

**BIO 113: Infectious Disease (SD-IP),  
SP13,  
Syllabus**



**Instructor:** Katherine Robertson  
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**Office hours:** T, R, 11:00 – 12:30

**Text:** There is no text for this course, but you will be provided with some supplemental reading material which you will be expected to read. There will also be several movies

**Assignments:** ALL assignments must be printed and handed in during lab (due dates are on the syllabus). I will not accept assignments by e-mail

**Introduction:** BIO 113 is a non-major's, service learning course during which you will learn about the causes, pathogenesis, transmission, treatment and prevention of infectious diseases while at the same time providing a service to a community partner. The course consists of lectures, readings and movies about many common and some uncommon infectious diseases as well as important global diseases such as malaria, TB, rabies, hepatitis, MRSA and schistosomiasis. There is a three hour/week lab component, during which some time will be spent doing typical biology lab exercises in which you will learn basic techniques such as how to culture and identify live organisms or simulate the transmission of infections. The rest of the time will be spent developing lab exercises and lesson plans for high-school students in underfunded schools in Malawi.

**Project Malawi:** Malawi is a recently democratic, developing country in sub-Saharan Africa. It has an established education system and many schools. However, the schools are underfunded and poorly equipped. The government of Malawi recognizes the need for improved education, especially in the fields of science, math and engineering, if Malawi is to compete globally and improve its economy, and for its people to lift themselves out of poverty. However, the department of education can't yet afford to fully support its educational programs. In addition to widespread poverty, Malawi endures the burden of several infectious diseases that are typical to sub-Saharan Africa, such as malaria, schistosomiasis and TB. The goal of Project Malawi is to enhance science education and raise awareness about infectious disease in a partner school by designing lab kits and lesson plans that bring hands-on microbiology experiments into their science classes.

Our community partner for this project is Kalibu Academy in Blantyre, Malawi. Our community liaison is science teacher, Ms. Wezzie Osman. Kalibu Academy serves secondary (high) school students in the Blantyre area. All classes are in English, and all the teachers and students speak English fluently (although the National language is Chewa). Compared to many schools in Malawi, Kalibu is reasonably well off, but they are also in a good position to communicate with us (they have good e-mail connection and access to the internet), to test our kits and to provide us with feedback for improving the kits in the future. The eventual goal is to make enough kits that Kalibu students can take them to underfunded schools nearby.

**Course objectives:** During this course students will be expected to

- Demonstrate an understanding about the different classes of microorganisms, their life cycles and their impact on humans
- Demonstrate an understanding of how organisms are transmitted from host to host, how they cause disease and how they may be managed
- Demonstrate an appreciation for global diseases and epidemics, and the impact they have on local communities
- Demonstrate an understanding of sub-Saharan culture and of the problems faced by educational institutions in developing countries
- Demonstrate an understanding of the scientific process by developing and testing experiments that can be used by school children to help them understand microbiology, and that will encourage their interest in science
- Demonstrate an ability to write effective lesson plans that help school children learn about microbiology

### **Exams**

There will be three exams during the semester which will be used to assess your knowledge of the content and your understanding of the concepts taught during this course. The exams will be sequential and each will be worth 100 points. There will also be a final exam, worth 100 points which will be in the form of a reflective exercise in which you will be asked to discuss what you learned during labs, during their service learning exercises and during discussions about Malawi.

### **Team Administrative project**

As a member of this class, you are also a member of the administrative team for Project Malawi. If Project Malawi is going to be a long-term success, it will need funding and it will need to be administered correctly. Your team's project may take the form of raising public awareness, contributing to our Project Malawi website or developing educational materials. We will discuss these projects as a class; once we have come up with a list of objectives, you will be placed in teams to work on those objectives depending on your talents and interests. At the end of the semester, you will write a report on what you did and what you achieved. Your efforts will be assessed by peer-review and by the content and quality of your report. Your project is worth 100 points.

### **Lab class service learning project**

During some of the lab periods you will work in teams to test experiments for use in the classroom, edit the protocols and write reports about your experiences. Your edited protocols and

reports will be graded for 30 points each (150 points total). After completion of each lab, kits will be put together and mailed to Malawi.

### Lab Protocol Presentation

At the end of the semester, you will turn one of your service learning lab protocols into a PowerPoint presentation and present it to the rest of the class for 50 points on the day of the final exam. Each student may also receive up to 20 points for audience participation (asking questions, making suggestions *etc.*) during the presentations.

### URAC

Up to 20 points will be given to students who attend an oral biology presentation or two biology posters at the Westminster Undergraduate Research and Arts Celebration (URAC) on April 25<sup>th</sup> and write a comprehensive summary of the research presented.

### Quizzes/Exercises

I have reserved 100 points for quizzes of class exercises which I may (or may not) use to help you understand more difficult concepts taught in class. The number and type will depend on your progress and need

Exams 3 X 100	300	<b>A</b>	≥ 93
Quizzes/Exercises	100	<b>A-</b>	90-92.9
<b>Lab project</b>		<b>B+</b>	87-89.9
Protocols/lesson	150	<b>B</b>	83-86.9
plans 5 X 30		<b>B-</b>	80-82.9
Admin project	100	<b>C+</b>	77-79.9
Lab Protocol Presentation	50	<b>C</b>	73-76.9
Participation	20	<b>C-</b>	70-72.9
URAC	20	<b>D+</b>	67-69.9
Final exam	100	<b>D</b>	63-66.9
<b>Total</b>	<b>860</b>	<b>D-</b>	60-62.9
		<b>F</b>	<60

### ACADEMIC INTEGRITY:

The issue of academic integrity is taken very seriously at Westminster. Students are expected to abide by the College Policy on Academic Integrity. The policy can be found at

[http://www.westminster.edu/acad/pdf/undergrad\\_catalog/current.pdf](http://www.westminster.edu/acad/pdf/undergrad_catalog/current.pdf)

I encourage you to work together and discuss your assignments with your colleagues, but **all written and oral assignments must be your own work**. Quotes, data, photographs or ideas taken from another source must be cited correctly. You will be given advice on how to do this throughout the course, but if you have any questions or doubts – you **MUST ASK**. **If there is plagiarism in one of your assignments, you will receive a score of zero (0) for that assignment, and a report will be sent, in writing, to the Dean. More than one incident of plagiarism may result in you being awarded an F for the course.**

Plagiarism includes: extensive quoting, paraphrasing or copying, from any other source: books, articles, websites, other students work or class material; Incorrect or inadequate citation of quotes, data, ideas or images; Directly copying experiments or research projects that have been developed by another student, or published by another researcher.

	<b>Starting Date</b>	<b>Topic</b> <i>*Denotes a movie</i>	<b>Labs (T) &amp; assignment due dates</b>
Week 1	W, 1-16-13	1. Introduction to Infectious Disease	<b>NO LAB</b>
Week 2	T, 1-22-13 (No class Monday)	2. Tour of Malawi and project assignment <i>*I Am Because We Are</i>	NO LAB (M classes)
Week 3	M, 1-28-13	3. Infectious agents	Lab #1a: Microscopy & Water Treatment
Week 4	M, 2-4-13	4. Influenza and Pneumonia <i>*Influenza 1918</i>	Lab #2: Culturing on Selective Media
Week 5	M, 2-11-13	<b>EXAM I (Monday)</b> 5. E.coli and Cholera	Lab #2b <i>Lab #1 protocol due</i>
Week 6	M, 2-18-13	6. Schistosomiasis	Lab #3: Food Preservation <i>Lab #2 protocol due</i>
Week 7	M, 2-25-13	7. The immune system	Lab #3b
Week 8	M, 3-4-13 (No class M, W, F)	NO CLASS SPRING BREAK	<b>NO LAB</b>
Week 9	M, 3-11-13	Immune System Review 8. HIV <i>*Surviving AIDS</i>	Lab #4: Soil Microbes & Agriculture <i>Lab #3 protocol due</i>
Week 10	M, 3-18-13	9. Hemorrhagic fevers <i>*Ebola: The Plague Fighters</i>	Lab #4b
Week 11	M, 3-25-13 W, 3-27-13 R, 3-28-13 (No class Friday)	<b>EXAM II (Monday)</b> 10. Malaria <i>*Malaria: Fever Wars</i>	Lab #5: Antibiotics <i>Lab #4 protocol due</i>
Week 12	W, 4-3-13 (No class Monday)	11. STIs	Lab #5b
Week 13	M, 4-8-13	12. Rabies	TBA HSC 150
Week 14	M, 4-15-13	13. Epidemiology <i>*Bird Flu: How Safe Are We?</i>	Presentations HSC 150
Week 15	M, 4-22-13 <b>(No class Wednesday; URAC)</b>	14. CDC and WHO <i>*The Final Inch</i>	Presentations HSC 150
Week 16	M, 4-29-13	Catch Up and Review <b>EXAM III (Friday)</b>	<b>NO LAB</b>

Final Exam: Thursday 5-9-12, 8:00 – 10:30 AM.