



COURSE OUTLINE

1. **Course:** NANS 511, Integration of Nanotechnology and Biology for Medical Applications - Winter 2021

Lecture 01: MWF 08:00 - 08:50 - Online

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) midterm during scheduled lecture on Monday February 22, 2021 that will be timed and synchronous. However, students will have the option to start their midterm at a time that best suits their situation within a 24-hour time period. Students will have access to the midterm at the beginning of the scheduled lecture via D2L. The midterm is designed to be completed in 30 minutes but students will be provided with 45 minutes in order to account for any technical issues. 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.** Time will be adjusted for SAS students if needed and accommodations for students will be done on a case-by-case basis.

Presentation

Students will give one (1) 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) research paper 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 11 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

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, 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. This final paper is based on the novel nanobiosensor presented by the students in the project pitch (above). Students will have to summarize their proposed nanobiosensor in a final paper in patent format. The final paper must be submitted no later than April 15, 2021 at 11:59 pm MDT via the D2L website.

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.

In NANS 511, **all lectures will be synchronous**. Because the lectures are heavily based on group discussions and student presentations, **most of the lectures won't be recorded**. Students are thus expected to be present for all lectures via Zoom during the scheduled time. Lectures will start on Monday January 11, 2021.

Office hours: TBA. Office hours will be virtual via the Zoom platform and students will have to schedule a meeting in order to get access to a link. More information will be provided on the first lecture.

Email Policy: Instructor and TA 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 2021)-Integration of Nanotechnology and Biology for Medical Applications

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):

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:

Component(s)	Weighting %	Date
Midterm examination	30	Monday February 22 2021
Presentation	20	various dates (from March 22 to March 31)
Participation	10	all term
Project pitch	15	various dates (from April 7 to April 14)
Final paper	25	April 15

A schedule for the order of presentations will be established during the first lecture.

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 %

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:**

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:

- 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:**

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 midterm scheduled on Monday February 22, 2021 and there is NO final examination. The midterm is designed to be completed in 30 minutes. Students will be given 45 minutes to complete it in order to account for any technical issues. While the midterm is scheduled to happen during the lecture time slot on Monday February 22, 2021 starting at 8 am MST, students will have the option to start their midterm at a time that best suits their situation within a 24-hour time period.

In NANS 511, the midterm is "open-notes". Reference to your course notes are allowed. No other aids are allowed on the midterm, including accessing internet resources such as search engines (Google, etc.), other websites, shared documents (Google docs etc.) or chat servers (Discord, WhatsApp, etc.), etc., and you are specifically prohibited from working with or contacting any other individuals while you complete the midterm. It is important to note that the time required for browsing your own course notes or textbook is not taken into consideration when evaluating the time it requires to complete the quizzes and/or final examination. This is why it is strongly advised for you to create your own formula sheet for an easy access to formula and constant values.

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 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 (svsa@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 Associate Head of the Nanoscience Program, Dr. Yuen-Ying Carpenter by email ahugchem@ucalgary.ca or phone 403-220-6908. 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.

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 2021 22:37

Department Approval

Electronically Approved - Jan 06 2021 11:47

Associate Dean's Approval