

Environmental Microbiology 001-2-5011 3 credits

3 Weekly Lecture Hours

Learning outcome

At the end of the course the student will be able to:

- compare different types of interactions between microorganisms and their biological and physicochemical environment;
- compare the role of microorganisms in the cycling of elements such as carbon, nitrogen sulphur, and metals;
- explain how microorganisms can transform the environment;
- explain how to harness microbial processes for environment benefit interpret experimental observations as indicators of specific microbial processes

Course subjects

- Introduction: historic perspective and environmental microbiology as an integration of many disciplines.
- Formation of the biosphere: key biogeochemical and evolutionary events.
- Resource exploitation by microorganisms: physiological ecology.
- A review of Earth's microbial habitats: terrestrial, aquatic and aero.
- Microbial diversity: who is where?
- Methods in environmental microbiology and their limitations.
- Microbial biogeochemistry and consequences of anthropogenic interferences in biogeochemical cycling.
- Applied topics in environmental microbiology (biodegradation, bioremediation, biomining, biofilms, water and waste treatment, etc).
- Future frontiers in environmental microbiology.

Course structure

Frontal lectures and discussion on biweekly reading assignments and final take home (research proposal writing).

Text (available in the library)

[Environmental Microbiology](#) 2nd Madsen (2015)

[Environmental Microbiology](#) Maier, Pepper and Gerba 2nd edition (2009)

[Brock Biology of Microorganisms](#) Madigan, M.; Martinko, J.; Stahl, D.; Clark, D.,