# Introduction to Plant Biology (BIOL 130)

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| **Professor:** Devinder Sandhu, Ph.D. |
| **Office** : TNR 467 |
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| **E-mail:** dsandhu@uwsp.edu |
| **Sections :** 9, 10 |
| **Lecture :** T/R/F, 2.00p – 2.50p, TNR 122 |
| **Lab Sec. 9** : M/W, 11.00a -12.50p, TNR 157 |
| **Lab Sec. 10** : M/W, 1.00a - 2.50p, TNR 157 |
| **Office Hours :** T/R, 3.00p – 4.30p or by an appointment. If I am not in my office, please check TNR458. |

## COURSE DESCRIPTION :

The course will provide an overview of major biological concepts as illustrated by plants. These concepts include anatomy (structure), morphology (function), physiology (basic biochemical life processes), reproduction (genetics and life cycles), ecology (interactions with other organisms and the environment), and classification (the names and distinguishing features of the major plant groups).

## PERFORMANCE OBJECTIVES:

- identify plant cells: structure, function, and reproduction.
- distinguish plant anatomy: roots, stems, leaves, flowers and fruit.
- describe the movement of water and solutes in plants.
- synthesize basic chemistry as it relates to living things: photosynthesis, respiration, the molecular composition of cells.
- examine, basis of inheritance. Mendelian genetics.
- learn major groups of plants, their characteristics, and distinctive features. Learn characteristic features of bacteria, viruses, fungi, and algae.

**TEXTBOOK** *Plant Biology* by Thomas Rost, Michael Barbour, C.R. Stocking, Terence Murphy 2nd edition. Required; rental from bookstore

**LAB MANUAL** *Essentials of Botany* seventh edition.
Required; purchase from bookstore. Do not buy a used copy.

**METHODS OF EVALUTION:**

You will receive one grade for this course. Lecture and laboratory scores are added together. Your final grade will be based on the total number of points that you receive out of a possible 800 points.

There will be three Lecture exams (100 points each) and a final exam (150 points). There will unannounced pop quizzes at the **beginning** of classes, consisting of 2 points each. There will be 10-15 pop quizzes in whole semester. This will be considered as an extra credit towards your final grade. There is no makeup for these quizzes. If you are late in class you will miss the quiz.

There will be six lab exams. Top five will be considered. Each exam is worth 50 points. The exams consist of material from the labs. You can review your lab images at http://www4.uwsp.edu/biology/courses/botlab/default.htm.

You will be given a Plant identification exam during the semester. It comprises of images of fifty selected plants and is worth 50 points. To prepare for this review the web page: http://www4.uwsp.edu/biology/courses/plantid/.

Break down of points needed for a Letter Grade:

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|---|---|
| First Lecture Examination | = 100 points |
| Second Lecture Examination | = 100 points |
| Third Lecture Examination | = 100 points |
| Final Lecture Examination | = 150 points |
| Online discussion | = 50 points |
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| Five lab exams | = 250 points |
| Plant Identification exam | = 50 points |

Plus there will opportunity to score extra points in lecture pop quizzes (~30 points).

Grading Scale for the course is

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| 740 - 800 | 92.5 – 100% | A |
| 720 - 739 | 90 - 92.4% | A- |
| 700 – 719 | 87.5 – 89.9% | B+ |
| 660 – 699 | 82.5 – 87.4% | B |
| 640 – 659 | 80 – 82.4% | B- |
| 600 – 639 | 75 – 79.9% | C+ |
| 560 – 599 | 70 – 74.9% | C |
| 520 – 559 | 65 – 69.9% | C- |
| 480 – 519 | 60 – 64.9% | D+ |
| 440 – 479 | 55 – 59.9% | D |
| < 440 | < 55% | F |

## ATTENDANCE:

**I expect you to attend each class meeting.** Consistent attendance will improve your final grade more than any other investment of time that you can make. I urge you to arrive punctually, attend each lecture, take detailed notes, and to complete all assigned work.

## MAKE-UP EXAMS

Make-up exams will be permitted at Instructor's discretion only for unavoidable emergencies. If you know that you will be unable to attend a scheduled exam, it is your responsibility to inform me in advance. In case of unplanned emergency, you must notify me of your absence within 48 hrs of exam and the reason for that absence. If you fail to follow this rule, I am within my rights to refuse to give you a replacement exam.

## ACADEMIC INTEGRITY

Academic dishonesty in any form will result in disciplinary action in accordance with UW System Administrative Code.

Here is the link to the document that explains your rights and responsibilities as a member of the UWSP community.
http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/SRR-2010/rightsChap14.pdf

**Biology 130 Lecture & Lab Schedule**

| Day/Date | Lecture Topic/Readings | Lab Exercise |
|---|---|---|
| | | |
| T 1/22 | Cell Biochemistry (pp. 19-28) | |
| W 1/23 | | Lab 1: Microscopes (count trichomes) |
| R 1/24 | Cell chemistry, cont. proteins & nucleic acids (pp. 19-28); | |
| F 1/25 | Plant cell structure (pp. 30-43) | |
| M 1/28 | | Lab 2: Microscopic measurements, (pollinate selected plants) |
| T 1/29 | Plant cell structure, cont. (pp 30-43) | |
| W 1/30 | | Lab 3: Plant cell structure |
| R 1/31 | Cell cycle, mitosis (pp. 43-47) | |
| F 2/1 | Plant cell types, Tissues (pp. 50-68) | |
| M 2/4 | | **LAB EXAM #1 (labs 1-3)**<br>Lab 4: Mitosis & Reproduction |
| T 2/5 | Stems (pp. 71-87) | |
| W 2/6 | | Lab 5: Meristems, cell types, herbaceous stems |
| R 2/7 | Stems cont.. (pp. 71-87) | |
| F 2/8 | Specialized stems (pp. 87-88) | |
| M 2/11 | | Lab 6: Twigs, woody stems, wood |
| T 2/12 | Roots (pp. 107-121) | |
| W 2/13 | | **LAB EXAM #2 (labs 4- 6)**<br>Lab 7: Modified stems, Roots |
| R 2/14 | Plant Nutrition<br>Leaves(pp. 92-104). | |
| F 2/15 | Leaves cont. (pp. 92-104). | |
| M 2/18 | ***Evening Review Session for Exam #1 (5-6 pm, TNR 122)*** | Lab 8: Leaves |
| T 2/19 | Leaves Cont. (pp. 92-104). | |
| W 2/20 | ***Exam 1 (5 -6 pm, TNR 122)*** | Lab 9: Water relations |
| R 2/21 | Water and solute movement in plants (pp. 164-179) | |
| F 2/22 | Food transport in plants (pp. 178-179) | |

| Day/Date | Lecture Topic/Readings | Lab Exercise |
|---|---|---|
| M 2/25 | | Lab 10: Enzymes, Digestion & Respiration |
| T 2/26 | Plant metabolism, Respiration (pp. 134-145) | |
| W 2/27 | | **LAB EXAM #3 (labs 7-10)** Lab 11: Photosynthesis I (light & photosynthesis) |
| R 2/28 | Respiration cont. (pp. 134-145), Photosynthesis (pp. 148-160) | |
| F 3/1 | Photosynthesis cont. (pp. 148-160) | |
| M 3/4 | | Lab 12: Set up for growth lab |
| T 3/5 | Photosynthesis, cont. (pp. 148-160) | |
| W 3/6 | | Lab 13: Photosynthesis II (gas exchange & photosynthesis) (harvest seed, plant F1) |
| R 3/7 | Photosynthesis, cont. (pp. 148-160) | |
| F 3/8 | Growth and development (pp. 235-254) | |
| M 3/11 | ***Evening Review Session for Exam 2 (5-6 pm, TNR 122)*** | Lab 12: Control of Plant Growth |
| T 3/12 | Growth and development (pp. 235-254) | |
| W 3/13 | ***Exam 2 (5 -6 pm, TNR 122)*** | Lab 14: Molecular Genetics |
| R 3/14 | Growth and development cont. (pp. 235-254) | |
| F 3/15 | Growth and development cont. (pp. 235-254) | |
| M 3/18 | | Lab 15: Mendelian Genetics (count trichomes) |
| T 3/19 | Alternation of generation and meiosis (pp. 183-192) | |
| W 3/20 | | **Plant ID exam (No lab)** |
| R 3/21 | Genetics and Heredity (pp. 258-272) Gene expression (pp. 276-288) | |
| F 3/22 | Bacteria (pp. 317-329), Viruses (pp. 330-332) | |
| 3/25-3/29 | SPRING BREAK | |
| M 4/1 | | **LAB EXAM #4 (labs 11-15)** Lab 16: Bacteria |
| T 4/2 | Fungi (pp. 337-358) | |
| W 4/3 | | Lab 17: Fungi I |
| R 4/4 | Fungi, cont. (pp. 337-358) | |
| F 4/5 | Algae (pp. 362-382) | |

| Day/Date | Lecture Topic/Readings | Lab Exercise |
|---|---|---|
| M 4/8 | | Lab 18: Fungi II |
| T 4/9 | Algae cont. (pp. 362-382) | |
| W 4/10 | | Lab 19: Cyanobacteria, Algal diversity |
| R 4/11 | Intro to plant Kingdom: Bryophytes (pp. 386-399) | |
| F 4/12 | | |
| M 4/15 | ***Evening Review Session for Exam 3 (5-6 pm, TNR 122)*** | Lab 20: Green Algae, Lichens |
| T 4/16 | Bryophytes (pp. 386-399) | |
| W 4/17 | ***Exam 3 (5 -6 pm, TNR 122)*** | **LAB EXAM #5 (labs 16-20)** Lab 21: Bryophytes |
| R 4/18 | Seedless vascular plants (pp. 402-424) | |
| F 4/19 | Seedless vascular plants cont. (pp. 402-424) | |
| M 4/22 | Gymnosperms (pp. 427-446) | Lab 22: Fern Allies & Ferns |
| T 4/23 | Gymnosperms (pp. 427-446) | |
| W 4/24 | | Lab 23: Gymnosperms |
| R 4/25 | Gymnosperms cont. (pp. 427-446) & Angiosperms (pp. 449-472) | |
| F 4/26 | Angiosperms cont. (pp. 449-472) | |
| M 4/29 | | Lab 24: Angiosperms |
| T 4/30 | Angiosperms- flower structure (pp. 196-206) | |
| W 5/1 | | Lab 25: Fruits, seed dispersal, and seed germination Lab 25: Seeds, Fruits |
| R 5/2 | Angiosperms- flower structure (pp. 196-206) | |
| F 5/3 | Angiosperms: seeds and fruits (pp. 213-231) | |
| M 5/6 | | **LAB EXAM #6 (labs 21-25)** |
| T 5/7 | Angiosperms: seeds and fruits (pp. 213-231) | |
| W 5/8 | | No class |
| R 5/9 | Angiosperms/ Review | |
| F 5/10 | Review | |
| **T 5/14** | **Final Exam (12.30 – 14.30) TNR 122** | |