INTRODUCTION TO PLANT MOLECULAR BIOLOGY

SYLLABUS

I. Course and Instructor Information.
Course: HOS 3305
Section: 3305
Credit Hours: 3
Period 2-3: Tu 8:30 - 9:20 am & 9:35 - 10:25 am, Th 8:30 - 9:20 am
Room: 2318 Fifield Hall
Pre-requisites: BSC 2007, BOT 2010, or BSC 2010

Instructors: Bao, Zhilong; Folta, Kevin; Gustin, Jeffery
Office: 1251 Fifield Hall (KF), 2239 Fifield Hall (ZB), 2B BLDG 710 (JG)
Phone: 352-273-4350 (KF), 607-342-5321 (ZB), 352-273-4608 (JG)
e-mail: zbao@ufl.edu, kfolta@ufl.edu, jgustin@ufl.edu , (Subject must be "HOS 3305")
Office hours:
Bao: Tu 1:00 - 2:00 pm, Th 9:30 - 10:30 am, or by appointment
Folta: M 12:00-1:00 pm, Th 9:30-10:30 am, or by appointment
Gustin: M 1:00 - 2:00 pm, Th 9:30 - 10:30 am, or by appointment

II. Course Description.
Molecular Biology is the branch of biology that studies the structure and function of macro molecules that encode and regulate the flow of genetic information used by living organisms. This course will focus on the structure and content of the three genomes found in plant cells, gene structure, expression, and regulation. Other topics addressed in this class are transposable elements, and plant transformation procedures. A brief introduction to bioinformatics is also included.

III. Course Goals. This course aims to:
- Provide students with a solid understanding of the relationship between structure and function of macromolecules that carry and express genetic information.
- Foster the development of critical thinking in considering methods of scientific inquiry and assessment of results.
- Familiarize students with the utilization of bioinformatics resources.

IV. Learning Objectives. After taking this course students should be able to:
- Identify the different components of the cell machinery that maintain and express the genetic information stored in cells of living organisms.
- Identify the basic methods and approaches used in molecular biology.
- Explain the role played by the molecular components of the genetic machinery.

- Use their knowledge of structure and function of macromolecules to interpret biological phenomena such as growth, development and responses to biotic and abiotic stimuli.

V. Reading Material.

Weaver, RF. Molecular Biology. New York, NY. McGraw-Hill publisher. 5th edition, 892 pp.

Additional References

Krebs, JE, ES Goldstein, ST Kilpatrick. 2009. Lewin's Genes X. Jones & Bartlett Learning. Sudbury, MA.

Buchanan, BB, W Gruissem, RL Jones. 2000. Biochemistry and Molecular Biology of Plants. John Wiley & Sons, Somerset NJ.

Weaver's book covers most of the topics that will be cover in this class, albeit in greater detail. An "Outline" for each section will be provided to delimit the areas that will be covered. When appropriate, specific articles dealing with plant-specific features will be addressed. Copies of these articles will be available to the class.

VI. Class Schedule.

Wk	Lecture	Date	Topic	Instructor
1	1	Aug-23, T	Introduction, History of Molecular Biology	Dr. Kevin Folta
	2	Aug-23, T	Molecular Tools A & B	Dr. Kevin Folta
	3	Aug-25, R	Molecular Biology Primer	Dr. Kevin Folta
2	4	Aug-30, T	Molecular Biology Primer	Dr. Kevin Folta
	5	Aug-30, T	Molecular Biology Primer	Dr. Kevin Folta
	6	Sep-1, R	Molecular Biology Primer	Dr. Kevin Folta
3	7	Sep-6, T	DNA Characterization	Dr. Kevin Folta
	8	Sep-6, T	DNA Characterization	Dr. Kevin Folta
	9	Sep-8, R	Cell Cycle	Dr. Kevin Folta
4	10	Sep-13, T	DNA Replication	Dr. Kevin Folta
	11	Sep-13, T	DNA Replication	Dr. Kevin Folta
		Sep-15, R	**First Midterm**	Dr. Zhilong Bao
5	12	Sep-20, T	DNA Repair	Dr. Zhilong Bao
	13	Sep-20, T	DNA Repair	Dr. Zhilong Bao
	14	Sep-22, R	DNA Recombination	Dr. Zhilong Bao
6	15	Sep-27, T	Plant Genome	Dr. Zhilong Bao
	16	Sep-27, T	Ribosomal DNA, satDNA	Dr. Zhilong Bao
	17	Sep-29, R	Centromeres, Transposons	Dr. Zhilong Bao

7	18	Oct-4, T	Transposons	Dr. Zhilong Bao
	19	Oct-4, T	Cytoplasmic Genomes	Dr. Zhilong Bao
		Oct-6, R	**Second Midterm**	Dr. Zhilong Bao
8	20	Oct-11, T	Transcription, mRNA	Dr. Zhilong Bao
	21	Oct-11, T	Transcription, Gene Structure, Transcription	Dr. Zhilong Bao
	22	Oct-13, R	RNA Polymerases	Dr. Zhilong Bao
9	23	Oct-18, T	Transcription, Activators	Dr. Zhilong Bao
	24	Oct-18, T	RNA Processing	Dr. Zhilong Bao
	25	Oct-20, R	RNA Processing	Dr. Zhilong Bao
10	26	Oct-25, T	RNA Processing	Dr. Zhilong Bao
	27	Oct-25, T	Transcriptional Regulation	Dr. Zhilong Bao
	28	Oct-27, R	Molecular Tools II	Dr. Zhilong Bao
11	29	Nov-1, T	Translation	Dr. Kevin Folta
	30	Nov-1, T	Translation	Dr. Kevin Folta
		Nov-3, R	**Third Midterm**	Dr. Kevin Folta
12	31	Nov-8, T	Translation	Dr. Jeff Gustin
	32	Nov-8, T	Translation	Dr. Jeff Gustin
		Nov-10, R	Translation	Dr. Jeff Gustin
13	33	Nov-15, T	Genome Sequencing	Dr. Jeff Gustin
	34	Nov-15, T	Transformation	Dr. Jeff Gustin
	35	Nov-17, R	Transformation	Dr. Jeff Gustin
14	36	Nov-22, T	Transformation	Dr. Jeff Gustin
	37	Nov-22, T	Transformation	Dr. Jeff Gustin
		Nov-24, R	**Thanksgiving**	Dr. Jeff Gustin
15	38	Nov-29, T	Bioinformatics	Dr. Jeff Gustin
	39	Nov-29, T	Bioinformatics	Dr. Jeff Gustin
	40	Dec-1, R	Bioinformatics	Dr. Jeff Gustin
16		Dec-6, T	**Oral Presentations**	Dr. Jeff Gustin
		Dec-6, T	**Oral Presentations**	Dr. Jeff Gustin
		Dec-13, T	**FINAL EXAM 5:30 – 7:30 pm**	Dr. Jeff Gustin

VII. Student Evaluation. Students will be evaluated according to their knowledge of the topics, level of comprehension, and ability to analyze and interpret information presented in class and in reading assignments. Exams will be closed book and closed notes. No phones will be allowed. Exams will focus on the material covered since the previous test.

Homework.	10%
Oral Presentation	10%
First Mid-Term.	20%
Second Mid-Term.	20%
Third Mid-Term.	20%
Final Exam.	20%

Make-up exams.

Students who are unable to take scheduled exams due to scheduling conflicts with other courses, or with religious holidays, should contact the instructor **ahead of time** to arrange for alternate time and place.

The final grade will be calculated according to a weighted average of the points accumulated throughout the semester. UF grading policies can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Grading Scale

100 ≥ **A** > 90	86 ≥ **B+** > 82	74 ≥ **C+** > 70	62 ≥ **D+** > 58	**E** ≤ 50
90 ≥ **A-** > 86	82 ≥ **B** > 78	70 ≥ **C** > 66	58 ≥ **D** > 54	
	78 ≥ **B-** > 74	66 ≥ **C-** > 62	54 ≥ **D-** > 50	

VIII. University Policies.

Attendance Policy

The requirement for class attendance for this class follows UF policy. However, students must be aware that the class is not designed as a tutorial course. Students with poor attendance records tend to have lower performance levels than those who attend regularly. UF attendance policy can be found at:https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Academic Honesty

Every student has signed the following statement after completion of the registration form at the University of Florida:

> "*I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and*

understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

Software Use

All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

Students with Disabilities.

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

IX. Student Services.

The University and Gainesville Community offer a number of personal counseling services for students at the University of Florida. Contact the appropriate agency listed below:

- Student Health Services 392- 1161
  Student Health Care Center (1 Fletcher Driver)
  Monday - Friday, 8:00am - 4:30pm
  http://www.shcc.ufl.edu

- University Counseling & Wellness Center 392-1575
  A counselor is available to assist students to work through personal issues.
  P301 Peabody Hall
  Monday - Friday, 8:00am - 5:00pm
  http://www.counseling.ufl.edu/cwc/

- International Student Services 392-5323, ext. 600
  Assistance is provided for International students at the University.
  123 Grinter Hall
  Monday - Friday, 8:00am - 4:30pm
  http://www.ufic.ufl.edu

- Career Development Assistance and Counseling 392-1601
  Career Resource Center M-F; 8:00am - 4:30pm
  http://www.crc.ufl.edu

- Dean of Students Office 392-1261
  A staff member is available to assist students.
  P202 Peabody Hall
  Monday - Friday, 8:00am - 4:30pm
  http://www.dso.ufl.edu