PHC330H1: Pharmaceutics 2
Fall 2023 Course Syllabus

I. CONTACTS

INSTRUCTORS:

Dr. Tameshwar Ganesh Course Coordinator tameshwar.ganesh@mail.utoronto.ca 416 706 7615 	**Dr. Tigran Chalikian** Instructor t.chalikian@utoronto.ca 416 946 3715 	**Dr. Heiko Heerklotz** Instructor heiko.heerklotz@pharmazie.uni-freiburg.de 
Dr. Shirley Wu Instructor sxy.wu@utoronto.ca 416 978 5272 	**Dr. Isadore Kanfer** Instructor izzy.kanfer@utoronto.ca 416 978 5291 	**Armin Geraili Nejadfomeshi** Teaching Assistant armin.geraili@utoronto.ca 416-978-0617. 

LECTURE LOCATION: PB 255
STUDENT HOURS:
Mondays 4-6p EDT
Tuesday 2-3pm EDT
Wednesday 2-3pm EDT

II. COURSE OVERVIEW

COURSE DESCRIPTION:
This course presents a detailed examination of the material properties of pharmaceuticals and the role of cellular processes in delivery of a drug to its site of action.

STUDENT LEARNING OUTCOMES:
Upon successful completion of the course, the student will be able to:

- Describe the measurement and use of diffusion in pharmaceutics
- Have a basic understanding of the properties of organic nanostructures and their use in drug delivery
- Describe how drug solubility is related to the thermodynamics of the drug-containing solution
- Explain the use and expected properties of excipients in liquid dosage forms
- Understand the fundamentals of polymeric materials, their solution and solid properties, structure-property relationship, and pharmaceutical applications
- Explain the use of polymers used in drug dosage forms and their necessary properties
- Understand the importance of rheological properties of polymer and drug solutions
- Describe the uses, desired properties, and bioequivalence assessment of dermatological dosage forms
- Understand the requisite physical and chemical properties of dermatological dosage forms

PREREQUISITE COURSES:
This course assumes the student has a basic understanding of organic and physical chemistry, as well as therapeutic dosage forms and delivery routes.
Prerequisite: CHM220H1/CHM222H1
Recommended: PHC230H1 (Pharmaceutics 1)
This course is a prerequisite for PHC489Y. PHC330H1 provides students with an introduction to material properties of pharmaceuticals and their role in formulation. The material covered in this course forms the basis of knowledge that can be employed in drug discovery and formulation within a research setting.

READINGS:
Necessary readings will be presented by each instructor. There is no required textbook.

III. COURSE ORGANIZATION

This course is organized by lectures on subject units relevant to drug delivery.
LECTURE LOCATION: PB255
LECTURE HOURS: Mondays 4-6p EDT, Tuesday 2-3pm EDT, Wednesday 2-3pm EDT

COURSE SCHEDULE AND RELEVANT SESSIONAL DATES:

Dates	Instructor	Topics
11 Sept - 20 Sept	Chalikian (6 Lectures)	Thermodynamics of drug solubility
25 Sept – 2 Oct	Ganesh (4 Lectures)	Diffusion, Organic nanostructures
2 Oct		**Problem Set 1, due 5:00 pm, 9 October**
10 Oct – 31 October	Wu (12 lectures)	Polymeric materials in pharma applications, rheology
30 Oct		**Mid-term exam, during tutorial time – Location PB 255**
31 Oct		**Problem Set 2, due 5:00 pm, 14 November**
6 Nov		**Last day to drop F courses**
6 Nov- 10 Nov		**Fall Reading Week**
1 Nov – 29 Nov	Kanfer (10 Lectures)	Dermatological dosage forms
29 Nov		**Problem Set 3 due 5:00 pm, 7 December**
4 – 6 December	Heerklotz (4 Lectures)	Excipients
9 Dec- 20 Dec		**Fall Exams**

TUTORIAL OBJECTIVES:
The tutorials provide the students an opportunity to ask questions. The TA for the tutorial will not present new course material.

IV GRADING SCHEME

OVERVIEW:
Problem sets, three worth a total of: 30%
Mid-term exam: 25%
Final Exam: 45%

ASSESSMENT DATES & MARK BREAKDOWN:
1. Problem set 1*: Available on Quercus 2 October, due 5:00 pm, 9 October
2. Mid-term exam: 25%, a fifty-minute exam. It will start at 5-6 pm, 30 October
3. Problem set 2*: Available on Quercus 31 October, due 5:00 pm 14 November
4. Problem set 3*: Available on Quercus 29 November, due 5:00 pm 7 December
5. Final Exam: 45%, scheduled during the Fall-semester exam person.

*** Three Problem sets/ Quizzes will be given and the best of the 3 will be worth 15% of the final grade with the reminder will each be 7.5% of final grade.**

IMPORTANT: if an unexpected technical issue occurs with a university system (e.g., Quercus services, network outage) that affects availability or functionality, it may be necessary to revise the timing or weighting of the quizzes/term tests.

V COURSE POLICIES

- All members of this course are expected to maintain a:

(i) professional and respectful attitude during all course activities, including classes, laboratories, tutorials, and online activity.
(ii) personal calendar/schedule/organizer to ensure that all course activities are completed, and due dates are met.
(iii) collection of notes recorded independently based on concepts covered in course activities (students registered with Accessibility Services requiring a class note-taker will have access to this accommodation)
(iv) familiarity with the university policy on Academic Integrity

- The University of Toronto is committed to equity, human rights, and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. As a Course Instructor, I will neither condone nor tolerate behaviour that undermines the dignity or self-esteem of any individual in this course and wish to be alerted to any attempt to create an intimidating or hostile environment. It is our collective responsibility to create a space that is inclusive and welcomes discussion. Discrimination, harassment and hate speech will not be tolerated. If you have any questions, comments, or concerns, we encourage you to reach out to the staff in our Equity Offices.

- Communication with instructor: Email is the preferred method. We will make every attempt to respond to email within 24 hrs on weekdays.

- Privacy language and appropriate use of course materials: https://teaching.utoronto.ca/ed-tech/audio-video/sample-statements/

- Policy for late assignment submissions (e.g., 5% will be deducted daily, including weekends and holidays).

- Problem sets may be handed in to the TA either in person (on paper) or on Quercus.

- Process for requesting re-grading of course work. If you have a question about the marking of a problem set or exam, please contact the TA first. If the TA then questions the mark, the TA will contact the appropriate lecturer

- Process for signaling course absences and requesting make-up tests or exams. If you are unable to write an exam, please contact the course coordinator and TA as soon as possible, preferably prior to the exam.

  Students presenting a valid petition for a missed examination will be given the opportunity to write a deferred examination. A petition is a student's formal request for an exception to the

normal rules and regulations of the Faculty of Arts and Sciences. You make such a request by writing a letter stating your request, explaining the reasons that support it, and attaching any relevant documentation. You then fill out a petition form (detailing your name, address, student number etc.) and submit it to the Faculty's Petitions Office. (Faculty of Arts and Science students submit petitions about any courses they are taking through their home college. Students from other faculties or graduate departments are governed by the rules and procedures of their home faculty or department.) Failure to do so will result in the student receiving a grade of zero for the missed evaluation.

VI TECHNOLOGY REQUIREMENTS

- Specific guidance from the U of T Vice-Provost, Students regarding student technology requirements is available here: https://www.viceprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning/
- Advice for students more broadly regarding online learning is available here: https://onlinelearning.utoronto.ca/getting-ready-for-online/
- This course requires the use of computers, and technical issues are possible. When working on a piece of academic work, students are responsible for scheduling enough time to allow for reasonable delays due to technical difficulties to be overcome, so such issues will not be acceptable grounds for deadline extension. Particularly, maintaining an up-to-date independent backup copy of your work is strongly recommended to guard against hard-drive failures, corrupted files, lost computers, etc.

VII INSTITUTIONAL POLICIES AND SUPPORT

ACADEMIC INTEGRITY

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

On quizzes and term tests:

1. Using or possessing unauthorized aids. **Please note that the use of websites (such as Chegg.com or the course discussion board) to post quiz/term test questions or to post/access answers to questions is an academic offence under the University of Toronto's Code of Behaviour on Academic Matters. Alleged instances of this nature are forwarded to the Faculty of Arts & Science Student Academic Integrity office.**
2. Looking at someone else's answers or collaborating/discussing answers during a quiz or term test.
3. Misrepresenting your identity.

In general, academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required by the University.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see www.academicintegrity.utoronto.ca/).

COPYRIGHT

If a student wishes to copy or reproduce class presentations, course notes or other similar materials provided by instructors, he or she must obtain the instructor's written consent beforehand. Otherwise, all such reproduction is an infringement of copyright and is absolutely prohibited. More information regarding this is available here: https://teaching.utoronto.ca/ed-tech/audio-video/copyright-considerations/

ACCESSIBILITY NEEDS

Students with diverse learning styles and needs are welcome in this course. The University of Toronto is committed to accessibility: if you require accommodations for a disability, or have any other accessibility concerns about the course, please contact Accessibility Services as soon as possible.

ACCOMMODATIONS FOR RELIGIOUS OBSERVANCES

Following the University's policies, reasonable accommodations will be made for students who observe religious holy days that coincide with the due date/time of an assignment, tutorial, class or

laboratory session. Students must inform the instructor **before** the session/assignment date to arrange accommodations.

ADDITIONAL SERVICES & SUPPORT

The following are some important links to help you with academic and/or technical service and support:

- General student services and resources at Student Life
- Full library service through University of Toronto Libraries
- Resources on conducting online research through University Libraries Research
- Resources on academic support from the Academic Success Centre
- Learner support at the Writing Centre
- Information for Technical Support/Quercus Support

ACKNOWLEDGEMENT OF TRADITIONAL LANDS

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca and, most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.