

COURSE SYLLABUS : CHEM 244A (Organic Chemistry Lab)

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This course is designed to acquaint and educate students on the basics of organic preparations and analytical techniques, distillations, sublimations, purifications of products, liquid-liquid extractions and preparation of organic compounds. Also the experiments will help students to understand and learn the instrumental analytical techniques including gas chromatography, thin layer chromatography, infrared-, and UV spectroscopy. The experiments included in this course will help students to develop skills to carry out organic synthesis, reactions, separations and analyses of products, and more important, help students learn good laboratory practices and also all safety protocols that must be strictly adhered in the laboratory. Handouts will be given to the students before the experiments and there would be a discussion on the theory and the procedure before each experiment.

Students are required to attend all the labs, perform all scheduled experiments, take the final exam quiz and follow the required safety guidelines, and the laboratory rules and ethics to pass this course.

The final grades will be based on the experimental work including results on the product yields and accuracy, laboratory reports and quizzes (a total of 70%) and a final quiz (30%).

Schedule

Week 1: Check-In and Safety Lecture.

Week 2, 3 and 4 Caffeine: Extraction from tea leaves, distillation, purification by sublimation and thin layer chromatography to identify caffeine

Week 5 and 6: Reduction of pinacolone to pinacolyl alcohol: preparative reaction, extraction, distillation and identifying product by IR Spectroscopy

Week 7 and 8: Dehydration and rearrangement of pinacolyl alcohol to alkenes: reaction, extraction, distillation and analysis of products by gas chromatography

Week 9 and 10: Conversion of benzoic acid to methyl benzoate by Fisher esterification: reaction, extraction, distillation and analysis by IR spectroscopy

Week 11 and 12: Aldol condensation reaction: reaction of benzaldehyde with acetone, extraction, distillation and product analysis by UV spectroscopy

Week 13: Aspirin synthesis: reaction, extraction, and purification by recrystallization.

Week 14: Final exam and Check-out.