SYLLABUS FOR BACTERIAL PHYSIOLOGY

Course Prefix, MICR 480/680; Title, Bacterial Physiology; Credits, 3

Prerequisites: MICR 350, MICR 350L, BIOC 460

Coordinator and Contact Information: Birgit M. Prüß, 108A Van Es Hall, Department of Veterinary and Microbiological Sciences, Birgit.Pruess@ndsu.edu, 1-7848, office hours MWF 1-2 pm.

Location: Morrill 103

E-mail and Course Website: Each student will be expected to have an e-mail address. There is a website for the course that will be used extensively. This website is on Blackboard (http://blackboard.ndsu.nodak.edu/index.html). Handouts for each lecture, a glossary and grades will be available on this website.


Course Goals: Understand the basic concepts of metabolic pathways and gene regulation. Know how to extract information from public databases. Learn to apply this information to problems of biological significance.

Course Objectives: Content driven course objectives are: i) understand gene regulation on the single gene level and as global regulation; ii) comprehend central metabolic pathways, energy production and nutrient transport in bacteria, iii) experience the power of genomics. Skill driven course objectives are: i) work in a team; ii) thrive in a multicultural environment; iii) improve time management skills; iv) gain a better understanding of the job market.

Attendance and Participation: Attendance and participation are expected for each class. Should attendance be impossible (for example, due to illness), powerpoint slides for all lectures are posted on Blackboard. It is the responsibility of the student to study these slides. Specific questions can be addressed to the instructor.

Reading Assignment: You will have a standing reading assignment to read the chapter of the book that corresponds to the lecture. You will be given the precise page numbers at the end of the lecture.

Evaluation Procedures and Criteria: Students will be evaluated through two knowledge tests (75 and 100 points) and numerous assignments (200 points). There will be one 10 point quiz at the beginning of the semester. The 400 points will be completed by drop-in quizzes. These are 3 point quizzes that will be given at the beginning of a class without notice.

Graduate students will give an additional lecture on a topic of their choice within the course objectives. This lecture will be an additional 100 points to a total of 500 points.

Material for the tests will be the required book “Microbial Physiology” and the lectures. A “Glossary” will be provided through Blackboard. Make-up exams will be allowed only for valid reasons, and only if the instructor
is notified before the exam. Please understand that the only reason that qualifies for a make-up exam is sickness, if documentation is provided. If an exam is not held as scheduled because of weather (or other disasters), the exam will be given during the next lecture. There will be no make-up for drop-in quizzes. These are designed to encourage attendance.

The final exam on May 12 will be cumulative. This includes questions about your assignments, especially the Microarray Assignment.

All assignments will be discussed extensively in class. Attendance of such classes is required. If you miss out on ‘in class’ instructions, you will have to follow the written instructions that can be downloaded on Blackboard. Students are expected to work as a group for all assignments. Students can form their own groups, but need to maintain them throughout the semester. The instructor reserves the right to include additional students to a group. This will be in cases where a student does not know anybody else or problems with a previous group have occurred.

The ethics and diversity assignments will each be 10 points and turned in together on January 28. The case study will be 20 points and turned in on February 4. The BLAST and Microarray assignments accompany the Genomics section. These will be 50 points each. Turn in for the BLAST Assignment is March 4, turn in for the Microarray Assignment is March 28. There will be a time management assignment for 10 points, to be turned in on April 1. Two assignments at 25 points each accompany the Metabolism section. These will the analysis of an API and Fermentation. These assignments will be turned in on April 29 and May 2, respectively. Late turn in of an assignment will be 10% the points of the assignment, unless in cases of sickness if the instructor is notified prior to the turn in date.

Drop-in quizzes will be 3 points each (there will be 5 of them) in the form of 3 multiple choice questions. The quizzes start at 11.00 am sharp. Late comers will not be able to take the test (otherwise we would be busy with this for the better part of the lecture). Students will have 5 min to complete the test.

Graduate student lectures will be given by single students on a topic of their choice within the course objectives.

*Course grading will be as follows:* There will be a total of 400 (undergraduate students) or 500 (graduate students) points. The grading scale for the 480 course will be the following: $\geq 90\%$ or 360 points A, $\geq 80\%$ or 320 points B, $\geq 70\%$ or 280 points C, $\geq 60\%$ or 240 points D, failing grade $< 60\%$ or 240 points. For graduate students, there will be a total of 500 points. The grading scale for the 680 course will be the following: $\geq 90\%$ or 450 points A, $\geq 80\%$ or 400 points B, $\geq 70\%$ or 350 points C, $\geq 60\%$ or 300 points D, failing grade $< 60\%$ or 300 points.
**Course Schedule/Outline/Calendar of events:** The class will meet 3 times a week throughout the entire semester. This will be on MWF from 11.00-11.50.

**Course schedule and topics:**

- Organization meeting, syllabus 1 lecture (01-12)

i) Regulation
   - Introduction 1 lecture (01-14)
   - Structure and Function 2 lectures (01-19 and 01-21)
   - 10 point quiz on Str/Func, and Ethics 1 lecture (01-24)
   - Diversity 1 lecture (01-26)
   - Turn in assignments ethics and diversity, References 1 lecture (01-28)
   - Case study 1 lecture (01-31)
   - Regulation and Global Regulation 6 lectures (02-02 to 02-14)
   - 75 point knowledge test 1 lecture (02-16)

ii) Genomics and Professional Development
   - Lectures 3 lectures (02-18 to 02-25)
   - BLAST Assignment Instructions 1 lecture (02-28)
   - Microarray Assignment Instructions 2 lectures (03-02 and 03-04)
   - **Turn in BLAST Assignment** 03-04
   - Outside speakers 4 lectures (03-07 to 03-21)
   - Lab visits 1 lecture (03-23)
   - Time Management 1 lecture (03-25)
   - **Microarray Assignment turn in and Discussions** 1 lecture (03-28)
   - Turn in Time Management Assignment 04-01

iii) Metabolism
   - Lectures 10 lectures (03-03 to 04-20)
   - API Assignment Instructions 1 lecture (04-27)
   - Fermentation Assignment Instructions 1 lecture (04-29)
   - Turn in API Assignment 04-27
   - Turn in Fermentation Assignment 05-02
   - Graduate lectures 3 lectures, (05-02, 05-04, and 05-06)
   - **Final test** 05-12

**Recommended Student Resources:** The book “Microbial Physiology” by Moat, Foster and Spector, published by Wiley is required for this course. The books “Bacterial Pathogenesis” by Salyers and Whitt, published by ASM Press and the book “Bioinformatics and Functional Genomics” by Pevsner, published by Wiley are recommended for additional information. The latter two books will be provided in three copies by the Department and can be obtained through the NDSU library.
I would like to point out that the course offers a variety of techniques that the students can use to learn. This addresses the observation that students have different learning styles. Some may learn better from listening in a lecture, while others may be better off reading a book. It is the responsibility of the students to take advantage of all opportunities, including the actual reading of the book. Page numbers that correspond to the lectures are indicated at the end of the lectures. Should students decide not to read the book, I want it understood that it is the responsibility of the student to be prepared for the test.

**Americans with Disabilities Statement about students with special needs:** Any students with disabilities or other special needs, which need special accommodations in this course, are invited to share these concerns or requests with the instructor as soon as possible.

**Course Academic Honesty Statement:** Please, remember when taking a College of Agriculture course that you are under the Honor System (http://www.ag.ndsu.edu/academics/honor.htm). The Honor System operates to prevent and stop cheating, as well as penalizing those who cheat. Cases can be reported to your instructor, the Department Head of VMS (Dr. Douglas Freeman), or the Dean of Agriculture (Dr. Kenneth Grafton). Cases will be reviewed by the Honor Commission. The following is a brief description of the Honor Commission. The full text can be found at http://www.ag.ndsu.nodak.edu/colag/honor.htm.

> ‘The Honor Commission is a student judicial organization that oversees the Honor System in the College of Agriculture, Food Systems, and Natural Resources. The Honor System is a method of student self-governing for those enrolled in courses in the College. Under the Honor System, students sign an honor pledge; the responsibility for proctoring examinations and quizzes lies with the individuals enrolled in the course. When a case of possible academic dishonesty is reported, the Honor Commission meets to review all pertinent evidence. If it determines that a violation occurred, the commission recommends disciplinary action.’

For the purpose of this course, this will mean:

1) Students will have to sign an honor pledge that reads the following ‘On my honor I have neither given nor received aid in completing this assignment’. Students who fail to sign the pledge will receive 0 points for the test. Please, note that giving help is considered cheating just as much as receiving help is. You do neither your friend nor yourself a favor with this.

2) Students who get accused of cheating by their instructor, one of their class mates, or one of the proctors will get reviewed by the Honor Commission. The Honor Commission will review evidence and testimonies; if a student is found to have most likely cheated, the Honor Commission will recommend a penalty. The final decision about this penalty will be with the instructor. Penalties include but are not limited to 0 points on the test or an F for the course.

3) Cheating on a knowledge test includes but is not limited to talking to your neighbor (regardless of the topic or language used), passing things to other students (such as pens), or using any kind of electronic devices. Please, do not leave anything on the seat between yourself and your neighbor. Turn off your cell phones during the test.

4) Naturally, students are expected to use the internet to complete their assignments. However, copying entire sentences, paragraphs or Figures from the internet (or any other source) is considered plagiarism. Students who are suspected to have plagiarized their homework assignment will be reviewed by the Honor Commission. Please, write a statement underneath your homework that you did not plagiarize and sign this statement. Also, attending the ethics class (01-24) is a requirement. This class will cover
precisely what constitutes plagiarism with respect to this course. Failure to attend this class will eliminate the option to earn extra credits that may be given out during the course. Please, note that your instructor will be able to use SafeAssign in connection with Blackboard to detect identities between your assignment and the database. Your assignment will not be added to this database. As a special note, copying my own lecture slides and turning them in for assignments is considered plagiarism as well. The same applies to copying the plagiarism essay from Wikipedia or other sources.

5) Please, treat the data set that you will receive for the Microarray Assignment as real experimental data. Do not modify or delete any data. Falsifying data is as bad or worse than plagiarizing. Doing so will mean that you will receive zero points for this assignment.

6) Please, note that all members of the group for the assignments will receive the same number of points. Should I detect any plagiarism on a group assignment, I will turn in the entire group to the Honor Commission. In addition, don’t work across groups. Plagiarizing off each other will have the same consequence. I would hate having to submit 10 students to the Honor Commission, but will do so if being forced.

**Student Code of Conduct:** Please, note that NDSU has a Student Code of Conduct, the full text of which can be found at [http://www.ndsu.edu/fileadmin/studentlife/PDF_Files/Codeof Student Behavior.pdf](http://www.ndsu.edu/fileadmin/studentlife/PDF_Files/Codeof Student Behavior.pdf). The second paragraph of the preamble is copied below:

‘A Code of Student Behavior contains statements of university policies relevant to student life. Development and enforcement of these standards of behavior are an educational endeavor designed to foster students’ personal, social, moral and ethical development. This document forms the basis for student behavioral expectations as a member of the NDSU community. The enforcement of these standards serves to promote the protection of the rights, responsibilities, health and safety of members of the NDSU community so its members may pursue their educational goals without undue interference and the personal growth of students in conflict with the code.’

For the purpose of this course this means that students are not to exhibit any kind of behavior that could be found offensive by others, such as class mates or the course instructor. This includes offensive remarks made in electronic form. It is important to understand that social media, such as Facebook, are not considered private.

Please, also refer to the mission statement of the VMS Department which explicitly states that ‘*Our department values lifelong discovery, intellectual integrity, collegiality, and diversity.*’

As a general rule, please, do not use your cell phones during class or during in class exams. This is considered a courtesy to your fellow class mates and your instructor. Also, please, come in on time and do not disrupt the class by late appearance. Again, this is a courtesy to your class mates. Enter the class room through the back door, should late arrival be unavoidable.