

NANO*4200
TOPICS IN NANOMATERIALS
Winter 2021 – Course Outline

This course will introduce students to selected topics in nanostructured materials. The course will illustrate how to understand, make, characterize and utilize new materials in which the presence of a nanoscale structure element results in new properties of fundamental or technological importance.

In the Winter-2021 offering, the course comprises five topics. The first two introduce the concept of materials, the principles of their design, fundamental background and terminology in the materials science and nanochemistry, the types and role of nano-size structure elements in materials, and basic concepts that describe the assembly of molecular species into larger entities. The three other topics overview several important types of materials illustrating the concepts and design principles of nanostructured materials to a greater degree of detail.

CREDIT WEIGHT 0.5

PREREQUISITES NANO*3300, NANO*3500, (CHEM*3860 or PHYS*3230).

WEBSITES <http://www.chemistry.uoguelph.ca/soldatov/N4200>
Contact info, course materials, schedule of classes (calendar), due dates, etc.
<https://courselink.uoguelph.ca/d2l/home>
Access to Virtual Classroom, Quizzes and Grades tools.

INSTRUCTORS **Prof. Dmitriy Soldatov** E-mail: [soldatov @ uoguelph.ca](mailto:soldatov@uoguelph.ca)
David Smith (TA) E-mail: [dsmith11 @ uoguelph.ca](mailto:dsmith11@uoguelph.ca)
During the pandemic, the instructors are available through virtual tools only.

SCHEDULE Mon, Wed, Fri (Jan 11 – Apr 12) 9:30–10:20 Virtual Classroom

OFFICE HOURS As needed By request Virtual Classroom

FINAL EXAM Mon, Apr 19 14:30–16:30 TBA

COURSE CONTENTS

- Topic 1. Materials and Nanochemistry (Introduction) [3 classes]
- Topic 2. Self-Assembly [7-8 classes]
- Topic 3. Inorganic Porous Materials [6-7 classes]
- Topic 4. Intercalates [5-6 classes]
- Topic 5. Organic Polymers [7-8 classes]
- Midterm exam, review classes, presentations [6 classes]

EVALUATION

Total marks [100]

Assignment [10] (CourseLink, due Feb 12)*

Midterm Exam [30] (administered remotely, Mar 8-10)

Paper Assignment [20] (form due Mar 26; presentations Mar 29-31)*

Final Exam [40] (Apr 19, 14:30-16:30)**

* Late assignments may be subject to 20% grade reduction per day.

** An in-person final exam has been scheduled, for which students must come to campus. In the event that an in-person final exam cannot proceed as scheduled due to COVID restrictions, the final exam will take place at the scheduled date and time, but will instead be administered remotely. Students will be informed of any such change via email, prior to the end of classes.

COURSE TEXTS

Lecture Notes (required) and complementary reading materials (recommended) will be provided through the course website.

GENERAL POLICIES AND REGULATIONS

E-mail Communication: As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement: When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Drop Date: The last date to drop the course, without academic penalty, is the last day of classes (**12 April 2021**). The regulations and procedures for Dropping Courses are available in the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Copies of out-of-class assignments: Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility: The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student. When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway. Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability. Use of the SAS Exam Centre requires students to make a booking at least 7 days in advance, and no later than March 1 (Winter semester). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time. More information: www.uoguelph.ca/sas

Academic Misconduct: The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor. The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Recording of Materials: Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources: The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:

<http://www.uoguelph.ca/registrar/calendars/index.cfm?index>