The exam will cover Chapters 14 and 15, parts of 12 and 13, and section 16.1.

**Chapter 12 Topics**

**Basic Spectroscopy**
- Be able to do a SODAR calculation

**UV-Vis Spectroscopy**
- Understand that UV-vis absorptions are caused by electronic transitions (HOMO→LUMO) and what the most common transitions are (n→π*; π→π*)
- Be able to interpret basic UV-vis spectra (understand the effects of conjugation on λ_max)
- Know the color wheel
- Know the Beer-Lambert Law and be able to perform the associated math

**Chapter 13 Topics**

Be able to interpret a ¹H NMR spectrum and come up with a reasonable structure; show your work!

**Combined Spectroscopy**

Given a combination of various sorts of spectral data, be able to come up with a reasonable structure; show your work!

**Chapter 14 Topics**

Understand the concept of aromaticity.

Know Hückel’s Rule.

Be able to classify compounds as aromatic, antiaromatic, or nonaromatic, and explain why.

Be able to name aromatic compounds with multiple substituents.

**Mechanisms:**

Electrophilic aromatic substitution (all types)
Other Reactions:

- Alkylation with a Gilman reagent
- Clemmensen reduction
- Wolff-Kishner reduction
- Side-chain reactions – NBS; reduction of a nitro group; oxidation of an alkyl group

Chapter 15 Topics

Mechanisms:

- Reaction of amines with nitrous acid (primary, secondary, tertiary)
- $S_{N}Ar$
- Benzyne formation and reaction

Other Reactions:

- Replacement of diazonium group with various other groups
- EAS with diazonium ion as electrophile (formation of an azo compound)

Chapter 16 Topics

Nomenclature of carboxylic acids, diacids, acid salts, esters, anhydrides, amides, and nitriles