1. **Course:** ENSC 501, Environmental Science Field Course II - Fall 2019
   Lab 01: MTWRFSSun 08:00 - 18:00 in ES 920

   **Instructor**
   - Dr Daniel Shugar: daniel.shugar@ucalgary.ca, 403 220-5028, ES 230, TBA
   - Dr Jurgen Gailer: jgailer@ucalgary.ca, 210-8899, SB 405, TBA

   Instructors: Dr. J. Gailer, SB 405, 403-210-8899, jgailer@ucalgary.ca
   Dr. D. Shugar, ES 230, 403-220-5028, daniel.shugar@ucalgary.ca

   **Course Site:**
   D2L: ENSC 501 B01-(Fall 2019)-Environmental Science Field Course II

   **Note:** Students must use their U of C account for all course correspondence.

2. **Requisites:**
   See section 3.5.C in the Faculty of Science section of the online Calendar.

   **Prerequisite(s):**
   Environmental Science 401 and admission to the Environmental Science program.

   **Note(s):**
   a. This course occurs in rugged field conditions and varying weather, for which participants must be prepared and equipped. A supplementary fee will be assessed to cover additional costs associated with this course.

3. **Grading:**
   The University policy on grading and related matters is described in F.1 and F.2 of the online University Calendar.
   In determining the overall grade in the course the following weights will be used:

<table>
<thead>
<tr>
<th>Component(s)</th>
<th>Weighting %</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>JG: Individual Assignment</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Individual Assignment 2</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Individual Assignment 3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Group Assignment 1</td>
<td>15</td>
<td>Aug 26-30</td>
</tr>
<tr>
<td>Site visit attendance</td>
<td>5</td>
<td>Aug 26-30</td>
</tr>
<tr>
<td>DS: Individual Assignment</td>
<td>10</td>
<td>Aug 31-Sept 4</td>
</tr>
<tr>
<td>Individual Assignment 2</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Group Assignment 1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Site visit attendance</td>
<td>5</td>
<td>Aug 31-Sept 4</td>
</tr>
</tbody>
</table>

   Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

   The conversion between a percentage grade and letter grade is as follows.

<table>
<thead>
<tr>
<th>Minimum % Required</th>
<th>A+</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D+</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>95 %</td>
<td>90</td>
<td>85</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>60</td>
<td>55</td>
<td>50</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

   This course has a registrar scheduled final exam.
4. **Missed Components Of Term Work:**

In the event that a student misses the midterm or any course work due to illness, supporting documentation, such as a medical note or a statutory declaration will be required (see Section M.1; for more information regarding the use of statutory declaration/medical notes, see FAQ). Absences must be reported within 48 hrs.

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in Section 3.6. It is the student's responsibility to familiarize themselves with these regulations. See also Section E.3 of the University Calendar.

If a laboratory or field component is missed, there will be a 50% deduction of the corresponding assignment unless there is a documented extenuating circumstance as outlined in the calendar for deferred final examinations. For assignments that are submitted late 10% will be deducted per day, including weekend days.

5. **Scheduled Out-of-Class Activities:**

There are no scheduled out of class activities for this course.

This class is an inquiry-based course that involves lectures as well as group participation. The course runs from Monday, August 26th to Wednesday September 4th and it is important to recognize that for field courses, the hours are not regular from day to day, but may vary considerably. Due to various site visits in the Calgary area and laboratory work, this course could run from 8 am to 8 pm on any given day. There is no overnight travel involved in this field course.

6. **Course Materials:**

There is no textbook for this course. Relevant materials will be posted on D2L.

7. **Examination Policy:**

There will not be a final examination in this course.

Students should also read the Calendar, Section G, on Examinations.

8. **Approved Mandatory And Optional Course Supplemental Fees:**

There is a mandatory supplementary fee of $105.00 for this course.

9. **Writing Across The Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section E.2 of the University Calendar.

In this course, the quality of the student's writing in reports and assignments will be a factor in their evaluation.

10. **Human Studies Statement:**

Students will not participate as subjects or researchers in human studies.

See also Section E.5 of the University Calendar.

If this course is being evaluated for education research, students will be given separate paperwork indicating whether students in the course are willing to be part of that study.

11. **Reappraisal Of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. **Non-academic grounds are not relevant for grade reappraisals.** Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See Section I.3 of the University Calendar.

a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within 10 business days of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections I.1 and I.2 of the University Calendar.

b. **Final Exam:** The student shall submit the request to Enrolment Services. See Section I.3 of the University Calendar.
12. **Other Important Information For Students:**

a. **Mental Health:** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive support when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](https://www.ucalgary.ca/services/mental-health)) and the Campus Mental Health Strategy website (Mental Health).

b. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call 403-210-9355.

c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy ([https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf](https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf)) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (svsa@ucalgary.ca) or phone at 403-220-2208.

d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K. Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. **These are only examples.**

e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](https://www.ucalgary.ca/services/assembly-points).

f. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](https://www.ucalgary.ca/services/accommodations).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Program Director of the Environmental Science Program, Dr. Daniel Shugar by email daniel.shugar@ucalgary.ca or phone 403 220-5028. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than 14 days prior to the date in question. See Section E.4 of the University Calendar.

g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](https://www.ucalgary.ca/services/safewalk) website). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lots/pay booths.

h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](https://www.ucalgary.ca/services/legal-services) website.

i. **Student Union Information:** VP Academic, Phone: 403-220-3911 Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: 403-220-3913 Email: sciencerep@su.ucalgary.ca. **Student Ombudsman,** Email: ombuds@ucalgary.ca.

j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
k. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction (USRI) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

l. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or non-academic misconduct, in addition to any other remedies available at law.

***NOTE THAT THIS SCHEDULE WILL CHANGE****

**ENSC Field Course 501 Schedule, Aug. 31-Sept 4, 2019**

**Contact:** Dan Shugar (cell 403-966-3671)

* indicates an assignment: altogether there are 5 individual assignments (3 JG + 2 DS) and 2 group assignments (1 JG and 1 DS), assignments (7 in total), oral presentation, walking tour. [ab] items in red to be confirmed

**WEEK 1 (J. Gailer)**

**Monday, August 26 (bus, morning)**

Please wear long pants, close toed shoes, bring plenty of water and bring a bagged lunch and sunscreen

8:30  Brief Course Overview, J. Gailer/D. Shugar, ES 920
9:30  Departure from Parking Pull-in in front of Biological Sciences
10:45 arrive at Olds College: 30' presentation on Mitigation of the impact of the livestock industry, Technology Access Center for Lifestock Production, Feedlot Equipment and Constructed Wetland (contact: Sean Thompson, 403-556-8314, 403-681-8316)
12:30 Lunch at wetland
1:00 pm Departure for UofC
2:00 pm Introduction to Landfarming, James Kilfoyle, ES 920
3:00 pm Analysis of hydrocarbon contaminated soils using Petroflag (in groups), ENSC Lab, ES 923/905 (JG-IA-1) F. Malekani, 220-6133
5:00 pm End

**Tuesday, August 27 (bus half day/afternoon)**

09:00 Manure management impacts on ground water, M. Iwanyshyn (PhD) ES 920
10:00 Bioremediation Strategy for an Industrial Site, R.J. Turner, PhD, ES 920, two back to back 75 min lectures with a break in between.
12:00 Lunch
1:00 pm Overview of activities at the Canadian Food Inspection Agency (CFIA) Laboratory, Calgary Research Park, 3650
36 Street, contact: A. Sullivan, MSc, (403-338-5292)

2:30 pm  Departure for AGAT Laboratories

2:45 pm  Arrival at AGAT Laboratories, 2905 12th Street NE, T2E 7J2, Introduction to AGAT Laboratories and overview of facility operations, contact Dev Vyas (403-735-2555)

3:45 pm  Departure for UofC

4:00 pm  Application of Bioanalytical Methods for On-Site \textit{E. coli} Detection, Robyn Mundle, MSc/Alberta Biophotonics, ES 443

4:30 pm  High Tech Trash/Biomonitoring, J. Gailer/ES 443 (*JG-IA-2)

5:30 pm  Please watch https://youtu.be/NGopFxRsQWg in preparation for tomorrow’s activities

\textbf{Wednesday, August 28 (bus whole day)}

Please wear long pants, close toed shoes, bring plenty of water and bring a bagged lunch

9:00  Departure from Parking Area outside of Biological Sciences

10:00  Arrival at ACWA site, Introduction to Wastewater Treatment (Water Educator) & Overview of the ACWA facility, contact Christine O’Grady (cell 403 804 8867) (*JG-IA-3)

12:00  Lunch

12:30  Department for Composting Centre

1:00 pm  Arrival City of Calgary Waste and Recycling Services, 11920- 68 St SE, Waste and Recycling Services: moving the community toward zero waste (45 min presentation), Overview of activities at the Shepard Landfill, contact Rachel Sank (403-268-8067)

3:00 pm  Departure for UofC

4:00 pm  Global Biogeochemical Element Cycles, J. Gailer (JG-GA-1), ES 920

5:00 pm  End

\textbf{Thursday, August 29}

9:00  Introduction to Forestry, XYZ PhD, ES920

10:00  Departure for Bragg Creek

11:00  Pick up David Klepacki

11:30  Managing forests to maintain natural diversity: the McClean Clearcut, David Klepacki

12:30  Departure for Elbow Falls

12:45  Lunch at Elbow Falls

1:15 pm  Role of alluvial aquifer for flood mitigation

1:45 pm  Departure for Quirk Creek/Upper Elbow watershed

Mustang Hills clearcut blocks and effect of wildfire on water chemistry

3:30 pm  Departure for Bragg Creek

4:00 pm  Departure for Discovery Ridge

4:30 pm  Witness suburban development along the ‘middle Elbow river watershed highway 8 corridor’

5:00 pm  Departure for Discovery Hills

5:15 pm  Walk of Discovery Hills pond to observe the effects of suburban development on the watershed and aquifer

5:30 pm  Departure for UofC

6:00 pm  End
**Friday, August 30 (bus, morning)**

Please wear long pants, close toed shoes and bring plenty of water

9:00  Negawatts first with passive solar, Dan Cloutier, Agro Resiliency Kit (ARK) Ltd, ES920
10:00 Departure for Passive Solar Greenhouse
10:45  **Passive Solar Green House**  *(Jeff Rempel)*
11:45 pm Departure for UofC
12:30 Lunch
1:00 pm  Climate Action at the University of Calgary: Emissions Reductions through New Building Innovation and Existing Building Energy Retrofits, joint presentation by J. Poirier (Senior Specialist Energy Performance, Energy, Planning & Innovation) and Adam Stoker (P. Eng), UofC/ES 443
2:00 pm  Meet in EEEL Building Central Atrium,  **Focus:** How was sustainability and energy performance incorporated into the design of this LEED certified building
3:00 pm  Introduction to Disinfection by-products, S. Kimura Hara, PhD, ES 920
4:00 Introduction to Individual/Group Assignment ES 920
5:00 pm  End

**WEEK 2 (D Shugar)**

**Saturday, August 26 (bus)**

Please wear closed toed shoes, bring plenty of water, a bagged lunch, and sunscreen

9:00 Departure from Parking Pull-in in front of Biological Sciences
11:00 Arrive at **Banff National Park:** Presentation on **Human-wildlife conflicts in the Rocky Mountains**
12:30 Lunch
1:00 pm Departure for Canmore
2:00 pm Tour of Cougar Creek
3:00 pm  End

**Sunday, Sept 1 (bus)**

Please wear closed toed shoes with ankle support (e.g. hiking boots), bring plenty of water, a bagged lunch, and sunscreen

8:30 Departure from Parking Pull-in in front of Biological Sciences
11:00 **Frank Slide Interpretive Center, Crowsnest Pass, Hwy 3**
12:30 pm Lunch
1:00 pm  **Walking tour of Frank Slide**
2:30 pm Depart for Okotoks (time-dependent)
4:30 pm     Tour of Okotoks erratics
5:30 pm     Return to UofC
6:00 pm     End

**Monday, Sept 2 (public transit)**

Please wear water shoes (e.g. Chacos, Tevas) if available. Bring plenty of water, a bagged lunch, sunscreen, and rain gear in case of bad weather.

9:00       Meet at Sandy Beach parking lot. **COORDINATES: ***. ***
10:00      Groups set out to locations along Elbow River to sample water and sediment. (**DS-GA-1**)
12:00 pm   Lunch (at your own pace)
2:00 pm    Return to UofC ES **Begin lab prep of samples**
6:00 pm    End

**Tuesday, Sept 3 (Bus & on campus)**

Please bring plenty of water, a bagged lunch, and sunscreen

9:30       Departure from Parking Pull-in in front of Biological Sciences
10:00      West Eau Claire flood mitigation project (Andrew Huang, Maggie Nelson, Andrew Forsyth, City of Calgary)
10:45      Departure for City of Calgary’s Bioengineering Demonstration Project, Harvie Passage, Bow River
11:45      Lunch
12:15 pm   Return to UofC ES254 or ES924 Flood frequency analysis workshop (**DS-IA-1**)
5:00 pm    End

**Wednesday, Sept 4 (on campus)**

9:00       Meet at ES905 Conduct lab analysis of Elbow River sediments (**DS-IA-2**)
6:00 pm    End

**Course Outcomes:**

- students demonstrate an understanding of the broad range of human impacts on the environment and are able to critically comment on how these can be mitigated
- students can explain the principles that form the basis for established environmental practices and procedures
- students develop and critically assess the experimental design of laboratory procedures and protocols
- students collect and interpret new and interesting data to come to novel conclusions
- students execute research and communication professionally within a research group so every group member has opportunity to contribute
- Students communicate scientific data in effective and engaging manner through tables, figures and concise reports
- Students synthesize and critically appraise reports and data on environmental pollution