



COURSE OUTLINE

1. **Course:** NANS 511, Integration of Nanotechnology and Biology for Medical Applications - Winter 2024

Lecture 01 : MWF 08:00 - 08:50 in EEEL 445

| Instructor | Email | Phone | Office | Hours |
|------------------|----------------------|--------------|--------|-------|
| Dr Belinda Heyne | bjmheyne@ucalgary.ca | 403 220-3887 | SB 419 | TBA |

In NANS 511, there will be five (5) different form of assessments related to the lectures.

Midterm

For the material covered in lectures, there will be one (1) open book take home midterm. The midterm will be provided via email to students on Monday March 4, 2024 at 8 am. Students will then have 48 hours to complete the midterm. They will have to upload the midterm on the D2L website of the course no later than Wednesday March 06, 2024 by 9 am. Should a student miss the midterm, they should contact Dr. Heyne within 48 hours to arrange for a re-adjustment of the examination date. **Absences not reported within 48 hours of the Midterm start time will not be accommodated and the student will receive a grade of zero for the midterm.**

Presentation

Students will give one (1) in-person individual 15 minute oral presentation on a company that is commercializing a nanotechnology. Students will have to prepare a deck of slides using PowerPoint and present their findings to their classmates regarding a company that is currently using nanotechnologies in one of its products portfolio. Students will have access to a database of commercial products to chose from. They will have to research the nanotechnology through recent literature and patent in order to explain how the nanomaterials are synthesized and what is the role of the nanomaterials in the commercial product. Students will also perform a market research on the company. A sample of a company presentation will be available to students on D2L. Students will be evaluated on their understanding of the nanotechnology and the quality of the oral presentation. Should a student miss their scheduled presentation, they should contact Dr. Heyne within 48 hours to arrange for a re-adjustment of the presentation date. **Absences not reported within 48 hours will not be accommodated and the student will receive a grade of zero for the presentation.**

Participation

In NANS 511, each student will have to chose one (1) to two (2) research paper(s) to share with the rest of the class. All students are expected to read the chosen papers and to participate in group discussions on the papers during lecture hours. Students are expected to attend a minimum of 75% of the paper discussion to obtain full participation grades. In other words, if 10 papers are discussed in lectures, students should be present and participate to discussion for at least 8 of them. Participation will be assessed on the student involvement during group discussion. Should a student miss a group discussion, that will be the one automatically dropped.

Project Pitch

Students will give one (1) in-person individual 10 minute pitch presentation. In NANS 511, based on solid evidence from the literature, student have to propose a novel nanobiosensor to detect an analyte. While the main application fields should be in biology and medicine, other fields can also be considered. In addition, students have to create a fictitious company to commercialize the nanobiosensor. They will validate their market, establish a customer profile and establish a path towards commercialization. Students will prepare a pitch deck that they will pitch to their classmates, who will act as VC (venture capitalist) and invest in their company (with fictitious money). Students will be evaluated on the quality of the presentation. Should a student miss their scheduled project pitch, they should contact Dr. Heyne within 48 hours to arrange for a re-adjustment of the presentation date. **Absences not reported within 48 hours will not be accommodated and the student will receive a grade of zero for the pitch presentation.** If the absence has been reported in due time but an alternate date cannot be accommodated then the percentage weight of the legitimately missed project pitch could also be pro-rated among the components of the course.

Final Paper

In NANS 511, each student will have to write a final paper on their project pitch. The paper will contain the same information that the project pitch. However, students will provide greater details on the science behind the proposed nanobiosensor, including appropriate references. Students will be evaluated on the science accuracy and the originality of the proposed nanobiosensor. **The final paper is due on the last day of lecture, Tuesday April 9, 2024 (11:59 pm) and should be uploaded in a Dropbox created on the course D2L site.** Late submission will result in 10% grade deduction per late day.

To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and

format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

In Person Delivery Details:

All lectures will be delivered in-person in the scheduled time unless novel health measures are put in place due to the constantly evolving global pandemic. Students are thus expected to be present for all lectures during the scheduled time.

Lectures will start on Monday January 8, 2024.

Office hours: TBA

Email Policy: Instructor will respond to students email inquiries about the course within 36 hours except on weekends and holidays. It is important to note that questions regarding the course material will not be answered individually via email. They will either be answered during office hours, or they will be addressed in lecture for the benefit of everyone. If a question is addressed in lecture, the anonymity of the person asking the question will remain confidential.

Course Site:

D2L: NANS 511 L01-(Winter 2024)-Integration of Nanotechnology and Biology for Medical Applications

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

Equity Diversity & Inclusion:

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

2. Requisites:

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

Prerequisite(s):

Nanoscience 401.

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:

| Course Component | Weight | Due Date (duration for exams) | Modality for exams | Location for exams |
|-----------------------------------|--------|-------------------------------------|--------------------|----------------------------|
| Participation ¹ | 10% | Ongoing | | |
| Presentation Company ² | 25% | Ongoing | | |
| Project Pitch ³ | 20% | Ongoing | | |
| Midterm ⁴ | 30% | Mar 06 2024 | | |
| Final Paper ⁵ | 15% | Apr 09 2024 at 11:59 pm (5 Minutes) | online | Dropbox on course D2L site |

¹ All term

² Various dates from February 28 to March 01, 2023.

³ Various dates from April 03 to April 08, 2024

⁴ Student will receive a take home midterm via email. The instructor will be available in class on Monday March 04 to clarify any question the students might have. The students will then have 48h to complete the midterm. They will have to upload the midterm on the course D2L no later than Wednesday March 6 at 9:00 am.

⁵ Student have to upload their final paper in the Dropbox created for that purpose on the course D2L website.

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 % | 86 % | 82 % | 78% | 74% | 70 % | 66 % | 62% | 58% | 54 % | 50 % |

The University of Calgary offers a [flexible grade option](#), Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: <https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade>

4. Missed Components Of Term Work:

In the event that a student legitimately fails to submit any online or in-person assessment on time (e.g. due to illness, domestic affliction, 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, or possible exemption and reweighing of components. Absences not reported within 48 hours will not be accommodated. Students may be asked to provide supporting documentation ([Section M.1](#)) for an excused absence, See [FAQ](#).

If an excused absence is approved, options for how the missed assessment is dealt with is at the discretion of the coordinator or course instructor. Some options such as an exemption and pro-rating among the components of the course may not be a viable option based on the design of this course.

5. Scheduled Out-of-Class Activities:

The following out of class activities are scheduled for this course.

| Activity | Location | Date and Time | Duration |
|----------|-------------------|----------------------------------|----------|
| Midterm | Take Home Midterm | Monday, March 4, 2024 at 9:00 am | 48 Hours |

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

6. Course Materials:

There is no textbook for this course. The course material is based on recent literature publications.

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:

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

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

7. Examination Policy:

Students who require accommodation must be registered with Student Accessibility Services (SAS) (see section 12 (f.) below) and must identify themselves to their instructor as soon as possible. Time will be adjusted for SAS students if needed and accommodations for students will be done on a case-by-case basis.

In NANS 511, there will be ONE open book take home midterm to be completed in 48 hours (provided on Monday March 04, 2024 at 8am - due on March 6, 2024 at 9:00 am) and there is NO final examination.

In NANS 511, the midterm is "open-notes". Reference to your course notes, search engines (Google, etc.) are allowed. Students are specifically prohibited from working with or contacting any other individuals while completing the midterm.

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.

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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 their [website](#) or call [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 (svsa@ucalgary.ca) or phone at [403-220-2208](#). The complete University of Calgary policy on sexual violence can be viewed [here](#).

d. **Student Ombuds Office:** A safe place for all students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems.

e. **Student Union Information:** [SU contact](#), Email your SU Science Reps: science1@su.ucalgary.ca, science2@su.ucalgary.ca, science3@su.ucalgary.ca.

f. Academic Accommodation Policy:

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Academic Accommodation Form](#) and sending it to Associate Head, Undergraduate by email ahugchem@ucalgary.ca preferably 10 business days before the due date of an assessment or scheduled absence.

g. **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](#)
[Faculty of Science Academic Misconduct Process](#)
[Research Integrity Policy](#)

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

- h. **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.
- i. **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.
- j. **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.

Course Outcomes:

- describe major areas of application of nanoscience and nanotechnology in medicine
- describe approaches to design and fabrication of nanobiosensors
- explain how nanoscience improves imaging diagnostic techniques
- interpret and communicate effectively published research in the field of nanobiomedicine
- generate and communicate effectively research ideas in the field of nanobiomedicine
- participate actively in a group by contributing to class discussions, generating research ideas, and writing a scientific text

Electronically Approved - Jan 05 2024 12:23

Department Approval

Electronically Approved - Jan 05 2024 16:35

Associate Dean's Approval