PLP428R/528R Section 1
MICROBIAL GENETICS
COURSE SYLLABUS
Spring 2015
(Subject to modification where necessary)

PLP428R/528R (MIC 428R/528R, ECOL 428R/528R, MCB 428R/528R, SWES428R/528R, ACBS 428R/528R).

WHERE: Mclelland Park 105
WHEN: MWF 9:00-9:50 AM

INSTRUCTOR

Dr. David A. Baltrus
Marley 821C
Baltrus@email.arizona.edu
Office Hours: I will have regular office hours on Wednesday each week from 10:00 to 12:00PM in Marley 821C. I am often available by appointment and I am at the laboratory sections regularly. Email also works well, and I will respond within 24 hours (If I don't, email again).

COURSE HOME PAGE

There is a D2L page for this course, and all relevant/necessary materials will be posted there (including slides from the lectures and supplementary material). Additionally, I have set up a facebook group (UA Microbial Genetics 428/528 https://www.facebook.com/groups/223285564421398/) where I will send out reminders of assignments/office hours/review sessions/tests and will also send out links relevant to the course. The facebook page also serves as a useful way to organize into groups and ask questions about the material.

COURSE INFORMATION

As microbiologists, biochemists, geneticists, doctors, medical technologists, biological engineers, or those in related biology-based careers, you will encounter situations where the concepts of microbial genetics apply. These may include dealing with an outbreak in a hospital or neighborhood, producing recombinant microbial products in large fermenters, dealing with bioterrorist agents, sequencing a novel gene that you have found in nature, or teaching the next generation of high school or college students about science.

Additionally, as educated members of society we have a responsibility to ensure that technology is used appropriately and ethically. You must be able to

read science news in the papers or hear about it on television or the radio and be able to think about the information in an intelligent and rationale manner. Examples include stem cell research, recombinant vaccines used in human gene therapy treatments, using engineered microbes to degrade environmental pollutants, the release of engineered crop plants or animals, etc.

Although general classes in biology, molecular biology and general genetics cover some of the aspects of microbial genetics, they lack the wide variety of concepts and methodologies that this course provides. We expect that going into this course that you have a solid if basic background in chemistry, biochemistry, and genetics: this is an advanced course and you will be given significant amounts of information. Strict memorization will not get you an A, but memorization is necessary for you to think critically. You will succeed if you understand that the lectures build on each other as the semester goes on, and if you are able to draw links across all topics.

COURSE ORGANIZATION

Lectures:

The material will be presented primarily through lectures. There is no assigned text as historically they are only useful for a portion of the material covered. Instead, I ask that you obtain a good microbial genetics text or good basic microbiology text to use as a reference. I **suggest** the following text:

Snyder, Larry and Wendy Champness. Molecular Genetics of Bacteria. 3rd. Washington, DC: ASM Press, 2007.

All PowerPoint slides used during the lectures will be available soon after the lecture, with "tentative" slides available the night before. However, simply reading over the slides will not be sufficient to pass this course. You need to attend lectures to get all the details. I will also record the lectures and post them on the D2L site as well; obviously this can't happen until after the lectures.

Discussion papers:

During the semester we will hold a general discussion of three research papers. Reading and understanding primary research papers is something all scientists must be able to do. It is not easy, as many papers are very tersely worded and full of experimental details. Most papers are written in a similar format (Introduction, Materials & Methods, Results and Discussion). All try to convey the scientific thought process. Please read them prior to attending the class discussions. It is often necessary to read a paper several times before all of the details can be understood. Study sheets will be available on D2L to help you in reading the papers. These discussions will build upon topics learned during the lectures and are fair game for test questions.

DNA sequence analysis:

One component of this course is the analysis of a sequence of DNA. This component is aimed at teaching you how to manipulate a sequence of DNA and how to glean information from it. Each pair of undergraduate students will be assigned an unknown DNA sequence for analysis (graduate students will work independently). We will be using all web-based programs for this analysis. The theory and steps of the analysis will be covered during the lectures and the computer lab periods. A DNA sequence analysis project manual will be available on the course web site. The computer labs will be held in the Koffler Biology Learning Center (BLC). During this analysis you will learn how to:

Identify open reading frames.
Use NCBI BLAST to identify potential genes, gene products, and operons.
Identify potential promoters, terminators, ribosome binding sites.

This analysis will be the basis of a poster that you and your partner will prepare. This poster will include figures illustrating key aspects of your and include information on the biological function of your gene products. This poster, will determine your grade for this part of the course.

EXTRA ASSIGNMENTS FOR 528R STUDENTS

Students taking PLP528R will be given extra exam questions and additional reading assignments for which they will write 1 page summaries of discussion papers. These summaries will give an overview of the question being asked in the paper, briefly describe the experiments, and include additional questions you have about the paper or future research directions. In addition, each graduate student will work alone on the DNA sequence analysis portion of the course and may be given larger regions to analyze.

REQUIRED TEXT AND OTHER MATERIALS

There is no assigned text for this course. Please have access to a good microbial genetics or basic microbiology text to use as a reference as needed. The discussion papers will be available from the course web site to download as PDF files. Throughout the course of the semester, I will also post a variety of other links/papers to the D2L website to be used as background information. A DNA sequence analysis manual will be available from D2L as a PDF file.

The laboratory manual is also available from the course D2L site as PDF files.

GRADES

There are a total of 900 points available for 428R and 1000 points available for 528R.

	428R	528R
“Clicker” Answers	50	---
In Class Exams (x2)	100	150
Online quizzes (x10)	150	150
Short Answer Question Sets (x3)	150	150
DNA sequence analysis poster	300	300
Extra reading	---	75
Final exam	150	175
TOTAL	900	1000

Written exams may consist of fill in the blank and short answer/essay questions. The questions cover the material and also your understanding of the material. You may also be presented with data and asked to explain it. If you think that you deserve more credit on an exam question or assignment, please contact me to discuss your answer. All exam questions are derived from the material presented during the lectures, the discussions and the DNA sequence analysis.

We will be using “clickers” and I will usually put up one question per class. I will be awarding 1 point for a correct answer. You will not be able to answer if you forget your clicker or if the clicker doesn’t work properly (i.e. you forget your password I can’t help you). If you don’t have a clicker they are available from the bookstore, but there is also an app available for your phone that is less expensive. This website provides information about clicker registration and setup: http://uits.arizona.edu/services/classroom-response-devices/student

You will be given 3 sets of short answer questions to answer outside of class and you can work in groups. These questions will be posted immediately after class and will be due the following class, no exceptions. These problem sets are worth 50 points each.

You will be given 10 total multiple choice quizzes on D2L, at the end of each week (not including in class test weeks). These quizzes are worth 15 points each.

Material for all exam/quiz/problem set questions will be cumulative over the course of the semester.

Attendance: you are all adults, it’s on you to show up for class. I’m not going to keep track of who is there and who is not.

I am not awarding points for participation outright, however, class participation will be considered at my discretion for students with scores that fall in between grades. What is participation you may ask? When I ask a question in class, try to answer it. Do I know your name because you answered questions in class, contributed to discussions, or showed up at office hours? Did you answer “clicker” questions on the screen correctly or at all? Etc…

If you accumulate 450 points or more over the course of the semester, you will be given at least a D. Final grades will be based on total points earned and the grade distribution will be curved. I will provide cumulative distributions of the total grades at various times during the semester. Typically, at the end of the semester, the top 20% of scores will receive an A, the next 30% will receive a B, the next 40% will receive a C, and the final 10% will receive a D.

I will also offer between 0 and 1 extra points for potential multiple choice exam questions emailed to me. Yes, that's subjective, but for the most part you'll get some credit (0.25 for standard questions, 1 point for very good ones) so long as the question is relevant to something in class.

NOTE: THE TIME TO EARN THE GRADE THAT YOU DESIRE IN THIS COURSE IS FROM THE FIRST DAY OF CLASS AND TO CONTINUE THROUGHOUT THE COURSE BY WORKING HARD. IT IS NOT APPROPRIATE TO TRY AND BARGIN FOR THE GRADE AT THE END OF THE SEMESTER.

MISSED ASSIGNMENTS OR EXAMS

I will not accept late assignments. I will not reschedule missed exams, but will try to accommodate exam timing around extenuating circumstances.

WITHDRAWLS

Students withdrawing from this course must notify the instructor prior to non-attendance in classes and execute drop or withdrawal procedures in accordance with the UA General Catalog. Any student failing to attend class in two or more successive classes is subject to automatic withdrawal if arrangements have not been made previously.

INCOMPLETES

Any incomplete given must be verified with a written agreement with the student that specifies the work to be done and a timetable of completion.

LETTERS OF RECOMMENDATION

Many of you are likely interested in attending graduate or professional school after graduation, and these applications will likely require 2 or 3 letters of recommendation. I'm happy to write these letters under certain conditions, but suggest you read this: http://mychrobialromance.blogspot.com/2012/11/letters-of-recommendation.html

ACADEMIC INTEGRITY

Students are expected to abide by the University of Arizona Code of Academic Integrity found at http://deanofstudents.arizona.edu/policiesandcodes

CLASSROOM BEHAVIOR

Students are expected to be familiar with the UA Policy on Disruptive Behavior in an Instructional Setting found at http://hr2.hr.arizona.edu/dos/pol_disrupt.htm and the Policy on Threatening

Behavior by Students found at http://hr2.hr.arizona.edu/dos/pol_threat.htm.

CELL PHONES AND COMPUTERS

Please turn off cell phones at the beginning of class. Computers are OK if you are using them to take notes. If your computer or phone disrupts the class (ringing, texting, general annoying noises, etc…) I reserve the right to confiscate phones/computers for the class period or ask you to leave class (temporarily or permanently). Also, see the above section on grading (especially on class participation) and know that it works the other way too.

DISABILITY ACCOMODATION

It is the University's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact Disability Resources (621-3268) to begin this conversation or to establish accommodations.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

SYLLABUS CHANGES

Information contained within the course schedule, other than the grade or absence policies may be subject to change with reasonable advance notice, as deemed appropriate.

SPECIAL NEEDS AND ACCOMODATION

Students who need special accommodation or services should contact the Disability Resources Center, 1224 East Lowell Street, Tucson, AZ 85721, (520) 621-3268, Fax (520) 621-9423, email: uadrc@email.arizona.edu, http://drc.arizona.edu/. You must register and request that the Center or DRC send me an official notification of your accommodations needs as soon as possible. Please plan to meet with me by appointment to discuss accommodations and how my course requirements and activities may impact your ability to fully participate. The need for accommodations must be documented by the appropriate office.

STUDENT CODE OF ACADEMIC INTEGRITY

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students

are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog.

See: http://deanofstudents.arizona.edu/policiesandcodes

CONFIDENTIALITY OF STUDENT RECORDS

http://www.registrar.arizona.edu/ferpa/default.htm

ADVICE TO SENIORS PLANNING TO GRADUATE

This course will be one of your final laboratory experiences. Soon you will be in the world of private industry or academia. Honesty and hard work are expected—excuses are not well tolerated. Enjoy the lab experiences and be sure to give your best- it's always good practice.

QUESTIONS, COMMENTS AND SUGGESTIONS

I am happy to discuss any aspect of the lecture/laboratory at any time. Please come see me during office hours or email me if you have questions or conceptual difficulties. I am often present in the lab sessions, so feel free to ask me questions during that time.