



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY
COURSE OUTLINE
WINTER 2017

1. **Course:** Nanoscience 511, Integration of Nanotechnology and Biology for Medical Applications

Lecture Sections:

L01: MoWe, 6:00-7:15 pm, SA147

Instructors	Office	Tel. No.	E-mail address	Office hours
Dr. Max Anikovskiy	EEEL 237A	(403) 220-3115	m.anikovskiy@ucalgary.ca	By appointment

Desire 2 Learn (D2L) Nanoscience 511

Nanoscience Program Office: SA 229J, 403-220-6049, undrchem@ucalgary.ca

2. **Prerequisites:** Nanoscience 401

<http://www.ucalgary.ca/pubs/calendar/current/nanoscience.html>

3. **Grading:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Midterm Examination (75 min; Mar. 1, 2017; in class):	35%
Presentations:	20%
Participation:	5%
Group project (presentation):	15%
Group project (final paper, due April 12, 2017):	25%

Late submission of the term paper will result in a 10% mark deduction for each day that the submission is late and a loss of the full mark 3 days past the due date.

Each piece of work submitted or presented by the student will be assigned a percentage score. The student's average percentage score for the various components 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.

A+	A	A-	B+	B	B-
>90% in <i>all</i> components	86-100%	82-85%	78-81%	74-77%	70-73%

C+	C	C-	D+	D	F
66-69%	62-65%	58-61%	54-57%	50% - 53%	< 50%

4. **Missed Components of Term Work:** 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 himself/herself with these regulations. See also Section E.6 of the University Calendar.

There are no deferred Midterm/ term test examinations. In the event that a student misses the midterm or any course work due to illness then an official medical note will be required. Absences must be reported **within 48 hrs**. If a student misses the midterm for other reasons, then analogous documentation will be required. The course coordinator will need to see the original documentation (not electronic copy) for review / decision and keep it (or a copy) for their records. The documentation must be provided to the course coordinator **within 15 days** of the date of the midterm in order for an excused absence to be considered. If an excused absence is approved, then the percentage weight of a legitimately missed midterm examination *will be pro-rated among the remaining components of the course* OR will be transferred to the final examination (see Section E.3 of the University Calendar).

5. **Scheduled out-of-class activities:** No class exercises will be held outside of scheduled class hours

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

6. **Course Materials:** Some course materials can be downloaded from D2L Nanoscience 511
No textbook is required for this course.
7. **Examination Policy:** Midterm examinations will be closed book. There is no final examination in this course. Students should also read the Calendar, [Section G](#), on Examinations.
8. **Approved Mandatory and Optional Course Supplemental Fees:** There are no supplementary fees associated with this course.
9. **Writing across the curriculum statement:** In this course, the quality of the student's writing in the exams, quizzes, and the final paper will be a factor in the evaluation of these pieces of work. See also [Section E.2](#) of the University Calendar.
10. **Human studies statement:** No human studies are conducted in this course.

11. OTHER IMPORTANT INFORMATION FOR STUDENTS:

(a) **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.

(b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

(c) **Student Accommodations:** 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 http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.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, preferably in writing, to the Associate Head of the Chemistry Department, Dr. Farideh Jalilehvand, by email ahugchem@ucalgary.ca or phone (403) 220-5341.

(d) **Safewalk:** Campus Security will escort individual's day or night (<http://www.ucalgary.ca/security/safewalk/>). Call (403) 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

(e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, 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 also <http://www.ucalgary.ca/secretariat/privacy>.

(f) **Student Union Information:** VP Academic Phone: 403 220-3911 Email: suvpaca@ucalgary.ca
SU Faculty Rep. Phone: (403) 220-3913 Email: science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca;
Student Ombuds Office: (403) 220-6420 Email ombuds@ucalgary.ca
<http://ucalgary.ca/provost/students/ombuds>

(g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

(h) U.S.R.I.: At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference – please participate in USRI Surveys.

Department Approval: Approved by Department Head

Date: December 20, 2016

Assistant Dean's Approval for

Alternate final examination arrangements: Approved by Assistant Dean

Date: December 22, 2016

Syllabus

1. Introduction to nanobiosensors; approaches to target detection.
2. Chemical modification; surface chemistry.
3. Protein labelling chemistry.
4. DNA labelling chemistry.
5. Linkers for bioconjugation.
6. Fluorescence based nanosensors.
7. Microfluidics.
8. Nanoscience in medical imaging and diagnostics.