

INTRODUCTIONS, SYLLABUS, & COURSE DETAILS

California Lutheran University, School of Management
IT-516 Data Structures & Algorithms
Sean Harrington, Instructor



COURSE INFO

- IT-516: Data Structures & Algorithms
- Class meets Wednesday evenings, 7PM – 10PM, SBET 139
- Data structures are ways to organize, store and retrieve data while algorithms are strategies for processing the data to solve computational problems. Efficient computer applications require good use of data structures and algorithms. This course introduces students to analysis and design of fundamental data structures and algorithms that are the basis of modern applications today. Students will learn how to write algorithms, evaluate tradeoffs between different algorithms and assess the efficiency of the best possible algorithm for solving complex computational problems.
- MSIT program requirement
- Prerequisites:
 - IT-501: Fundamentals of Java Programming (or equivalent experience)
 - IT-508: Information Technology Management

INSTRUCTOR

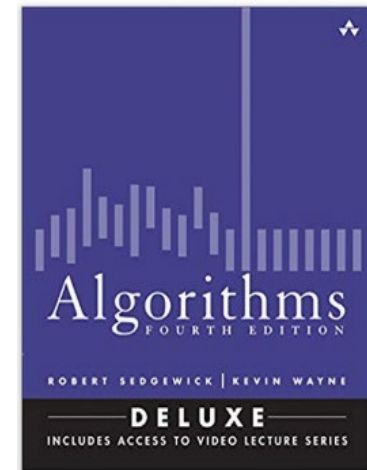
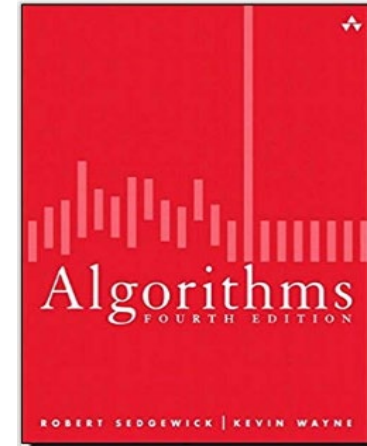
- Sean Harrington
 - spharrin@callutheran.edu
 - 818-836-1174
 - Office hours by appointment only
 - Fridays off
- BSCS (2002) & MSCS (2018) from CLU
- Manager of Application Development for Ventura County Fire Department
- Family & hobbies

TELL US ABOUT YOU

- Name (full name & your preferred name)
- Your program & track (MSIT? Management? Analytics?)
- How many classes have you taken & how many left?
- Experience with Java, data structures, & algorithms
- What do you want to get out of this course?
 - Good grade?
 - Programming skills?
 - Knowledge of algorithms & data structures?

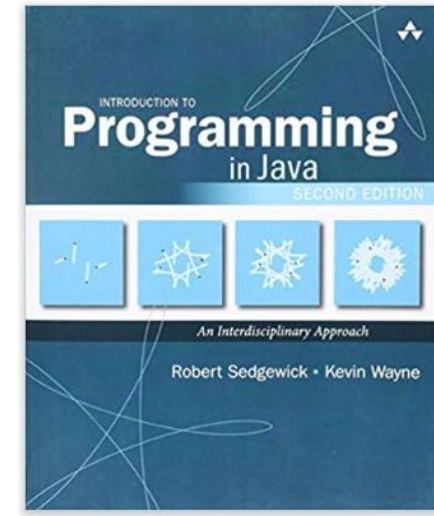
TEXTBOOK INFO

- Required
 - **Algorithms, 4th Ed.**
Robert Sedgewick & Kevin Wayne
ISBN-13: 978-0321573513
ISBN-10: 032157351X
Recommendation: eTextbook
- Alternate
 - **Algorithms, 4th Ed. DELUXE EDITION**
(includes access to videos)
Robert Sedgewick & Kevin Wayne
ISBN-13: 978-0134384689
ISBN-10: 0134384687
Recommendation: eTextbook



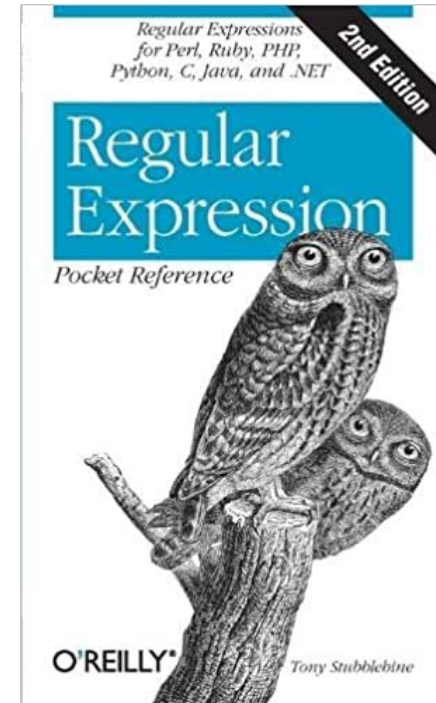
TEXTBOOK INFO

- Optional
 - Introduction to Programming in Java, An Interdisciplinary Approach, 2nd Ed.
Robert Sedgewick & Kevin Wayne
ISBN-13: 978-0672337840
ISBN-10: 9780672337840
Recommendation: eTextbook



TEXTBOOK INFO

- Optional
 - Regular Expression Pocket Reference, 2nd Ed.
Tony Stubblebine
ISBN-13: 978-0596514273
ISBN-10: 0596514271
Recommendation: Paperback



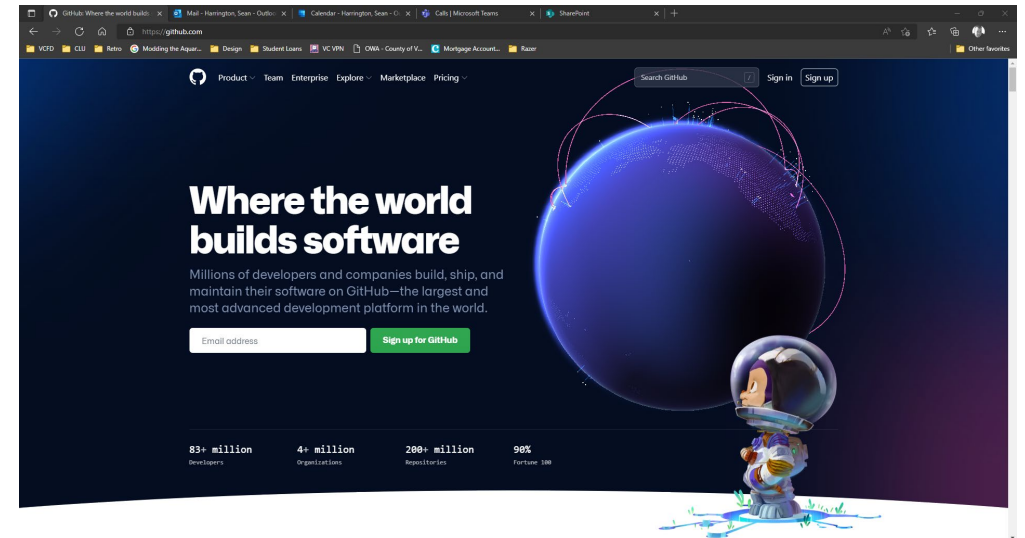
SOFTWARE

- IntelliJ IDEA, Community 2021.1
- Windows, MacOS, Linux
- FREE! DO NOT BUY IT!
 - ZERO benefit to purchasing the Ultimate Edition
 - Complicates your course experience
- DO NOT install Java independently
 - Too many system resources tied up
 - Complicates your course experience



SOFTWARE

- GitHub – github.com
 - Register with your CLU email address
 - Download course starter folder
- GitHub Desktop - OPTIONAL
 - Collaborate on Group Discussions
 - Synchronize repositories with desktop



CLASS POLICIES

- For Zoom sessions, please test your connection ahead of time
- A web camera is NOT required, but a microphone is VERY helpful; if you use a camera, please present yourself and your background environment appropriately!
- Please MUTE your microphones when entering the Zoom sessions, and unmute only when asking a question or participating in a group breakout
- Classroom attendees MUST be masked at all times; no exceptions
- CLU attendance policy allows up to 3 missed classes, but your success in the course will be greatly diminished
- Students MUST notify instructor in advance of absences or special needs
- It is student's responsibility to obtain information missed during absence

ACADEMIC INTEGRITY POLICY

- Academic Dishonesty is "...any behavior or act that implies intent to make someone believe what is not true, as giving a false appearance"
- California Lutheran University's Bachelor's Degree for Professionals program is designed and dedicated to achieve academic excellence, honesty and integrity at every level of academic life
- Students and faculty share responsibility for maintaining high levels of scholarship and academic integrity, as well as an obligation to report violations of academic integrity to their Program Director
- Plagiarism (any failure to document sources), cheating, unethical use of technology, and facilitation of academic dishonesty are examples of such behaviors
- Any behavior or act that falls within the definition of academic dishonesty will meet with appropriate disciplinary remedies
- Due to the serious nature of such offenses and resulting questions regarding student ethics, graduate programs within MSIT may assign remedies including academic probation, suspension or dismissal from the university after a first offense with the approval of the Dean and Vice President for Academic Affairs

CLASS FORMAT

- Class starts promptly at 7PM Pacific Time
- Class discussion on readings and groups
- Lecture & exercise/quiz A: 7:15PM to 8PM
- Break at around 8PM (+/- 10 min.)
- Lecture & exercise/quiz B: 8:15PM to 9:15PM
- Break at around 9:15PM (+/- 10 min.)
- Lecture & exercise/quiz C: 9:30PM to 10:00PM

FERPA & ONLINE TEACHING

- Family Educational Rights and Privacy Act
- CLU's Interpretation:
 - If a recording of the class is to be made available that contains students' faces or voices, they must ALL agree to have their likenesses made available.
 - If even one student does not agree, a recording may not be made, either by instructor OR other students.
 - If a recording is NOT being made, instructor can require that students MINIMALLY have a microphone to interact with the class.
- Course Impact:
 - If a recording cannot be made, students will have to take notes and will not have the recording to refer back to.
 - Typically, instructor uses recording to capture presentations in real-time for more effective grading.
 - Class recordings give students the ability to refer back to homework answers & subtleties in the lectures that are not included in the slide decks

FERPA SURVEY

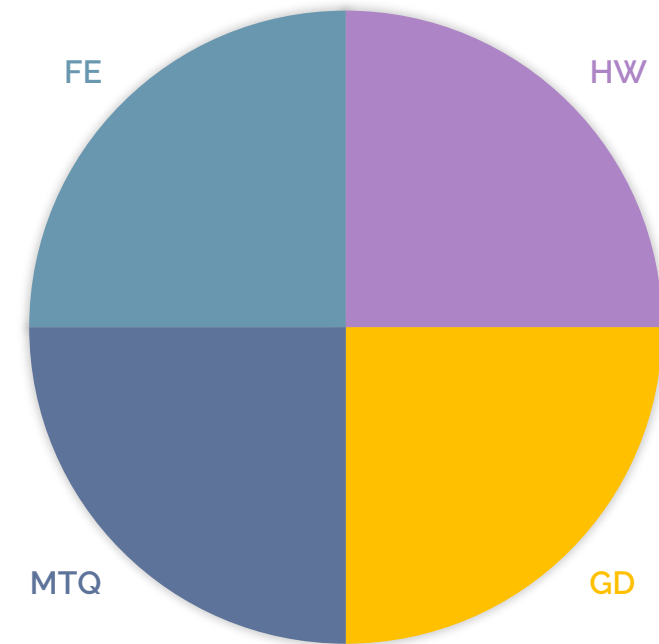
- Send an email from your CLU address to instructor before end of first class, making one of these two statements:
- *I **agree** to allow my VIDEO and/or AUDIO to be recorded for use as part of the HyFlex environment.*

OR

- *I **DO NOT agree** to allow my VIDEO and/or AUDIO to be recorded for use as part of the HyFlex environment.*

STUDENT RESPONSIBILITIES: GRADED ITEMS

- Homework = 25%
- Group Discussions = 25%
- Mid-Term Exam & Quizzes = 25%
- Final Exam = 25%



FINAL GRADING PERCENTAGE

$$\begin{aligned} & ((\text{HW earned}/\text{HW possible}) * .25) \\ & + ((\text{GD earned}/\text{GD possible}) * .25) \\ & + ((\text{MTQ earned}/\text{MTQ possible}) * .25) \\ & + \underline{((\text{FE earned}/\text{FE possible}) * .25)} \\ & \text{FINAL GRADING PERCENTAGE} \end{aligned}$$

Numeric Percentage	Grade
95% to 100%	A
90% to 94.9%	A-
87% to 89.9%	B+
83% to 86.9%	B
80% to 82.9%	B-
77% to 79.9%	C+
73% to 76.9%	C
70% to 72.9%	C-
67% to 69.9%	D+
63% to 66.9%	D
60% to 62.9%	D-
0% to 59.9%	F

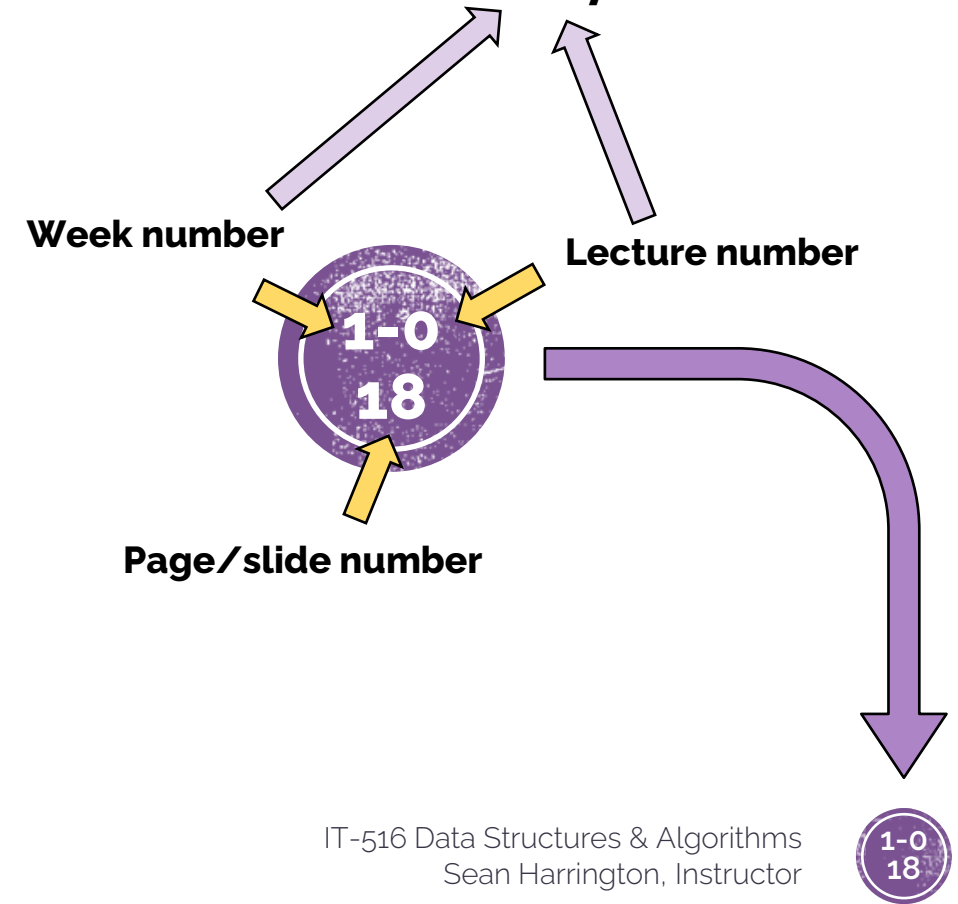
WEEKLY READINGS

- **NOT graded**, but contribute SIGNIFICANTLY to your success in the course
- 1 - 4 Algorithms chapters
- This is COLLEGE-LEVEL information, not children's stories
- Focus on what's shown **in bold and color** in the Algorithms textbook
- Use the lectures to clarify and “lock in” what you've read
- If you need Java help, consider the *Intro to Java Programming* textbook

LECTURES

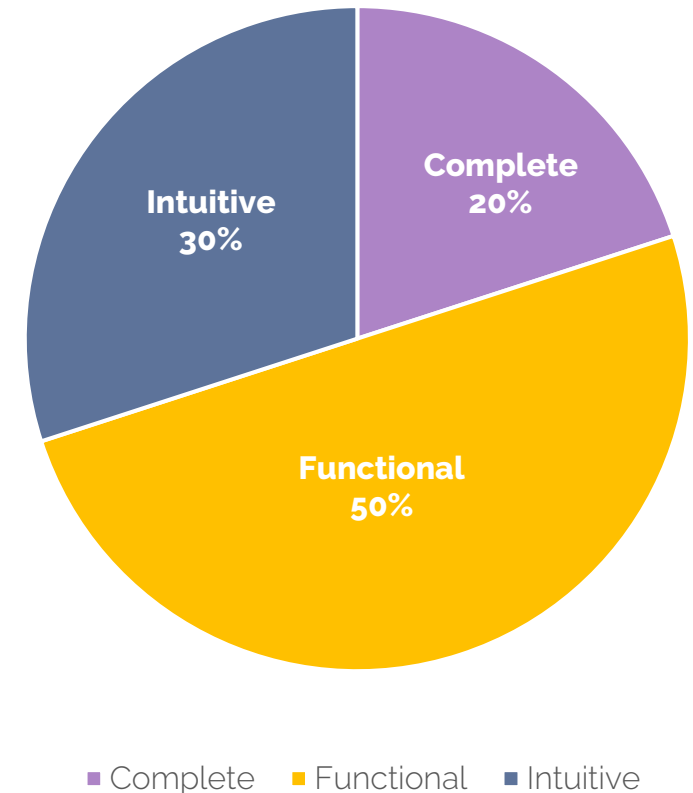
- Typically two or three sessions per class, ~50 minutes each, 7-10 pm
- Format includes PowerPoint, videos, whiteboard, etc.
- PDFs of presentations made available to students at end of class (after quizzes)
- x-**0** decks are **administrative**
- x-**1**, x-**2**, etc. decks have **course content**

Lecture Filename: **Deck 1-0.pdf**



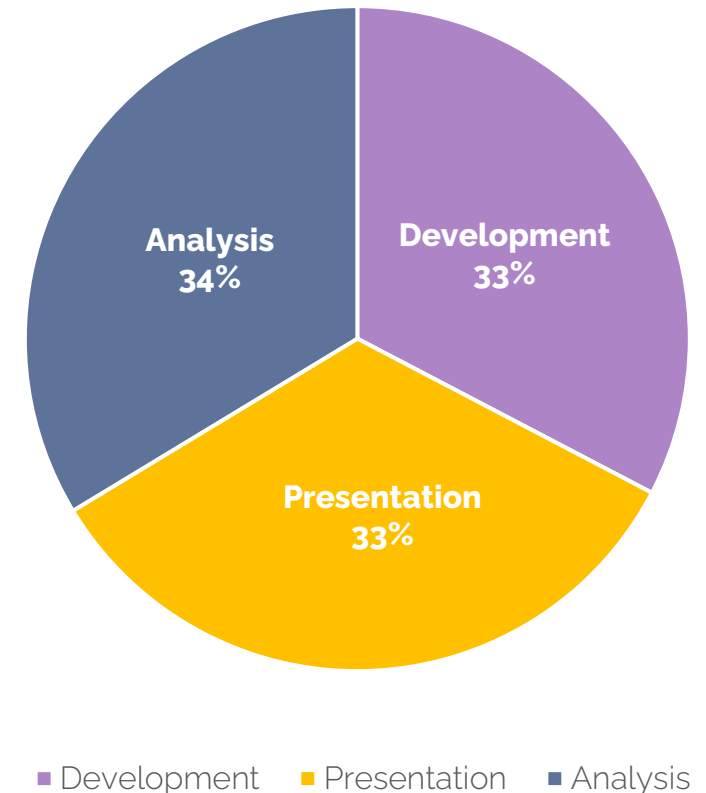
HOMEWORK

- 10 total, 20 points each
- Based on in-class exercises of functional Java algorithm examples
- Due at 7PM day of class (no exceptions)
- Will involve writing one or more Java programs
 - Must run without errors in IntelliJ IDEA Community 2019.2
 - Turn in the **.java** files, NOT the compiled .class files
 - Will USUALLY have an OUTPUT file (TXT) also attached with demonstration of program running three or more times



GROUP DISCUSSIONS

- 3 total “mini projects”, 100 points each
- Work in different groups for each topic
- Process
 - Analysis (one week)
 - Development (one or two weeks)
 - Presentation (one or two weeks)
- Topics
 - #1 – Sorting, Due Week 3
 - #2 – Graphs, Due Week 7
 - #3 – Data Processing, Due Week 11
- Use modern collaboration tools to facilitate and assign work across the whole team



QUIZZES

- 9 total, 20 points each
- Typically 1 per week
- Graded and may include extra credit
- Reinforce topics & terms from the lectures
- Cannot be made up

MID-TERM EXAM

- Broken into three parts:
 - Basic Assignment: 15-30 minutes
 - Moderate Assignment: 30-60 minutes
 - Advanced Assignment: 45-90 minutes
- Managed through BlackBoard
 - Students can take each part independently, whenever convenient during the test period
 - Assignments can be taken in any order
- Covers content from Weeks 1 – 5
- Available Sunday BEFORE Week 6 – Due Sunday AFTER Week 6

FINAL EXAM

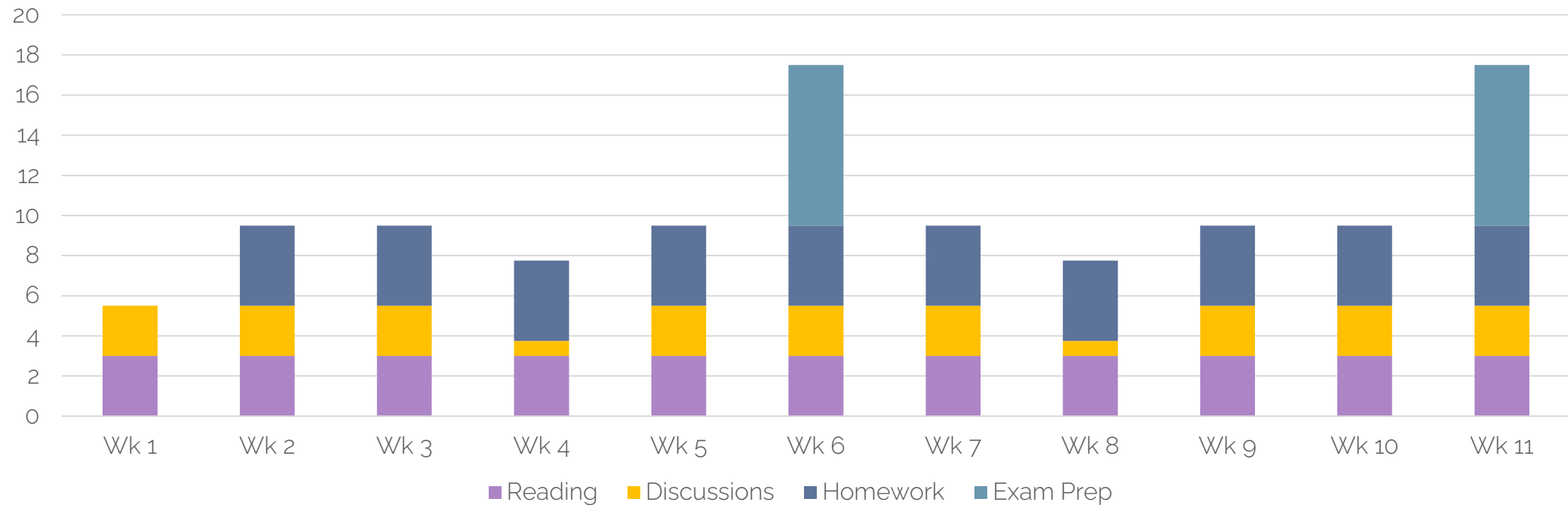
- Broken into three parts:
 - Basic Assignment: 15-30 minutes
 - Moderate Assignment: 30-60 minutes
 - Advanced Assignment: 45-90 minutes
- Managed through BlackBoard
 - Students can take each part independently, whenever convenient during the test period
 - Assignments can be taken in any order
- Covers content from Weeks 1 – 10
- Available Sunday BEFORE Week 11 – Due Sunday AFTER Week 11

STUDENT RESPONSIBILITIES: PREPARATION

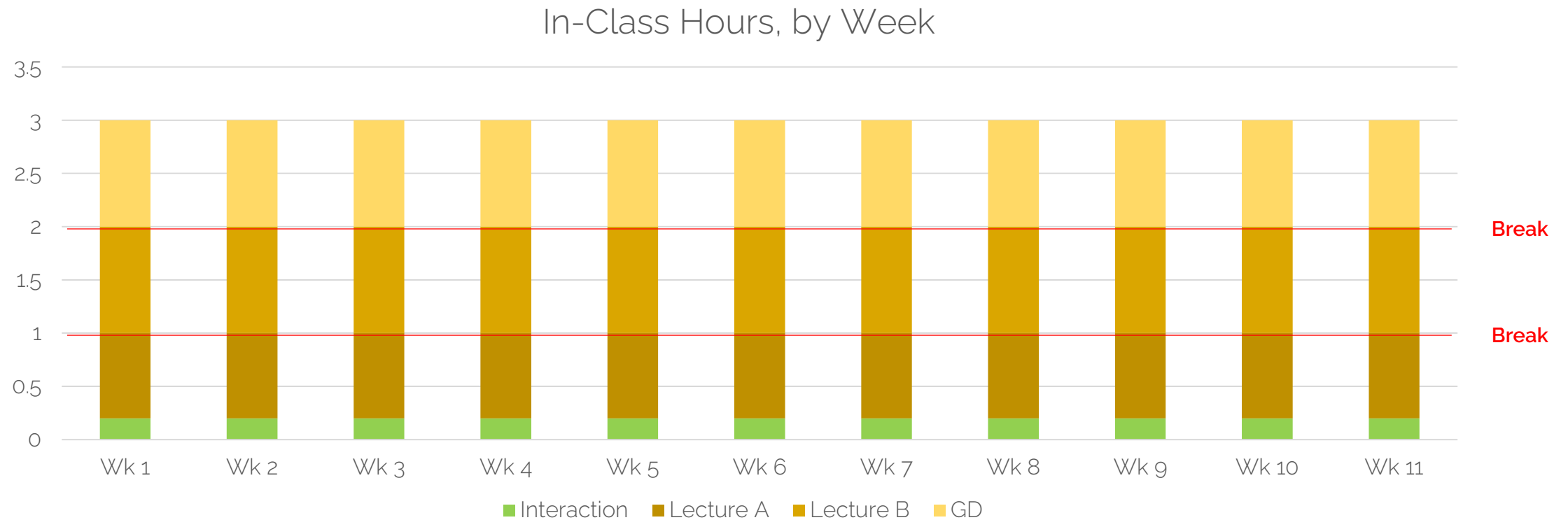
- Weekly Readings, ~3 hrs. per week, completed by 7PM day of class
- Discussion Groups, ~2.5 hrs. per week
- Weekly Homework, ~4 hrs. per week, completed by 7PM day of class
- Mid-Term Exam Preparation, ~8 hrs. during week before exam
- Final Exam Preparation, ~8 hrs. during week before exam

STUDENT TIME COMMITMENT: OUTSIDE OF CLASS

Preparation Hours Prior to Class, by Week



STUDENT TIME COMMITMENT: DURING VIRTUAL CLASS SESSION



ADDITIONAL RESOURCES

- Author's course website: <http://algs4.cs.princeton.edu>
 - Algorithms featured in the book in MANY programming languages
 - Online synopsis of the book
 - Exercises & SOME answers (as examples)
 - Additional course materials (data & code)
 - CHEATSHEET!

SYLLABUS

- Full details in the course syllabus
- When there's a discrepancy, the syllabus is always correct...

BUT

- Syllabus MAY be updated during the term of the course, but I will notify you WHEN changes are made, and WHY

SUMMARY

- Class meets 7-10, Wednesdays, Zoom online session
- Success = Do your work. Be courteous. Participate!
- Group Discussions = 3 “mini projects” due about every 3 weeks
- Reading = ~3 hours every week
- Weekly assignments, discussion forum, class prep = ~7 hours per week
- Exams: Mid-term and Final = ~8 hours of prep, week prior to test
- Learn and enjoy yourself!

REFERENCES

- Sedgewick, R. & Wayne, K (2011) *Algorithms, Fourth Edition*. Pearson Education.



QUESTIONS?