COURSE TITLE  Principles of Scientific Research and Communication

Department  Soil Science  Course Number  SOIL7220
Academic Session  Winter 2022  Credit Hours  3
Classroom Location  Virtual
Meeting Days and Class Hours  TTh 1130 - 1245
Department Office location  Ellis 362  Phone Number: 204-474-8153

Instructor Information
Course coordinator:  Dr. Francis Zvomuya (Francis.Zvomuya@umanitoba.ca, 204 474-9932)
Instructors:  Dr. Inoka Amarakoon (Inoka.Amarakoon@umanitoba.ca)
             Dr. Chantal Bassett (Chantal.Bassett@umanitoba.ca)
             Dr. Nasem Badreldin (Nasem.Badreldin@umanitoba.ca)
             Dr. Annemieke Farenhorst (Annemieke.Farenhorst@umanitoba.ca)
             Dr. David Lobb (David.Lobb@umanitoba.ca)
             Dr. Mario Tenuta (Mario.Tenuta@umanitoba.ca)
             Dr. Xiaopeng Gao (Xiaopeng.Gao@umanitoba.ca)

Course Philosophy

Students’ Learning Responsibilities
Students are required to attend all lectures in a given unit and therefore each lecture offered in the course is mandatory. Students are responsible to actively participate in each unit.

Why this course is useful?
This course prepares graduate students for activities during their graduate degree and beyond.

Who should take this course?
Graduate students in the Department of Soil Science. This is a mandatory course for all M.Sc. graduate students and a required course for some of the Ph.D. students in the Department of Soil Science.

Course Description/Objectives

Calendar Description
Principles of scientific research; management skills; writing skills; oral and poster presentation; preparation of research proposal and thesis (pass/fail). These topics will focus on aspects of soil science and will give students experience in writing and presenting scientific material to increase their professionalism as soil scientists. Prerequisite: Consent of instructor.

Instructional Methods
Lectures, discussions, practice in writing, poster production and oral presentations.

Course Objectives
The objectives of SOIL7220 are to provide students with the scientific principles, critical thinking and ability to express ideas; to improve written and verbal skills; to impart ethical and respectful work attitudes and to gain experience in writing and presenting scientific material to increase their professionalism as soil scientists.
Learning outcomes
Upon completion of the course, the student should:
- Fully understand ethical scientific behavior,
- Fully understand the importance of respectful behavior in a workplace with diversity of personnel
- Fully understand plagiarism and other forms of academic dishonesty related to the University and all aspects of scientific endeavor,
- Understand the requirements of writing a thesis research proposal and their thesis to fully satisfy Departmental requirements,
- Have a good working knowledge of how to write a scientific paper and a funding proposal, and to understand the scientific publishing process
- Be able to plan their thesis and other projects using time management tools,
- Be able to make and present a good poster at a scientific conference,
- Be able to answer questions concerning their scientific presentations confidently,
- Be able to give a good oral presentation on a scientific subject using visual aids.

Assignment Due Dates
As given by each instructor in class.

Grade Evaluation
In some cases, there will be written and/or oral exercises. Each course unit will be assigned a pass/fail grade by the instructor involved. Each instructor will clearly explain in his/her first or only lecture what entitles a pass or fail in his/her lecture unit. Students will need to pass EACH unit in order to earn a PASS in the ENTIRE course.

Important Dates
First Class Date: February 1, 2022
Mid-term break: Feb 22. No classes
Voluntary withdrawal date: TBD
Last day of class Date: April 20 (might vary depending on number of students in the course)

Texts, Readings, Materials
Textbook(s) – Authors, Titles, Edition
Note that no particular textbook is prescribed for this course. However, a range of course materials may be distributed or discussed in class. Please read these materials at home. These materials will help you to better understand the lectures and the in-class discussions. In some cases, they will also help you to complete your assignments.

Course Policies
Late Assignments: Set by each instructor.

Missed Assignments: Set by each instructor.

Missed Exams: No exams.

Academic Integrity
Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty. A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Students should acquaint themselves with the University’s policy on academic integrity (http://umanitoba.ca/academicintegrity/).

Group Work Policies: Set by each instructor in class.
Course Content

**Lectures:** Lectures are to be held virtually (link to be provided) on Tuesday and Thursday from 11:30 to 12:45 pm from February 1 to April 7, as shown below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Lectures</th>
<th>Instructor</th>
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</thead>
<tbody>
<tr>
<td>Feb 1</td>
<td>How to be a successful student: Introduction</td>
<td>Zvomuya</td>
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<tr>
<td>Feb 3</td>
<td>MSSS – No class</td>
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<tr>
<td>Feb 8</td>
<td>How to be a successful student: EDI training – workplace climate, culture &amp; dimensions awards</td>
<td>Farenhorst</td>
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<td>Feb 10</td>
<td>Research and Professional Ethics</td>
<td>Tenuta</td>
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<tr>
<td>Feb 15</td>
<td>Scientific Research Principles (readings)</td>
<td>Zvomuya</td>
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<tr>
<td>Feb 17</td>
<td>Scientific Research Principles (assignment)</td>
<td>Zvomuya</td>
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<tr>
<td>Feb 22</td>
<td><strong>Midterm Break - No class</strong></td>
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<tr>
<td>Feb 24</td>
<td>Thesis Proposal and Outline</td>
<td>Xiaopeng</td>
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<tr>
<td>March 1</td>
<td>Project Management</td>
<td>Xiaopeng</td>
</tr>
<tr>
<td>March 3</td>
<td>Poster Presentations 1</td>
<td>Badreldin</td>
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<tr>
<td>March 8</td>
<td>Media and Job Interviews</td>
<td>Tenuta</td>
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<tr>
<td>March 10</td>
<td>Poster Presentations 2</td>
<td>Badreldin</td>
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<tr>
<td>Mar 15</td>
<td>Poster Presentations 3</td>
<td>Badreldin</td>
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<tr>
<td>Mar 17</td>
<td>Writing Research Funding Proposals</td>
<td>Bassett</td>
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<td>Mar 22</td>
<td>Writing Scientific Articles 1</td>
<td>Lobb</td>
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<tr>
<td>Mar 24</td>
<td>Writing Scientific Articles 2</td>
<td>Lobb</td>
</tr>
<tr>
<td>Mar 29</td>
<td>Oral Presentations 1</td>
<td>Amarakoon</td>
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<tr>
<td>Mar 31</td>
<td>Oral Presentations 2</td>
<td>Amarakoon</td>
</tr>
<tr>
<td>Apr 5</td>
<td>Oral Presentations 3</td>
<td>Amarakoon</td>
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<tr>
<td>Apr 7</td>
<td>Seminars</td>
<td>Xiaopeng</td>
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Some topics discussed in each unit are as follows:

*How to be a successful student:* expectations and hints for your programs; equity, diversity and inclusiveness; respect

*Scientific principles and ethics:* scientific philosophy, ethics and science, critical thinking and evaluation, and research observations and recording.

*Poster presentations:* techniques for preparing and delivering an effective poster presentation, poster critique, preparation of a poster.

*Project Management:* managing time, managing projects, and tracking and charting progress in projects (e.g. completing your graduate program on time).

*Thesis Proposal and Outline:* organization, content, format and presentation of your thesis to follow our guidelines.

*Writing Scientific Articles:* writing a manuscript, techniques, formats, audience.

*Writing Research Funding Proposals:* writing proposals to attract funding.

*Interviews:* addressing questions at a conference or thesis defense, or when being interviewed by the media or potential employers.

*Oral presentations and seminars:* preparing and delivering an effective oral presentation, using software for oral presentations, chairing and conduct of presentations, in-class practice presentations.