UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

Natural Sciences Program
SB 149
403 220-6760
usc@ucalgary.ca

REVISED COURSE OUTLINE FOR REMOTE LEARNING

To account for the necessary transition to remote learning from March 13 onward, adjustments have been made to assessment deadlines and requirements so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff). If you are unable to meet the deadlines or requirements specified, please connect with your course instructor to work out alternative dates/assessments.

1. **Course:** SCIE 431, Principles of Hydroelectric Energy - Winter 2020

   Lecture 01: MWF 10:00 - 10:50 - Remote Learning (check with your instructor or coordinator for details)

Instructor	Email	Phone	Office	Hours
Dr Jason Donev	jmdonev@ucalgary.ca	403 210-6343	SA 101A	Monday 11-12:00, Tuesday 9:30-10:30, Wednesday 15:00-16:30

   This course is an introduction to the fundamental scientific principles of generating useful work, usually electricity, from water moving through the environment. This understanding and this course forms part of the core in the Energy Sciences concentration. In this course you will explore the technological, environmental, societal and economic issues that are important to extracting energy from the water we find in nature, with particular emphasis on critically evaluating the factors that promote or limit the functional utility of hydroelectric energy as a sustainable energy option. Students will combine the basics of hydrology and fluid mechanics to gain an understanding of the power generation potential of hydroelectric systems. Later in the course, we will examine the environmental and socioeconomic factors that are also needed to make well-informed decisions on hydroelectric energy resources development.

   Course Site:

   D2L: SCIE 431 T01-(Winter 2020)-Principles of Hydroelectric Energy

   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):
   Science 317 or Geology 353 or Engineering Energy and Environment 355. Also known as: (formerly Science 531)

   Students are required to have taken and passed physics 211 (or 221 or 227), 223 (or 255) and PHYS 371 or ENEE 355 or get permission from the natural sciences director.

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
Midterm 1	15	February 10, 2020
Midterm 2 (take home)	15	March 23, 2020
Final Exam (take home)	30	due 3pm, April 20, 2020
Classwork & Homework	20	Ongoing
Project (done online)	20	April 6th -10th, 2020

   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 %	90 %	87 %	84%	81%	78 %	75 %	72%	69%	66 %	63 %

4. **Missed Components Of Term Work:**

   The University has suspended requirements for students to provide evidence for reasons for absences so please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations. Please let your instructor know immediately if you are ill and cannot meet the deadlines specified.

   When people miss class or are late for class they must contact me within 48 hours of missing the class with an explanation in order for it to be excused. Doctors notes are not required, but contacting the instructor is. Unexcused missed work will receive a zero.

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

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

6. **Course Materials:**

   Required Textbook(s):

   Peake, Stephen, *Renewable Energy: Power for a Sustainable Future, 4th Edition*: Oxford University Press.

   Access to an introductory (first year) physics textbook, like the text used for PHYS 211/221/223 is strongly recommended.

7. **Examination Policy:**

   Non-programmable calculators will be allowed on all exams. Midterm 2 and the final exam will be take home exams.

   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.

   There will be writing requirements in this course. Grammar, punctuation, spelling and effective writing are necessary in this world, and therefore necessary in this class. Proofread everything that you turn in to me. If you fall behind or have trouble, please come to me and we can figure out what can be done about it. The earlier in the course you approach me the more help I can be.

10. **Human Studies Statement:**

    If you agree, your course work may be used for research purposes. Your responses will remain anonymous and confidential. Grouped data (no individual responses) may be used in academic presentations and publications. Participation in such research is voluntary and will not influence grades in this course. Students' signed consent forms will be withheld from instructors until after final grades are submitted. More information will be provided at the time student participation is requested.

    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 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 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) 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.

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.

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.

g. **Safewalk:** Campus Security will escort individuals day or night (See the Campus Safewalk website). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot 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 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.

How we'll spend classroom time

I believe in active learning and everyone participating in discussion; this class will centre around on dialogues about energy production and use. I'll distribute sheets of questions with checkpoints interspersed. You'll answer the questions in groups by reading the textbook, discussion with your classmates and researching on the internet. Students are encouraged to bring laptops and tablets. Computer simulations will be provided to aid discussion. When you get to a checkpoint, call me over to discuss your answers. Every member of the group is expected to have answers to all of the questions. If everyone seems to have sufficient understanding of the material, you get checked off, if not, your group goes back and fixes the problem and re-does the checkpoint. You will then turn your checkpoint sheets in to be assessed electronically. Test material will be based on material that we discuss in these checkpoints and the homework.

If you miss class for any reason, including illness, you must contact me promptly (within 48 hours of the missed class) to make up the missed material, likewise tardiness will cost checkpoints:

- 5+ minute late, you must do your checkpoint outside class time
- 15+ minutes late, unexcused, miss a checkpoint (no credit for that checkpoint).
- Unexcused absence, miss checkpoints covered that day.

Bring:

The checkpoint questions and an electronic device for answering them. If you have no electronic device to do this, please talk with me and we'll come up with a paper way to do this.

There will be writing requirements in this course. Grammar, punctuation, spelling and effective writing are necessary in this world, and therefore necessary in this class. Proofread everything that you turn in to me. If you fall behind or have trouble, please come to me and we can figure out what can be done about it. The earlier in the course you approach me the more help I can be.

Homework solutions will be submitted electronically.

Assessments

1. Worksheets & homework Due: Almost every class period Value: 20%

You will be given questions on sheets to do both in class and at home. Additional homework will be assigned and turned in throughout the term. Make sure to show up on time for class, or you will lose points on the checkpoints.

Assessment Criteria: Punctuality of assignments (if late they will be marked down 20%/day they are late unless discussed specifically with the instructor), clear demonstration of work done, neatness and readability, and the correct answer. A correct answer with no work, or indecipherable work will not receive full credit.

3. Midterm Exams Value: 30%

Assessment Criteria: The exams will cover material from the checkpoints, the assignments and the book. You'll be marked on material comprehension and how well you can communicate the material on the exams. If you have special requirements for exams, please let me know as soon as possible.The second midterm will be a take home exam.

4. Final Exam Date: TBD by registrar Value: 30%

This will be a comprehensive final exam, including questions the presentations on the projects.

Assessment Criteria: This exam will cover material from lecture, the assignments and the book and different projects. You'll be marked on material comprehension and how well you can communicate the material on the exams. For the final exam, you will also be asked to integrate the course material into a large picture of thermodynamics and electricity.The final exam will be a take home exam.

5. Project Value: 20%

In order to deepen your understanding of the material, each student will research and present on a hydro project. By understanding one system in detail, you'll have a better understanding of other systems.

a) Presentations Due April 6th - 8th Value: 10%

The presentation will be 15 minutes, plus 5 minutes for discussion with the class. You will work in groups, and your group will present your hydro system. These presentations will be done online.

Assessment Criteria: Knowledge of material, professionalism of presentation, how questions are handled.

b) Paper Value: 10%

The final paper will be 10 - 12 pages, double spaced 10 pt font of text (pictures, diagrams and tables excluded), IEEE format (a template will be available on D2L). Your group will initially turn in the paper for peer evaluation from other groups. Proofread your work before turning it into for peer evaluation. You will make corrections and turn in the final paper .

Assessment Criteria: Length, professionalism of presentation, depth and knowledge of subject matter.

c) Peer evaluation Value: A homework Assignment

Evaluating peer's work is important in technical fields. You must be able to read documents on subject matter that are related to, but not necessarily in your field of expertise. You will be given papers from other groups to read through and comment on. Future courses will involve peer evaluation as well.

Assessment Criteria: Professionalism and thoughtfulness of comments.

Course Outcomes:

- Find and summarize information on current worldwide hydroelectric energy production, with particular emphasis on the Canadian context.
- Explain the components of the hydrologic cycle and the factors that influence the volume and timing of streamflow from a watershed.
- Apply the principles of fluid mechanics to solve problems related to water flow, energy conversion, and energy loss during the generation of hydroelectricity.
- Integrate course concepts to evaluate different hydroelectric plant designs and quantify their power.
- Review and critique hydropower developments based on the potential environmental, social and economic benefits and drawbacks.
- Communicate the core principles behind hydroelectric energy to either a scientific or lay audience, in written, oral or graphical formats.

Electronically Approved - Mar 19 2020 19:03

Department Approval

Electronically Approved - Mar 20 2020 18:31

Associate Dean's Approval for alternate final examination arrangements or remote learning