



COURSE OUTLINE

1. **Course:** SCIE 421, Fundamentals of Nuclear Energy Production - Winter 2021

Lecture 01: MWF 10:00 - 10:50 - Online

Instructor	Email	Phone	Office	Hours
Dr Jason Donev	jmdonev@ucalgary.ca	403 210-6343	SA 101A	Monday 14-15:00, Tuesday 13:00-14:30, Friday 14:00-15:30

This is a one term course on nuclear power. This will include a short review of the necessary physics, which you will be expected to know from previous classes. We will concentrate on fission, since that's the far more commercially viable process. We will compare and contrast some of the current and proposed types of nuclear power plants. The class will take a look at some of the accidents that have occurred, and what may have prevented them. We will also briefly look at issues of storage of nuclear waste and the mining of uranium.

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.

We will have lively discussions synchronously about all aspects of nuclear power.

Course Site:

D2L: SCIE 421 L01-(Winter 2021)-Fundamentals of Nuclear Energy Production

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):

3 units from Science 317, Physics 449, Chemistry 371 or Engineering Energy and Environment 355.

Students are required to have taken and passed physics 211 (or 221 or 227), 223 (or 255) and 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 22nd
Midterm 2	15	March 29th
Final Exam	30	TBD
Classwork & Homework	20	Ongoing
Project	20	April 5th-15th

Midterms and final exams will be done synchronously.

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 %

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.

5. Scheduled Out-of-Class Activities:

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

6. Course Materials:

Required Textbook(s):

Murray and Holbert, *Nuclear Energy: An Introduction to the Concepts, Systems, and Applications of Nuclear Processes*: Butterworth-Heinemann;.

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:

Exams will be open books, open notes, but communicating with other people won't be allowed. Your midterm exams will have an hour and twenty minute writing time (80 minutes) with a forty minute buffer.

Your final exam will have a 2 hour writing time with a 1 hour buffer.

These exams will be done synchronously.

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 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 (syssa@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](#)

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 (FOIP). 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](tel:403-220-3911) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](tel: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.

How we'll spend classroom time:

I believe in active learning and everyone participating in discussion; this class will centre around on dialogues about nuclear power that will happen synchronously online, during class time. I'll distribute sheets of questions. You'll answer the questions in groups by reading the textbook, discussion with your classmates and researching on the internet. Computer simulations will be provided to aid discussion. Your answers will often, but not always be discussed in class. Every member of the group is expected to have answers to all of the questions, this in class work is ~10% of the grade for the class, this will be mixed in with 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. Test material will be based on material that we discuss in these exercises.

Assessments

1. Classwork and homework

Due: Almost every class period

Participation is an important skill; specifically, asking questions and making appropriate comments are essential and will be part of your mark. We will learn a great deal from each other if everyone participates in the classroom discussions. You will be given questions on sheets to do both in class and at home. As long as you keep up with the material and write it up and discuss it in class, and correct as you go then you'll get full marks for the checkpoints.

Make sure to show up on time for class, or you won't get full credit for in class work. If a student has an unexcused tardy for class (3-7 minutes), they will lose the marks for one checkpoint, if they are more than 7 minutes late (without providing an adequate excuse to the instructor) they will lose the marks for two checkpoints. Unexcused absences will result in a zero for that day's work. Explanations for being tardy and absent must be provided by e-mail to the instructor within 48 hours of the class period.

Additional homework will be assigned and turned in throughout the term, graded by the instructor or TA and returned to you.

Assessment Criteria: Ability to communicate the correct answer as well as the answer itself, Punctuality of assignments (if late they will be marked down 20%/day they are late unless discussed specifically with the instructor). Written assignments must have a 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.

2. Midterm Exams

The first exam will cover nuclear science, Chapter 1-7

The second exam will cover nuclear power, Chapters 8, 10, 15, 16, 17, 23, 27

Assessment Criteria: The exams will cover material from the in class work, 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.

3. Final Exam

This will be a comprehensive final exam, including questions the presentations on various reactor types.

Assessment Criteria: This exam will cover material from class time, the assignments and the book. 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 b

Course Outcomes:

- Discuss technical and social issues related to nuclear power as part of the electricity generation portfolio.
- Communicate to peers the fundamental science behind various types of nuclear reactors and their operation.
- Understand the biological effects of radiation, especially as they pertain to the environmental and health risks associated with nuclear power
- Understand and be able to discuss nuclear waste transportation and disposal issues.
- Discuss and evaluate the issues related to nuclear weapons proliferation and current and proposed technological solutions.

Electronically Approved - Apr 06 2021 16:55

Department Approval