FORMEN CHRISTIAN COLLEGE, LAHORE
Department of Chemistry
Instructor: Dr. Muhammad Abbas
Email: muhammadabbas@fccollege.edu.pk
Advising hours: 10:00-13:00)
in S-313 (Armacost Science Building)

Course Objective:

- To develop the understanding of basic concepts of synthetic organic chemistry
- Study the C-C bond formation reactions, Oxidation, Reduction and Rearrangements
- How to plane and design a synthesis route
- Why different reaction conditions are important for the same chemical conversion
- How to translate this knowledge to solve the problems of chemical industry

Course Content:

A Comprehensive study of mechanism and synthetic applications of some of the widely used name reactions such as Bayer-Villiger Reactions, Beckman rearrangement, Benzoin condensation, Claisen condensation, Cope Rearrangement, Curtius rearrangement, Dieckmann condensation, Ficher-Indole synthesis, Gabriel synthesis, Heck reaction, Hell-Volhard-Zelinksy reaction, Hoffman rearrangement, knoevenagel condensation, Kolbe Electrosynthesis, Periken reaction, Reformatsky reaction, Robinson annulation, Schmidt and related reactions, Suzuki coupling and related reactions, Ulmann reaction, Vilsmeier reaction, wittig reaction, Micheal addition, and other related name reactions

Recommended textbook:

- Organic Syntheses Based on Name Reactions by A. Hassner, and I. Namboothiri
- Named_organic_reactions by Thomas Laue and Andreas Plagens
- Strategic Applications of Named Reactions in Organic Synthesis by László Kürti and Barbara Czakó.
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Evaluation/Examination:

1.	Moodle Assignments	10%
2.	MCQs	20%
3.	Presentation	10%
4.	Mid Term	20%
5.	Final Examination	35%
6.	Class participation	05%

Attendance

A student must be regular and punctual. He/she should normally attend al classes. 80% attendance is must to qualify to sit in the final examination.

Week Plan/Semester Breakup

Week	Course Content
1st Week	1. **Writing Mechanism of a Chemical Reaction** i. Polar covalent bond and bond shifting, Electrophiles ad Nucleophiles ii. Oxidizing and Reducing agents iii. Mechanism for Addition to double bond iv. Mechanism for SN reactions v. Mechanism for Elimination Reaction 2. Chirality, Diastereoselective and enantioselective reactions **Moodle Assignment 01**
2nd Week	3. Aldol Reaction, Mechanism, Thermodynamic and kinetic controls, Zimmermann-Traxler model, and Applications 4. Mannish Reaction, Mechanism and Applications **Moodle Assignment 02** Quiz 1
3rd Week	5. Hell-Volhard-Zelinsky Reaction 6. Claisen Condensation and Applications 7. Dieckmann Condensation and Applications **Moodle Assignment 03** Quiz 2
4th Week	8. Michael Reaction, Mechanism and Applications 9. Reformatsky Reaction, Mechanism and Applications 10. Mitsunobu Reaction, Mechanism and Applications **Moodle Assignment 04** Quiz 3
5th Week	11. Corey-Fuchs Reaction 12. Alder-Ene Reaction and Applications 13. Diels Alder Reaction and Applications 14. Click Reaction and Applications **Moodle Assignment 05** Quiz 4
6th Week	15. Ugi Reaction, Mechanism and Applications 16. Passerini Reaction, Mechanism and Applications 17. Biginelli Reaction and Applications Quiz 5
7th Week	18. Grubbs Reactions Mechanism and Applications 19. Heck Reaction, Mechanism and Application Quiz 6

8th Week	Mid-Term Examination
9th Week	20. Nigishi Coupling, Mechanism and Application 21. Stille Coupling, Mechanism and Application 22. Suzuki Coupling, Mechanism and Application **Moodle Assignment 06** Quiz 7
10th Week	23. Curtius Rearrangement, Mechanism and Applications 24. Beckmann Rearrangement, Mechanism and Applications 25. Backer-Venkatraman Rearrangement, Mechanism and Applications 26. Benzilic Acid Rearrangement, Mechanism and Applications **Moodle Assignment 07** Quiz 8
11th Week	27. Claisen Rearrangement, Mechanism and Applications 28. Cope Rearrangement, Mechanism and Applications 29. Oxy-Cope Rearrangement, Mechanism and Applications **Moodle Assignment 8** Quiz 9
12th Week	30. Fries Rearrangement, Mechanism and Applications 31. Overmann Rearrangement, Mechanism and Applications 32. Pinacol Rearrangement, Mechanism and Applications **Moodle Assignment 9** Quiz 10
13th Week	33. Wittig Rearrangement, Mechanism and Application 34. Wolf Rearrangement, Mechanism and Applications 35. Some Other General Name Reactions **Moodle Assignment 10** Quiz 11
14th Week	PRESENTATIONS
15th Week	36. Sharpless Epoxydation, Mechanism and Applications 37. Swern Oxidation, Mechanism and Applications Revision and exercise
16th Week	Final