

LIFS 3060: MICROBIOLOGY (Spring 2017)

Course Instructors:

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Entry Level: Pre-requisite LIFS 2040 or LIFS2060 or with permission of the course director.

Course schedule: Mondays, Wednesdays: 12.00 p.m.-1.20 p.m. in LTB.

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, 9th edition, 2014. (In University bookstore)
- **E-book version: Learnsmart standalone** can be purchased from McGraw Hill online, HKD 128 for one semester

Access "<http://www.mheducation.com.sg/9781259120640-asia-smartbook-online-access-for-prescotts-microbiology-group>".

| Week | Date | Topic | Instructor |
|-------------|-------------|--|-------------------|
| 1 | 1/2 | Introduction to microbiology | BANFIELD |
| 2 | 6/2 | Introduction to microbiology | BANFIELD |
| 2 | 8/2 | Bacteria | BANFIELD |
| 3 | 13/2 | Bacteria | BANFIELD |
| 3 | 15/2 | Bacteria | BANFIELD |
| 4 | 20/2 | Bacteria | BANFIELD |
| 4 | 22/2 | Fungi | BANFIELD |
| 5 | 27/2 | Fungi | BANFIELD |
| 5 | 1/3 | Protists / Viruses | BANFIELD |
| 6 | 6/3 | Mid-term | BANFIELD |
| 6 | 8/3 | Microbial interactions (Chapter 32) | TANG |
| 7 | 13/3 | Microbial genomics (Chapter 18) | TANG |
| 7 | 15/3 | Control of microorganisms in the environment (Chapter 8) | TANG |
| 8 | 20/3 | Antimicrobial chemotherapy (Chapter 9) | TANG |
| 8 | 22/3 | Antimicrobial chemotherapy (Chapter 9) | TANG |
| 9 | 27/3 | Innate and adaptive immunity (Chapter 33, 34) | TANG |
| 9 | 29/3 | Pathogenicity and infection (Chapter 35) | TANG |
| 10 | 3/4 | Pathogenicity and infection (Chapter 35) | TANG |
| 10 | 5/4 | Clinical microbiology and immunology (Chapter 36) | TANG |
| 11 | 10/4 | Clinical microbiology and immunology (Chapter 36) | TANG |
| 11 | 19/4 | Epidemiology and public health microbiology (Chapter 37) | TANG |
| 12 | 24/4 | Epidemiology and public health microbiology (Chapter 37) | TANG |
| 12 | 26/4 | Industrial Microbiology (Chapter 42) | TANG |
| 13 | 8/5 | Microbiology of food (Chapter 41) | TANG |