

**The University of Wisconsin Milwaukee  
Microbial Diversity and Physiology BioSci-540**

**Fall 2021**

Course instructor: Dr. Gyaneshwar Prasad  
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Office: Lap Hall 440

**Office Hour: Virtual and by appointment**

**Course description:** To provide students with broad knowledge about microbial physiology and metabolism. In-depth knowledge of microbial metabolic function is essential in order to give biochemical, physiological and ecological meaning to the ever-increasing genomic information.

This course addresses the following program objectives;

1) Apply scientific method to biological questions 2) Demonstrate an understanding of Microbiology, including fundamental metabolic and regulatory mechanisms, microbial physiology and microbial applications.

There is no required textbook. Materials from recently published reviews and research papers will be used.

**Course prerequisite: BioSci-383 or Graduate studies**

**Schedule**

<u>Date</u>	<u>Topic</u>
9/8	Introduction/Syllabus
9/13	Microbes in sustainable planet/ Intro to molecular microbial taxonomy
9/15	Uncultured microbial diversity
9/20	General regulatory mechanisms in bacteria
9/22	Composition and structure of bacteria and archaea
9/27	Microbial growth/Regulation
9/29	Regulation of bacterial growth
10/4	Cell envelope biosynthesis
10/6	Carbon Cycle-Photosynthesis
10/11	Carbon Metabolism-Glycolysis and TCA
10/13	EXAM I
10/18	EXAM I discussion; Energy production
10/20	Energy Generation; regulation of aerobic and anaerobic respiration
10/25	Nitrogen cycle- assimilation and regulation of inorganic nitrogen
10/27	Nitrogen Fixation in free living organisms
11/1	Plant associated nitrogen fixation
11/3	Symbiotic nitrogen fixation and regulation
11/8	Phosphorus cycle- Microbial phosphate solubilization

11/10	Sulfur cycle; Sulfur assimilation and its regulation
11/15	Iron metabolism
11/17	EXAM II
11/22	Graduate Student Presentations
11/29	Graduate Student Presentations
12/1	Biofilm and quorum sensing
12/6	Antibiotics
12/8	Heterocyst formation
12/13	STUDY DAY

**Final Exam- (Cumulative) December 22<sup>nd</sup> 10.00AM-12.00.** As dictated by UWM policy students should arrange their classes to avoid Final Exam conflicts and overly demanding schedules.

**CANVAS:** This course will have a CANVAS website. Course syllabus, outlines of lectures, reference materials will be posted.

**Examination Policy.** There will be two midterm exams during class hours as schedules and one 2 hr final examination. Exam will be a combination of objective and short answer questions. Exam questions will come from the lecture material, and reference articles. Make-up exams will be oral or written, at the discretion of the instructor. In order to qualify for a make-up exam, you must call or email Dr. Prasad ([prasadg@uwm.edu](mailto:prasadg@uwm.edu)). Request for make-up exams should be supported by documentation.

**Grading Policy.** Grades will be calculated on the basis of 3 exams for undergraduate students. The final exam will be cumulative. In addition, the graduate students will write a brief (5 page max) summary on a topic related to Microbial Diversity and Physiology and present it in the class.

Grading

A (94-100%); A- (90-93%); B+ (87-89%); B (83-86%); B- (80-82%); C+ (77-79%); C (73-76%); C- (70-72%), D+ (67-69%), D (63-66%), F (0-59%).

**Campus Credit Hour Policy:** This three-credit course meets for 3 hours of lecture lab per week during the semester. Students are expected to put in 2-4 hours per week studying to achieve the learning goals of this course.

**COVID-19 Information:** <https://uwm.edu/cetl/covid-19-syllabus-statements/>

**Accommodations for students with disabilities.** If you are a student with disability and require special accommodations contact the instructor early in the semester and also contact the Student Accessibility Center (Mitchell Hall room 112; 229-6287; <http://www.sac.uwm.edu>).

**Academic misconduct.** Cheating on exams or plagiarism are violations of the academic honor code and carry severe sanctions, including failing a course or even suspension or dismissal from the University.

[http://www4.uwm.edu/acad\\_aff/policy/academicmisconduct.cfm](http://www4.uwm.edu/acad_aff/policy/academicmisconduct.cfm).