University of Rhode Island
CHM 521: Advanced Organic Chemistry 1
Department of Chemistry
Spring 2019; TR 11:00-12:15 am, 215 Beaupre
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Office Hours	by appointment
Textbook	(suggested) Anslyn and Dougherty; Modern Physical Organic Chemistry
Course Description	CHM 521 is a survey of *physical organic chemistry* with an emphasis on experimental applications. Physical organic chemistry is the study of structure and reactivity. This field has experienced almost constant renaissance and currently manifests in the forms of bioorganic, organometallic, materials, supramolecular chemistry, catalysis and MANY more sub-disciplines that all have their roots in physical organic chemistry. There is virtually no aspect of modern chemistry that is untouched by the various facets of this field. This is not a history course but rather a survey of classic physical organic chemistry geared to the contemporary research laboratory.
Topics	All the material that fits. Topics include: 1. *Chemical Kinetics, Reaction Mechanism and Catalysis* (multi-order kinetics, approach to equilibrium, Hammond Postulate, Curtin-Hammett, experimental considerations and reaction mechanism); *2. Thermodynamics* (Van't Hoff equation, isotope effects, Hammett Plots and LFERs); *3. Non-Covalent Interactions* (π effects, induced dipoles, H-bonding); 4. *Polymers* (polymer issues, mechanisms); 5. *Magnetic Resonance* (NMR, EPR, DNP); 6. *Aromaticity; 7. Random musing and tales.*
Goals	A solid grasp of *physical organic chemistry* allows a researcher to design experiments that they have never conducted before and answer questions that they have never thought of before. To a physical organic chemist every chemical reaction is the same: the interaction of electrons that proceeds spontaneously under the given conditions to the lowest energy state. The task of the chemist then is to: 1) ask a question that allows one to probe the system; 2) know the ground rules that the mindless electron must obey; and 3) know that the rules must always be obeyed. If the student is able to form a sound hypothesis to explain a problem they have never encountered before, design an experiment to probe their hypothesis and correctly interpret their data to explain the 'impossible,' then they will have achieved the goals of this course.
Policies and Grading	Daily attendance will not be taken but is strongly encouraged. A missed exam will be scored as zero, no exceptions. Graded work should be that of the student only; cheating and plagiarism will result in a zero on any given assignment and possible referral to the Dean and a failing grade in the course. Students are expected to follow the University policy of ACADEMIC HONESTY and all other University policies. Student grades will be based on 3 in-class exams (100 pts each), a final exam (100 pts) and a research proposal (100 pts). The lowest score will automatically be dropped. Final grades will be determined by: >86% A, >75% B, >65% C, >55% D. Students have 2 school days to contest the grade on any evaluation from when the evaluation is made available in class.
Due Dates	Exam 1 2/21/19; Exam 2 3/21/19; Proposal 4/4/19; Exam 3 4/25/19; Final 5/2/19 8 am-11 am.