

Texas A&M University - Corpus Christi  
SYLLABUS

**BIOLOGY 2472.001/2472.101**

**Principles of Botany**

(4 Credits)  
Fall 2009

**Class Meetings:** Tuesday/Thursday 11:00 - 12:15 AM Bay Hall 127

**Laboratory:** Tuesdays 2:00 - 4:55 PM CS 240

**Prerequisites:** Biology II (Biol 1407)  
General Chemistry I (Chem 1311)

**Instructor:** Dr. Kirk Cammarata  
*Office:* ST 319B  
*Lab:* NRC 3227  
*Phone:* 825-2468 (Office)  
825-2145 (Lab)  
*E-mail:* [Kirk.Cammarata@tamucc.edu](mailto:Kirk.Cammarata@tamucc.edu)

**Office Hours:** [Subject to change pending advance notice]  
M 11:15 - 12:00  
T 8:30 - 9:30  
F 11:15- 12:00

*Please note that you are welcome to come by my office or lab at anytime, though you may wish to call first. I will be glad to help you if I am not busy. I am likely to be in lab on Wednesday - Friday afternoons.*

**Required Texts:** *Biology of Plants*, 7<sup>th</sup> Ed. by Raven, Evert & Eichorn (2005)  
W.H. Freeman and Co., NY, NY  
ISBN 0-7167-1007-2

*Laboratory Topics in Botany (To Accompany 7<sup>th</sup> Ed. Raven), Evert, Eichorn & Perry (2005) W.H. Freeman and Co., NY, NY ISBN 0-7167-6205-6*

**You must obtain, bring and maintain the Qwizdom Class Response “CLICKER”**

**Laboratory** will be led by the Teaching Assistant whose contact information is provided below. Some labs may be led by the course instructor or a guest instructor.

**Required Items for Laboratory:** You will need your laboratory book, an additional notebook for recording notes and observations, a “sharpie” and a calculator. Students will be responsible for obtaining - and wearing – a **laboratory coat** and **safety glasses**.

**Laboratory Instructor:** Valerie Chilton

*E-mail:* [Valerie.Chilton@tamucc.edu](mailto:Valerie.Chilton@tamucc.edu)

*Office:* CS 240 or ST 301  
825-2924 or 825-5467 (Lab-call only during office hours)

*Office Hours:* Fridays 10-11 CS 240  
Mondays 1-2 ST 301

### **Course Description**

This course introduces students to the structure, function, diversity and application of plants. Features of both vascular and non-vascular plants, including life cycles, are explored. The anatomy of vegetative and reproductive organs of plants are studied. Physiological mechanisms and adaptations used by plants, including water relations, will be considered.

### **Student Learning Outcomes**

Upon successful completion of this course, the student will:

1. Describe plant cell structure and distinguishing features
2. Understand the role of biological macromolecules and be able to identify some important plant secondary metabolites
3. Understand and distinguish respiratory and photosynthetic energy transformations
4. Describe the anatomy of the plant body, including roots, stems, leaves, flowers, fruits and seeds
5. Recognize plant growth and response to external factors, including tropisms, circadian rhythms, photoperiodism, nastic movements and dormancy
6. Understand plant nutritional requirements, soil characteristics, and nutrient cycles
7. Explain historical accomplishments, and the importance of and challenges to agriculture for food, fuel and environment
8. Understand the mechanisms of plant reproduction and genetic variability
9. Describe issues and applications of recombinant DNA technology and biotechnology
10. Understand and categorize plant diversity, evolution and systematics including protists, bryophytes, seedless vascular plants, gymnosperms and angiosperms

**IMPORTANT DATES:**

<b>Aug. 26</b>	<b>Classes begin</b>
<b>Sept 7</b>	<b>Labor Day (Campus Closed)</b>
<b>Nov 6</b>	<b>Last day to drop with a "W"</b>
<b>Nov 25-27</b>	<b>Thanksgiving Break (Campus Closed)</b>
<b>Dec 8</b>	<b>Last day of classes</b>
<b>Dec 10</b>	<b>Final Examination (Thurs 11:00 - 1:30)</b>

**Evaluation:**

Your final grade will be based on the percentage you earn out of the total possible points. Individual extra credit is not possible, but extra points may be built into exams or other assignments. Statistical manipulations, *if used* (at the Instructor's discretion), will be performed only once, at the end of the semester. A 10-point grading scale will be used:

<b>A = 90 - 100 %</b>
<b>B = 80 - 89.9 %</b>
<b>C = 70 - 79.9 %</b>
<b>D = 60 - 69.9 %</b>
<b>F = 0 - 59.9 %</b>

**Components of Course Grade (Tentative)****Lecture: 75%**

<b>3 Exams @ 100 pts</b>	<b>=</b>	<b>300</b>
<b>Final Exam</b>	<b>=</b>	<b>200</b>
<b>Quizzes and Attendance</b>	<b>=</b>	<b>100</b>
<b>[Additional Assignments @ Instructor's Discretion</b>		
	<b>=</b>	<b>up to 100]</b>

**Laboratory: 25%**

<b>(reports, quizzes, assignments, presentations)</b>	<b>=</b>	<b>200</b>
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<b>TOTAL</b>	<b>=</b>	<b>800</b>
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The time schedule may require adjustment. Should this be the case, the assignments and weighting may change slightly. Additional assignments may or may not be provided at the Instructor's discretion. Such assignments might include homeworks, group projects, reading assignments, quizzes, etc. Regardless of any such changes, the lecture and laboratory weighting of your grade shall remain at 75 % and 25 %, respectively. For example, if you make 90 % of total points available for the lecture and 80 % of total points available for the laboratory portion, then your grade would be calculated as:

$$(0.9 \times 75) + (0.8 \times 25) = (67.5) + (20) = 87.5/100 \text{ possible} = B$$

***An assignment will likely be due during the last week of class.***

**Every attempt will be made to follow the time and evaluation schedules shown here. It is the student's duty to attend each class session and be aware of all assignments, deadlines, changes, etc.**

**NOTE:** All Exams are the property of the Instructor as they must be saved for course records. Students may use the exams for study purposes during specified lab periods, but they must be saved and returned to the Instructor at the time of the Final Examination in order for the final grade to be submitted. **DO NOT LEAVE THE ROOM WITH OR COPY THE EXAMS !**

**Other Course Requirements:**

- 1. All students must subscribe to the class listserv, using your official University-mandated email account (firstinitiallastname@islander.tamucc.edu). You may ask questions to the instructor or other students on the class listserv, eg. clarification of an assignment, as well as receive important class announcements. You are encouraged to subscribe to the Opportunities Listserv as well.**

To subscribe, send an e-mail to "[Botany-list-request@sci.tamucc.edu](mailto:Botany-list-request@sci.tamucc.edu)". Make sure that your e-mail address appears in the "From:" heading, and that the word "**subscribe**" is typed in the subject line. You will receive a subscription acknowledgement confirming that you have done everything correctly. To post messages to the listserv, send to "[Botany-list@sci.tamucc.edu](mailto:Botany-list@sci.tamucc.edu)". **Because of security concerns, you should post messages from the official TAMUCC computer account (Islander) that is used to subscribe to the listserv.**

**You should receive the following email shortly after subscribing:**

"Welcome to the Botany Listserv! You should be subscribed using your official University-mandated email account (firstinitiallastname@islander.tamucc.edu). Because of security concerns and University requirement, you should post messages from the official TAMUCC computer account (Islander) that is used to subscribe to the listserv.

**TO POST:** You may ask questions of interest to the instructor or other students on the class listserv, eg. clarification of an assignment, as well as receive important class announcements. To post messages to the listserv, send to "[Botany-list@sci.tamucc.edu](mailto:Botany-list@sci.tamucc.edu)". Please include something descriptive in the subject line: "Question about lab report", for example.

**TO UNSUBSCRIBE:** At the end of class, please send an e-mail to "[Botany-list-request@sci.tamucc.edu](mailto:Botany-list-request@sci.tamucc.edu)" with "**unsubscribe**" in the subject heading. Please use this service to ask questions about class materials, dates, assignments, etc. **PLEASE SAVE THIS MESSAGE."**

You should also subscribe to the **Opportunities Listserv** using the same procedure: "[opportunities-list-request@sci.tamucc.edu](mailto:opportunities-list-request@sci.tamucc.edu)" This service provides notification of scholarships, research and volunteer opportunities and science-related job opportunities.

**2. ALL E-MAIL COMMUNICATIONS WITH THE INSTRUCTOR OR LAB TA MUST BE MADE THROUGH YOUR OFFICIAL UNIVERSITY E-MAIL (@ISLANDER), BY UNIVERSITY RULE.**

**Additional Electronic Resources:** The Instructor may make additional learning resources (Website URLs, books, reserve articles, software) available at the library, laboratory or on WebCT. You may use these with proper sign-out procedure.

The textbook has a free companion website with study-aids, animations & videos, essays, and links to additional materials:

[www.whfreeman.com/raven](http://www.whfreeman.com/raven)

**PowerPoint lecture notes, supplementary materials (eg readings, Study Guides for exams, lab data, etc) and assignments will be posted on the WebCT site for this course (WebCT Help x2825). Last year's course PPT notes are currently posted, and updated versions of the notes will be posted upon completion of each chapter or topic.**

**It is important to do the specified readings BEFORE coming to class for coverage of that topic. Lecture will consist of an overview, answering questions and problem-solving. The PPT notes may not be reviewed in detail except in regard to specific questions. Quizzes will be used to make sure you stay on-track. You must take the responsibility for your education.**

**Explanation of Assignments:**

**Exams** will be a mixture of multiple choice, matching, fill-in the blank, short answer, labeling, calculations and essay questions. Some may require analysis and interpretation of data or experimental design to assess critical thinking skills. The **Final Exam (Thursday, December 10 from 11:00 AM - 1:30 PM)** will be a comprehensive review of entire course content.

**Quizzes** may be given at any time in class, and will often be taken using the required Class Response "Clickers". There will be no makeups.

**Attendance at class is required, and will be monitored by either direct roll call or through the use of the Class Response "Clickers".** You must bring a functional "Clicker" to class each day. If roll is taken by "Clicker" and you do not have yours, you will be counted as absent. Please do not ask for an exception. Each student will be given a 3-absence grace allowance before losing attendance points. If you use

another (absent) student's clicker, in addition to your own, in an attempt to count the absent student as present, you will be counted as absent yourself.

**Outside reading** may be assigned, and will be provided as web links, in handout form or on reserve at the library. **Homeworks and other assignments** may be given in class. The other assignments may include student presentations, data interpretation, experimental design, calculations, opinion papers, research article summaries, etc. They will generally be due at the start of lecture class the following week. You are encouraged to get together and work on them as a group. However, unless specified otherwise, the assignments must be turned in individually and be written ***in your own words, NOT COPIED***. An assignment grade of ZERO will be given if the work is not in your own words.

All assignments and examination answers must be legible to the Instructor. Illegible answers will receive no credit.

#### **Rules:**

All TAMU-CC policies are in-force and described in the TAMU-CC catalog and in the Student Handbook.

#### **Policy on Academic Dishonesty:**

**Academic dishonesty, in all its forms, including plagiarism, is not tolerated. Students found responsible for violating this rule WILL be prosecuted to the fullest extent of University Regulations (see the current TAMU-CC catalog). Be especially careful when completing assignments or lab reports. Everything should be in your own words. The following procedures will be enforced:**

- You must be prepared to present a photo ID at all examinations
- Different test forms may be prepared for a single examination. Follow instructions
- If you leave an examination room—for any reason—you must hand in your test and you will not be allowed to resume the examination. Attend to personal matters (e.g., rest room visits) before the examination.

**LATE WORK will not be accepted, except as below, or unless otherwise specified.**

#### **Attendance Policy:**

Attendance is the student's responsibility, and **laboratory attendance is mandatory**. You are responsible for the material covered in every lecture, even if it is not in the book, regardless of your attendance. **Nothing** missed during an **unexcused** absence can be made up. An excused absence allows us to make alternative arrangements to complete an assignment. Only **unavoidable** absences are excused. Routine events (holiday travel, non-emergency medical visits, parent-teacher conferences, household or auto repairs) **should be scheduled to avoid conflicts with class**. An acceptable excuse *must* be:

- from an appropriate source (doctor, dentist, funeral director) stating the nature of

- the event
- In writing, on official letterhead, and signed (it will not be returned)
  - *presented prior to, or within 1 week of, the absence*
  - ***It must state the dates for which the excuse applies***

**There are No make-up examinations:** For some scheduled events, you may arrange to take a lecture exam before, **but not after**, its scheduled time. Quizzes cannot be made-up.

### **Policy on Disruptive Behavior:**

As adult university students, you are expected to act with courtesy and common sense. Disruptive, disrespectful, or abusive language/behavior towards anyone in class (student, staff, faculty) will not be tolerated and could result in permanent removal from class. This includes tardiness to class, talking in class, insubordination, and **electronic disturbances (cell phones, ipods, gameboys, etc)**. **Turn it off**. Hazardous materials are used in the laboratory so “play” or reckless behavior will not be allowed. Children are not allowed in class or lab.

**Disability and Veterans’ Services:** Texas A&M University-Corpus Christi is committed to providing persons with disabilities an equal opportunity to access campus facilities, resources and programs. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. Support and accommodations are also available for returning veterans who experience cognitive and/or physical access issues in the classroom or on campus. Our Office of Disability Services arranges such support and academic accommodations. To make a request, or for more information, call (361) 825-5816 or visit Driftwood 101. It is important to contact the Office of Disability Services in a timely fashion as it will take time for them to review requests and prepare accommodations and accommodation letters.

**Grade Appeals:** The Texas A&M University-Corpus Christi University Rules and Procedures (Section B [Academic Program], Part 13 [Students]: 13.02.99.C2 [Student Grade Appeals] and 13.02.99C2.01 [Student Grade Appeal Procedures]) provides details regarding the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process. Consult the University Rules and Procedures specified above (accessible through the University Rules and Procedures website at [http://www.tamucc.edu/provost/university\\_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html)).

### **Other Expectations:**

**You are expected to attend all classes in a timely manner.** It is expected that you will take notes, ask/answer questions, and participate in group activities. Learning is more than spoonfeeding, memorization and regurgitation. While memorizing is an

important first step, you should also be able to apply knowledge by linking data and synthesizing into useful concepts.

You are responsible for your own education. Take notes in class as some new information may be presented. Read the book and handouts for further detail not covered in class. If you don't understand, then please ask, or see the instructor after class. **Don't allow yourself to fall behind. Be diligent and thorough on written assignments and examination answers.** If you are not sure of an answer, at least try. For many people, putting anything down on paper clarifies their thinking and helps with recall. Also:

- Be aware of university-imposed deadlines (ie drop dates)
- Be aware of test times and dates, including changes
- Check your answers against a key as soon as possible. Check for clerical errors. The test score is not the end of the learning process. Review tests to determine why you missed an answer. Correcting your mistakes is an effective way to learn material (*reflective learning*).
- Keep track of your progress in class.

### **Suggestions for Improving Course Performance:**

1. Attend all lectures and laboratories in a timely manner.
2. Utilize the WebCT, textbook, and course listserv resources
3. Take notes, ask/answer questions, and participate in group activities.
4. If you don't understand, then please ask, or see the instructor or TA after class.
5. Purchase and read the assigned textbook for further detail not covered in class. The textbook has **key terms boldfaced**, a list of key concepts (*Checkpoints*) at the start of each chapter, and a *summary* at the end of each chapter. There are *links* to relevant websites throughout each chapter. Helpful *review questions* are found at the end of each chapter.
6. The textbook has a free companion website with study-aids, animations & videos, essays, and links to additional materials:  
[www.whfreeman.com/raven](http://www.whfreeman.com/raven)
7. *Work the chapter problems and seek help* from the Instructor. DO NOT BE SHY !
8. Form study groups and question each other about the textbook figures.
9. Be diligent and thorough on written assignments and examination answers. If you are not sure of an answer, at least try. For many people, putting anything down on paper clarifies their thinking and helps with recall.

### **Laboratory**

The **laboratory activities** provide an opportunity to integrate classroom concepts with the real purpose of science: **Discovery**. Laboratory contributes significantly towards your grade. **Quizzes** (5 - 20 pts each) may be given at any time during the lab period, and may cover material from the previous lab or from the current one being performed that day. Thus, you should come prepared and on-time. **Attendance is mandatory.** You may not take the quiz if you arrive late. Everyone should keep a lab notebook to record protocols, perform calculations, record

experimental observations, and make notes. All entries should be titled and dated. This information will be essential when writing laboratory reports. **Lab reports** will be completed in a variety of formats, including on provided handouts, or in formats to be specified. They are generally **due at the start of lab the following week.**

### OUTLINE AND SEQUENCE OF TOPICS

1. Introduction to plants and botany; overview of topics
2. Biological macromolecules & plant secondary metabolites
3. Plant cell structure
4. Water movement in cells
5. Respiration
6. Photosynthesis
7. The plant body and seedling structure
8. Plant growth and effects of external physical conditions
9. Soils and mineral nutrition
10. Sexual reproduction
11. Diversity & systematics
12. Algae & heterotrophic protists
13. Bryophytes
14. Seedless vascular plants
15. Gymnosperms
16. Introduction to angiosperms
17. Evolution of angiosperms
18. Plants & people
19. Recombinant DNA technology, biotechnology & genomics

### TENTATIVE SCHEDULE

Please note that this schedule is subject to change. Changes will be announced in class. It is your responsibility to attend class and be aware of changes.

<u>Week</u>	<u>Lecture</u>	<u>Date</u>	<u>Topic</u>	<u>Chapters</u> *	<u>Notes</u>
1	1	8/27	Introduction to plants and botany; overview of topics	1	<b>Complete Lab Safety Quiz</b>
2	2	9/1	Biological macromolecules & plant secondary metabolites	2 (pp 27-34)	
	<b>Lab 1</b>		Lab Safety; Plant Propagation (Video); Start Herb Seeds; Microscopes, Hypotheses	Lab Topics 1, 2 (Also text pp 158-160)	Propagation Handout

<u>Week</u>	<u>Lecture</u>	<u>Date</u>	<u>Topic</u>	<u>Chapters</u> *	<u>Notes</u>
	3	9/3	Plant cell structure	3	
3	4	9/8	Water movement in cells	4 (pp 71-77)	
	<b>Lab 2</b>		Plant Body & Tissues; Plant Cells	Lab Topics 3, 4	
	5	9/10	Respiration	6	
4	6	9/15	Photosynthesis	7	
	<b>Lab 3</b>		Respiration (& Fermentation)	Lab Topics 7	
	7	9/17	Photosynthesis	7	
5	8	9/22	Photosynthesis	7	
	<b>Lab 4</b>		Photosynthesis I	Lab Topics 8	
	9	9/24	The plant body and seedling structure	22	
6		<b>9/29</b>	<b>EXAM I (Lectures 1-8)</b>		
	<b>Lab 5</b>		Photosynthesis II; Exam Review	Lab Topics 8	
	10	10/1	Plant growth and effects of external physical conditions	28	
7	11	10/6	Plant growth and effects of external physical conditions	28	
	<b>Lab 6</b>		Tropisms; Nastic Responses	Lab Topics 28	
	12	10/8	Plant growth and effects of external physical conditions	28	
8	13	10/13	Soils and mineral nutrition	29	
	<b>Lab 7</b>		Plant Nutrition	Lab Topics 29	
	14	10/15	Soils and mineral nutrition	29	

<u>Week</u>	<u>Lecture</u>	<u>Date</u>	<u>Topic</u>	<u>Chapters</u> *	<u>Notes</u>
9	15	10/20	Diversity & systematics	12	
	<b>Lab 8</b>		Herbarium; Algae	Lab Topics 13	
	16	10/22	Algae & heterotrophic protists	15	
10	17	10/27	Field Trip: Laguna Madre 11 AM – 5 PM		Class + Lab Period
	<b>Lab 9</b>		Field Trip: Laguna Madre (Wetland & aquatic plants)		
	18	10/29	Algae & heterotrophic protists	15	
11	19	11/3	Bryophytes	16	
	<b>Lab 10</b>		Bryophytes	Lab Topics 15	
		<b>11/5</b>	<b>EXAM 2: (Lectures 9-18)</b>		
12	20	11/10	Seedless vascular plants; Exam Review	17	
	<b>Lab 11</b>		Seedless vascular plants	Lab Topics 16	
	21	11/12	Gymnosperms	18	
13	22	11/17	Introduction to angiosperms	19	
	<b>Lab 12</b>		Gymnosperms, Video	Lab Topics 17	
	23	11/19	Introduction to angiosperms	19	
14	24	11/24	Evolution of angiosperms	20	
	<b>Lab 13</b>		Angiosperms, Video	Lab Topics 18	
		<b>11/26</b>	<b>Thanksgiving Holiday</b>		
15	24	12/1	Plants & people	21	
	<b>Lab 14</b>		Fruits	Lab Topics 19	

<u>Week</u>	<u>Lecture</u>	<u>Date</u>	<u>Topic</u>	<u>Chapters</u> *	<u>Notes</u>
	25	12/3	Recombinant DNA technology, biotechnology & genomics	10	
16		<b>12/8</b>	<b>EXAM III: (Lectures 19 - 25)</b>		
	<b>Lab 15</b>		Guest Lecture (?), Exam Review		
		<b>12/10</b>	<b>FINAL EXAM (11:00 - 1:30) [COMPREHENSIVE]</b>		

**General Disclaimer:**

The Instructor reserves the right to modify the schedules and policies in this syllabus if and when necessary. Such changes will be announced during regularly scheduled lecture or laboratory periods, but no attempt will be made to contact students who were absent when an announcement was made. Students are responsible for abiding by all announced changes, and it is a student's responsibility to obtain this information.

**Laboratory Activities:**

Time and materials permitting, the following laboratory activities are planned:

1. Macro- and microscopic observation of plant structures
  - Tissues, roots, stems, leaves, flowers, fruits, seeds
2. Tour, operation and utility of Herbarium
3. Macro- and microscopic observations of Algae, bryophytes and seedless vascular plants
4. Comparisons of gymnosperms and angiosperms
5. Effects of environmental conditions & nutrients on growth
6. Production of herbs for sale and benefit of herbarium
7. Measurement of photosynthesis and effects of controlling parameters
  - Pigments, starch, oxygen evolution
8. Plant propagation
9. Field trip to LMFS: Study of wetland and aquatic plants
10. Computer resources: Databases