

# BISC 637 – COURSE SYLLABUS

**Course Description:** Bisc 637 Prokaryotic Development is a 3 credit hour discussion based course designed for graduate students to read and critically analyze contemporary literature on the topic of Prokaryotic Development.

**Learning Objectives:** By the end of this course students should have detailed knowledge of the three major model developmental bacterial systems, including mechanisms of regulation and signaling that coordinate and control these complex processes. Students should also be able to critically analyze experimental design and technique used to address molecular microbiology questions, and be able to lead a discussion of these topics with their peers. Students should be able to analyze primary scientific literature, and place multiple pieces of information within a larger scientific concept.

**Independent Learning Statement:** Critical reading of primary research literature and the ability to analyze experiments for expected outcomes and potential problems are fundamental skills used in all science professions. These skills are used in both the publication of self-generated scientific works, as well as in the peer review of the work of others. This class trains students in these skills and provides extensive practice through the discussion of contemporary primary research publications.

**Course Requirements:** none.

**Instructor:** Dr. Patrick Curtis ([pdcurtis@olemiss.edu](mailto:pdcurtis@olemiss.edu), Office: Shoemaker 402)

**Office Hours:** Wednesday 2-4, or by appointment

**Course materials:** Papers to be discussed will be posted to Blackboard.

**Attendance:** While there is no graded attendance, the class is predominantly discussion based, therefore continued absences will be reflected in the participation portion of the grade. To comply with attendance verification requirements, a report of your attendance will be made within the first two weeks of class.

**NO CELL PHONE DISRUPTIONS WILL BE TOLERATED IN CLASS**  
**Cell phone disruptions will count against your participation grade**

**Grades:** The final grade will be made of 100 points. 40% of those points will be based on discussion participation. 20% of those points will be one page summaries. 20% of those points will be based on leading class discussion of your assigned class day (to be discussed by the professor). 20% of those points will be the final exam (also to be discussed by the professor).

*One page summaries* – each class period the student will turn in a one-page summary of the assigned reading for that day that covers major topics, critical techniques and important findings.

*Leading discussion* – towards the end of the semester each student will lead the class discussion of two prokaryotic development papers of their choice. The papers must be approved by the instructor at least one month prior to their assigned class period. After leading the discussion, the instructor will provide feedback.

*Final exam* – the final exam is a written report (due by the Wednesday of finals week) discussing a topic that was covered during the course. The student must analyze that topic in depth, citing literature, pointing out important techniques or results, discussing potential future experiments, and placing the topic in the larger context of prokaryotic development.

## Grading Scale

90-100%	A
80-89%	B
70-79%	C
60-69%	D
59%-below	F

**Conflicts:** Make up exams are generally NOT given except under exceptional circumstances, such as a death in the immediate family or a serious illness, or other circumstances such as religious beliefs and observances and formal participation in scheduled activities of officially recognized groups, such as field trips in other courses and athletic teams. If you have a conflict with any scheduled exam this semester (including the final), contact Dr. Curtis as soon as possible. If you are forced to miss an exam, provide Dr. Curtis with a written statement explaining the reason for the absence and supply supporting evidence. If health related, a note from your physician or nurse is required.

**Students with Special Needs:** If you are a student with special disability needs, please schedule an appointment with Dr. Curtis.

## **Tentative Schedule (subject to change)**

<b>Date</b>	<b>Topic</b>
Tues, Jan 23	Introduction
<b><i>Bacillus subtilis</i></b>	
Thurs, Jan 25	Introductory review Higgins 2011
Tues, Jan 30	Spo0A – Pre-sporulation responsibilities Gonzalez-Pastor 2003, McLoon 2011
Thurs, Feb 1	Spo0A – Entry into sporulation Eswaramoorthy 2010, Levine 2012
Tues, Feb 6	The DNA translocase SpoIIIE Ptacin 2008, Shin 2015
Thurs, Feb 8	Forespore engulfment mechanisms Broder 2006, Gutierrez 2010
Tues, Feb 13	Cross-compartment communication Camp 2008, Camp 2009
Thurs, Feb 15	Environmental importance of the spore coat Klobutcher 2006, Laaberki 2008
<b><i>Caulobacter crescentus</i></b>	
Tues, Feb 20	Introductory review Tsokos 2012
Thurs, Feb 22	Modularity of global regulators Collier 2007, Jonas 2011
Tues, Feb 27	CtrA in other Alphaproteobacteria Greene 2012, Wang 2014
Thurs, Mar 1	The GcrA/CcrM epigenetic system Fioravanti 2013, Gonzalez 2014
Tues, Mar 6	Polar protein localization Radhakrishnan 2008, Jiang 2014
Thurs, Mar 8	DivL Iniesta 2010, Tsokos 2011
Tues, Mar 13	Spring break – no class
Thurs, Mar 15	Spring break – no class
Tues, Mar 20	c-di-GMP and cell cycle progression Abel 2011, Abel 2013
Thurs, Mar 22	The stalk Gonin 2000, Schlimpert 2012
<b><i>Myxococcus xanthus</i></b>	
Tues, Mar 27	Introductory review Zhang 2011
Thurs, Mar 29	The gliding motility system Mignot 2007, Sun 2011
Tues, Apr 3	Controlling reversals: the Frz system Inclan 2008, Nan 2015

Thurs, Apr 5	Myxobacterial predation and behavior Berleman 2007, Berleman 2008
Tues, Apr 10	Teach the controversy: The Mysterious C Signal Lobedanz 2003, Avadhani 2006
Thurs, Apr 12	Lipids and development Hoiczky 2009, Bhat 2014
Tues, Apr 17	Some things about <i>Streptomyces coelicolor</i> Elliot 2003, Tran 2011
Thurs, Apr 19	Outputs of circadian rhythms in cyanobacteria Markson 2013, Diamond 2015
Tues, Apr 24	Student led discussion – topic TBD
Thurs, Apr 26	Student led discussion – topic TBD
Tues, May 1	Student led discussion – topic TBD
Thurs, May 3	Student led discussion – topic TBD
May 7-11	Finals