Fayetteville State University
College of Arts and Sciences
Department of Biological Sciences
ZOOL 410, Principles of Genetics Syllabus
Spring semester, 2012

I. Locator Information:

Instructor: Dr. Lieceng Zhu
Course # and Name: ZOOL 410, Principles of Genetics
Semester Credit Hours: Three hours

Day and Time Class Meets: T 10 am -11:50 am (Lecture)
R 11am -12:50 pm (lab)

Total Contact Hours for Class: Four hours
Email address: lzhu@uncfsu.edu

Office Location: LS 215
Office Hours:
W 8am-12 pm T 8-10:00, R 9-11am
Office Phone: 672-1655

Class room: LS129
Lab: LS 206

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (username@uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Rules and regulations governing the use of FSU email may be found at http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf

II. Course Description: The objectives of ZOOL 410, Principles of Genetics are to study the fundamental concepts and principles of Mendelian genetics, cytogentics, molecular genetics, and application of genetic technologies. You will be also introduced to the various methods that scientists have used to solve different problems in genetics. The laboratory experiment and exercises are designed to reinforce and deepen your understanding to the basic concepts and principles in lectures and to provide opportunity to obtain hands-on experimental and problem solving skills.

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability. Please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. **Textbook & Laboratory Manual:**

Textbook for lecture: Genetics: Analysis and Principles, Third Edition. Robert J. Brooker, McGraw Hill Co ©2009, ISBN 9780072992786.
Outside materials maybe used in supplement of textbook.
Lab manual will be prepared by instructor. In addition, you are expected to buy the access of an online Fly Lab in http://biologylab.awlonline.com/

V. **Student learning outcome and measurement:** Upon completion of this course, students will be able to

Outcome	Measurement
1. Understand the concepts of Mendelian genetics and to apply the concepts to solve problems regarding the inheritance patterns of living organisms.	Test, quiz, assignment, lab exercise and report
2. Understand and describe the chromosome and molecular basis for heredity.	Test, quiz, assignment, lab exercise and report
3. Understand the structure and function of DNA from the level of entire chromosomes to individual molecules.	Test, quiz, assignment, lab exercise and report
4. Understand and apply the concepts and principles of linkage, crossover, and genetic mapping.	Test, quiz, assignment, lab exercise and report
5. Understand basic concepts and principles of genetics in population	Test, quiz, assignment, lab exercise and report
6. Understand and appreciate the application of recombinant DNA technology, biotechnology in improving the well being of human life.	Test, quiz, assignment, lab exercise and report Presentation
7. Develop laboratory skills that allow a student to perform experiments and analyze data based on the concepts listed above.	Lab exercise and report
8. Demonstrate effective communication skills.	Presentation, lab report

VI. Course Requirement and Evaluation Criteria

a. Grading Scale: Evaluation will be based primarily on tests, lab exercises, quizzes, presentation and other assignments.

Two tests (2 x 100pt)	=	200
Final exam (Comprehensive)	=	150
Laboratory exercises	=	100
Quiz and assignments	=	100
Presentation	=	60
Total	=	610

*Points may vary.
*Attendance policy does not apply to students who had special arrangements with the instructor.
*Tests may consist of materials from lecture, reading, lab practice and other class assignments.
Final grade will be based on the percentage of total points.

Grade	=	Percentage
A	=	90-100%
B	=	80-89.9%
C	=	70-79.9%
D	=	60-69.9%
F	=	≤ 59.9%

b. Attendance Requirements: Attendance in lecture and lab is required. Students are expected to attend class on time and remain in class until the class is dismissed. Attendance will be checked at the beginning and the end of the class and lab. **Tardiness or early leave in class will be counted as absence**. **Five time absences without valid excuses will lower your semester grade by one letter grade.** To get full points for each lab practice, students should conduct lab exercise in her or his designated area and provide proper evidence that she or he has successfully completed required lab activity before leaving the lab.
Students will be assigned to an interim grade "X" for no show in class, and "EA, Excessive absence" if your absence exceed 10% of contact hours of the class. The interim grade is for warning purpose only.

c. Graded assignments and lab report: Assignment and lab report must be **written clearly or typed and printed out. Electronic version is not acceptable**.
d. Value of each assignment: (To be announced).
e. Policy on missed or late assignment. Late work is not acceptable unless students have valid excuses. In case of **unforeseen emergency**, provide me with written, verifiable documentations **as soon as possible after your emergences**. Missed assignment result in a "0" grade.
f. Make up exam: No makeup exam unless students have acceptable excuses. Make up exams must be done before the scheduled exam or within a week after the scheduled exam. In case of **unforeseen emergency**, provide me with written, verifiable documentations **as soon as possible after your emergences**. Missed exam result in a "0" grade. **No make up for final exam**.
g. Final exam: Final exam will be comprehensive.
h. Quizzes: Quizzes will be given announced or unannounced. Some quizzes maybe given at the very beginning or at the end of the class period. **No makeup quiz**.
i. Grade changing policy: Students are welcome to discuss with me about your grades for each test, quiz, assignment, lab report etc. However, **the grades can only be changed within one week from the day I handed back your graded items in class.** Grades will be posted on Blackboard timely, and it is your responsibility to check your grade on Blackboard.
j. Graded items: You are responsible for getting your graded test papers, assignments, and lab report back timely. In case you missed the class when I hand your graded items back, you should come to my office and get the items within two days.
k. **Email and Blackboard**: You are expected to check your email and announcement on Blackboard on a daily basis. If you miss any information, **no excuses will be accepted**.
l. Online assignment, quiz etc: Please do online assignments or quizzes as soon as they become available and report any problems immediately. Never work on online assignments and quizzes until the last minutes, if you do, when your computer or internet has a problem, you will miss the deadline and lose a letter grade each day after the deadline for your assignments. **No make up for online quiz**.
m. Cheating: University policy concerning cheating will be adhered to. Cheating will result in zero grades.

n. Cell phone: **No cell phone was allowed to be used in class, lab and tests**. You are expected to turn off your cell phone and put it away during class or lab sections.
o. Lab top computer: **It is not allowed in this class.**
p. Lab materials and devices: Students are responsible for cleaning lab devices and put them back to drawer after each lab activity.
q. Student behavior expectations: The instructor will respect all students and will make every effort to maintain a classroom climate that promotes learning for all students. Students must accept their responsibility for maintaining a positive classroom environment by abiding by the following rules:

1. Any behavior and activity that disrupt teaching and learning are prohibited. Any activities that are not associated with learning of the subject matter are prohibited.
2. Students will not use cell phone and pagers, will not eat, listen music, sleep, working on other projects.
3. Students will not carry on private conversations while class is being conducted
4. Students should raise their hands and get permission from instructor when they need to ask questions.
5. Students are expected to arrive to class on time, remain in class until dismissed by the instructor, and refrain from preparing to leave class until it is dismissed.
6. Students are prohibited to walk around in classroom when the class is underway.
7. Student/teacher relationships, as well as relationships among peers, must be respectful at all times.
Students will not use computer in the classroom unless it is related to the lab practice
8. Students will speak to instructor and peers respectively.
9. Students will not ask for extra work to improve grade after final exam.
10. Student will not use any way to make instructor change his or her grade after final exam unless there are mistakes in calculation of your total grade or in grading of your final exam.
11. FSU policies regarding disruptive behavior (http://www.uncfsu.edu/policy/academic_affairs/DisruptiveBehavior.Final.pdf) will be followed. **Disruptive behavior may result in deducted points from the students' semester grade.**

VII. Academic Support Resources:

Smartthinking (http://www.uncfsu.edu/fsuretention/Smarthinkingresources.htm),
University College Learning Center

VIII. Course Outline:

Weekly lecture schedule (may be changed due to progress made)

Date	Week	Topic	Chapter
1/10	1	Syllabus/ Review-Mitosis, meiosis	3
1/17	2	Role of segregation, probability	2
1/24	3	Role of independent assortment/ Chi-square analysis / Chromosome theory of inheritance	2
1/31	4	Sex-determination, X-linked inheritance/ Pedigree analysis of human disease	3, 22
2/7	5	Review/Extension of Mendelian inheritance	4
2/14	6	**Test 1**	2, 3, 22
2/21	7	Linkage and genetic mapping	
2/28	8	Linkage and genetic mapping	5
3/6	**9**	**Midterm break**	
3/13	10	Non-Mendelian inheritance	7
3/20	11	Non-Mendelian inheritance	7
3/27	12	Review/ Variation in chromosome structure and number	8
4/3	13	**Test 2**	4, 5, 7
4/10	14	Variation in chromosome structure and number	8.
4/17	15	Variation in chromosome structure and number/ Organization and molecular structure of chromosome	8, 10
4/19 (lab section)	15	Cancer genetics	22
4/24	16	Population genetics **(Graduating senior final)**	
	17	**Final exam**	

Laboratory schedule
(Lab schedule and activities may be changed. Please check Blackboard for any changes before you come to lab. Lab will be conducted in LS206 unless announced otherwise)

Date	Lab #	Lab activity	Point	Week
1/12	1	Mitosis/meiosis	10	1
1/19	2	Plant root chromosome spread	10	2
1/26	3	Probability	10	3
2/2	4	Monohybrid cross, dihybrid/ test cross	10	4
2/9	5	Fly Lab, sex-linked genes	10	5
2/16	6	Fly Lab, genetic recombination	10	6
2/23	7	Genetics and Chi-square analysis	10	7
3/1	8	DNA isolation	10	8

3/8		**Midterm break**		9
3/15	**9**	PCR and primer design	10	10
3/22	10	Student presentation		11
3/29	11	Student presentation		12
4/5	12	Student Presentation		13
4/12	13	Catch up		14
4/19	**14**	**Lecture: Cancer Genetics**		
4/26	15	TBA		

IX. Teaching Strategies

ZOOL 410 is a lecture-based course designed to help student understand the basic theories and principles of genetics. The laboratory component provides hands-on experiments to illustrate these theories and principles. Student presentations are designed to enhance students' skills in scientific communication. Questions from students are encouraged. The lecture is enhanced by using visual aids such as PowerPoint.

IX. Bibliography

1. Nature
2. Nature Biotechnology
3. Science
4. Cell

Topics for Presentation

	Topic	Student Name (Print)	Signature
1	Gene and environment		
2	Genetic counseling		
3	Genetics of homosexuality		
4	PCR and its application		
5	Gene cloning		
6	Genetics of cancer		
7	Down Syndrome		
8	Turner's syndrome		
9	Gene therapy		
11	Perspective of stem cell research		
12	Importance of Genetic mapping		
13	Gene transformation		
14	Application of linkage mapping		
15	Genetics of blood type in Human		
16	Hybrid advantage		

17	Genetics of cancer		
18	Down Syndrome		
19	Turner's syndrome		
20	Genetic testing		
21	Issues related to genetics technology		
22	Genetics of intelligence		
23	Genetics of behavior		
24	Misuse of genetic technology		

Guidelines for Preparation of your Presentation

1. Your time of presentation is 7 minutes (5 minutes for presenting, and 2 minutes for question).
2. You are required to prepare a well organized presentation and present professionally.
    a. You should have less than 10 slides.
    b. The font in the slides must not smaller than 20.
    c. In each slide, the text should be as less as possible.
    d. You should always face and speak to audience while you are presenting.
    e. The graphics and pictures must be relevant.
    f. You should give credit to people who generate data used in your presentation.
3. You are expected to be actively involved in others presentation by
    a. Attending the section and listening carefully.
    b. Providing comments and suggestions.
    c. Asking questions.
4. **Your presentation will be evaluated by one or two students based on the criteria listed bellow on the spot publically**

Evaluation of your presentation

Points	Minimum 0	Maximum 10
Organization	Audience cannot understand presentation because there is no sequence of information. Much or too little time is spent.	Student presents information in logical, interesting sequence which audience can follow. Timing is perfect.
Subject knowledge	Student does not have grasp of information; Student cannot answer questions about subject.	Student demonstrates full knowledge on the subject.
Slides	Student uses superfluous graphics or no graphics. Student's presentation has many spelling errors and/or grammatical errors.	Student's graphics explain and reinforce screen text and presentation. Presentation has no misspellings or Grammatical errors.

Presentation skills	Student mumbles, incorrectly pronounces terms, and speaks too quietly for students to hear. Student reads most of the report and does not make eye contact.	Student uses a clear voice and correct, precise pronunciation of terms so that all audience members can hear presentation. Student maintains eye contact with audience.
Professional manner	Student dress casually, disrespect audiences	Student dress professionally and respect audience all the time
Participation	Student absent in others presentation or does not participate in the other's presentation, does not listen or remain in professional manners during other's presentation	Student present in all the presentations on time and are actively involved in the presentation in a good manner