UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
NANOSCIENCE PROGRAM
COURSE OUTLINE
FALL 2016

1. **Course:** Nanoscience 301, Introduction to Nanoscience and Nanotechnology

   Lecture Sections:

   L01: TuTh 6:00 pm - 7:15 pm, SA 104

Instructor	Office	Tel. No.	e-mail address	Office hours
Dr. Max Anikovskiy	EEEL 237A	(403) 220-3115	m.anikovskiy@ucalgary.ca	By appointment
Dr. Elmar Prenner	BI 145A	(403) 220-7632	eprenner@ucalgary.ca	By appointment

   Desire 2 Learn (D2L) Nanoscience 301
   Nanoscience Program Office: SA 229J, Tel. No.: (403) 220-6049, e-mail address: nanosci@ucalgary.ca

2. **Prerequisites:** Completion of 18 units (3.0 full-course equivalents) in courses offered by the Faculty of Science (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 Test	25% (75 min; Oct. 25, 2016; in class)
Quizzes and assignments:	20%
Term paper:	15% (group project)
Participation:	5%
Final Examination:	35% (120 min; to be scheduled by the Registrar)

   Each piece of work (midterm test, quiz, term paper, or final examination examination) submitted 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. The conversion between course percentage and letter grade is given below:

A+	A	A-	B+	B	B-
> 90% in *all* 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

5. **Scheduled out-of-class activities:** No class activities 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 301
   No textbook is required for this course.

7. **Examination Policy**: Examinations will be closed book. Non-programmable calculators during examinations will be allowed:
   Calculator Feature: the capability to perform calculations electronically on user-entered numerical data without the capability to employ pre-stored or user-entered formulae. This feature is provided by the most elementary calculator,

permits the elementary arithmetic operations (addition, subtraction, multiplication and division) and possibly the trigonometric, hyperbolic, exponential and logarithmic operations.
Students should also read the Calendar, Section G, on Examinations.

8. **Approved Mandatory and Optional Course Supplemental Fees**: There are no supplemental fees associated with this course.

9. **Writing across the curriculum statement:** In this course, the quality of the student's writing in all submitted work will be a factor in the evaluation of this 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 individuals 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.

Program Director's Approval: Approved by Department Head Date: August 30, 2016

Syllabus

Week number	Dates	Topic	
1	SEP 13, 15	Scientific method; scientific communication	
2	SEP 20, 22	Peer-review; properties of materials at nanoscale	
3	SEP 27, 29	Light-matter interactions; intro to quantum	
4	OCT 4, OCT 6	Quantum confinement: particle in a box	
5	OCT 11, 13	Confinement in quantum dots; tunneling	
6	OCT 18, 20	Scanning tunneling microscopy	
7	OCT 25, 27	**Midterm exam**	Self-assembly: definition & energetics
8	NOV 1, 3	Self-assembly in nature; DNA and phospholipids as building blocks for nanostructures	
9	NOV 8, 10	Self-assembled monolayers	**Midterm Break**
10	NOV 15, 17	DNA origami; self-assembled nanomachines	Microcontact printing demo
11	NOV 22, 24	Dip-pen nanolithography	Bio-systems
12	NOV 29, DEC 1	Drug carriers-1	Drug delivery routes-1
13	DEC 6, 8	Drug delivery routes-2	Nanotoxicology

Term paper: first draft is due Nov 13, 2016; final submission is due Dec 9, 2016

Late submission of the draft will result in a loss of 2 participation marks; 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.