

DEPARTMENT OF SCIENCE

COURSE OUTLINE – WINTER 2023

BT2050 (A3): FUNDAMENTALS OF PLANT BIOLOGY – 3 (3-0-3) 90 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR:	Dr. Jessie Zgurski	PHONE:	780-903-6313
OFFICE:	J221	E-MAIL:	JZgurski@nwpolytech.ca
OFFICE HOURS:	Monday 1:00 – 4:00 PM,	Tuesday, & Th	nursday 11:30 AM – 2:00 PM,
	or by appointment.		

CALENDAR DESCRIPTION: An overview of the diversity and biology of organisms traditionally included in the plant kingdom (algae, fungi, lichens, mosses, ferns, gymnosperms, and flowering plants). Emphasis throughout the course is on the relationship between structural and functional innovations in plants and how these have influenced their reproduction and evolution in various ecosystems. Symbioses and co-evolutionary relationships between or among different kinds of plants, and with other groups of organisms, are also considered.

PREREQUISITE(S)/COREQUISITE: BI1080 (Prerequisite)

REQUIRED TEXT/RESOURCE MATERIALS:

"Botany: An Introduction to Plant Biology" by James D. Mauseth, 2017, 6th edition, Jones and Bartlett Learning. (**Recommended Textbook**)

Botany 2050 Laboratory Manual 2021. (Required, Will be Provided in Lab)

DELIVERY MODE(S): Lecture (Wednesday and Friday 1:00 PM – 2:20 PM, H211), Lab (Tuesday, 2:30 – 5:20 PM, J126).

COURSE OBJECTIVES: The major objective of this course is to provide students with a foundational understanding of the morphology, physiology, and evolution of plants and other photosynthetic organisms. Throughout the course, students will also be introduced to various human

interactions with plants so they may better appreciate our dependence on these organisms. Practical applications of many of the concepts introduced in the course will also be discussed. After completing the course, students should have improved their communication skills, especially in the use of botanical terminology that will allow them to articulately discuss the morphology, ecology, and evolution of plants. In the laboratory, students will also learn practical techniques used to study plants and algae.

LEARNING OUTCOMES:

Upon completion of this course, students should be able to:

• Describe the internal and external organization of plants and explain the functions of the different tissue types found in plants.

• Describe the structures involved in plant reproduction, and compare the reproductive structures found among the major plant groups and algae, including green algae, nonvascular plants, seedless vascular plants, gymnosperms, and angiosperms.

• Explain the process of photosynthesis and compare the three major photosynthetic pathways used by plants: C3 photosynthesis, C4 photosynthesis and CAM photosynthesis.

• Name the various lineages (phyla) that diverged within the kingdom Plantae and discuss the evolutionary relationships among them.

NOTE: Additional, detailed learning outcomes will also be provided for each topic included in the course.

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page <u>http://www.transferalberta.ca</u>.

** Grades of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students** are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability

EVALUATIONS: Midterm Exam – 20% (February 24) Laboratory – 50% Final exam – 30% (Exam week, exact time and place TBA)

The 50% for the laboratory mark will be broken down as follows:

Research Proposal – 6% Algae Lab Report – 11% Plant Nutrition Assignment – 6% Quizzes – 15% (5 at 3% each). Poster Assignment – 12%

GRADING CRITERIA:

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha	4-point	Percentage	Alpha	4-point	Percentage
Grade	Equivalent	Guidelines	Grade	Equivalent	Guidelines
A+	4.0	90-100	C+	2.3	67-69
А	4.0	85-89	С	2.0	63-66
A-	3.7	80-84	C-	1.7	60-62
B+	3.3	77-79	D+	1.3	55-59
В	3.0	73-76	D	1.0	50-54
B-	2.7	70-72	F	0.0	00-49

COURSE SCHEDULE/TENTATIVE TIMELINE:

Lecture Schedule						
Торіс	Dates (Tentative)	Recommended Text Reading				
Introduction to BT2050 and Overview of Plant Life	January 4 & 6	Chapter Two				
Plant Tissues and the Primary Growth of Stems	January 11 & 13	Chapter Five				
Leaves	January 18 & 20	Chapter Six				
Roots	January 21 & 24	Chapter Seven				
Secondary Growth and Woody Plants	January 25 & 27	Chapter Eight				
Flowers and Reproduction	February 1 & 3	Chapter Nine				
Photosynthesis (and Respiration)	February 8, 10, 22	Chapters Ten (and Eleven)				
Midterm (20%)	February 24	Includes all material				
		covered up to February				
		22.				
Transport Processes	March 1 & 3	Chapter Twelve				
Soils and Mineral Nutrition	March 8 & 10	Chapter Thirteen				
Plant Development	March 15 & 17	Chapter Fourteen				
Algae	March 22 & 24	Chapter Nineteen				
Nonvascular Plants	March 29	Chapter Twenty				
Seedless Vascular Plants	March 31	Chapter Twenty-One				
Gymnosperms	April 5 and 7	Chapter Twenty-Two				
Angiosperms	April 12	Chapter Twenty-Three				
Final Exam (30%)	Exam Week	Includes all material				
		covered after the				
		midterm.				

Laboratory Schedule				
Date	Lab	Assignment or Quiz?		
January 10	Lab 1 – Set up Algae Experiment and Plant Seeds	No		
January 17	Lab 2 – Seeds, Seedlings, and Roots	No, but bring ideas for		
		independent experiment.		
January 24	Lab 3 – Vegetative Morphology and the Anatomy	Quiz on Lab 2 (3%), Hand in		
	of the Shoot.	Research Proposal (6%).		
January 31	Lab 4 – Leaves, & Set up Plant Nutrition	Quiz on Lab 3 (3%), Receive		
	Experiment	feedback on research proposal.		
February 7	Lab 5 – Set up Independent Experiment	Quiz on Lab 4 (3%).		
February 14	No Labs – Winter Break	N/A		
February 28	Lab 6 – Algal Community Structure	No		
March 7	Lab 7 – The Seedless Embryophytes	No		
March 14	Lab 8 – Gymnosperms	Algae Lab Report Due (11%)		
March 21	Lab 9 – Plant Nutrition Data Collection	Quiz – Labs 7 & 8 (3%)		
March 28	Lab 10 - Data collection for independent	Plant Nutrition Assignment		
	experiment	Due (6%)		
April 4	Lab 11 – Angiosperms	No		
April 11	No Labs this week.	Online Lab 11 Quiz (3%),		
		Poster Assignment Due (12%)		

STUDENT RESPONSIBILITIES: Students are expected to attend classes and complete all assignments. Refer to the College Policy on Student Rights and Responsibilities at https://www.nwpolytech.ca/about/administration/policies/#academic_policies

Please inform the instructor if you cannot make it to a lab due to an illness or another compelling reason. Missed lab quizzes can be made up at a later date.

Late assignments will be docked 10%. However, if you have a compelling reason for requiring an extension (such as an illness), please contact the instructor. Failure to write the midterm or final exam will result in a grade of zero unless the exam was missed for a compelling reason (such as illness). In such a case, the exam will be deferred.

STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the College Calendar at https://www.nwpolytech.ca/programs/calendar/or the College Policy on Student Misconduct: Plagiarism and Cheating at https://www.nwpolytech.ca/programs/calendar/or the College Policy on Student Misconduct: Plagiarism and Cheating at https://www.nwpolytech.ca/about/administration/policies/

**Note: all Academic and Administrative policies are available on the same page.

ADDITIONAL INFORMATION: Copies of the lecture Powerpoint presentations will be made available on the course website. I recommend printing out copies of the Powerpoint files prior to class and writing additional notes on them during lecture. Other learning resources, including practice exam questions, diagrams, and videos, will be added to the page during the semester.