TRAILBLAZER ADVENTURER
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ADVENTURER TRAILBLAZER DEFENDER VISIONARY
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Syllabus

Crop Production

PLNT 2500 Winter term, 2022

Professor Martin H. Entz. PhD

Faculty of Agricultural & Food Sciences

University of Manitoba

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COURSE DETAILS

Course Title & Number:	Crop Production PLNT 2500
Number of Credit Hours:	3
Class Times & Days of Week:	8:30 to 9:45 AM Tuesday/Thursday
Location for classes/labs/tutorials:	2:30 to 5:30 Monday/Tuesday/Wednesday/Thursday
Pre-Requisites:	Agri 1600

Instructor Contact Information

Instructor(s) Name & Preferred Form of Address:	Professor Martin H. Entz "Professor Entz"
Office Location:	Plant Science Room 309
Office Hours or Availability:	Make an appointment face-to-face or email
Office Phone No.	204 474-6077
Email:	m.entz@umanitoba.ca
Contact:	The best way to contact me is by email. Then we can arrange an in person meeting.

Course Description

U of M Course Calendar Description

An introduction to the principles and practices of crop production in Canada. Topics will include physiological processes and factors affecting plant yield; plant improvement; seed production; and production of the major cereal, oilseed, forage and special crops, plus selected horticultural crops. Prerequisite: AGRI 1600 (or the former AGRI 1500).

General Course Description

Through lectures, laboratory experiences, responding to student questions, and voices from different people involved in crop production in Canada and around the world, students will gain a comprehensive perspective of global crop production.

Course Goals

Course goals are to build on students knowledge of crop production (from Agri1600) by providing greater depth of analysis of crop production principles and practices. Themes include crop adaptation, history of crop production, crop rotation planning, seed selection, land management, integrated pest management, stress tolerance, development agronomy, food security, and other current issues. The lab section provides students with hands-on crop production experience as well as crop quality analysis. These activities equip students for jobs within the crop production sector and provide critical background for more advanced crop production courses.

Course Learning Objectives

Course Objectives - After completing this course, students will:

- Understand the principles and practices of grain, forage and selected horticultural crop production in Manitoba.
- Understand some of the current issues in production and utilization of field, forage and selected horticultural crops in Manitoba and Canada.
- Have an appreciation of crop production in different parts of the world and the history of crop production in Canada.
- Have experience conducting germination, emergence, yield component and grain quality analysis in the lab portion of the course
- Have experience assessing climate resilience of major Manitoba cropping systems using through a major project.
- Learn about cropping system design from farmers and agronomists.
- Gain confidence in independent learning through the student-led daily reflection exercises

Textbook, Readings, and Course Materials

There is no selected textbook for this course. Reference book chapters and journal articles are available through UM library links, and a reading list is provided below.

Required textbook – There is no textbook for this course.

Supplementary readings – will be posted on UM Learn.

Recommended or required materials (e.g. lab equipment, art supplies, computers, etc.) – none required.

Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and university guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, uncles an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the

University's Copyright Office website at http://umanitoba.ca/copyright/ or contact um_copyright@umanitoba.ca.

Course Technology

The course will be offered in person, or a combination of in-person and WebEx. Students are free to use tablets, cellphones, laptops, etc. in the classroom provided these are used in a responsible, efficient, ethical and legal manner.

Expectations: I Expect You To

All students are expected to complete weekly reading before class. All students are expected to participate in class discussions. All students are expected to attend all classes. We will adhere to the UM's respectful work and learning policy See Respectful Work and Learning Environment Policy.

The policies and services students are listed below (Section 2.5 ROASS).

Class Communication:
You are required to obtain and use your University of Manitoba email account for all communication between yourself and the university. All communication must comply with the Electronic Communication with Student Policy: http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html.

Academic Integrity:
Each student in this course is expected to abide by the University of Manitoba Academic Integrity principles. Always remember to reference the work of others that you have used. Also be advised that you are required to complete your assignments independently unless otherwise specified. If you are encouraged to work in a team, ensure that your project complies with the academic integrity regulations. You must do your own work during exams. Inappropriate collaborative behavior and violation of other Academic Integrity principles, will lead to the serious disciplinary action. Visit the Academic Calendar, Student Advocacy, and Academic Integrity web pages for more information and support.

Refer to specific course requirements for academic integrity for individual and group work such as:

I. Students must complete class and lab assignments on their own – no collaboration on assignments is allowed; and
II. All other work should be completed independently unless otherwise specified.

Recording Class Lectures:
The discussion periods will not be recorded. In case of students missing class due to medical (e.g. Covid 19) reasons, students will be able to join the class through WebEx; these sessions will be recorded.

Student Accessibility Services:
The University of Manitoba is committed to providing an accessible academic community. Students Accessibility Services (SAS) offers academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services
520 University Centre
Phone: (204) 474-7423
Email: Student_accessibility@umanitoba.ca

Expectations: You Can Expect Me To

I will be in class for 10 minutes prior to and after the class time to discuss any questions or comments you may have. I will also be present in the greenhouse during certain lab periods to address questions you may have about your greenhouse or other lab projects. I am available to discuss class material and answer questions outside of class time. Please email to make an appointment. I will not answer emails between 6 PM on Fridays and 7 AM on Mondays.

CLASS SCHEDULE AND COURSE EVALUATION

This course is divided into 22 lessons. Lessons typically require one full lecture period to complete, though some lessons will more or less than one full lecture period. Lecture notes for each lesson are on the UM Learn site for this course. The individual lesson notes are accompanied by the powerpoint slides for that lesson and any additional resource material (eg., websites, extra readings and statistical information regarding crop production). All lecture resources are available on UM Learn.

Lesson 1. Where do our crop plants come from?
Lesson 2. Crop diversity for people and the planet
Lesson 3. Some crop production history
Lesson 4. Shifting cropping systems: Exploration and technology impacts
Lesson 5. The crop production cycle: Systems thinking is the key
Lesson 6. Crop rotation
Lesson 7. When crop rotation requires environmental modification
Lesson 8. Land management for crop production
Lesson 9. Seed selection
Lesson 10. Seeding and crop establishment
Lesson 11. Crop diagnostics
Lesson 13. Crop quality
Lesson 14. Pasture production and management
Lesson 15. Organic crop production
Lesson 16. From no-till to conservation agriculture
Lesson 17. Plant breeding
Lesson 18. Crop production and food security
Lessons 20 to 22. Stories from the field

Date	Class Content & Teaching Strategies	Required Readings or any Pre-class Preparation	Evaluation		
			Type of Assessment	Due Date	Value of Final Grade (%)
Lessons 2-22	Lecture/discussion format	Some lessons will require preparation through readings. Podcasts or videos	Daily response log. Students complete 250 word assignment within 36 hours of each lecture (1.5 marks per lesson). A tutorial will be provided.	Question log completed on line (in UM Learn) and due 36 hours after each lecture	Total = 30
Weekly labs	A combination of hands-on and "at home" lab projects (see lab manual for details)	Lab Manual. Available on UM Learn	Each lab has marks attached to lab assignment (vary between labs – details in lab manual)	Various (see details in lab manual)	40
Exam period	Final project	Reading list at end of syllabus	An essay or detailed powerpoint project on a subject assigned by instructor	April 22 – upload to UM learn	30
Total					**100**

Grading

Indicate your grading scale. A sample is given below that you can adjust to your course expectations. Note that students must receive a minimum grade of 50% in the lab in order to pass the course.

Letter Grade	Percentage out of 100	Grade Point Range	Final Grade Point
A+	95-100	4.25-4.5	4.5
A	86-94	3.75-4.24	4.0
B+	80-85	3.25-3.74	3.5
B	72-29	2.75-3.24	3.0
C+	65-71	2.25-2.74	2.5
C	60-64	2.0-2.24	2.0
D	50-59	Less than 2.0	1.0
F	Less than 50		0

Voluntary Withdrawal

Students should refer to the Registrar's Office web page for more information on voluntary withdrawal date. This date is the last day to drop the class and receive 100% refund. Students who do not drop the course by the deadline will be assigned a final grade. Withdrawal of courses will be recorded on official transcript. The professor is willing to discuss student's progress and strategies for improvement prior the withdrawal date.

ASSIGNMENT DESCRIPTIONS

Daily response log (*30%): A 250 word response for each class worth 1.5 marks

After each class, students must respond in two different ways in the daily response log. First, in a paragraph of 150 words, students must elaborate on two points which they found interesting in that day's class. The elaboration could include an analysis on why students found this interesting, a deeper analysis of the subjects, or a linkage to other knowledge that students have gained in other courses or in their agricultural experience. If students wish to cite a scholarly article to support a point, be advised that only one scholarly article per class is allowed. The citation can include one from the bibliography included in the respective lesson. In the second part of the response, students must raise two question from the class. In 100 words list 2 questions and explain why they are of interest to you. Only responses posted in UM Learn will be accepted – email responses will not be accepted. The daily response log will begin with the second lecture – not the introductory lecture. Note: 250 words x 21 lessons = 5,250 words, the approximate word count for a comprehensive essay or literature review.

Daily question log from Tuesday classes are due 5 PM Wednesday (34 hours after end of class)
Daily response log from Thursday classes are due 7 PM Saturday (60 hours after end of class)

* 21 lessons x 1.5 marks per lesson = 31.5. Note that lowest grade will be removed so total will out of 30.

Laboratory section (40%)

The laboratory section of the course involves 7 modules. Information for each lab and the lab schedule is included in the course laboratory manual (available on UM Learn). A lab instructor will be available to assist students with all labs. Labs 2, 3, 4 and 7 can be done at your home, if you wish. Other labs must be conducted at the UM since greenhouse space or other resources are required. Each student will receive a lab box with all the lab supplies at the beginning of the term (in first lab session). Please do not loose your box as their will only be one lab box provided to each student. All lab assignments must be uploaded to UM learn on the appropriate due date (listed in lab manual).

Lab 1. Seed identification (1%) Students will tape seeds onto the paper seed key provided in the lab kit. Students must submit an image of the completed project.

Lab 2. Yield components (5%) Students have received pods of canola, soybean, peas, dry beans and seed heads of wheat, rye, barley, and oats, and bolls of flax. Students must separate the seeds from the non-grain material and count the seeds in each unit (ie., number of seeds per wheat head; number of seeds per canola pod). Students must submit the data for each crop.

Lab 3. Germination tests (4%) Students will take the seeds harvested in lab 2 and conduct a standard germination test. Take the seeds from each crop and roll into a wetted paper towel. The standard germination test is conducted at room temperature so leave these samples on your kitchen counter. Make sure the paper towel stays damp for the entire 10-day period. After 10 days, open the paper towels and count the number of germinated seed. Calculate the percentage. Submit the data in an organized table.

Lab 4. Effect of seeding depth on emergence and growth of pea and canola (10%) Use the root trainers provided in the lab kit. Open trainers and fill one half overflowing with soil. Place seeds at 4 different depths, 1 cm, 2, cm, 3, and 4 cm. Place the pea and canola into separate compartments within the root trainer. Allow all seedlings to emerge from the soil. Then open the root trainers, gently wash away the soil and lay the seedlings onto paper towel in preparation for photographing. Take a picture of each crop separately (one image for pea and one image for canola). Import the image into powerpoint and label all the parts of the seedlings. and place seeds at different depths. Which seedling has an epigeous and which has a hypogeous emergence mechanism? Identify each seedling's growing point. Submit the powerpoint images.

Lab 5. Growing a crop (14%) Each student has been randomly assigned a crop for you to grow in a UM greenhouse. Fill one of your pots with soil and plant your assigned crop. Use three seeds per crop; thin down to two plants per pot after they all emerge. Take a picture of your crop each week. Import the images to a word document. Write a short description of your plant's development progress each week. Submit the word document, complete with images, at the end of the growing period.

Lab 6. Crop quality assessment (4%) This will be conducted at Point crop processing facility.

Lab 7. Taping a tree for syrup production (2%) Each student has been given a tree tap in your lab box. We will review how to tap a tree in class. At the end of March or beginning of April, tap a tree and try to collect some syrup. Send a video of the installed tap and any production of syrup.

Final Presentation (30%) Essay or powerpoint presentation

Students will be given a list of themes to select for a final class project. Information on the subject can be presented in one of two ways: a 1500 word essay, or a 10 slide powerpoint presentation.
A minimum of 5 scientific papers must be reviewed for your report. These must be peer-reviewed scientific papers from journals. Popular articles on the internet are not considered peer-reviewed literature. The powerpoint slide must include text that discusses your topic and includes direct reference to the scientific papers that you reviewed. **Images should also be included, but the images must be selected to help convey the points you wish to make. Remember that "A picture tells a 1000 words!" The final slide must include the citations of your scientific papers. The audience for your powerpoint presentation is the Crop Production class (2nd year University students). The suggested length is 10 powerpoint slides.

Topic options

- The role of biological N fixation in crop production
- Rotational benefits of canola in cereal rotations
- Rotational benefits of peas in Prairie crop rotations
- Crop breeding for disease management (focus on one crop only)
- Crop breeding for drought tolerance (focus on one crop only)
- How intercropping grains reduce plant diseases
- Critical weed-free period research in a Manitoba crop (select one crop)
- Crop root growth research
- Discovery of First Nations agriculture in Manitoba
- Increasing yield stability in perennial forage crops through intercropping
- Effects of weather on crop quality (focus on one crop only)
- Benefits of red clover cover crops in Canadian cropping systems
- How high temperature during flowering reduces canola seed set and yield
- The role of pigeon pea in intercropping (tropical agriculture)
- Some others may be added based on additional topics raised in the course

**A required tutorial session will be included in part of one class on image selection for powerpoint presentations.

Referencing Style

Assignments should use the APA reference style as outlined in the text: American Psychological Association. (2009). Publication manual of the American Psychological Association (6th ed.). Washington, DC: Author.

Assignment Feedback

Marks for the daily log will be provided before the following class. This way, students will have immediate feedback on their performance and can therefore adjust to improve future grades. Lab and class assignments will be graded and returned to students within one week of receiving them. Each assignment will receive feedback in terms of content, level of insight and analysis, and grammar and overall

composition. There will be both formative (i.e., comments) and summative (i.e., grade) feedback. The feedback will be delivered electronically.

Assignment Extension and Late Submission Policy

No late assignments for the daily response log will be accepted. UM Learn will be blocked after the allotted time and no further options for submission of the daily response logs will be possible. For all other assignments, students will lose 10% for each 24 hours late. All assignments must be submitted to pass the course.

UNIVERSITY SUPPORT OFFICES & POLICIES

Information on university support offices and policies are provided in Schedule "A" below.

Schedule "A"

Section (a) sample re: A list of academic supports available to Students, such as the Academic Learning Centre, Libraries, and other supports as may be appropriate:

Writing and Learning Support

The Academic Learning Centre (ALC) offers services that may be helpful to you throughout your academic program. Through the ALC, you can meet with a learning specialist to discuss concerns such as time management, learning strategies, and test-taking strategies. The ALC also offers peer supported study groups called Supplemental Instruction (SI) for certain courses that students have typically found difficult. In these study groups, students have opportunities to ask questions, compare notes, discuss content, solve practice problems, and develop new study strategies in a group-learning format.

You can also meet one-to-one with a writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already have a draft. If you are interested in meeting with a writing tutor, reserve your appointment two to three days in advance of the time you would like to meet. Also, plan to meet with a writing tutor a few days before your paper is due so that you have time to work with the tutor's feedback.

These Academic Learning Centre services are free for U of M students. For more information, please visit the Academic Learning Centre website at: http://umanitoba.ca/student/academiclearning/

You can also contact the Academic Learning Centre by calling 204-480-1481 or by visiting 205 Tier Building.

University of Manitoba Libraries (UML)

As the primary contact for all research needs, your liaison librarian can play a vital role when completing academic papers and assignments. Liaisons can answer questions about managing citations, or locating appropriate resources, and will address any other concerns you may have, regarding the research process. Liaisons can be contacted by email or phone, and are also available to meet with you in-person. A complete list of liaison librarians can be found by

subject: http://bit.ly/WcEbA1 or name: http://bit.ly/1tJ0bB4. In addition, general library assistance is provided in person at 19 University Libraries, located on both the Fort Garry and Bannatyne campuses, as well as in many Winnipeg hospitals. For a listing of all libraries, please consult the following: http://bit.ly/1sXe6RA. When working remotely, students can also receive help online, via the Ask-a-Librarian chat found on the Libraries' homepage:www.umanitoba.ca/libraries.

Section (b) sample: re: A statement regarding mental health that includes referral information:

For 24/7 mental health support, contact the Mobile Crisis Service at 204-940-1781.

Student Counselling Centre
Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre:* http://umanitoba.ca/student/counselling/index.html
474 University Centre or S207 Medical Services
(204) 474-8592

Student Support Case Management
Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.
Student Support Intake Assistant http://umanitoba.ca/student/case-manager/index.html
520 University Centre
(204) 474-7423

University Health Service
Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.
University Health Service http://umanitoba.ca/student/health/
104 University Centre, Fort Garry Campus
(204) 474-8411 (Business hours or after hours/urgent calls)

Health and Wellness
Contact our Health and Wellness Educator if you are interested in peer support from *Healthy U* or information on a broad range of health topics, including physical and mental health concerns, alcohol and substance use harms, and sexual assault.
Health and Wellness Educator https://umanitoba.ca/student/health-wellness/welcome-about.html
britt.harvey@umanitoba.ca

Live Well @ UofM
For comprehensive information about the full range of health and wellness resources available on campus, visit the Live Well @ UofM site:
http://umanitoba.ca/student/livewell/index.html

Section (c) sample: re: A notice with respect to copyright:

> All students are required to respect copyright as per Canada's *Copyright Act*. Staff and students play a key role in the University's copyright compliance as we balance user rights for educational purposes with the rights of content creators from around the world. The Copyright Office provides copyright resources and support for all members of the University of Manitoba community. Visit http://umanitoba.ca/copyright for more information.

Section (d) sample: re: A statement directing the student to University and Unit policies, procedures, and supplemental information available on-line:

> **Your rights and responsibilities**
>
> As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school.
>
> The Academic Calendar http://umanitoba.ca/student/records/academiccalendar.html is one important source of information. View the sections *University Policies and Procedures* and *General Academic Regulations*.
>
> While all of the information contained in these two sections is important, the following information is highlighted.
>
> - If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar's Office website for more information including appeal deadline dates and the appeal form http://umanitoba.ca/registrar/
>
> - You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support http://umanitoba.ca/academicintegrity/ View the **Student Academic Misconduct** procedure for more information.
>
> - The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected conduct yourself in an appropriate respectful manner. Policies governing behavior include the:
>
> **Respectful Work and Learning Environment**
>
> http://umanitoba.ca/admin/governance/governing_documents/community/230.html
>
> **Student Discipline**

http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html and,

Violent or Threatening Behaviour
http://umanitoba.ca/admin/governance/governing_documents/community/669.html

- If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at:
  http://umanitoba.ca/admin/governance/governing_documents/community/230.html
  More information and resources can be found by reviewing the Sexual Assault site
  http://umanitoba.ca/student/sexual-assault/

- For information about rights and responsibilities regarding **Intellectual Property** view the policy http://umanitoba.ca/admin/governance/media/Intellectual_Property_Policy_-_2013_10_01.pdf

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site
http://umanitoba.ca/faculties/

Contact an **Academic Advisor** within our faculty/college or school for questions about your academic program and regulations http://umanitoba.ca/academic-advisors/

Student Advocacy

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.
http://umanitoba.ca/student/advocacy/
520 University Centre
204 474 7423
student_advocacy@umanitoba.ca