

***"ENVIRONMENTAL MICROBIOLOGY"***  
***(EESC30 H3-S L01)***

**Instructor:** Dr. Silvija Stefanovic

**Lecture:** Friday 1–3pm; IC320

**Office:** EV366

**Office hours:** Thursday 2-4pm

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**Intent of the course:**

This course examines the diversity of microorganisms, their adaptations to special habitats, and their role in the ecosystem and geochemical cycling. Other topics include microbial phylogeny, physiological diversity, species interactions and state of the art methods of detection and enumeration.

**Prerequisite:** CHMA10H3 & CHMA11H3 & BIOB50H3 & BIOB51H3

**Exclusion:** (BGYC55H3)

**Breadth Requirement:** Natural Sciences

**Suggested readings:**

“Environmental Microbiology”, Ian L. Pepper, Charles P. Gerba, Terry J. Gentry, 2014, Google eBook.

“Microbial Ecology: Fundamentals and Applications”, Ronald M. Atlas, Richard Bartha, 1998, Benjamin/Cummings.

**Lecture notes:**

The lecture slides will be posted in \*.pdf format on the Blackboard. You will require Adobe Reader to open the files (available free of charge at [www.adobe.com](http://www.adobe.com)).

**Course email policy:**

Email is not an effective way of teaching and email inquiries regarding course materials will not be answered. Dr. Stefanovic will be available during designated office hours to answer questions regarding course material. Teaching assistant will be available during tutorials to answer questions pertaining to the term assignment and seminar. If you have questions, then please see instructors during these times –it is for you so please do not hesitate to use it.

## Grading:

Assignments (2):	20% (10% each)
Seminar	10%
Participation	5%
Midterm	25%
Final Examination	40%

## Assignments:

You will have two individual assignments during the term, each worth 10% of the final grade. You will be able to access the problem sheets on the Blackboard at the times detailed below. The assignments are due during the tutorials at the dates detailed below. More details on the assignments will be circulated during the first tutorial section on Jan. 16<sup>th</sup> /17<sup>th</sup>. **There is no tutorial on Jan. 9<sup>th</sup> /10<sup>th</sup>.**

<i>Topic</i>	<i>On the Blackboard</i>	<i>Submission Due</i>
Assignment #1	Jan .16 <sup>th</sup>	Jan. 30 <sup>th</sup> /31 <sup>st</sup>
Assignment #2	Mar. 13 <sup>th</sup>	Mar. 27 <sup>th</sup> /28 <sup>th</sup>

## Seminar:

Teams of maximum two students will need to review ONE recent research paper (from the last 10 years) on the following topic: Environmental conditions and biogeochemical processes. Students need to prepare a short power point presentation (15 min) of these findings. The chosen articles have to be pre-approved by your TA. Your TA will organize the seminar presentation schedule and instruct you on format and content guidelines in tutorial on Jan.30<sup>th</sup>/31<sup>st</sup>. The presentations will take place during the tutorials on Feb. 6<sup>th</sup>/7<sup>th</sup>, Feb. 13<sup>th</sup>/14<sup>rd</sup>, Feb. 27<sup>th</sup>/28<sup>th</sup>, and Mar.6<sup>th</sup>/7<sup>th</sup>. The rest of students are expected to participate in discussions following each presentation and to submit hand written summary of the presentations for participation mark.

## Midterm:

The 80 min long IN-CLASS midterm examination will worth 25% of the final grade for the course. It will be a combination of multiple choice and true-false choice questions. The midterm will cover Lectures 1-4 and guest lecture. The midterm will draw from lectures and assignments and includes lecture notes and *any* material presented in the classroom. Information from the readings and other resources not directly covered in class will not be tested on exams. More details about the exams will follow.

## Final Exam:

The 2-hour final examination will worth 40% of the final grade for the course. It will be a combination of multiple choice and true-false choice questions. The final will cover lectures 5-9 and second guest lecture. The final exam will draw from lectures and assignments and includes lecture notes and *any* material presented in the classroom. Information from the readings and other resources not directly covered in class will not be tested on exams. More details about the exams will follow. *The final exam is NOT cumulative.*

## Other Course policies:

Tutorials are MANDATORY. In a case of absence, you need to provide you TA with appropriate documentation.

Late assignments will not be accepted and assigned a grade of zero. *Extensions will be granted ONLY with medical note or under exceptional circumstances. Your TA must be informed about that immediately.*

Plagiarism will not be tolerated. Students are expected to submit **individual work** for grading. It is an academic offense to plagiarize and those who do, will be subjected to University procedures (see the University calendar).

### Lecture topics:

1. Introduction, ground rules, expectations and course structure. Concept of microbial biogeochemistry; Microbial ecology.	Jan. 5 <sup>th</sup>
2. Microbial metabolism and energy production; Bacterial Growth	Jan. 12 <sup>th</sup>
3. Interactions among microbial populations	Jan. 19 <sup>th</sup>
4. TBA (Guest lecturer: Dr. Patricia dorr de Quadros)	Jan.26 <sup>th</sup>
5. Interactions between microbes and plants	Feb.2 <sup>nd</sup>
6. <b>Midterm</b>	Feb.9 <sup>th</sup>
7. Microbes in terrestrial environment	Feb.16 <sup>th</sup>
8. <b>READING WEEK</b>	Feb. 23 <sup>rd</sup>
9. Microbes in aquatic environments	Mar.2 <sup>nd</sup>
10. Microbes in extreme environments	Mar. 9 <sup>th</sup>
11. Biogeochemical cycling of carbon, nitrogen and sulphur	Mar. 16 <sup>th</sup>
12. Biodegradation of organic pollutants and inorganic pollutants (metals)	Mar. 23 <sup>rd</sup>
13. <b>Good Friday – University Closed</b>	Mar.30 <sup>th</sup>
14. TBA (Guest lecturer: Dr. Patricia dorr de Quadros)	April 6 <sup>th</sup>

*I will follow this schedule as closely as possible, but things being what they are, some of these topics may "overflow" over into other time slots.*

### Tutorials schedule:

1. Jan. 9, 10 **No tutorial**
2. Jan. 16, 17 Assignment 1 Tutorial
3. Jan. 23, 24 Assignment 1 Tutorial
4. Jan. 30, 31 Assignment 1 due; Research paper proposal and seminar requirements
5. Feb. 6, 7 Handing out marked Assignment 1 and feedback; Presentations
6. Feb. 13, 14 Presentations
7. Feb. 20, 21 **Reading week (No tutorial)**
8. Feb. 27, 28 Presentations
9. March 6, 7 Presentations
10. March 13, 14 Assignment 2 Tutorial
11. March 20, 21 Assignment 2 Tutorial
12. March 27, 28 Assignment 2 due; Presentations marks and feedback; **Tutorial only 1 hour (Tue. 9-10am and Wed. 1-2pm)**
13. April 3, 4 Handing out marked Assignment 2 and feedback; **Tutorial only 1 hour (Tue. 9-10am and Wed. 1-2pm)**