Department of Bioagricultural Sciences and Pest Management
Insect Biotechnology BSPM 280A1
Spring 2019

Course Information
- Number of credit hours: Three (3)
- Days and times: MWF, 9-9:50 AM
- Room: E008, Plant Sciences

Instructor Information
Dr. Punya Nachappa
Office: C028
Office hours: The best way to contact me is after class. You can also stop by my office at your convenience or make an appointment and I will do my best to make myself available.
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Course Description
The course is intended to provide students with an introduction to concepts, terminology and applications of molecular biology techniques as it relates to the entomology. Students will learn about the use of whole insects, as well as their cells, tissues, and associated bacteria in medical, pharmaceutical, and agricultural applications.

Course Learning Objectives
Upon successful completion of this course, students will be able to:
1. *Relate* the structure and function of the DNA molecule to its functional role in encoding genes and proteins.
2. *Describe* basic principles and techniques of molecular biology.
3. *Apply* knowledge of molecular techniques to the various sub-disciplines of entomology.
4. *Explore* problems and opportunities in entomology that can be addressed using modern molecular tools.
5. *Evaluate* scientific methods, interpret evidence and draw conclusions.
6. *Communicate* principles of insect biotechnology to variety of audiences.
7. *Develop* logical arguments in debating scientific, social and ethical issues surrounding insect biotechnology.

BSPM Majors' Learning Outcomes
Our major will focus on plant and ecosystem health in agricultural and natural ecosystems and will provide the following:
1. Technical competency: Integrate skills and knowledge to solve problems related to plants, insects, and microbes.

2. Agricultural Literacy: Formulate coherent, objective, and balanced arguments regarding management of biological
3. problems.
4. Critical Thinking: Describe, assess, analyze, and synthesize knowledge from across the curriculum to create solutions
5. for pests and beneficial species.
6. Leadership: Promote and practice inclusion to form effective teams that solve complex problems.
7. Communication: Communicate effectively with broad and diverse audiences regarding sustainable management.

Grading

The evaluation methods for student learning are through exams, quizzes, Powerpoint presentation, as well as attendance and participation during in-class activities.

Quizzes (5)	50 (10 pts each)
Exam 1	50
Exam 2	50
Exam 3	50
Cumulative Final	100
Paper Discussion (5)	50 (10 pts each)
Presentation	75
Attendance and participation	25
Total	450 points

Final grades: Grades are based on cumulative points and are awarded on the following scale:
 A = 90% and above (405-450)
 B = 80-89.99% (360-404)
 C = 70-79.99% (315-359)
 D = 60-69.99% (270-314)
 F = below 60% (< 270)
Grading will be based on CSU Grading Policies (http://catalog.colostate.edu/general-catalog/academic-standards/grading/) except there will be no +/-.
The exams/quizzes will include multiple choice and short answer questions.

Course Prerequisites
None

Course Home Page
Canvas: All course materials including lectures powerpoints, syllabus, supplemental reading will be available on the course website AT Canvas, CSU's online learning system (http://info.canvas.colostate.edu/login.aspx). Please check the site regularly for important announcements, exam and quiz scores, and study guides etc. You will also take quizzes online on the course Canvas site. Please get in touch with me immediately if you cannot access the Canvas website for some reason.

Canvas Email System Utilization
Using the University's systems or networks for personal gain; for example, by selling access to your eID or to university systems or networks, or by performing work for profit with university resources (e.g. selling your notes or promoting a personal agenda) in a manner not authorized by the University is strictly forbidden within the CSU Code of Conduct and also CSU's policy for Acceptable Use for Computing and Networking Resources. All cases of this type of code

violation will be reported to the Office of Conflict Resolution and Case Management and dealt with following CSU legal counsel guidance.

Contacting You
Make sure you regularly check your official university email. You can set your official email address by:
1) Log into RamWeb (https://ramweb.colostate.edu/index.aspx)
2) Under the Record tab select the "change my email address" link and follow the instructions.

Attendance and Class Etiquette
I expect all students to attend class meetings and to complete all assignments. For official rules on attendance, please visit CSU Academic Integrity Policy and Student Conduct Code (http://catalog.colostate.edu/general-catalog/academic-standards/academic-policies/website) Moreover, you will have a chance to score points towards your grade by attending class and participating in in-class activities.

Class etiquette and conduct
- I expect students to be seated and prepared at the start of the class meeting.
- Please switch off your cell phones or turn on "silent" mode during class.
- If you are late to class, please try to find your seat quietly without much disruption.
- If you have to be late regularly, please discuss the reason with me and obtain approval.
- If you missed a class, you will still be responsible for all lecture materials discussed during the period(s) of absence.

Civility and Ground Rules for Discussion
Students will have full freedom to raise relevant questions pertaining to classroom discussions, and to express their opinions to those being discussed. Please visit the CSU Academic Integrity Policy and Student Conduct Code (http://catalog.colostate.edu/general-catalog/academic-standards/academic-policies/website) for addition information. I expect you to adhere to Student Conduct Code.

This course will adhere to the Academic Integrity Policy {Section 1.6} of the Colorado State University General Catalog, the Student Conduct Code, and University Principles of Community.
- Please refer to The University Principles of Community found on page 9 of this syllabus.
- Please refer to our cheating and plagiarism policy found on the Canvas homepage and page 11 of this syllabus.
- Student Conduct Code: http://www.conflictresolution.colostate.edu/conduct-code.aspx#conduct
- Colorado State University General Catalog: http://www.catalog.colostate.edu/

Exams and quizzes
Everyone will receive access to exams and quizzes on the same day. I encourage you to make your best effort to submit all quizzes and exams on time, but I understand that sometimes circumstances arise that are beyond your control. Students that miss an exam due to illness, family emergencies, or other University approved excuses will be able to make up exams by special arrangement. For athletes and others with schedule conflicts; prior arrangements must be made. Students who use alternative testing at RDS can contact me prior to the exam to make arrangements and sign applicable paperwork. Please contact me ASAP if you miss an exam (preferably the day of the exam).

Academic honesty

Academic dishonesty including any form of cheating and plagiarism will not be tolerated. The processes, procedures, rules and definitions associated with academic misconduct may be found at CSU Academic Integrity/Misconduct Policy (http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/#academic-integrity). Any misconduct will result in a reduced grade or failing grade in the course and will be reported to Student Conduct Services at the Student Resolution Center. For serious infractions such as reduced or failing grade a hearing be conducted to determine whether additional university disciplinary action should be taken. Finally, a notation of "AM" (Academic misconduct) will be made on your transcript if the Hearing Officer and I agree that this penalty should be imposed.

Principles of Community

In this course we strive to follow and extend Colorado State's University's Principles of Community, and welcome spirited discussion, lively debate and pursuit of knowledge in a manner that respects each of us as individuals.

The Principles of Community support the Colorado State University mission and vision of access, research, teaching, service and engagement. A collaborative and vibrant community is a foundation for learning, critical inquiry, and discovery. Therefore, each member of the CSU community has a responsibility to uphold these principles when engaging with one another and acting on behalf of the University.
- Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.
- Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.
- Respect: We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.
- Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.
- Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

Title IX: Sexual Assault, Sexual Violence, Sexual Harassment

CSU's Discrimination, Harassment, Sexual Harassment, Sexual Misconduct, Domestic Violence, Dating Violence, Stalking, and Retaliation policy designates faculty and employees of the University as "Responsible Employees." This designation is consistent with federal law and guidance, and requires faculty to report information regarding students who may have experienced any form of sexual harassment, sexual misconduct, relationship violence, stalking or retaliation. This includes information shared with faculty in person, electronic communications or in class assignments. As "Responsible Employees," faculty may refer students to campus resources (see below), together with informing the Office of Support and Safety Assessment to help ensure student safety and welfare. Information regarding sexual harassment, sexual misconduct, relationship violence, stalking and retaliation is treated with the greatest degree of confidentiality possible while also ensuring student and campus safety.

Any student who may be the victim of sexual harassment, sexual misconduct, relationship violence, stalking or retaliation is encouraged to report to CSU through one or more of the following resources:

Emergency Response 911
- Deputy Title IX Coordinator/Office of Support and Safety Assessment (970) 491-1350
- Colorado State University Police Department (non-emergency) (970) 491-6425
- Please Visit: http://oeo.colostate.edu/title-ix-sexual-assault for more information.

Service Animals in the Classroom
This course will follow all the policies regarding service animal access to the classroom. The full university policy may be found here: http://policylibrary.colostate.edu/policy.aspx?id=747 .

Policy statement
The University will not discriminate against individuals with disabilities who use service dogs, nor, subject to the terms of this Policy, deny those persons access to programs, services and facilities of the University. In addition, only under certain limited conditions as stated in this policy, the University may permit an individual with a documented disability to have an Emotional Support Animal in a University residential facility. Pets are not permitted in any University building, including residence halls, except for the Veterinary Teaching Hospital and other veterinary facilities in accordance with their rules and policies, or when otherwise specially allowed with advance approval from Environmental Health Services for bona fide academic or University business purposes.

Service Dogs
Subject to some limitations, a service dog may accompany an individual with a disability throughout campus, such as in classrooms, recreational facilities and campus residences. It is strongly encouraged, but not required, that a service dog be identifiable to others through a visible signifier (e.g., vest or harness). Individuals with a disability who require a service dog in the classroom should contact Resources for Disabled Students (RDS) for assistance with accommodations.

Emotional Support Animals
An emotional support animal (ESA) is one that alleviates one or more identified symptoms or effects of a person's disability. ESAs are not permitted in university buildings, except in the rare situation where use of an ESA in University housing is approved in advance by the University upon the submission of appropriate documentation, as set forth in this policy. ESAs are not permitted in non-residential buildings such as classrooms, laboratories, business offices, recreational facilities, dining halls, or the Lory Student Center; they are limited to the disabled individual's residence in a University residence hall, apartment, or other housing unit, and permitted only with prior approval.

Plagiarism and Academic Integrity
We take the issue of academic integrity very seriously in this course. You are expected to do your own work and to not access notes or the web during an exam, copy from someone else's exam or to provide exam answers to another student during an exam. We reserve the right to proctor all exams and will take actions to ensure that all students are following this policy.

"Plagiarism includes the copying of language, structure, ideas, or thoughts of another, and representing them as one's own without proper acknowledgment. Examples include a submission of purchased research papers as one's own work; paraphrasing and/or quoting

material without properly documenting the source" (CSU Policies and Guiding Principles, 2017-2018).

Our motivation for rigorously enforcing a no-plagiarism policy is twofold: First, plagiarism is a form of theft. Taking someone else's words or ideas without attribution is stealing someone else's work. Second, copying someone else's work does not fulfill the purpose of the assignment, which is for you to develop critical thinking and analysis skills. You demonstrate this by presenting your own, new, synthesis and analysis in your writing. Simply copying or paraphrasing from source materials does not demonstrate this, however insightful the source(s) may be. Good writing generates new knowledge. This should be your goal in this class, in other courses at CSU and in your career after you leave here.

In this course all written work will be spot checked for plagiarism issues by both instructors and originality checking software such as VeriCite. If you are caught plagiarizing materials you will receive a 0 for the assignment/exam/project, and depending upon the severity of the offense, an F in the course. All examples of plagiarism or academic dishonesty and will be reported to the Office of Conflict Resolution and Student Conduct Services for additional disciplinary action as outlined in the student handbook under the heading "academic integrity/Misconduct" (http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/).

Need Help? Rams Take Care of Rams
Reach out and ask for help if you or someone you know is having a difficult time. Always feel free to come and talk to me; I will always make myself available to help connect you with any resources you need. CSU is a community that cares for you. If you are struggling with drugs or alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others please know there is help available. Counseling Services has trained professionals who can help. Contact 970-491-6053 or go to http://health.colostate.edu. If you are concerned about a friend or peer, tell someone by calling 970-491-1350 (or visit http://safety.colostate.edu/tell-someone.aspx) to discuss your concerns with a professional who can discreetly connect the distressed individual with the proper resources. Rams take care of Rams.

Tentative Schedule: *(note: dates of guest lectures are subject to change)*

Module	Date	Course Learning Outcomes	Course Content/Lectures	Objective Level	Quiz
1	1/23	1	Introduction: course goals and outline, assessment	Introduction	
	1/25		*Why study insects?*		
	1/28		Molecules of life		
	1/30		Cell structure		
	2/1		DNA structure and function (1)		
	2/4		DNA structure and function (2)		Q1
	2/6		Gene Expression and control (1)		
2	2/8	2	Gene Expression and control (2)	Engagement	
	2/11		PCR and applications		
	2/13		Restriction digestion of DNA		
	2/15		Exam 1 Review		
	2/18		**Exam 1**		
	2/20		Gene cloning		
	2/22		DNA sequencing		
	2/25		'Omics (1)		
3	2/27	3, 5, 6, 7	'Omics (2)	Engagement	Q2
	3/1		**Paper Discussion**		
	3/4		Molecular insect systematics		
	3/6		Insect population genetics		
	3/8		**Paper Discussion**		
	3/11		Molecular biology of insect behavior		
	3/13		Insect molecular physiology		
	315		**Paper Discussion**		Q3
	3/18-22		Spring Break		
	3/25		Exam 2 Review		
	3/27		**Exam 2**		
4	3/29	3, 5, 6, 7	Molecular plant-insect interaction (1)	Engagement	
	4/1		Molecular plant-insect interaction (2)		
	4/3		**Guest lecture**		
	4/5		Entomotherapy		
	4/8		Molecular plant-insect-pathogen interaction		
	4/10		**Guest lecture**		
	4/12		Molecular forensic entomology		Q4
	4/15		No class		
	4/17		Insect gene silencing and applications		
	4/19		**Paper Discussion**		
	4/22		Exam 3 Review		
	4/24		**Exam 3**		
5	4/26	4, 5, 6, 7	Plant transgenesis	Engagement	
	4/29		Insect transgenesis		
	5/1		**Paper Discussion**		
	5/3		Genome engineering in insects		
	5/6		Paratransgenesis		
	5/8		**Guest lecture**		Q5
	5/10		**Student presentations (1, 2)**		
	5/13		**Student presentations (3)**		
	5/16		**Final Exam**		