

August 26, 2009/Bvk

Syllabus

Name of Course: BIO 354 (Microbiology)
Time of Course: M/W/F - 11.30 am to 12.20 pm
Room: HS G59

Contact info

The best way to reach me is to email in advance to set up an appointment. Otherwise find me in the labs (G32 teaching lab, Gxx Research Lab) or office and we will schedule an appointment.

Email: birthe.kjellerup@goucher.edu
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Textbook

Prescott's Principles of Microbiology, 2009, 1st edition, ISBN: 978-0-07337523-6.

Course Description

This course introduces bacterial, fungal, viral and eukaryotic microbes. Topics include: microbial structure, classification, metabolism, growth, diseases, diversity of the microbial world and microbial ecology/symbiosis.

Course Objectives

- A. Outline the historical origins of microbiology and the structure of microbial organisms.
- B. Identify the major groups of microorganisms according to their taxonomic classification and describe their main characteristics including any ecological, economic or medical significance.
- C. Compare and contrast prokaryotic and eukaryotic cells in terms of their structure, replication and flow of genetic information within the cell.
- D. Identify the physical and chemical factors that influence growth of microorganisms.
- E. Explain common physical and chemical methods to inactivate or limit the growth of microorganisms, including antimicrobial therapies.
- F. Summarize the modes of transmission of disease including pathogenic mechanisms used by microbes to invade and damage the host.
- G. Describe the interactions and impact of microorganisms in the environment.

Grading:

- | | |
|---|------------------------------------|
| • Effort (Attendance and participation): | 10% |
| • Micro Project: Student presentation and paper | 30% (Paper: 15%, Presentation:15%) |
| • 1 st exam | 20% |
| • 2 nd exam | 20% |
| • 3 rd exam | 20% |

Extra points: For high interest in the Micro project, high quality paper (5-7 pages) and well structured presentation.

Lecture schedule

(Can be revised in the first weeks of September 2009).

Lect. #	Date	Topic	Reading
PART ONE: INTRODUCTION TO MICROBIOLOGY			
1	Sept 2	The History and Scope of Microbiology	Self study Chapter 1 & 2
2	Sept 4	The Study of Microbial Structure: Microscopy & Specimen Prep.	
3	Sept 9	Prokaryotic Cell Structure and Function	Chapter 3
4	Sept 11	Eukaryotic Cell Structure and Function	Chapter 4
	Sept 11	Paper on "Important historical microbiologists" is due	
5	Sept 14	Viruses and Other Acellular Agents	Chapter 5
PART TWO: MICROBIAL NUTRITION, GROWTH, AND CONTROL			
6	Sept 16	Microbial Nutrition	Chapter 6
7	Sept 18	Microbial Growth	Chapter 7
8	Sept 21	Control of Microorganisms by Physical and Chemical Agents	Chapter 8
PART THREE: MICROBIAL METABOLISM			
9	Sept 23	Introduction to Metabolism	Chapter 9
10	Sept 25	Catabolism: Energy Release and Conservation	Chapter 10
11	Sept 28	Anabolism: The Use of Energy in Biosynthesis	Chapter 11
PART FOUR: MICROBIAL MOLECULAR BIOLOGY AND GENETICS			
12	Sept 30	Genes: Structure, Replication and expression	Chapter 12
13	Oct 2	Regulation of gene expression	Chapter 13
14	Oct 5	Mechanisms of genetic variation	Chapter 14
15	Oct 7	Microbial Genomics	Chapter 15
16	Oct 9	1 st exam	
17	Oct 12	Industrial Microbiology and Biotechnology: Guest Lecture	Chapter 16
PART FIVE: THE DIVERSITY OF THE MICROBIAL WORLD			
18	Oct 14	Microbial Evolution, Taxonomy, and Diversity	Chapter 17
19	Oct 16	The <i>Archaea</i>	Chapter 18
20	Oct 21	Bacteria: The <i>Deinococci</i> , Non- <i>Proteobacteria</i> Gram Neg. & <i>Proteobacteria</i>	Chapter 19 & 20
21	Oct 23	Bacteria: The Low & High G + C Gram Positives	Chapter 21 & 22
22	Oct 26	Eucaryotic Microbes	Chapter 23
23	Oct 28	Guest Lecture	Chapter 24
PART SIX: ECOLOGY AND SYMBIOSIS			
24	Oct 30	Biogeochemical Cycling and the Study of Microbial Ecology	Chapter 25
25	Nov 2	Microorganisms in Natural Environments	Chapter 26
26	Nov 4	Microbial Interactions	Chapter 27
27	Nov 6	Biofilms & Applied environmental microbiology	Other material
28	Nov 9	2 nd exam	
PART SEVEN: HOST DEFENSES			
29	Nov 11	Normal Microbiota and Nonspecific Host Resistance	Chapter 28
30	Nov 13	Specific Immunity	Chapter 29
PART EIGHT: MICROBIAL DISEASES AND THEIR CONTROL			
31	Nov 16	Pathogenicity of Microorganisms	Chapter 30
32	Nov 18	Antimicrobial Chemotherapy & Clinical Microbiology	Chapter 31 & 32
33	Nov 20	Biofilms in disease	Other material
34	Nov 23	The Epidemiology of Infectious Disease	Chapter 33

	Nov 23	Applied Micro Project Paper is due	
PART NINE: APPLIED MICROBIOLOGY			
35	Nov 30	Applied Micro Project - Student presentation I (Mandatory)	
36	Dec 2	Applied Micro Project - Student presentation II (Mandatory)	
37	Dec 4	Applied Micro Project - Student presentation III (Mandatory)	
38	Dec 7	Applied Environmental Microbiology	Chapter 34 & 35
39	Dec 9	3 rd exam	

Course Policies

Attendance

Since your effort (attendance and participation) counts as a part of your grade and the questions on the exams will reflect the topics covered in class but not necessarily shown on the power point handouts (available at Blackboard) you are highly encouraged to attend all lectures. Attendance will be taken and repeated absences are taken into consideration for border line grades and professionalism points.

Normal lecture days: If you are sick, please contact me via email before class starts. Otherwise you will be counted as “absent without reason”.

Exam days: If you are sick, please contact me via phone or email as soon as possible AND prior to the exam, so we can find a solution. Otherwise you will be noted as “absent without reason” and receive a 0% on the test.

Electronic devices

All electronic devices must be turned off during lectures and put away. They are not to be placed on the desk.

Late work

If you experience a high work load or other issues come up during the semester, please contact me as soon as this occurs, so we can make a plan avoiding late assignments. Late assignments will not be accepted after the assignments have been returned to students.

Exams and presentations

The dates for exams, presentations and other assignments are listed in the syllabus and will be held on those dates. Please do not schedule appointments or commit to other obligations during these times. Exams cannot be made up unless I grant you an excused absence due to a medical emergency or some other major unforeseen catastrophe.

In the event that the college is closed, due to bad weather or some other major problem, the scheduled exam will be given during the first lecture class that we meet after the college reopens.

We will be communicating via email throughout long periods of college close-downs, so please check your email regularly in order to receive information on assignments etc., since the plans might change.

Academic Honor Code

Reminder: All students are bound by the standards of the Academic Honor Code, found at www.goucher.edu/documents/General/AcademicHonorCode.pdf