Course Title: Introduction to Agrometeorology
Department: Soil Science
Course Number: SOIL 3060
Credit Hours: 3
Academic Session: Fall 2016

Prerequisites and how they apply to this course: None
Classroom Location: Agriculture Building, Room 134
Lab/Seminar Location: none.
Department Office location: 362 Ellis Bldg
Course Web Page (if applicable): UM Learn
Meeting Days and Class Hours: MWF 10:30-11:20 a.m.
Lab/Seminar/Hours: none
Department Phone Number: 204 474-8153

Instructor Information
Name & Title: Dr. Brian Amiro
Office Location: 313 Ellis Bldg
Office Phone Number: 204 228-3374
Office Hours: By appointment or drop-in if available, contact me by email
Email Address: Brian.Amiro@umanitoba.ca
Note that you must email from your University of Manitoba account. Normal response time will be within 48 hours.

Teaching Assistant: Justice Zhanda. Ellis Building Room 288. Email: zhandaj@umanitoba.ca

Course Philosophy

Students’ Learning Responsibilities
Students are expected to download the lecture slides and have them for reference during class. The lecture slides are available for students on the UM Learn course page prior to start of each class. Students are also expected to supplement the slides with their own notes from the lectures. The slides are made available to facilitate learning the course material and to provide an opportunity for interactive class sessions. Class attendance is needed if students are to gain a full understanding of the course material. Students who attempt to pass this course without attending class will jeopardize their ability to answer some questions on exams.

Review questions are provided at the end each section of lecture slides and are intended to assist students by testing their knowledge of course material prior to the midterm and final exams. Students are expected to study the review questions on their own and seek clarification prior to the midterm or final exam on any material that they do not fully understand.

Why this course is useful?
The course provides the opportunity to more fully understand weather and climate, in particular how they impact agriculture as well as general day-to-day effects on people. This knowledge is fundamental to an appreciation of how the environment affects agricultural practices, decision-making and outcomes.

Who should take this course?
The course is designed to be easily scheduled and broadly available to students from a wide background, since it does not require university prerequisites nor have a separate laboratory period. Any person studying agriculture, agroecology, environmental science or geography will benefit from an improved understanding of how weather affects living organisms as covered by this course. Anyone with an interest in understanding the fundamental way that weather affects everyday life will benefit from the knowledge gained in this course.

How this course fits into the curriculum
SOIL 3060 is a restricted elective in the Agronomy and Agroecology programs in the Faculty of Agricultural and Food Sciences.

Course Description/Objectives
Undergraduate Calendar Description
Basic description and discussion of properties of the atmosphere, radiation, temperature, effect of temperature on plant growth, climate and animal response, water, evapotranspiration, insect adaptation, activity in relation to climate, climatic data.

Instructional Methods
There will be lectures and student interaction during class periods, as well as demonstrations of various items of meteorological equipment. Students will apply the concepts from class in the assignments and term project.

Course Objectives
To have students:
1. learn basic concepts of energy and mass transfer in the Earth’s atmosphere,
2. recognize the types and basic principles of common instruments used to characterize weather,
3. learn to solve basic problems related to quantifying weather and climate parameters that impact agriculture,
4. learn to interpret common measures used to assess the impact of specific weather conditions on crops, insects, pathogens and livestock.
5. become familiar with the climate of the main crop-growing region in western Canada

Learning outcomes
At the end of this course, students will be able to:
1. recognize basic weather instruments and describe their strengths and weaknesses,
2. calculate a variety of agrometeorological measures relevant to crops, livestock and agricultural pests
3. assess and quantify weather impacts on agriculture in western Canada

Description of Examinations
Midterm exam: October 28, 2016. 50 minutes duration during the class period
Final exam (will be scheduled during the December final exam period): 2 hours duration

Description of Assignments
Over the duration of the term, there are 7 assignments, which are problem-solving exercises. They will be announced in class and posted on the UM Learn course page. They are due in class 1 week after being assigned. They will be graded and returned 1 week after submission

A term project will be assigned in September. Each student will receive their own unique weather dataset to be used for analysis. Some of the analysis will be completed as part of the assignments above. When the students have completed all of the analyses, they will write a report on the combined results from all the student results. The grade for the term project will be based on students’ final reports.

Assignment Due Dates
Assignments will normally be given out on Monday and are due at 10:30 a.m. the following Monday as a printed hardcopy. The term project is due December 5, 2016 at 10:30 a.m.

Grade Evaluation
Midterm Exam – 20%, Assignments – 3% x 7 =21%, Term Project – 20%, Final Exam – 39%

Letter Grade Equivalency:
A+( >/=90%); A(80-89%); B+(75-79%); B(70-74%); C+(65-69%); C(60-64%); D(50-59%); F(<50%)

Important Dates
First Day of Classes: Sept 9, 2016
Last Day of Classes: Dec. 9, 2016
Voluntary Withdrawal date: Nov. 18, 2016.
Textbook(s) – Authors, Titles, Edition
No textbook is required. The Powerpoint slides used in class and available for download constitute the study material for the class.

Course Policies

Late and Missed Assignments
Assignments must be submitted on the due date and time in order to accommodate timely feedback of grades and comments. If students know beforehand that they will not be able to submit an assignment on the due date, they should either submit the assignment early or contact the instructor to make alternate arrangements. Penalties for late submission of Assignments and the Term Project Paper are 10% per day late (i.e., a report that is 10 days late will be marked as zero). Assignments submitted after those from the other students have been corrected and returned will receive a grade of zero.

Missed Exams
If students know beforehand that they will not be able to attend an exam, they must contact the instructor to make alternate arrangements. Students who miss an exam without notice will receive a grade of zero on the exam. Students who miss the final exam will receive a grade of “Incomplete – Fail” on the course.

Academic Integrity
Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty. Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room. Exam cheating can also include exam impersonation. A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Students are responsible for ensuring they comply with academic integrity rules and guidelines. Check the University online Calendar section on Academic Integrity, including plagiarism and cheating. If in doubt, check with the instructor.

University Policies
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.

Student Accessibility Services
If you are a student with a disability, please contact SAS for 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 http://umanitoba.ca/student/saa/accessibility/. 520 University Centre, 204 474 7423. Student_accessibility@umanitoba.ca

Copyright
Please respect copyright. See the University’s Copyright Office website at http://umanitoba.ca/copyright/ or contact um_copyright@umanitoba.ca.

Use of Third Party Detection and Submission Tools
Electronic detection tools may be used to screen assignments in cases of suspected plagiarism.
## Course Content

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<th>Section</th>
<th>Topic</th>
<th>Approximate Number of Lectures</th>
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<td>Earth’s Atmosphere</td>
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<td>- chemical composition, temperature, pressure, density</td>
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<td>- atmospheric motion and winds</td>
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<td>- weather and climate characterization and data</td>
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<td>- probability and extreme events</td>
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<td>- Prairie climate</td>
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<td>2.</td>
<td>Energy and Energy Transfer</td>
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<td>- energy transfer</td>
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<td>- EM, solar, terrestrial and top-of-atmosphere radiation</td>
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<td>- Global energy balance, greenhouse effect</td>
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<td>- planetary boundary layer, local energy flux and partitioning</td>
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<td>- measurement of radiation</td>
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<td>3.</td>
<td>Water Cycling</td>
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<td>- atmospheric water and precipitation</td>
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<td>- evapotranspiration, soil moisture</td>
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<td>- measurement of atmospheric water, precip, ET, soil water</td>
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<td>Weather and Crops</td>
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<td>- solar radiation and crops</td>
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<td>- crop water demand, use and balance</td>
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<td>- crop yield estimation in water-limited environments</td>
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<td>- crop yield estimation with remote sensing</td>
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<td>5.</td>
<td>Weather Impacts on Animals and Pests</td>
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<td>- windchill, humidex, animal heat balance</td>
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<td>- weather impacts on insects, weeds</td>
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<td>- weather impacts on crop pathogens</td>
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<td>6.</td>
<td>Climate Change and Agriculture</td>
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