



Course Director: Dr. Jennifer L. Farmer

Campus Address: Room 450, Chemistry Building (CB)

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SC/CHEM 3071 4.0

Time: W 7-10PM

Location: Life Science Building (LSB) 105

Focus:

A practical look into the pharmaceutical industry will be covered providing an overview of the drug discovery process. Topics include: choosing disease states to study, pharmacological assays, rational drug-design, synthetic and analytical chemistry, toxicology, drug metabolism, clinical trials, and aspects of intellectual property and patenting.



Expanded Course Description:

Historical evolution of medicines

- natural products, extracts, herbal medicines, etc.
- chemical synthesis, chromatographic separation, structural identification, molecular biology, molecular modeling, high throughput screening (HTS), combinatorial chemistry, genomics, proteomics, glycomics, lipomics, metabolomics, etc.
- The drug discovery ‘team’ (what forms the modern day pharmaceutical development process)

What disease areas are under investigation by big pharma and what drugs are on the market?

Governing bodies that control the pharmaceutical industry

- legal (patenting)
- FDA, EPA (Canadian equivalents)

The process of drug discovery

- pharmacological assays: how to assay against biological targets (e.g., enzymes, receptors, etc.) and how active compounds (potential drug candidates) are discovered
- synthetic chemistry: how are diverse collections of compounds prepared (combi-chem)
- rational-drug design (modeling, crystal structures, etc.)
- animal testing
- Toxicology
- drug metabolism (drug movement in the body, drug delivery, etc.)
- pharmacokinetics (drug metabolism and the production of secondary drug byproducts)
- clinical trials

Case Studies



Background Preparation:

Prerequisites: CHEM 2020 6.0, BIOL 2020 3.0 or CHEM 2050

A solid grasp of university-level biology, biochemistry and organic chemistry is required to understand and appreciate the material that will be covered in lecture. The material from these two courses *will not be reviewed specifically*, although it will be discussed as necessary for the material being covered.

To be clear, you are responsible for knowing and, if necessary, re-learning any of this material that is necessary to know for Pharmaceutical Discovery from these prerequisites.



Office Hours:

I will be in my office specifically to handle questions Mondays and Fridays from 3:30 – 5:00 PM. I am always willing to meet with people at times other than those listed above if people choose to contact me and set up an appointment.

I am unavailable on any Tuesday from 10-12:30PM or Wednesday and Thursday from 4:00 PM onward due to other responsibilities.

NB: if my door is closed, I am either away or not to be disturbed. **Do not knock!** It is best to e-mail me and set up appointments if you are traveling to York specifically to see me.

E-mail use:

The only e-mails that I will respond to will be ones of an administrative nature. I will not reply to any e-mail relating to explaining course material; book an appointment and come in and see me or ask me after class.



Textbook(s) and the Presentation of Material:

The course does not follow any one text specifically. You will be responsible for what is covered in lecture and the readings and question material that are assigned to you in lecture. Many aspects of the course are covered closely in "An Introduction to Medicinal Chemistry, Fifth Edition" by Graham L. Patrick (Oxford Press). This book is available at the York University Bookstore and it is compulsory. The Fourth and Third Editions are also suitable to use.

The sections covered in class that relate to material in the textbook will be pointed out in lecture. At that time, questions from the textbook will also be assigned.

Special Lectures:

A number of lectures will be provided by seasoned experts working in the pharmaceutical industry or from other universities. Where applicable, they will refer to the textbook in support of their lectures. All lectures will be supported by documentation that will be made available to you and you are responsible for all aspects of these lectures as well.



Final Grade Determination:

The final grade will be determined by the following breakdown:

midterm examination (in class)	30
take-home assignments (2)	30
final examination	<u>40</u>
	100

Letter grades will be given out as follows:

A+, 90 – 100%; A, 80 - 89%; B+, 75-79%; B, 70 - 74%; C+, 65-69%;
C, 60 - 64%; D+, 55-59%; D, 50 - 54%; F, <50%

***NB Missed midterm exam:** if the midterm exam is missed you will automatically be given a ‘zero’ grade and no make-up test will be offered. If you are legitimately ill, you will require an original, signed note on proper letterhead from a certified physician (MD) with a phone number clearly written on the note to verify absences; all medical absences are verified. In the event of a tragedy such as a death in the family, you will be required to provide a death certificate from the funeral director of the funeral home handling the burial. If you have a legitimate reason for missing the midterm exam, the value of that exam will be added to the final examination. There are no exceptions.



Student Responsibilities:

- Students are responsible for information covered in class, course readings and any supplemental information posted on Moodle. I will be communicating all information through Moodle so it is your responsibility to check Moodle regularly for updates and announcements.

- Students must make themselves aware of university policies on Academic Honesty/Integrity, Access/Disability, Student Conduct, Religious Observance and other matters. We take academic honesty very seriously and so I encourage you to familiarize yourself with York University's current policies. Please visit:

<http://www.yorku.ca/secretariat/policies/>

- Other useful links:

Religious Observance and Accommodation Guidelines and Forms:

<https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs>

Academic Accommodations for Students with Disabilities

<http://www.yorku.ca/secretariat/policies/document.php?document=68>



Important Term Dates:

Take-home Assignments:

- Assignment #1:

Available on Moodle: January 20th, 2016. **Due January 27th**, 2016 at the beginning of class, after which a 10% per day penalty will be enforced. Answers will be provided on-line at 5 PM on January 29th, 2016; after that time, no late assignments will be accepted and you will receive a grade of zero.

- Assignment #2:

Available on Moodle: March 16th, 2016. **Due March 23rd**, 2016 at the beginning of class, after which a 10% per day penalty will be enforced. Answers will be provided on-line at 5 PM on March 25th, 2016; after that time, no late assignments will be accepted and you will receive a grade of zero.

Mid-term Examination:

Wednesday, February 10, 2016 (in class examination 150 minutes)

Final Examination:

TBA



Important Term Dates:

- Winter reading week: February 13-19, 2016
- Family day: February 15, 2016
- Good Friday: March 25, 2016

- Last date to:
 - add a course **without permission** of instructor: January 17, 2016
 - add a course **with permission** of instructor: January 29, 2016
 - drop a course **without** receiving a grade: March 4, 2016