



UNIVERSITY of HAWAII®
WINDWARD
COMMUNITY COLLEGE

GENERAL MICROBIOLOGY

3 Credits (CRN 63018)
WWW and Virtual Course
C19 and DB

INSTRUCTOR: Teena Michael PhD
OFFICE: Hale Palanakila 142
OFFICE HOURS In-person meeting by appointment only
Zoom meeting Topic: Micro Zoom Discussion and Meetings
Topic: Microbiology
Time: This is a recurring meeting Meet anytime
Join Zoom Meeting
<https://hawaii.zoom.us/j/92454752623>
Meeting ID: 924 5475 2623
Passcode: Polio

TELEPHONE: (808) 236-9114
EMAIL (best contact): teena@hawaii.edu
EFFECTIVE DATE: Fall 2022 (8-22-22 through 12-16-22)

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

'O keia ka wā kūpono e ho'onui ai ka 'ike me ka ho'omaopopo i kō Hawai'i mau ho'oilina waiwai. Aia nō ho'i ma ke Kulanui Kaiāulu o ke Ko'olau nā papahana hou o nā 'ike 'akeakamai a me nā hana no'eau. Me ke kuleana ko'iko'i e ho'ohiki ke Kulanui e kāko'o a e ho'okumu i ala e hiki kē kōkua i ka ho'onui 'ike a nā kānaka maoli. Na mākou nō e ho'olako, kāko'o a paipai i nā Ko'olau a kō O'ahu a'e me nā hana no'eau ākea, ka ho'ona'auao 'oihana a me ka ho'onui 'ike ma ke kaiāulu — hō'a'ano a e ho'oulu i nā haumāna i ka po'okela.

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide the Ko'olau region of O'ahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

Fundamentals of microbiology: growth, development, and classification of bacteria, viruses, protozoa, fungi and algae; roles of microorganisms in the environment and human affairs; medical microbiology, immunology, and applied microbiology for food sanitation and public health.

Requirement course satisfies:

Successful completion of this course fulfills natural science requirements for AA degree (WCC) and for arts and science BA programs (UHM).

AT WCC: ([HTTP://http://windward.hawaii.edu/Courses/MICR130/](http://windward.hawaii.edu/Courses/MICR130/))

- Associate in Arts – Biological Sciences (DB, DY)

- *CA Agripharmatech*: Required for Plant Biotechnology & Ethnopharmacognosy Tracks (http://windward.hawaii.edu/Academics/Agripharmatech_CA/)
- Elective for AS in Natural Sciences

At UHM:

- Bachelor of Science Degree Program in Plant and Environmental Biotechnology.
- Accepted as an elective for the following specializations: Plant Biotechnology, General Biotechnology and Environmental-Microbial Biotechnology.

Activities Required at Scheduled Times Other than Class Times

Read the presentations and text/OER resource chapter before ‘class’.

- 1) Do the worksheets that are written in the style of the exams.
- 2) Complete “Options” and Project development as described.
- 3) Complete assigned homework.
- 4) Note—material assigned as worksheets and homework support what we cover in presentationa and these ARE the basis for our exams. Material NOT covered in class will not be on exams. You will need to access resources however to remember and apply and understand so succeed and ‘master’ microbiology.
- 5) An outside of class zoom discussion will support learning and be guided by questions for those that can attend and/or questions sent to me (teena@hawaii.edu) and can include worksheet components!

STUDENT LEARNING OUTCOMES

As a result of taking this course, students can expect to attain the following outcomes:

- *Describe* and give examples of the main morphological characteristics, growth, reproduction and classification of algae, bacteria, fungi, protozoa, viruses and helminths.
- *Discuss* etiologies, reservoirs of infection, modes of transmission, signs, symptoms, and treatments and/or methods of prevention of common infectious diseases of humans.
- *Describe and discuss* the basic principles of molecular genetics as they relate to cell division, mutation, genetic engineering, protein synthesis, viral and bacterial virulence, and antibiotic resistance.
- *Describe* pathogenicity, immunity and allergies.

COURSE CONTENT

The course is designed to introduce the fundamentals of microbiology, growth, development and classification of microorganisms, role of microorganisms in relation to environment and human affairs. The course also acquaints the students to medical microbiology, microbial genetics, immunology, molecular biology and, applied microbiology for food, sanitation and public health.

- A basic knowledge of introductory chemistry, though not required as a prerequisite, is strongly recommended.
- The background for our studies this semester includes the pandemic and this will influence both the content and how we consider/apply the content to our lives, other classes and programs. We are facing 2 additional viral diseases during our semester and note—news in general is included/discussed in our class!

COURSE TASKS, ASSESSMENT AND GRADING

Note! The diversity of our assignments supports the successes of diverse learners.

Your final grade is based on:

- 1) *OPTIONS*:

<ul style="list-style-type: none"> ■ <i>Journal Assignments/Article/Movie Review/Reflections/Book</i> ■ <i>See description below**</i> 	25 points
2) <i>Group or Individual Project OR Round Table</i>	35
3) <i>Forums (2)</i>	25
4) <i>Worksheets (6)</i>	60
5) <i>Assignments/Homework (3)</i>	30
6) <i>3 exams at 100 points each</i>	300
7) <i>Final exam</i>	125
	<hr/> <i>Total 600</i>

Students will receive a letter grade based on the following scale:

A = 90-100% B = 80-89% C = 70-79% D = 60-69%

I (incomplete) grade is given at the instructor’s option when a student has failed to complete a small part of a course because of circumstances beyond student’s control. It is the **student’s responsibility** to contact the instructor to make up the incomplete work with a minimum level (or better) of achievement. Failure to satisfactorily make up incomplete work within the appropriate time period will result in a grade change for “I” to the contingency grade identified by the instructor.

* Zoom sessions will be offered to discuss *the material and *news as relates to our class. We will schedule a session per week to accommodate diverse schedules/needs. Sessions that ARE the content lectures and/or worksheet discussions will be recorded and posted for review and/or for those that cannot attend.

** Elect activities that total 25 points. *Requirements for each are described below and *declare your choices to me! The first journal OR other option is due *4 September in Laulima Assignments by midnight. The other work can be spaced out through the semester and could complement your project. All other work is due by 8 December at the latest (sooner is better!) in Laulima Assignments by midnight.*

*Consistent attention to the lectures, resources, discussions and assignments/quizzes is necessary to learn the information and to perform well in exams.

*Tests will be made up of jeopardy, objective questions (multiple choice, short answer, short essays and drawings; sample questions will be provided throughout the lecture classes. The worksheets ARE basic study guides for the exams—the will be posted as Assignments and Due before the Exams. Please take the exams as scheduled.

* The last day to Withdraw (W) from class is 10/31/22.

* See catalog for specifics and calendar for dates in general and for I grades and NC grades. Taking this class as Credit/No credit is an option.

Worksheets/Exams

Worksheets in the style of the exams will be added as WORKSHEET Assignments throughout our studies of Microbiology, as Google Docs for individual and/or cooperative learning.

*I encourage you to work with each other in Google Drive (for example). To do this you need to agree to be constructive (not delete or hamper the work of each other) and contribute! *Worksheets will be posted in Google Docs and—both earn you points for good progress towards completion and are *important in understanding the material and *key to doing well on exams.*

Successful performance on the exams will require that you can recall, analyze, problem solve and understand the information presented in class. The worksheets are designed to aid you in these processes. *Solo OR cooperative completion of worksheets IS STUDYING for our exam.*

OPTIONS to mix-and-match (25 points). Turn your work in to **Laulima Assignments**

* **Option Journal 10 points each**

Options for problems or questions for journal entries will be discussed in class. You will be evaluated on: 1) your handling and understanding of basic information; 2) analysis of the problems; 3) inventiveness and 4) correct citing of your reference(s) with in text citing and listing at the end. Each journal is 10 points and should be 1 or more single-spaced typed pages. Four options are listed here but you can *make your own options* that come out of your own focus/interest/fear or concern/need-to-know!

Journal idea 1. What do you know about Covid 19 or Polio or Monkeypox? If you choose this as a first option/journal I encourage you to include what you know –or think you know—as well as do a bit of research.

Journal idea 2. How has war influenced medicine? Choose a war that interest you, compile information, refer to your reference(s) as you write and think about the information adding your own thoughts/opinions. List your reference(s).

Journal idea 3. How has this pandemic, exposed disparities in who might get or survive Covid19, and/or health care in general?

Journal idea 4. Racial disparities in medicine—what are they and how do they manifest? Please see this (or other) URL to learn about or more about discoveries by black microbiologists.

<https://medicine.umich.edu/dept/immunology/events/202009/black-micro-week-vibrant-celebration-black-microbiologists>

Is YOUR ethnicity represented fully in medicine and/or society? USE this journal as a chance to find microbiologists that represent your culture or ethnicity.

* **Option Reflections 5 points each** ***I highly recommend that you do at least one reflection in the first week of class!*

Five reflections on class content could complete your 25 points of options. With your notes open or not open (!) write the story of the class including examples and dilemmas--what *you understand and *do not yet understand. Five points will be assigned for each reflection with 5 points being complete and exploratory or thoughtful, 3 points being a collection of information, 1 point contains some information but not complete or thoughtful.

* **Option Book** You may choose to read a book for 25 points including (*but not limited to*):

Cook, R. Toxin. 1998

De Kruif, P. Microbe Hunters; the Classic Book on the Major Discoveries of the Microscopic World. 2002

Dixon, B. Animalcules: the Activities, Impacts, and Investigators of Microbes. 2009

Hotez, P. Forgotten People, Forgotten Diseases: the Neglected Tropical Diseases and their Impact on Global Health and Development. 2013

Kaplin, M. Medusa's Gaze and Vampire's Bite: The Science of Monsters. 2012

<http://www.npr.org/2012/10/26/163712865/medusas-gaze-and-vampires-bite>

Karlen, A. Man and Microbes; Disease and Plagues in History and Modern Times. 2003

Klarsfeld, A. & F. Revah. The Biology of Death: Origins of Mortality. 2003

Potten, C. & J. Wilson. Apoptosis: the Life and Death of Cells. 2004

Preston, R. The Hot Zone (1998), Cobra Event (1998), The Demon in the Freezer. 2002

Raymond, B. A Chronology of Microbiology in Historical Context. 2000

Reilly, P. Is it in your Genes? 2004.

Sherman, I. Twelve Diseases That Changed Our World (2007), The Elusive Malaria Vaccine: Miracle or

Mirage? 2009

Walters, M. J. Six Modern Plagues and How We Are Causing Them. 2003

Wills, C. Yellow Fever Black Goddess, The Coevolution of People and Plagues. 1996

Option Audiobooks!

**Audible Books can be used for the book option. I include two only here for people that subscribe to Audible.com.*

IF you have a monthly subscription to Audible.com then these are two (of many) options. The first is 30 minutes and the second is huge so choose a couple of viruses (or more) and use those for your 2 pages of facts. What topics pertain to Micro?

**How many points for a book or audiobook? Twenty five (25) points will be earned when you turn in 2 single spaced pages of bulleted facts. When will this be due? Turn in your 2 pages of bulleted facts by the last day of our class.*

Soldiers of Science; An Interview with Dr. Anthony Fauci by Alan Alda, Dr. Anthony Fauci, Kate Rope
***30 minutes**

Viruses, Plagues, and History; Past, Present and Future by Michael B.A. Oldstone *13.5 hours
(choose a chapter that fascinates you for your 'book' points:

Publisher's Summary: The story of viruses and humanity is a story of fear and ignorance, of grief and heartbreak, and of great bravery and sacrifice. Michael Oldstone tells all these stories as he illuminates the history of the devastating diseases that have tormented humanity, focusing mostly on the most famous viruses.

Oldstone begins with smallpox, polio, and measles. Nearly 300 million people were killed by smallpox in this century alone and the author presents a vivid account of the long campaign to eradicate this lethal killer. Oldstone then describes the fascinating viruses that have captured headlines in more recent years: Ebola, Hantavirus, mad cow disease (a frightening illness made worse by government mishandling and secrecy), and, of course, AIDS. And he tells us of the many scientists watching and waiting even now for the next great plague, monitoring influenza strains to see whether the deadly variant from 1918 - a viral strain that killed over 20 million people in 1918-1919 - will make a comeback. For this revised edition, Oldstone includes discussions of new viruses like SARS, bird flu, virally caused cancers, chronic wasting disease, and West Nile.

Viruses, Plagues, and History paints a sweeping portrait of humanity's long-standing conflict with our unseen viral enemies. Oldstone's book is a vivid history of a fascinating field, and a highly reliable dispatch from an eminent researcher on the front line of this ongoing campaign.

©2010 Michael B. A. Oldstone (P)2018 Tantor

*** Option Literature** (10 points/short article, 15 points long article). Each student is to choose one or more "short" articles (e.g. Science News) at 10 points each or one "long" article (e.g. Scientific American, 15 points) from any area of microbiology and write a review. The first paragraph will summarize the information, the second will summarize or point out the merits of a web site or other resource that addresses the topic and the third is for you to develop your own thoughts on the information and/or subject. The article(s) may be used to help you prepare for your class project presentation.

*** Option Podcast** (10 points each) Listen to a podcast that pertains to our class and write a one-page reflection on what you learned and your thoughts on the subject. *Examples of podcasts that pertain to our class during the pandemic can be found at: <https://www.vulture.com/article/coronavirus-podcasts.html>*

*** Option Movie** (15 points) Watch a movie and explain/explore the microbiology OR the biology that is relevant to microbiology involved in the movie. Examples include (but are not limited to!)



Cowspiracy, Food Inc., Emerald Forest, Boys from Brazil, Gattaca, Outbreak, Monsters Inside Me (Discovery channel). A movie reflection is 15 points and should be 1 or more single-spaced typed pages. Include information and your reactions to the information--your thoughts are important.

Grey's Anatomy is also an option in that the show is addressing the pandemic from both medical and human perspectives...

The Good Doctor is also an option in that the show is addressing the pandemic from both medical and human perspectives...

PROJECT Guidelines (note each student/group will choose and develop PROJECT OR ROUND TABLE!)

Each student is to choose a topic near the beginning of the semester, form a group then develop and record your presentation and your presentations will be added to Laulima for others to enjoy/learn from and be bases for conversation via Forums as we complete our class.

How do you record your presentation? Guidance and help will be discussed in class. Think about what fascinates you—what bothers you and that could be your topic.

The starred (*) topics on the schedule are project areas and presentation dates. For full credit (30 points), you will need to show your understanding of the topic, agent(s) and/or disease(es) you choose relative to:

- How does disease/disorder manifest in the body? What is the basic anatomy and physiology of the system that is impacted by the pathogen(s)?
- How is the system protected from pathogens and how is the system is vulnerable to pathogens?
- What are diseases and disease-causing agents of the system?
- How do the disease-causing agents (viral and/or bacterial and/or helminthes and/or other eukaryotes) infect and interact with the system and the host?
- What are signs, symptoms and disease development as well as mechanism of treatment?
- What do the treatments do at the level of the cells and molecules? Can you invent a treatment or cure based on your understanding of molecules and cells?

**Any aspect of the pandemic could be the subject of your presentation!*

Students before you have successfully carried out other project approaches including:

- How have diseases impacted the Hawaiians (past and/or present)?
- What are diseases of poverty?
- What are microbial diseases that have led to malpractice lawsuits in Hawaii?
- Did Chagas disease kill Darwin?
- What are cancers caused by viruses?
- What is the microbiology of Food Inc.? OR What is the microbiology of sushi?
- What are diseases of prostitution? OR What are emerging diseases?
- When did *the plague* hit Oahu and what happened?
- What are nosocomial infections?
- What is Ebola and where did it come from?
- What are fecal transplants and how are they used? OR Microbiome! OR Zika!

NOTE! WHAT is going on in the news? THIS could be your project! Try to know more about what our world/society/cultures are facing during our time together. What is the agent that 'causes' the disease? What basket is the agent in? Prok? (Gram positive or negative?) Euk? (Protista that is animal-like, plant-like or fungus-like? OR a Helminth = worm? OR a fungus? OR a plant?) OR a non-living 'agent' (Virus? if so RNA or DNA virus? PRION?). This could be your project!

EXAMPLES of Student Projects will be posted in Laulima Resources for both the information and as examples of how to approach your own project.

ROUND TABLE Guidelines (note each student/group will choose and develop ROUND TABLE OR PROJECT!)

Round Tables originated 3 semesters ago when students that attended zoom discussions, talked with each other about what it was like to be...1) working in a child's oncology ward...or 2) to be a person that was or was concerned about disparities in medical care, or 3) to be a person that say experienced cultural aspects of disease...and 'we' wanted to think and learn more hence—the ROUND TABLE was born.

TO INITIATE a Round Table—simply let me know your title and if possible—gather 2-8 (ish) colleagues that also want to earn points (35 points for EITHER successful Round Table OR successful Project) and talk...listen. Round Tables are conducted by Zoom discussion format and all are welcome/encouraged to attend and ask questions...learn!

Students that attend earn points as well. We record Round Table(s) and post them along with Projects.

LEARNING RESOURCES

Class presentations and resources are the primary sources of information/concepts and stories that support our developing RECALL, ANALYTICAL THINKING, and UNDERSTANDING. The following are excellent resources options that support those objectives—for gaining mastery of the microbiology that we study.

1) **TEXTBOOK:** Ideally I would like for us all to have the following excellent text which is electronic and you would purchase a subscription to the etext for \$9.99/month with a 4 month minimum subscription (so ~\$40 for our semester). I will work closely with this text. Follow the procedure below and note that you will receive a 10% discount from the publisher. Tortora is a good reference to support understanding and learning that is *based primarily on our lecture presentations and resources.

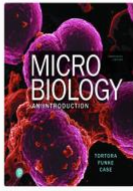
Purchase access to the eText through Pearson+ at this link:

Pearson+: <https://www.pearson.com/en-us/pearsonplus.html>

Along with the Promotional code: learn10 - gives the student a 10% discount.

The price is **\$9.99/month for one 4-month term (before the discount)**

- Through the link above you can search for the title they are looking for. The ISBN for our eText is Tortora: 9780135789377
- eTexts can be read on their mobile device or laptop, online and offline



OR!

2) IF for any reason you prefer to have a hard copy--I encourage you to go to the internet and purchase an OLD EDITION of any edition of Microbiology by Tortora (due to affordability).

OR!

3) This ***Open Educational Resource (OER)** text can BE your text reference for our course [//openstax.org/details/books/microbiology?Book%20details](https://openstax.org/details/books/microbiology?Book%20details)
* *register on the site to use the book online.*

I want you to be prepared by setting up strong foundations...and for you to succeed.

LEARNING ACTIVITIES

- Join our zoom discussion group whenever possible
- Work with each other on worksheets (for example) and Projects or Round Tables
- Take time to apply what we are learning to your lives and to understanding the news in general
- Utilize WCC learning/student support services including **TRIO** for tutoring and Ka Piko below:

[Ka Piko Services](#) provides FREE academic and technical support to all WCC students. Our services are available both in-person and virtually (via Zoom). Our goals are to help students succeed academically and to become independent lifelong learners. We are staffed by friendly and knowledgeable peers who are ready to assist you!

- **Ka Piko Math Lab** provides assistance for all math courses offered at WCC, helping to improve students' understanding of important concepts and problem solving processes.
- **Ka Piko Writing Lab** provides assistance with any and all aspects of the writing process, including: brainstorming, research, MLA formatting and citations, drafting, and revising.
- **Ka Piko Student Tech. Support** can assist students with Google@UH, Lualima, MyUH, UH accounts, and can provide best-effort support for problems or questions with personal computers and other smart devices.
- **Success Connection Workshops**, weekly student success workshops, are also available.

Visit the Ka Piko webpage at go.hawaii.edu/A42 for more information about our services, to learn how to connect with our tutors and tech assistants, or to RSVP for a Success Connection Workshop. Contact the Ka Piko Coordinator, Scott Sutherland, at scottjks@hawaii.edu if you have any questions.

DISABILITIES ACCOMMODATIONS

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Accessibility Counselor to discuss reasonable accommodations that will help you succeed in this class. Roy Inouye can be reached at (808) 235-7448, royinouy@hawaii.edu, or you may stop by Hale Kāko‘o 106 for more information.

SEX DISCRIMINATION AND GENDER-BASED VIOLENCE RESOURCES (TITLE IX)

Windward Community College is committed to providing a learning, working, and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking. If you or someone you know is experiencing any of these, WCC has staff and resources to support and assist you. To report an incident of sex discrimination or gender-based violence, as well as receive information and support, please contact one of the following:

UH Confidential Advocate

Phone: (808) 348-0663 Email: Advocate@hawaii.edu

Karla K. Silva-Park, Title IX Coordinator
Phone: (808) 235-7468

Email: karlas@hawaii.edu Office: Hale Kāko‘o 128

As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled. My goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need. For more information regarding sex discrimination and gender-based violence, the University’s Title IX resources and the University’s Policy, Interim EP 1.204, go to manoa.hawaii.edu/titleix/

Nondiscrimination and Affirmative Action

The University of Hawaii is committed to a policy of non-discrimination on the basis of race, sex, age, religion, color, national origin, ancestry, disability, marital status, arrest and court record, sexual orientation, or veteran status in all of its programs, policies, procedures, or practices. This policy covers admission and access to, participation, treatment and employment in university program and activities.

ALTERNATE CONTACT INFORMATION

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

- Location: Alaka‘i 121. Phone: (808) 235-742

FALL 2022 SCHEDULE

WEEK 1		
August 22-28	Introduction to the Course & Scope	1
	Agents We Study in Micro-- <i>similarities and differences</i> and why these are important. Covid19 Issues and Polio and Monkeypox News	
WEEK 2		
August 29-Sept 4	History of Microbiology Before Pasteur	
	Microbiology Pasteur On and NOW	1
	<i>If I set out to prove something I am no real scientist-- I have to learn to follow where the facts lead me-- I have to learn to whip my prejudices...</i> – Spallanzani	
	The first journal OR <i>other option</i> is due *4 Sept in Laulima Assignments by 11:55 pm.	
WEEK 3		
Sept (5 Holiday) 6-11	Chemistry & the Cell	2
	<i>“Scientists working on the origin of life deserve a lot of credit; they have attacked the problem by experiment and calculation, as science should. And although the experiments have not turned out as many hoped, through their efforts we now have a clear idea of the staggering difficulties that would face an origin of life by natural chemical processes. In private many scientists admit that science has no explanation for the beginning of life.”</i> – Michael Behe	
WEEK 4		
Sept 12-18	Chemistry & Cells	2, (3), 4
	Microscopy & Cells	
	Eukaryotic & Prokaryotic Cells	
	<i>“We cannot fathom the marvelous complexity of an organic being; but on the hypothesis here advanced this complexity is much increased. Each living creature must be looked at as a microcosm--a little universe, formed of a host of self-propagating organisms, inconceivably minute and as numerous as the stars in heaven.”</i> – Charles Darwin	
WEEK 5		
Sept 19-25	EXAM 1 in Laulima and based on presentations, discussions, homework and worksheet for Chapters 1-4	
	Cells –sites for Metabolism	4(5)
WEEK 6		
Sept 26-Oct 2	Microbial Metabolism	5
WEEK 7		
Oct 3-9	Microbial Growth & Control	(5)6 & 7
	<i>The cause of nutrition and growth resides not in the organism as a whole but in the separate elementary parts—the cell.</i> – Theodor Schwann	
WEEK 8		
Oct 10-16	Microbial Growth & Control	6 & 7
	EXAM 2 in Laulima based on presentations, discussions, homework and worksheet for Chapters 4, 5-7	
WEEK 9		
Oct 17-23	Genetics	8

<p><i>“In microbiology the roles of mutation and selection in evolution are coming to be better understood through the use of bacterial cultures of mutant strains.” – Edward Tatum</i></p>		
WEEK 10		
Oct 24-30	Genetics & Recombinant DNA, Horizontal Gene Transfer	8 & 9
WEEK 11		
Oct 31-Nov 6	Viruses & Prions	13
<p><i>“For comparison, tap out a single grain of salt from a shaker. You could line up about ten skin cells along one side of it. You could line up about a hundred bacteria. Compared to viruses, however, bacteria are giants. You could line up a thousand viruses alongside that same grain of salt.”</i></p> <p><i>– Carl Zimmer, <u>A Planet of Viruses</u></i></p>		
<p><i>October 31 Last Day to Withdraw with a W</i></p>		
WEEK 12		
Nov 7-13	EXAM 3 in Laulima and based on presentations, discussions, homework and worksheet for Chapters 8(9), 13	
	*Classification/Diversity of Microbes→Eukaryotes (projects)	10, 12
WEEK 13		
Nov 14-20	*Classification/Diversity of Microbes→Prokaryotes (projects)	11
<p><i>Alice Augusta Ball was an African American chemist who developed the most effective treatment of leprosy until the 1940s and she died at 24 years old. She was also the first woman and first African American to graduate from the University of Hawaii with a Master’s degree.</i></p>		
	*Disease	14
WEEK 14		
Nov 21- (24 & 25 Holiday) 27	*Epidemiology & PROJECT/Round Table Proposal to TM	15
WEEK 15		
Nov 28-Dec 4	*Microbial Mechanisms of Pathogenicity & Host Defense PROJECTS and ROUND TABLES!	15-19 (selections)
WEEK 16		
Dec 5-8	*Microbial Mechanisms of Pathogenicity & Host Defense PROJECTS and ROUND TABLES! Final Preparation	
Dec 10-16	FINAL EXAM TBA	

Note: The order of the topics will remain although the schedule may be modified as we proceed. I will announce any changes ahead of time. Have a great semester!