



## COURSE OUTLINE

### 1. **Course:** SCIE 421, Fundamentals of Nuclear Energy Production - Winter 2019

Lecture 01: MWF 10:00 - 10:50 in SA 119

Instructor	Email	Phone	Office	Hours
Jason Donev	jmdonev@ucalgary.ca	403 210-6343	SA 101A	Tuesday 9:30-10:30 Tuesday 13:30-14:30, Wednesday 14:00-15:30

This is a one term course on nuclear power. We will have lively discussions about all aspects of nuclear power. This will include a short review of the necessary physics. 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.

#### **Course Site:**

D2L: SCIE 421 L01-(Winter 2019)-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):**

Engineering Energy and Environment 355 and Physics 223 or 255, or one of Physics 301, 323, or 325.

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	Feb 1st, 2019
Midterm 2	15	March 18th, 2019
Final Exam	30	TBD
Classwork & Homework	20	Ongoing
Project	20	April 1st-15th

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
<b>Minimum % Required</b>	95 %	90 %	87 %	84%	81%	78 %	75 %	72%	69%	66 %	63 %

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 N.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.

#### 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;.

#### 7. **Examination Policy:**

Non-programmable calculators will be allowed on all 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 **15 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

[1.2](#) of the University Calendar

- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section 1.3](#) 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](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel: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](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel: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](mailto:ntscdirector@ucalgary.ca) or phone [403 220-8393](tel: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](tel: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 (FOIPPA). 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](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](#) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). Student Ombudsman, Email: [suvpaca@ucalgary.ca](mailto:suvpaca@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 nuclear power. 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. Students are encouraged to bring laptops and textbooks, but only one laptop per group will be needed. 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.

Bring:

A calculator

Paper and pen/pencil to write answers to the checkpoint questions

The textbook that we're working out of

A laptop if you have one (one will be needed for every group)

The checkpoint questions

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 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 be asked to integrate the course material into a large picture of nuclear power.

## 4. Project

In order to deepen your understanding of the material, each student will research and present on a particular reactor type. By understanding one reactor in detail, you'll have a better understanding of other reactors, and how the various subjects in this class relate to nuclear power. You'll pick a reactor by Feb 8th.

a) Presentation	April 1st -April 5th	Value: 10%
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The presentation will be 15 minutes, plus 10 minutes for discussion with the class. You will work in groups, and your group will present how the reactor works, its advantages, disadvantages, history and where it's currently being used.

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

b) Paper	April 7th, April 11th	Value: 10%
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The final paper will be 10 - 12 pages, double spaced 10 pt font of text (pictures, diagrams and tables excluded), IEEE format. Your group will initially turn in the paper on April 7th 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 April 11th.

