

**LIFS 3060: MICROBIOLOGY (Spring 2018)**

**Course Instructors:**

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**Entry Level:** Pre-requisite LIFS2040 or LIFS2060 or with permission of the course director.

**Course schedule:** Tuesday and Thursday 9:00-10:20 in LT-A

**Course objectives:** This course aims to introduce students to the fundamentals of identification, structure, physiology, and genetics of microorganisms; and the importance of microorganisms in human health, the environment, and in biotechnology.

**Learning outcomes:** Upon completion of this course students will be able to:

1. Describe and comprehend important features of bacteria, fungi, protozoa and viruses.
2. Describe and comprehend important aspects of the physical and nutritional requirements of microorganisms.
3. Describe the methods used to measure microbial numbers and those to control the growth of unwanted microorganisms.
4. Identify the driving forces for the distribution of microbial diversity in the natural environment.
5. Discuss the roles of environmental microorganisms in the functioning of the biosphere and in the development of human civilization.
6. Describe important infectious diseases locally and internationally, in the past and present time.
7. Explain how pathogenic microbes cause human diseases and how the human body guards against microbial invasion.
8. Explain the biological principles underlying medical intervention of infectious disease.

**Course Assessment:**

Assessment Tasks	Contribution to Final Grade (%)	Learning Outcomes to be Assessed
Midterm exam	40%	1, 2, 3, 4, 5
Final exam	60%	1, 3, 6, 7,8

**Recommended Textbook:**

- **Prescott's Microbiology**, by Willey, Sherwood and Woolverton, 10<sup>th</sup> edition, 2017. (In University bookstore)

E version: Prescott's Microbiology with Connect (includes adaptive questions) can be purchased from McGraw Hill online, HKD 225 for one semester

Access: <http://www.mheducation.com.sg/9781259669934-asia-connect-online-access-for-microbiology>

**Course Calendar:**

<b>Lecture</b>	<b>Date</b>	<b>Topic</b>	<b>Instructor</b>
1	1/2	Introduction to microbiology (Chapters 1, 2)	Banfield
2	6/2	Bacterial cell structure (Chapter 3)	Banfield
3	8/2	Archaeal and Eukaryotic cell structure (Chapters 4, 5)	Banfield
4	13/2	Viruses (Chapters 6, 27)	Banfield
5	15/2	Microbial growth (Chapter 7)	Banfield
6	20/2	Microbial metabolism (Chapters 10, 11, 12)	Zeng
7	22/2	Microbial metabolism (Chapters 10, 11, 12)	Zeng
8	27/2	Diversity of the microbial world (Chapters 19-26)	Zeng
9	1/3	Microorganisms in marine and freshwater ecosystems (Chapter 30)	Zeng
10	6/3	Microorganisms in terrestrial ecosystems (Chapter 31)	Zeng
11	8/3	<b>Mid-term exam</b>	Banfield / Zeng
12	13/3	Microbial interactions (Chapter 32), Microbial genetics (Chapter 18)	Tang
13	15/3	Microbial interactions (Chapter 32), Microbial genetics (Chapter 18)	Tang
14	20/3	Control of microorganisms in the environment (Chapter 8))	Tang
15	22/3	Antimicrobial chemotherapy (Chapter 9)	Tang
16	27/3	Antimicrobial chemotherapy (Chapter 9)	Tang
17	29/3	Innate and adaptive immunity (Chapter 33, 34)	Tang
18	10/4	Pathogenicity and infection (Chapter 35)	Tang
19	12/4	Pathogenicity and infection (Chapter 35)	Tang
20	17/4	Clinical microbiology and immunology (Chapter 36)	Tang
21	19/4	Clinical microbiology and immunology (Chapter 36)	Tang
22	24/4	Epidemiology and public health microbiology (Chapter 37)	Tang
23	26/4	Epidemiology and public health microbiology (Chapter 37)	Tang
24	3/5	Microbiology of food (Chapter 41)	Tang
25	8/5	Revision class	Tang