



COURSE OUTLINE

1. **Course:** SCIE 433, Principles of Geothermal Energy - Winter 2021

Lecture 01: MW 14:00 - 15:15 - Online

Instructor	Email	Phone	Office	Hours
Dr Edwin Cey	eccey@ucalgary.ca	403 220-8393	ES 220	TBA

Online Delivery Details:

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

This course has a registrar scheduled, synchronous final exam. The writing time is 2 hours + 50% buffer time.

Lectures - All lectures will be synchronous online sessions using Zoom. The lectures will be recorded and posted for subsequent viewing. Lecture sessions will include 'live' Top Hat questions that require students to respond in real time, so students are expected to participate regularly. Students cannot make up for missed Top Hat questions during lectures, but the bottom 10% of questions will be removed to allow flexibility for occasional missed responses or technical issues.

Tutorials - All tutorial sessions will be synchronous and students are expected to attend to interact with the instructor and teaching assistant.

Quizzes - Students will complete a number of short, online quizzes using Top Hat to support their learning. All quizzes will be completed synchronously during lecture or tutorial periods.

Course Site:

D2L: SCIE 433 (Winter 2021) - Principles of Geothermal Energy

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

Given the online nature of the course, students are encouraged to use the discussion forums in D2L for technical questions related to the course. All other communications (i.e., non-technical or including personal information) should be conducted using ucalgary.ca email channels. The instructor and teaching assistant will attempt to reply to student emails within one (1) full business day whenever possible, however, certain inquiries may require additional time.

2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Prerequisite(s):

3 units from Science 317, Geology 353 or Engineering Energy and Environment 355. Also known as: (formerly Science 533)

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:

Component(s)	Weighting %	Date
Tutorial Work	25	
Top Hat and Quizzes	10	
Term Project	25	
Midterm Exam	15	Tentatively Mar. 4, 2021
Final Exam	25	Scheduled by Registrar

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.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	95 %	88 %	84 %	80%	75%	70 %	66 %	62%	58%	54 %	50 %

This course will have a final exam that will be scheduled by the Registrar. [The Final Examination Schedule](#) will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

The final exam will be administered using an on-line platform. Per section [G.5](#) of the online Academic Calendar, timed final exams administered using an on-line platform, such as D2L, will be available on the platform. Due to the scheduling of the final exams, the additional time will be added to **the end** of the registrar scheduled **synchronous** exam to support students. This way, your exam schedule accurately reflects the **start time** of the exam for any **synchronous** exams. E.g. If a **synchronous** exam is designed for 2 hours and the final exam is scheduled from 9-11am in your student centre, the additional time will be added to the **end** time of the **synchronous** exam. This means that if the exam has a 1 hour buffer time, a synchronous exam would start at 9 am and finish at 12pm. – updated April 6, 2021

4. Missed Components Of Term Work:

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

All assigned work (tutorial work, term projects) should be submitted when due. Due dates for all assigned work will be indicated clearly on the student handout, and unless otherwise indicated all tutorial work is due at the end of each tutorial session. All late work will be subject to a late penalty of 10% per day (including weekends and holidays). Arrangements for submitting late assignments must be made with the instructor, preferably BEFORE the assigned work is due. Any student who fails to submit an assignment or similar required piece of work for legitimate reasons (e.g., illness, religious conviction) must discuss an alternative course of action with the instructor.

5. Scheduled Out-of-Class Activities:

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

6. Course Materials:

Required Textbook(s):

Banks, David, *An Introduction to Thermogeology : Ground Source Heating and Cooling (2nd ed.)* John Wiley & Sons, Incorporated.
Glassley, William E., *Geothermal Energy: Renewable Energy and the Environment, Second Edition* Taylor & Francis Group.

Recommended Textbook(s):

Rosen, Marc A.; Koohi-Fayegh, Seama, *Geothermal Energy : Sustainable Heating and Cooling Using the Ground*: John Wiley & Sons, Incorporated.
DiPippo, Ronald, *Geothermal Power Plants : Principles, Applications, Case Studies and Environmental Impact* Elsevier Science & Technology.

Online Course Components: Course announcements, lecture and laboratory materials, and additional online resources will be provided on Desire2Learn (<https://d2l.ucalgary.ca/d2l/home>). Please check the D2L course site regularly, since students are responsible for ensuring they have the necessary materials for lectures, laboratories, and assignments.

We will use the Top Hat classroom response system to enhance learning and interaction in lectures throughout the term. Students are required to have a portable electronic device, such as a cellular telephone, tablet or laptop computer. Please contact the instructor for accommodation requirements if you do not have one. Instructions for Top Hat registration will be given in class and on D2L. Your grade (as indicated above) will include a component related to Top Hat evaluations.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

7. Examination Policy:

All midterm and final exams will be synchronous, timed exams. All exams will be written online, with additional time provided to account for potential technical issues. For example, the final exam will be designed for 2 hours, but 3 hours will be allowed for writing.

All exams will be closed book. Only writing instruments, erasers, rulers and non-programmable calculators will be permitted on exams. No other aids will be allowed. Students are expected to work entirely on their own to complete the exams, with no interaction or input from any other individuals other than the instructor or TA. An instructor-prepared equation sheet will be provided.

Students should also read the Calendar, [Section G](#), on Examinations.

8. Approved Mandatory And Optional Course Supplemental Fees:

There are no mandatory or optional course supplemental fees 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.

Students are expected to submit high quality work. In all cases, quality work must be well organized, clearly written and presented, and have all information sources properly noted. Where applicable, questions should be labelled and in order, all tables and diagrams properly labelled, assumptions clearly stated, and final answers clearly indicated (with appropriate units and significant figures). You are expected to show all your work, including equations and sample calculations where necessary (especially when relying on spreadsheets or computer programs to generate results).

10. Human Studies Statement:

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

See also [Section E.5](#) of the University Calendar.

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 **ten 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 submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. 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 supports 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](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Services:** For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** 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 (syva@ucalgary.ca) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)
Student Academic Misconduct [Policy](#) and [Procedure](#)
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- e. **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](#).

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 Natural Sciences Program, Dr. Edwin Cey by email ntscdirector@ucalgary.ca or phone 403 220-8393. 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.

- f. **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](#) website.
- g. **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.
- h. **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.
- i. **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.

Electronically Approved - Apr 06 2021 16:55

Department Approval