

CSL201

Data Structures

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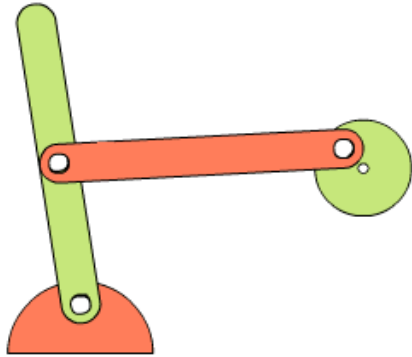
Consulting: by appointment

Teaching Assistants

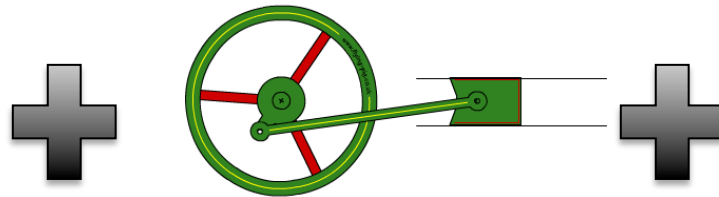
Amit- 2016csz0003@

Why do we study
data structures?

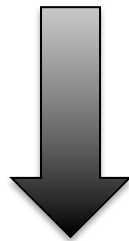
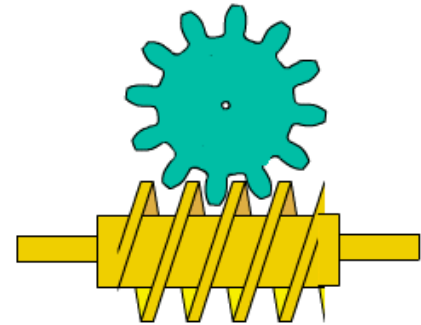
Crank



Piston



Gear



Data structures are the
fundamental building
blocks of computer
science!

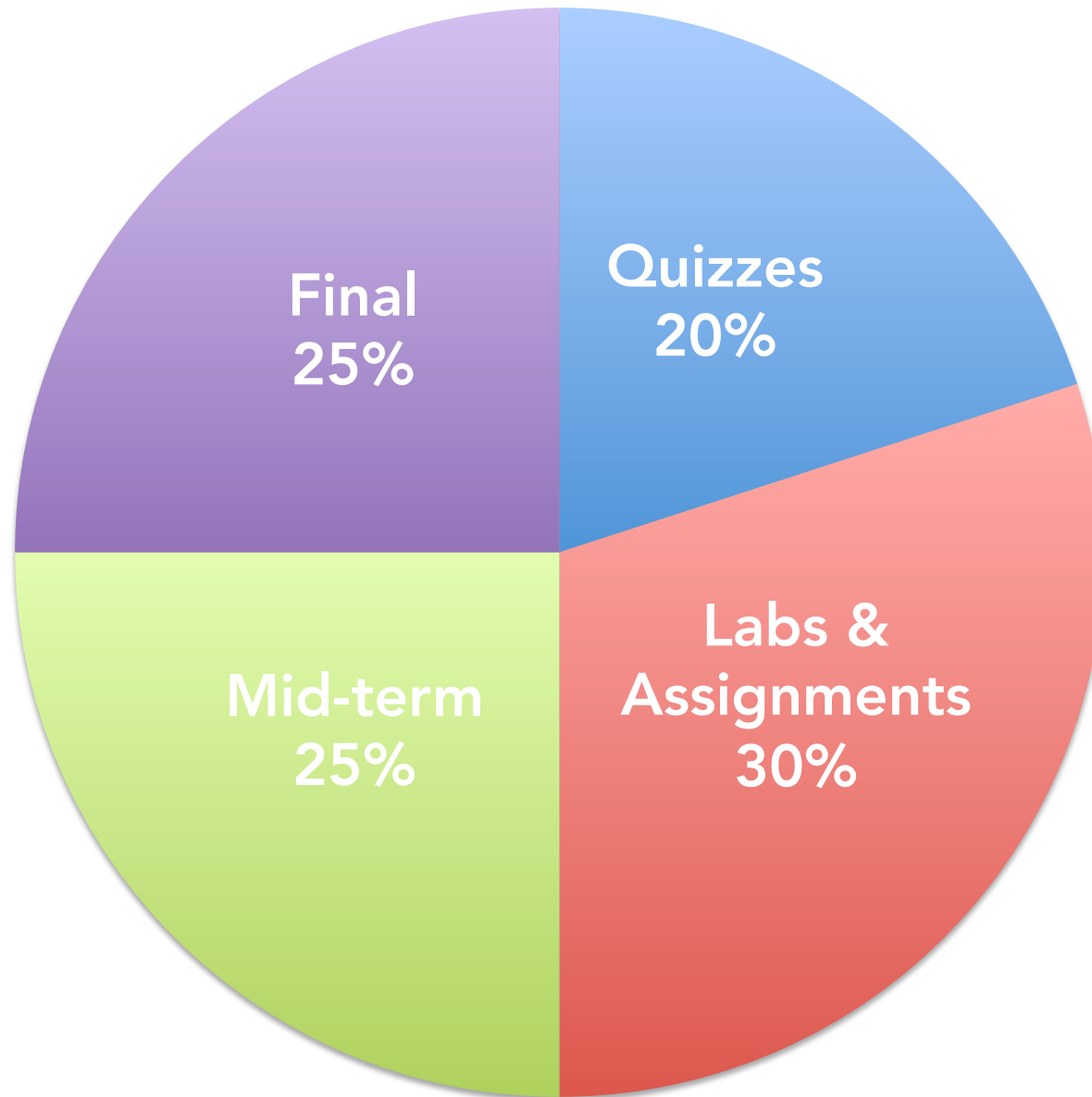
Lectures

Wed – 4:45 to 5:35 PM

Thu – 2:00 to 2:50 PM

Fri – 2:55 to 3:45 PM

Pass $\geq 40\%$



Lab

Fri 9 AM - 12.35 PM

Platform: g++

Assignments

- Use Makefile to compile
- Add documentation
- Code should run on lab 2 machines

Exams

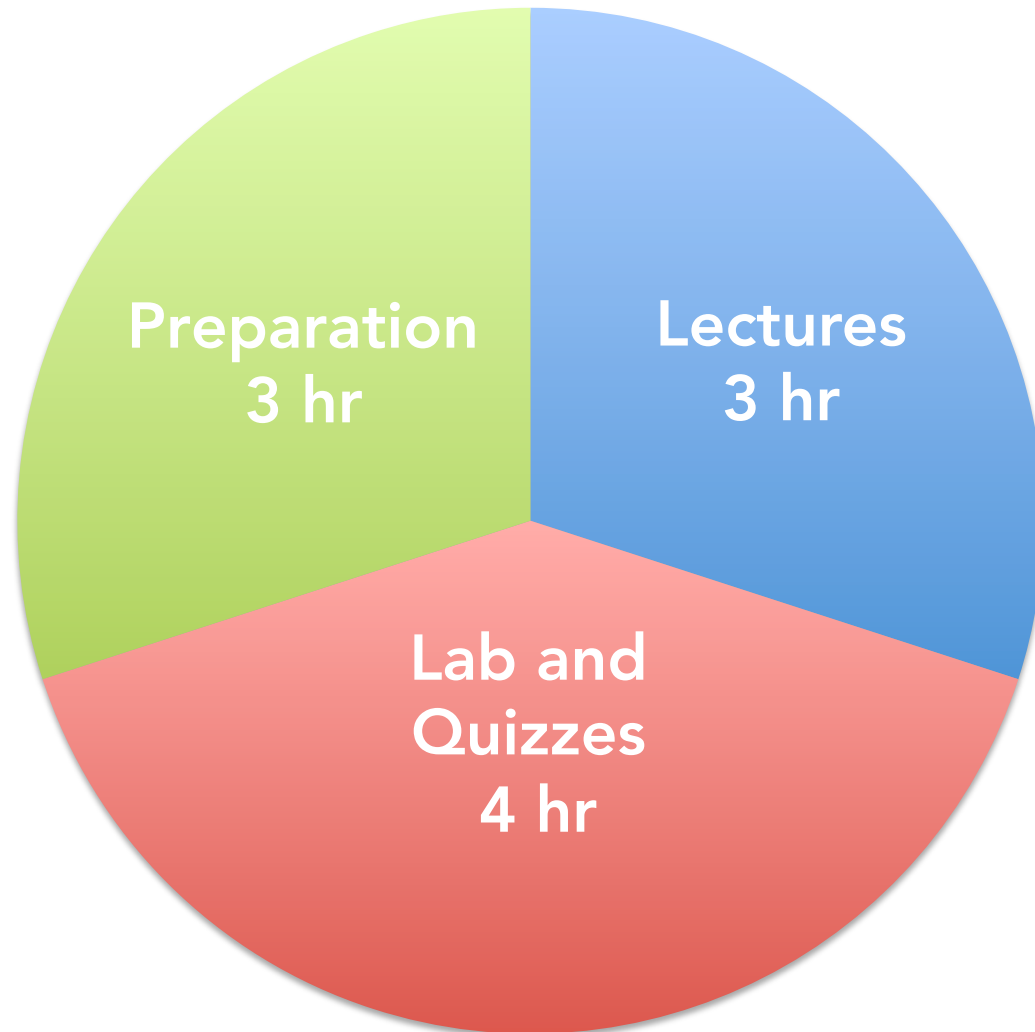
Mid-term – 3rd-9th Oct

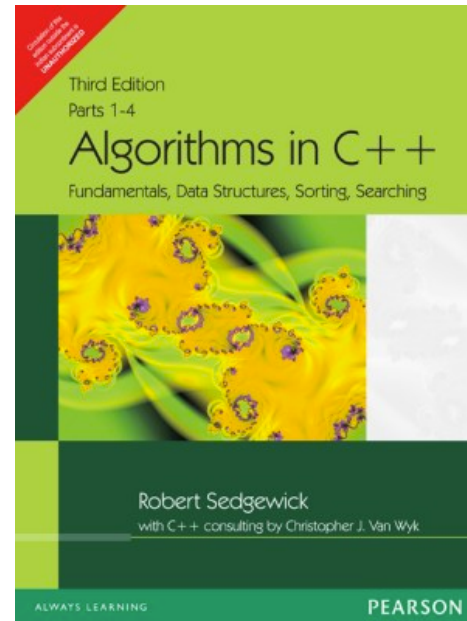
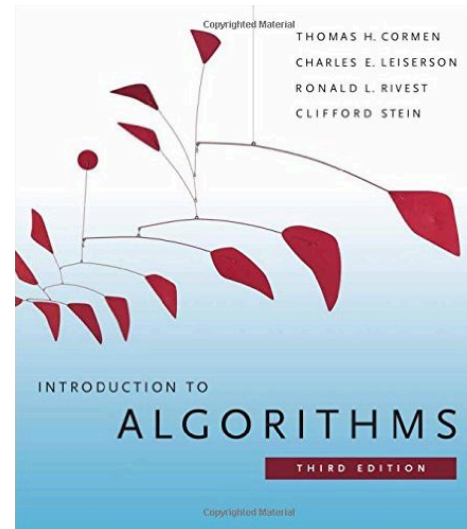
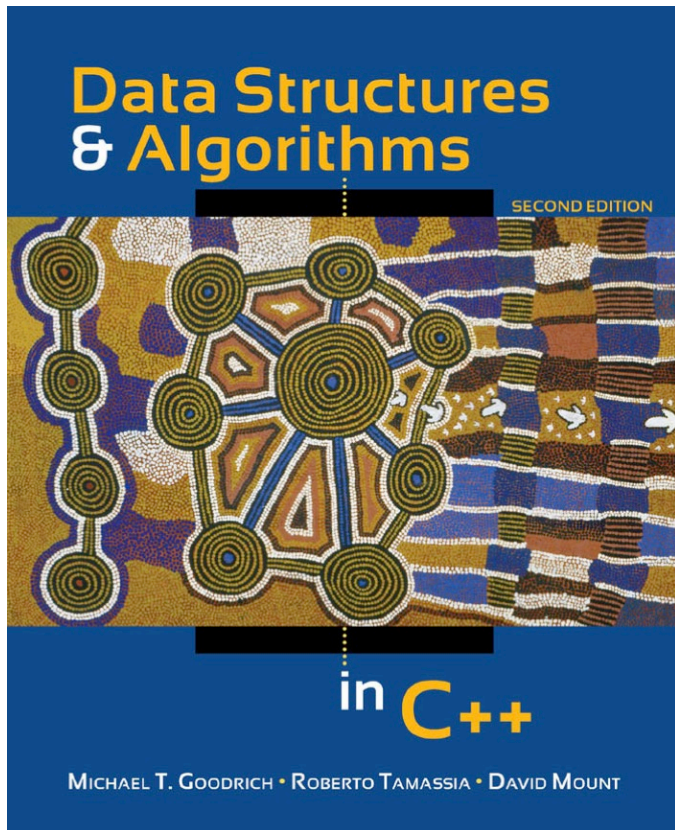
Final – 29th Nov - 8th Dec

Quizzes in alternate
weeks!

Friday: 9:30-11 AM
Computer Lab 2

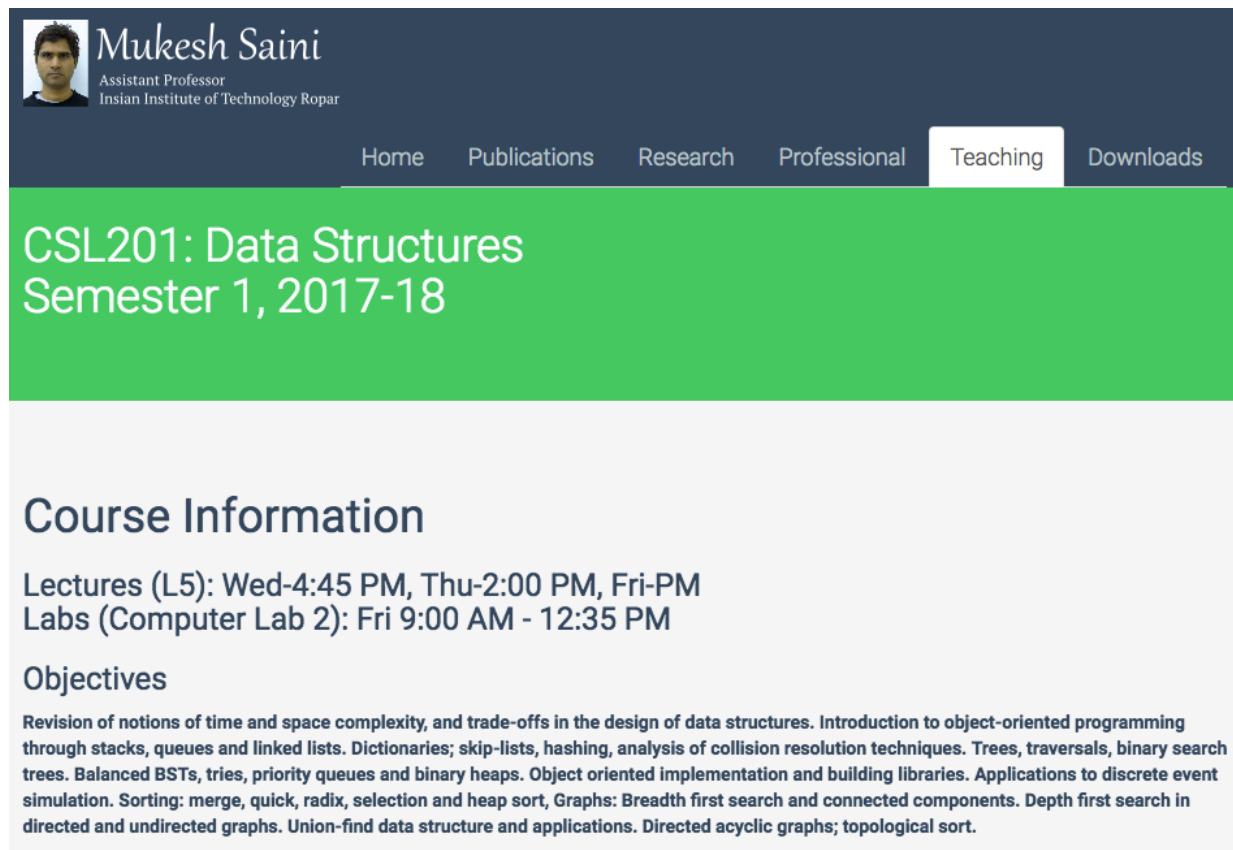
Expected Weekly Workload






Course Webpage

<http://www.iitrpr.ac.in/mukesh/CSL201-S1-Y1718.html>



 **Mukesh Saini**
Assistant Professor
Indian Institute of Technology Ropar

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CSL201: Data Structures Semester 1, 2017-18

Course Information

Lectures (L5): Wed-4:45 PM, Thu-2:00 PM, Fri-PM
Labs (Computer Lab 2): Fri 9:00 AM - 12:35 PM

Objectives

Revision of notions of time and space complexity, and trade-offs in the design of data structures. Introduction to object-oriented programming through stacks, queues and linked lists. Dictionaries; skip-lists, hashing, analysis of collision resolution techniques. Trees, traversals, binary search trees. Balanced BSTs, tries, priority queues and binary heaps. Object oriented implementation and building libraries. Applications to discrete event simulation. Sorting: merge, quick, radix, selection and heap sort, Graphs: Breadth first search and connected components. Depth first search in directed and undirected graphs. Union-find data structure and applications. Directed acyclic graphs; topological sort.

Prerequisite:
Introduction to
Computing

Outcomes

- You will be able to tell which data structure is good!
- You will be able to design data structure for a given problem!

Code of Ethics & Professional Responsibility

- Discussions are encouraged
- Submit only original work
 - No plagiarism/copying

-slides will be posted
online

-students should check
the schedule regularly

-take notes in the class

-interact with me and

TAs

feedback



Fundamental data structures

- array
- linked list
- string
- stack
- queue
- priority queue
- graph
- tree
- set and dictionary
- map

Algorithm Design Strategies

- Brute force
- Greedy approach
- Divide and conquer
- Dynamic programming
- Decrease and conquer
- Space and time tradeoffs