Part A Rules
1. All students must check-in and check-out. The check-in/check-out sheet must be signed and returned to the instructor prior to starting the first experiment.
2. Before any lab activity can be carried out, the “Safety Practices in the Organic Chemistry Laboratory” document must be read; then the Lab Safety Statement must be signed and returned to the instructor.
3. There are no make-up labs. If a lab is missed, it will be assigned a grade of zero. If you are more than 15 minutes late for lab, or do not complete the prelab assignment, you will not be allowed to attend that lab and a grade of zero will be recorded for that lab.
4. Your laboratory book must be turned into the instructor to be graded at the end of the semester.
5. Exams will be available for review but will not be returned.
6. You must be in class for recitation or you will not be allowed in the lab.

Part B Laboratory Research Notebook
1. Students must complete a prelab write-up prior to coming to lab. The prelab is to be done in the lab research notebook, in ink. The lab research notebook must be brought to every lab. A copy (stapled, if more than one page) of the prelab must be submitted to the instructor at the beginning of the lab period. The prelab must legible and contain the following:
   a. The title of the experiment, date(s) the lab is performed, and your name on every page.
   b. Reaction or Isolated Substance
      1) For reactions, give the overall reaction with structures and names of reactants and products and the reaction conditions.
      2) For isolations, give the structure(s) and name(s) of the compound(s) to be isolated.
   c. A table of all chemicals being handled (used or produced) in the lab, that includes:
      (1) amount needed (or theoretically produced, for products)
      (2) density (for liquid reagents),
      (3) molecular weight
      (4) # mmols (for all reactants, catalysts, and products)
      (5) mp (for solid reagents)
      (6) bp (for liquid reagents),
      (7) hazards (flammable, toxic, corrosive, mutagen, carcinogen, irritant, lachrymator,…)
      (8) units belong in the heading of the table, not in the body (except for amounts)
      (9) reference(s) (use ACS style guidelines)
   d. A flow chart or outline of the procedure, with references if appropriate. You must use this flow chart to do the experiment (not your book, etc.)

2. a. All data and observations must be recorded directly into your lab research notebook, in ink, during the lab.
   b. All original IR and \(^1\)H NMR spectra, TLC plates, and GC chromatograms must be permanently affixed into your notebook.
Part C  Worksheets/post lab exercise
Most labs will have a post lab exercise that must be turned in at the beginning of the next laboratory period to be graded. This should be your own individual work and not done in “groups”. Any evidence of cheating or working in “groups” will be sent to the honor court.

Part D  Formal Lab Reports
You will have to complete a formal lab report for some of the laboratory experiments. This will give you practice in scientific writing and compiling very detailed scientific reports. It is highly recommended that you look at the example on Dr. Feske’s website. Be very careful to not plagiarize, I will be looking for this!
Below is a general outline for the report: All structures must be drawn using the ChemDraw software

1. Cover Sheet
   a. title
   b. your name
   c. course name and day # (e.g. CHEM 2101L-Monday)
   d. date(s) the lab was performed
2. Abstract
   a. the purpose(s) (the title of the experiment is usually the purpose)
   b. a statement (complete sentence) of the reaction equation, including the reaction conditions, but excluding the by-products
   c. major findings (results)
   d. major conclusions [Whether or not the purpose was met, how you know the purpose was or was not met (expected product obtained or not), and proof of how you know this (listing of analytical techniques used)]
3. Introduction
   a. from McMurry or other reference, significance and/or history of the reaction, as appropriate
   b. reaction equation(s) – structures/names of reactants/products; reaction conditions
   c. mechanism(s) (showing the movement of electrons, with arrows, for the reaction)
4. Experimental Details
   a. procedure, as actually done in lab
   b. amounts follow reagents in parentheses; for reactants, catalysts, and products only, also include # mmoles within the same set of parentheses, but separated with a comma
   c. no observations
5. Results (Do not use complete sentences in this section. Report one result immediately after the other, separating them with a period and a space. Do not use a separate line for each result.
   a. (1) yield: #grams, #mmoles, % (Example- Yield: 0.147 g, 3.67 mmol, 89.1%.)
      (2) melting point (°C) (Example- Melting point: 47-50 °C.)
   b. spectroscopic data
      (1) IR: solvent or physical state, plate type, frequency of absorptions in cm⁻¹, functional group represented. [Example- IR (neat/NaCl), 3000-2720 (C-H), 1660 m (C=C).]
      (2) ¹H NMR: instrument frequency, solvent, reference, chemical shift of each signal, structural assignment, splitting pattern, relative integration, coupling constant.
c. Sample calculations (as appropriate)
   (1) theoretical yield (convert from mass or volume, as appropriate, of limiting reactant to grams of product)
   (2) % yield
   (3) $^1$H NMR: (show all work on the spectrum)
      (a) draw the structure of the expected compound on the spectrum
      (b) identify structural assignments
      (c) identify chemical shifts
      (d) calculate J values, if appropriate
      (e) calculate relative integration
   (4) IR
      (a) label the spectra with the sample name, and prep method and plate type used
      (b) label the significant peaks with the appropriate functional group

6. Discussion
   a. In a sentence, state the yield in grams followed in parentheses by the percent yield and account for values less than or greater than 100% in a thoughtful manner.
   b. In a sentence, identify the product and list the analytical techniques that were used.
   c. If the data includes anomalies it must be discussed. For example, if the melting point of the product is not exactly the same as the literature value for the expected product, you must include the following information in a concise paragraph.
      (1) melting point of the product (initial and final value)
      (2) literature value for the melting point of the expected product
      (3) range of melting (number of degrees over which the sample melted)
      (4) depression (number of degrees the sample value was depressed from literature value)
      (5) assessment of the purity of sample based on the melting point data

7. Conclusion A short summary of the report. It should be similar to the abstract

8. References (for introduction and experimental details sections, as appropriate; use ACS style guidelines)

9. Attachments, as appropriate (8.5x11” copies; never give your original data away!)
   a. IR spectra
   b. $^1$H NMR spectra (For the 60 MHz $^1$H NMR report, you must fold the margins of the original back to eliminate blank paper and obtain an 8.5 x 11” copy.)