. You can get support and file a Title IX report by contacting the UAF Title IX coordinator at 474-7599.
3. You may file a criminal complaint by contacting the UAF Police Department at 474-7721.

16. Note on Sexual Misconduct

Our school is committed to fostering a safe, productive learning environment. Title IX and our school policy prohibits discrimination on the basis of sex. Sexual misconduct — including harassment, domestic and dating violence, sexual assault, and stalking — is also prohibited at our school.

Our school encourages anyone experiencing sexual misconduct to talk to someone about what happened, so they can get the support they need and our school can respond appropriately.

If you wish to speak confidentially about an incident of sexual misconduct, want more information about filing a report, or have questions about school policies and procedures, please contact our Title IX Coordinator, which can be found on our school’s website.

Our school is legally obligated to investigate reports of sexual misconduct, and therefore it cannot guarantee the confidentiality of a report, but it will consider a request for confidentiality and respect it to the extent possible.

17. Student protections and services statement

Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: www.uaf.edu/handbook/