

INTRODUCTION TO PLANT MOLECULAR BIOLOGY

SYLLABUS

I. Course and Instructor Information.

	Course:	HOS 3305
	Class Number:	14584
	Credit Hours:	3
	Period 2-3 (no break):	Tu 8:30 – 10:10 am Th 8:30 - 9:20 am
	Room:	1306 Fifield Hall
Pre-requisites:		BSC 2007, BOT 2010, or BSC 2010
	Instructor:	Kevin M. Folta
	Office:	2239 Fifield Hall
	Phone:	273-4350
	e-mail:	kfolta@ufl.edu (Subject must be “HOS 3305”)
	Office hours:	Tu 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 as it applies to 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. 2018. Lewin's Genes XII. Jones & Bartlett Learning. Sudbury, MA.

Buchanan, BB, W Gruissem, RL Jones. 2015. Biochemistry and Molecular Biology of Plants. 2nd Edition. John Wiley & Sons, Somerset NJ.

VI. Class Schedule.

Wk	Lecture	Date	Topic
1	1	8/21, R	Introduction, History of Molecular Biology, Why Study Plant Molecular Biology?
2	2	8/26, T	History of Molecular Biology, Molecular Biology Tools – I
	3		Molecular Biology Tools – I, Molecular Biology Primer
3	4	8/28 R	Molecular Biology Primer
	5	9/2, T	Molecular Biology Primer
	6		DNA Characterization
4	7	9/4, R	DNA Characterization
	8	9/9, T	In Vitro Modification of Nucleic Acids
	9		Cell Cycle
5	10	9/11, R	Molecular Biology Tools – II, DNA Replication
	11	9/16, T	DNA Replication
	12		DNA Replication
6		9/18, R	First Midterm
	13	9/23, T	DNA Repair
	14		DNA Recombination
7	15	9/25, R	Plant Genome
	16	9/30 T	Ribosomal DNA, satDNA

	17		Centromeres, Transposons
8	18	10/2 R	Transposons
	19	10/7, T	Cytoplasmic Genomes
	18		Transcription, mRNA
8	19	10/9, R	Transcription, Gene Structure
	21	10/14, T	RNA Polymerases
9	22	10/16, R	Second Midterm
	23	10/21, T	Transcription, Activators
	24		RNA Processing
10	25	10/23, R	RNA Processing
	27		RNA Processing
	28		Translation
11	29	10/28, T	Transformation
	30		Transformation
	31	10/30, R	Transformation
12	32	10/29, T	Genetic Engineering
	33		Genetic Engineering
		10/31, R	RNAi and Epigenetics
13	34	11/4, T	Third Midterm
	35		RNAi and Epigenetics
		11/6, R	DNA Sequencing
14	36	11/11, T	Veteran's Day – No Class
	37		
	38	11/13, R	DNA and Genome Sequencing
15	39	11/18, T	Bioinformatics – bring a laptop
		11/20 R	Bioinformatics – bring a laptop
		11/26 T	No Class
		11/28 R	Thanksgiving.

		12/2	Oral Presentations
**		12/8	Fourth Midterm 3-5 pm

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 either. Exams will focus on the material covered since the previous test.

Quizzes	100 points
Oral Presentation	50 points
First Mid-Term.	100 points
Second Mid-Term.	100 points
Third Mid-Term.	100 points
Final Exam.	100 points

Quizzes: Homework will be assigned as brief sets of questions that will reflect the depth and scope expected for the exams.

Exams: Exams will be closed book and will administered online through Canvas using the Honorlock system. Exams are scheduled for one hour, but additional time will be discussed.

Make-up exams.

There are no make-up exams. It is impossible to execute make up exams and be fair to all students. Mark exam dates on your calendars and be prepared to take them.

Oral Presentation: The oral presentation will be delivered during the last several class periods. Each student will prepare a presentation based on a topic provided, and will incorporate elements of the subjects discussed during the course.

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. Course evaluations – GatorEvals.

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

IX. 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. Most of the PowerPoint presentations serve as aids during lectures and may not mean much unless students attend class, or read the textbook on their own. UF attendance policy can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Academic Honesty

The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, students are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor in this class. Every student has signed the following statement after completion of the registration form at the University of Florida:

“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.””

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 with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

X. 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>

- International Student Services

392-
5323

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.career.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>