

**ICS 6B**  
**Boolean Algebra**  
**and**  
**Logic**  
**Winter 2015**

# Course Instructors

- Instructor: **Prof. Sandy Irani**
- Teaching Assistants:
  - **Zachary Destefano**
  - **Mengfan Tang**
- Readers
  - **Prolok Sundaresan**
  - **Primal Pappachan**
  - **Xikui Wang**

# Course Meeting Times

- Lectures: MWF 2:00-2:50
  - BioSci3 1200
- Discussion
  - Four different groups (12, 1, 3, 4PM)
    - Two hours per week (Wed, Fri)
    - Lead by teaching assistants
    - No new material presented
    - Question and answer format

# Course Web Page

- [www.ics.uci.edu/~irani/w15-6B/6B](http://www.ics.uci.edu/~irani/w15-6B/6B)
  - Office hours, contact info
  - Course administration
  - Schedule
    - Topics
    - Reading assignments
    - Homework/solutions
    - Quiz schedule

# Course Grades

- Homework: (total of 8 out of 9) 5%
- Reading: 4%
- Quizzes: (total of 6 out of 8) 60%
- Final Exam: 30%
- Completing Course Evaluation: 1%
  - (Anonymous)

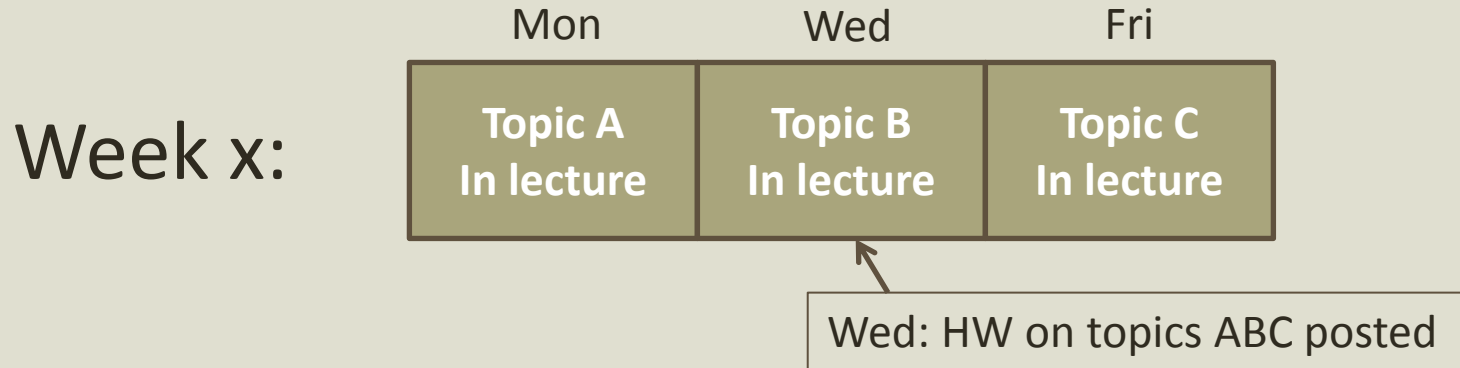
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# Weekly Schedule

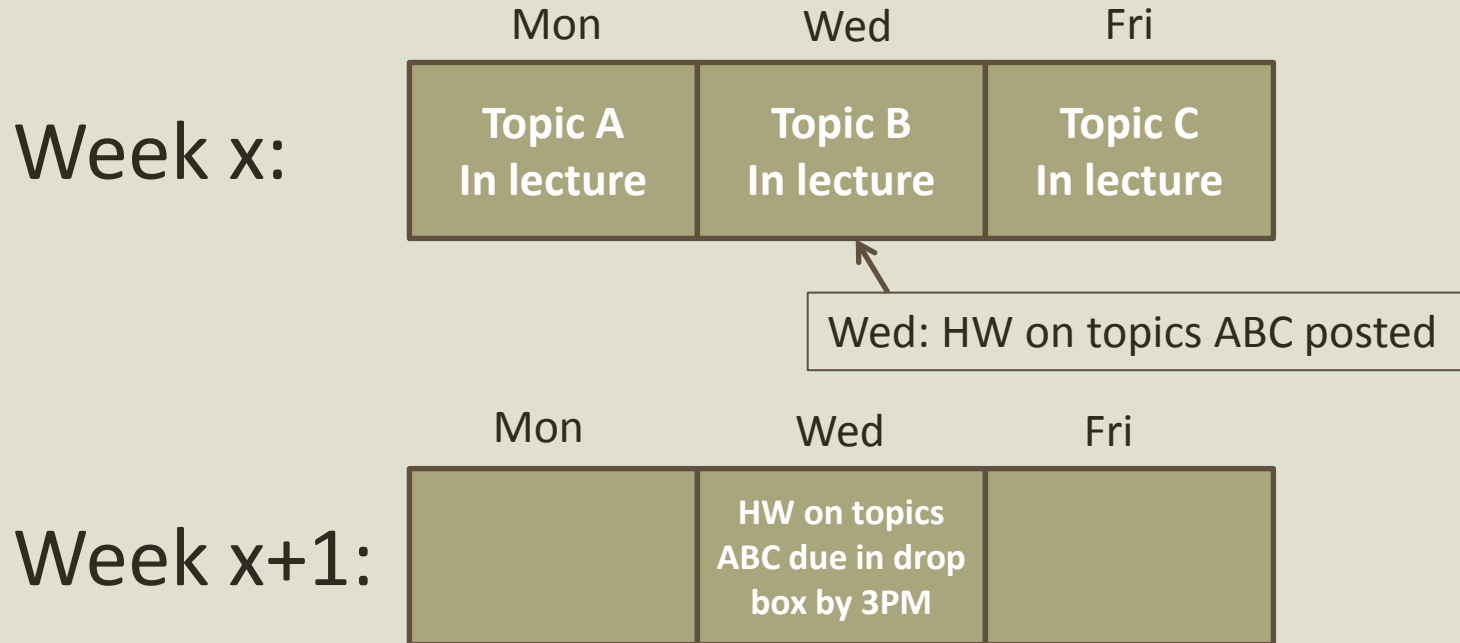
	Mon	Wed	Fri
Week x:	Topic A In lecture	Topic B In lecture	Topic C In lecture

# Weekly Schedule

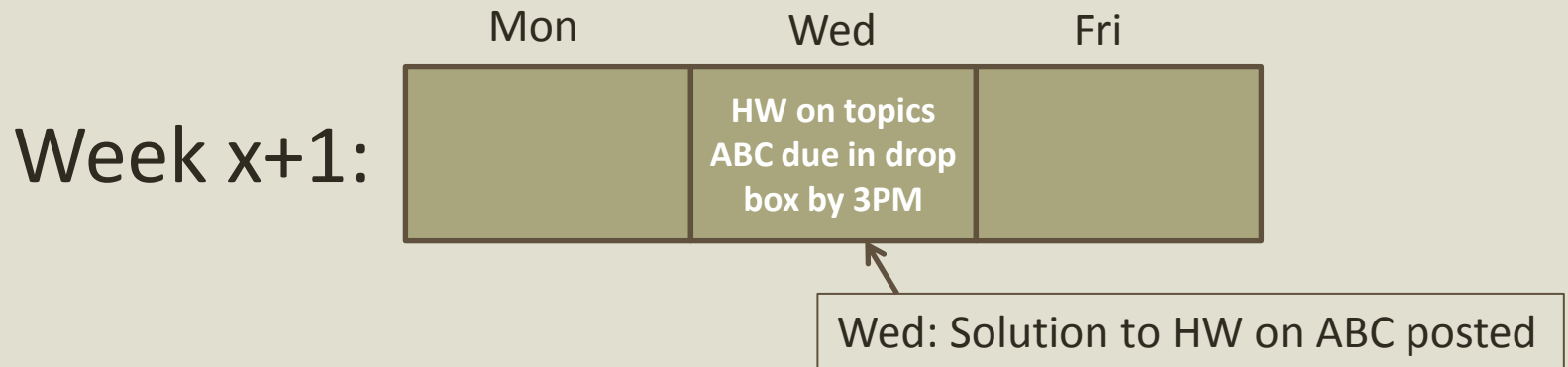
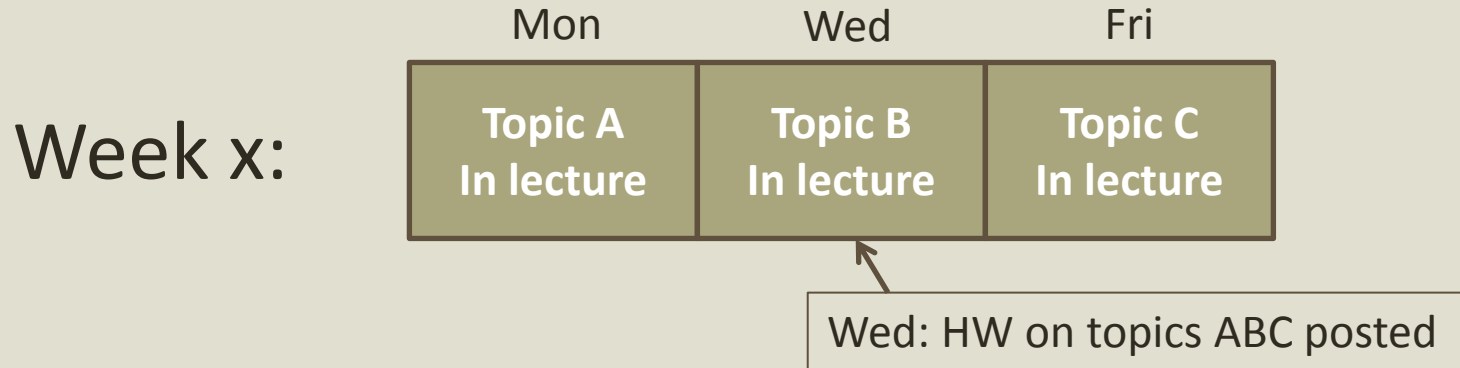




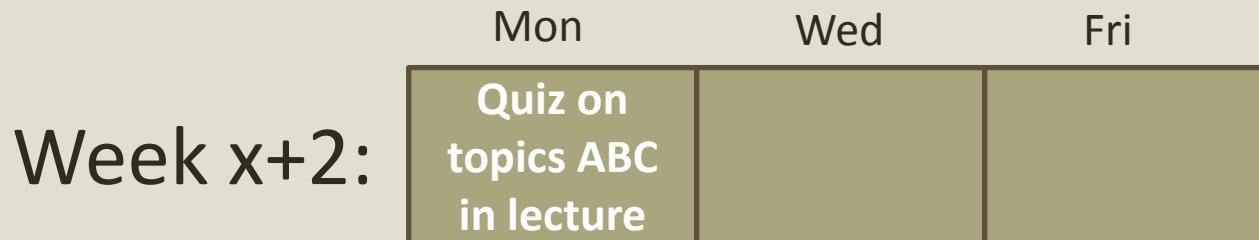
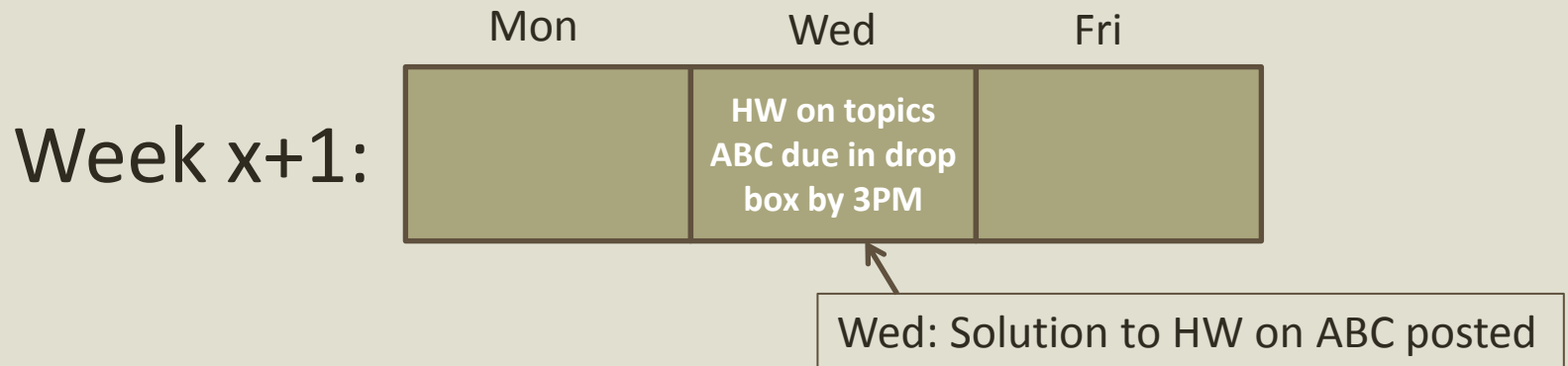
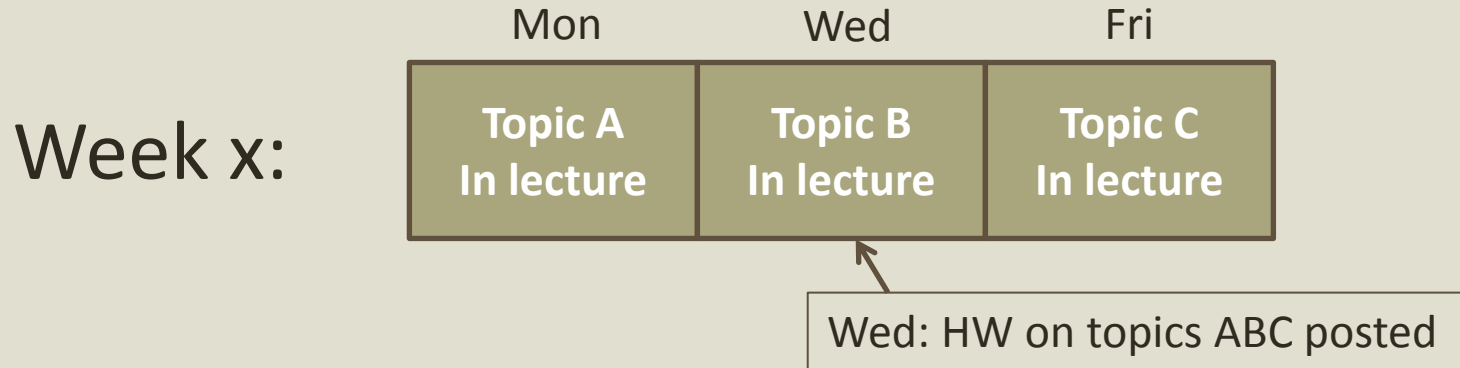
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# Weekly Quizzes

- Quiz every Monday (except Jan 21 and Feb 18):
  - Starting in Week 3
  - Given during the last 20 minutes of lecture
  - Cover material from the previous homework assignment
  - Two lowest quiz scores dropped in calculating final grade
    - This covers all excused absences.
    - No make up quizzes.
  - No written solutions posted
    - Questions about quiz solutions answered in dicussion
    - Blank quizzes (without solutions) posted prior to final

# Weekly Quizzes

- Topics covered on quizzes correspond to HW
- Quiz format will be multiple choice or short answer
  - Format not announced in advance
- No electronics
  - No calculators
  - Laptops and tablets must be closed or stowed
  - No visible phones

# Homework

- Homework due must be in dropbox around the corner from DBH 3013 by 2PM
- No late homework accepted.
  - Solutions posted right after they are turned in.
- Pick up graded homework from the reader who graded them (will be posted)
- Homework solutions will be posted on the course web page several days before the quiz.
- Scores posted on EEE (HW and Quizzes)

# Questions on Grading?

- After each quiz or HW score is posted the person who graded it will post a note
- Questions on grading should first go to the person who graded it
  - Office hours preferred
  - By appointment as needed
- Come see me about unresolved grading questions.

# Text (zyBook)

- Web-based, interactive text
  - Subscription for the quarter (\$40)
    - [zyBooks.com](http://zyBooks.com) to sign up.
    - zyBook code: **UCIICS6BWinter2015**
  - Required for the course:
    - Data on activities is recorded and counts for a small portion of course credit.
    - You get credit if you eventually get the question correct.



# Text (zyBook)

- Student activities automatically time-stamped
  - Your progress visible on your dashboard
  - Reading for the first two weeks due at the end of the second week.
  - After the first two weeks, the reading for each lecture is due by 2PM on the day of the lecture.

# Text (zyBook)

- Provide feedback:
  - Technical issues with your subscription:
    - [support@zyBooks.com](mailto:support@zyBooks.com)
  - Small bugs in the text
    - “Feedback” buttons in the text
  - Technical problems that prevent understanding material:
    - [support@zyBooks.com](mailto:support@zyBooks.com)
    - CC me: [irani@ics.uci.edu](mailto:irani@ics.uci.edu)
  - General ideas on how to improve the text
    - Come talk to me.

# Board notes

- After each lecture, I will post the contents of the board generated from lecture
  - Purpose: **reduce** the amount of writing you need to do in class (not eliminate the need to take notes).
- Posted board notes are **NOT** a complete record of what happened in class
- You are responsible for whatever is said in lecture.
- If you can not read anything written during lecture, **please ask!**

# Board notes

$$\langle 4 | (e^{-\beta T} - e^{-\beta(T+A)})^2 | 4 \rangle$$

$$2 - \cos a - \cos b$$

$$0 \leq b \leq 2\pi$$

$$\frac{e^{\frac{1}{T}}}{\ln(e^{\frac{1}{T}})}$$

$a < b$

$\cdot |\psi_{a,b}\rangle$

$$\frac{e^{-\beta T}}{\ln(e^{\beta T})}$$

$$\frac{e^{-\rho(T+\Delta)}}{1 + \lambda(e^{-\rho(T+\Delta)})}$$

$$\sum_{j=0}^{n^2} e^{-\beta j/n^2} \geq n^{1+\epsilon}$$

$$1 - e^{-\beta} \geq \frac{1}{n^{1+\epsilon}}$$

$$\rho_{\beta} \leq h^{1-\epsilon}$$

$$\beta \leq (1-\epsilon) \log n.$$

$$\beta \leq \kappa \log n.$$

Upper bound  $\frac{|\text{tr}(e^{\beta T} \cdot e^{-\beta(T+A)})|}{\text{tr } e^{\beta T}} \leftarrow \approx \Omega(n^{1/2})$

num.  $\approx \left| \text{tr} \left( \frac{1}{2} \tilde{\beta} T^2 - \frac{1}{2} \tilde{\beta}^2 T^2 - \frac{1}{2} \tilde{\beta} (A^2 + AT + TA) \right) \right|$

W/  $\beta = \tau$  and  $\tilde{\beta} = \tau$ , pick any  $\psi \in T$ . Upper bound.

$\frac{|\langle e^{-\beta A} \cdot \psi | e^{-\beta(T+A)} \psi \rangle|}{e^{\beta \lambda}}$

2nd order bound  $|\lambda - \langle \psi | T + A | \psi \rangle| = |\langle \psi | A | \psi \rangle|$

$\in O(n) \cdot O(\frac{1}{n^2}) = O(\frac{1}{n})$

$$\text{tr} \Delta^2 = \sum_{\text{edges}} w_{ij}^2 = |\Delta|_{\text{FROB}} \in \mathcal{O}(n)$$

$$\text{tr } e^{-\pi T} \geq \text{Tr} (I - \beta T) = n - \beta \text{Tr}(T)$$

# Class attendance

- If you need to miss a class, ask a friend for notes.
- If you do not understand an example or idea presented in class
  - Ask a question
  - Write down your question and bring it to discussion section.

# Piazza

- Online forum/”wiki”
  - All questions related to course content should be posted on Piazza (**not asked by email**).
  - Students can post anonymously
  - Collectively written/edited student solution
  - Instructor can mark “good question”/”good solution”
  - Instructors can add their own solution.
- The TAs and I will each check Piazza at least once a day..

# Piazza

- Post general administrative questions on Piazza
  - e.g., What does quiz 1 cover?
- Routine announcements will be posted on Piazza
  - Time sensitive announcements will generate an email to the class.
- Check Piazza at least twice per week.

# Piazza Questions

- Questions/comments can be posted anonymously to Piazza, but they are only anonymous to other students.
  - Instructors see the identity of any individual who posts on Piazza
- Before posting an administrative question to Piazza:
  - Check the course web page or Piazza announcements for an answer
- Before posting a question to Piazza about course content:
  - Check the text for an explanation



# Questions

- The best way to get questions answered:
  - Discussion section
  - My office hours
  - TA office hours

# Final Exam

- Friday, March 20, 1:30PM-3:30PM
- There are only two ways to miss the final and not get a 0:
  - Preapproved absence
    - Not a work commitment or family vacation
  - Unforeseeable emergency – documented
    - e.g., medical

# Academic Honesty

- It's important!
- Read the school policy.
- Write up your homework solutions on your own
- Keep your eyes on your own test/quiz.