

Marco Bonizzoni & Diana Leung

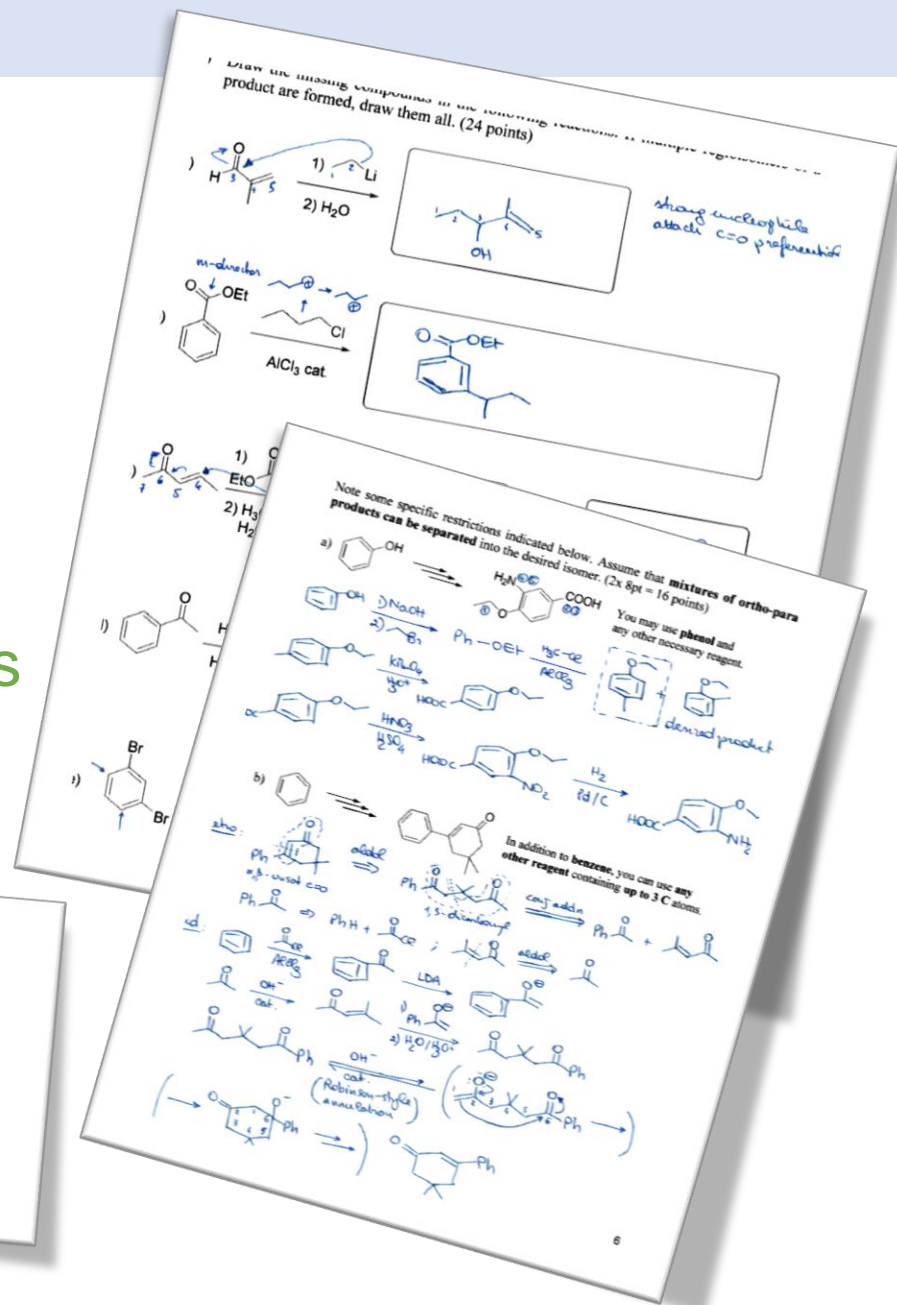
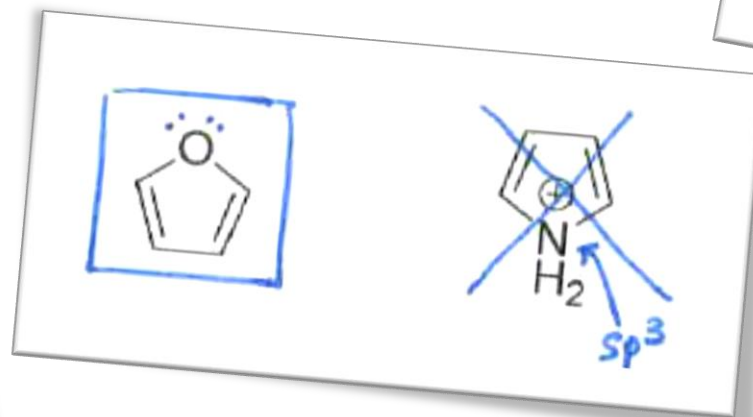
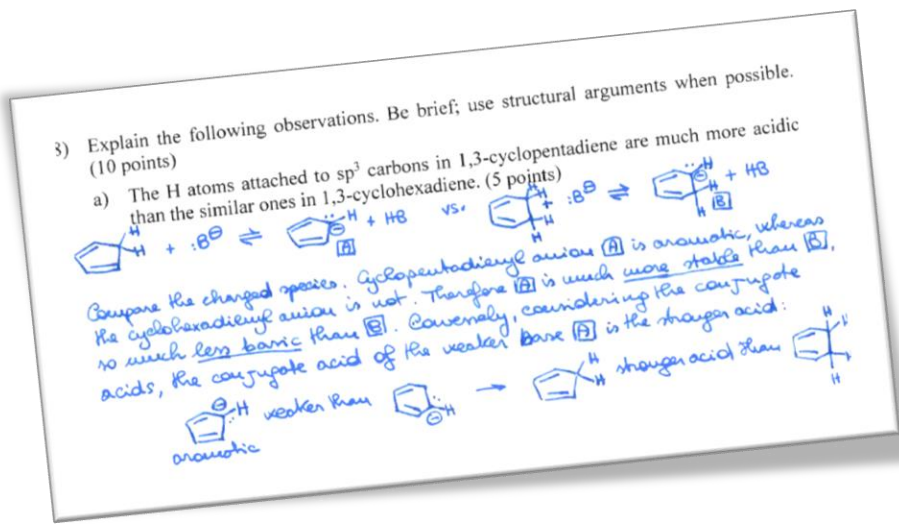
Managing hand-graded exams in large enrollment classes

THE UNIVERSITY OF
ALABAMA[®]

College of
Arts & Sciences
Department of Chemistry

Organic chemistry exams

- Organic chemistry is a surprisingly **visual** discipline:
 - molecules are 3D objects
 - shape profoundly influences properties
 - students learn a **visual language** (= a highly stylized representation of 3D objects in 2D)
- Organic chem tests still contain **open-ended questions**
- Students answer in **handwritten long form**



Returning graded exams

- Students must learn from their mistakes → graded exams must be returned
- Bring exams to class, let students find their own:
 - **messy, time consuming** in large-enrollment classes (150-250 students)
 - may **jeopardize students' privacy**
 - **ineffective**: some students cannot wait and collect exam; a handful of exams are never picked up, no matter the effort.
- Invite students to pick up exams during office hours:
 - minimum effort for instructor
 - **extremely ineffective**



Electronic alternative

1. Exams must be **scanned in bulk** for speed
 2. Resulting scan file (PDF) **automatically separated** into individual exams
 3. Exams must carry **unique, machine-readable identifier**
 4. Individual exam delivery through **electronic media**
- Automatic-feed scanning available in-house (departmental copiers)
 - **Barcoded labels** carrying:
 - name of students in text
 - bar code encoding CWID



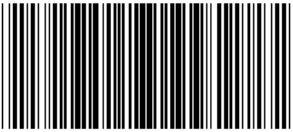
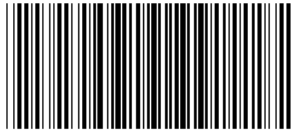
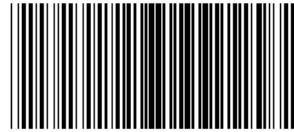


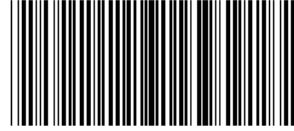



Barcode label preparation

<u>Last</u>	<u>First</u>	<u>CWID</u>
Adams	John	17971801
Adams	John Quincy	18251829
Arthur	Chester	18811885
Buchanan	James	18571861
	George	

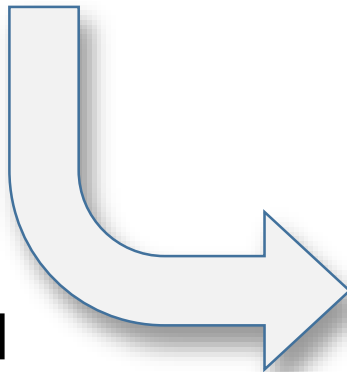
← from class roster

Standard 1" x 2-5/8"
address labels



Adams, John 17971801 	Adams, John Quincy 18251829 	Arthur, Chester 18811885 
Buchanan, James 18571861 	Bush, George 19891993 	Bush, George W. 20012009 
Carter, Jimmy 19771981 	Cleveland, Grover 18851889 	Cleveland, Grover 18931897 

MS Word
"Mailings"
function



Workflow

1. Students affix barcode label to their exam before turning it in
2. Exams hand-graded, sorted alphabetically
3. Scores entered into instructor's gradebook
4. Exam booklets dismembered by cutting stapled corners off
5. Loose stacks scanned to a single high-quality PDF (automatic feeder)
6. Key tool: **A-PDF Scan and Split** ®
 1. splits large file into smaller files when barcode is found
 2. names files with value of barcode
7. "Mail merge" tool assembles individual emails with exam attached

Outcomes

1. Students like receiving the exam **as soon as available**
2. Exam return rate is **100%!**
3. Electronic copy **always available:**
 - office hours
 - email questions
 - future reference
4. Exam **integrity** is **guaranteed** (e.g. for regrade requests)

CH 231-003, Fall 2016
Dr. Bonizzoni
Exam #4
November 21st, 2016

Name: _____ (print)

Honor pledge: I promise or affirm that I will not at any time be involved with cheating, plagiarism, fabrication, or misrepresentation while enrolled as a student at The University of Alabama. I have read the Academic Honor Code, which explains disciplinary procedures that will result from the aforementioned. I understand that violation of this code will result in penalties as severe as indefinite suspension from the University.

_____ (signature)

DO NOT OPEN this exam until instructed.

Make sure that your booklet contains all 7 pages of this exam.

You have **1 hour and 30 minutes** to complete this exam.

You may use molecular models during the exam, but no textbooks or notes. Reference tables are provided on the last page of this exam.

No electronic device is allowed. Turn cell phones off and put them away; remove smart watches; put away calculators.

Ex:	Score:
1	3 / 6
2	9 / 12
3	8 / 10
4	0 / 6
5	12 / 12
6	4 / 10
7	4 / 18
8	0 / 18
9	2 / 10
TOTAL	42 / 100

(2 extra points built-in)