Course Syllabus (Spring Semester, 2021)

Course Title: Synthetic Organic Chemistry
Course Number: 33704, 3 credits
Instructor: Soo Young Ko, Ph.D., FRSC
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1. The Course Objectives

Organic synthesis is in the heart of organic chemistry, as synthesis is what separates chemistry from other natural sciences. Through medicines, fragrances, pesticides, and synthetic polymers, organic synthesis has made an enormous contribution to the well-being of our everyday life.

The students of this course will have completed a two-term introductory course in organic chemistry and are expected to have acquired basic knowledge in functional group transformations and reaction mechanism. During this course, the students will review some basic reactions, study some new ones, and learn to tackle synthetic problems strategically, wherein they must combine all these as-yet-fragmented pieces, put them in the right places, in the right orders, so eventually they can plan and execute synthesis of fairly complex organic compounds.

2. Pre-requisite

Organic Chemistry I and II

3. Text and references

text:
Laurie S. Starkey, Introduction to Strategies for Organic Synthesis, 2nd Ed., 2018, Wiley

references: L.G. Wade, Jr., Organic Chemistry, 9th Ed., 2017,
Mackie, Smith and Aitken, Guidebook to Organic Synthesis, 3rd Ed. 1999,
Warren and Wyatt, Organic Synthesis: The Disconnection Approach, 2nd Ed, 2008
Zweifel, Nantz, Somfai, Modern Organic Synthesis, 2nd Ed, 2017

4. Lecture schedule

week	contents	chapters
1	introduction, review of OC I&II	
2	Retrosynthesis; Organometallics	1.1; 2.1; 3.1
3	Synthesis of alcohol	3.1
4	Red-Ox	2.2
5	Carbonyl group chemistry	3.9; 3.10; 3.11
6	Carbonyl group chemistry	3.9; 3.10; 3.11
7	Mid-term Exam period Protective Groups	 1.2
8	alkene synthesis; alkyne synthesis	3.6; 3.7; 4.1
9	Cyclic compounds	6
10	Cyclic compounds	6
11	C-hetroatoms	3
12	Illogical disconnections	4.3
13	selected syntheses	assignments
14	selected syntheses	assignments
15	Final Exam period	

5. Evaluation

Mid Exam	100
Final Exam	100
assignments	200
total	400

6. Course Format

in-person + on-line hybrid

1) The course will consist of two parts:
   i) Lecture works (on-line for everybody).
      Lecture notes and lecture videos will be provided.
   ii) Problem-solving and Q&A sessions (in-person participations optional)
      - In-person sessions for discussion, Q&A, problem solving, term-projects, etc.
      - About once per week (Fridays, P3, but not every week, schedule TBA)
      - Participations for these in-person sessions are optional.
      - For those opting for a full on-line mode, relevant materials will be provided.

2) The course format is subject to change depending on the COVID-19 situations.
3) Exam formats will be announced at later dates.