

Strategies and Tactics in Synthetic Medicinal Chemistry

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Spring 2016

Faculty: Dr. Rice; Office: Room 320; Email: jrice@rci.rutgers.edu

Schedule: Monday, Wednesday, 8:15 -9:35 AM, PH 323A

Required Textbooks

- Organic Synthesis, The Disconnection Approach, 2nd Edition by Stuart Warren and Paul Wyatt, Wiley, 2008 (paperback)
- Organic Synthesis, Strategy and Control by Paul Wyatt and Stuart Warren, Wiley, 2007 (paperback)

Suggested Supplementary Textbook

- Modern Organic Synthesis, An Introduction by George S. Zweifel and Michael H. Nantz, W.H.Freeman & Co., 2007 (paperback)

Grading: Exams (3) will be worth 90% of your grade with attendance, punctuality, preparedness and class participation counting for the remaining 10% of your grade.

Topics:

- Retro-Synthetic Analysis
- Strategies for Aromatic Compounds
- Protecting Groups
- Polarity Reversal (Umpolung) and Synthetic Equivalents
- Template and Chelation Effects
- Asymmetric Synthesis
- Photochemistry
- Synthesis under Extreme Conditions
- Synthesis using Solid Supports
- Instructive Examples of Synthesis Planning and Execution

Learning Goals: This course is intended for graduate students that have completed a basic course in synthetic organic chemistry. The student will learn a variety of methods to evaluate the structure of a target molecule, complete a thorough retro-synthetic analysis of that structure, and decide upon strategies for its efficient synthesis. The student will also gain an appreciation for a variety of tactics that can be brought to bear to achieve the synthesis of the targeted compound.

Supplemental Reading

- *Fundamentals of Asymmetric Catalysis* by P.J. Walsh and M.C. Kozlowski, University Science Books, 2009.
- *Organic Synthesis* by Michael B. Smith, McGraw-Hill, 1994.
- *Classics in Total Synthesis I and II* by K.C. Nicolaou and E.J. Sorensen, 1996.
- *Organic Chemistry in Action - The Design of Organic Synthesis* by Felix Serratosa, Elsevier, 1990.
- *The Logic of Chemical Synthesis* by E.J. Corey and X-M. Cheng, John Wiley & Sons, 1989.
- *Tactics of Organic Synthesis* by Tse-Lok Ho, John Wiley & Sons, 1994.
- *Strategies and Tactics in Organic Synthesis Volumes 1,2, and 3* - Edited by Thomas Lindberg, Academic Press, 1984, 1989, and 1991.

- *Protective Groups in Organic Synthesis, 3rd Edition*, by T.W. Greene and P.G.M. Wuts, John Wiley & Sons, 1999.
- *Protecting Groups, 3rd Edition* by Philip J. Kocienski, Thieme, 2004.
- *Total Synthesis of Natural Products: The 'Chiron' Approach* by Stephen Hanessian, Pergamon, 1983.
- *Unpoled Synthons: A Survey of Sources and Uses in Synthesis* by Tapio Hase, Wiley, 1987.
- *Tactics of Organic Synthesis* by Tse-Lok Ho, Wiley, 1994.
- *Selectivity in Organic Synthesis* by Robert S. Ward, Wiley, 1999.
- *Asymmetric Synthesis* by Garry Procter, Oxford, 1996.
- *Advanced Organic Chemistry: Parts A and B, 4th Ed.* by Frances A. Carey and Richard J. Sundberg, Kluwer, 2001.