

CS5630

Cloud Computing

Prof. Supreeth Shastri

Computer Science

The University of Iowa

Am I in the right room?



A first course in cloud computing

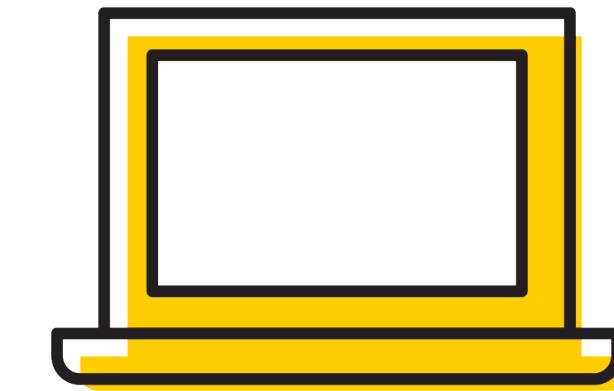
Technical foundation of cloud and its services w/ a focus on large-scale data processing



Graduate students and well-prepared CS undergraduates

Prerequisites: CS 2820 and 3620/3640 (min. grade of C)

Comfortable in programming (Python)



Website: <https://shastri.info/teaching/cs5630>

Sessions: TuTh 12:30 - 1:45pm
(221 MacLean Hall)

Discussions: <https://ui-cs5630-fall22.slack.com>

Meet your teaching staff



Supreeth Shastri (instructor)

- *Joined UI computer science in fall 2020*
- *I'm an experimental computer scientist*
- *Research: Cloud, Databases, Data regulations*

I started working on cloud as a grad student (and never stopped)

More: <https://shastri.info>



9

Thesis: Managing financial risks in cloud platforms

Total research papers related to cloud computing



I'm an organizing member of the ACM Symposium on Cloud Computing

Meet your teaching staff

Chaitraj Mete (TA)

- *2nd year CS graduate student*
- *Alumni of CS5630 (fall 2021)*
- *<https://www.linkedin.com/in/chaitraj-mete-b1296316a/>*



Best way to reach your teaching staff is via **Slack**

Course Structure

Foundation lectures

Instructor delivered content covering the technical foundations of cloud

Programming Projects

Learning to use the cloud, program for it, and deploy software on it

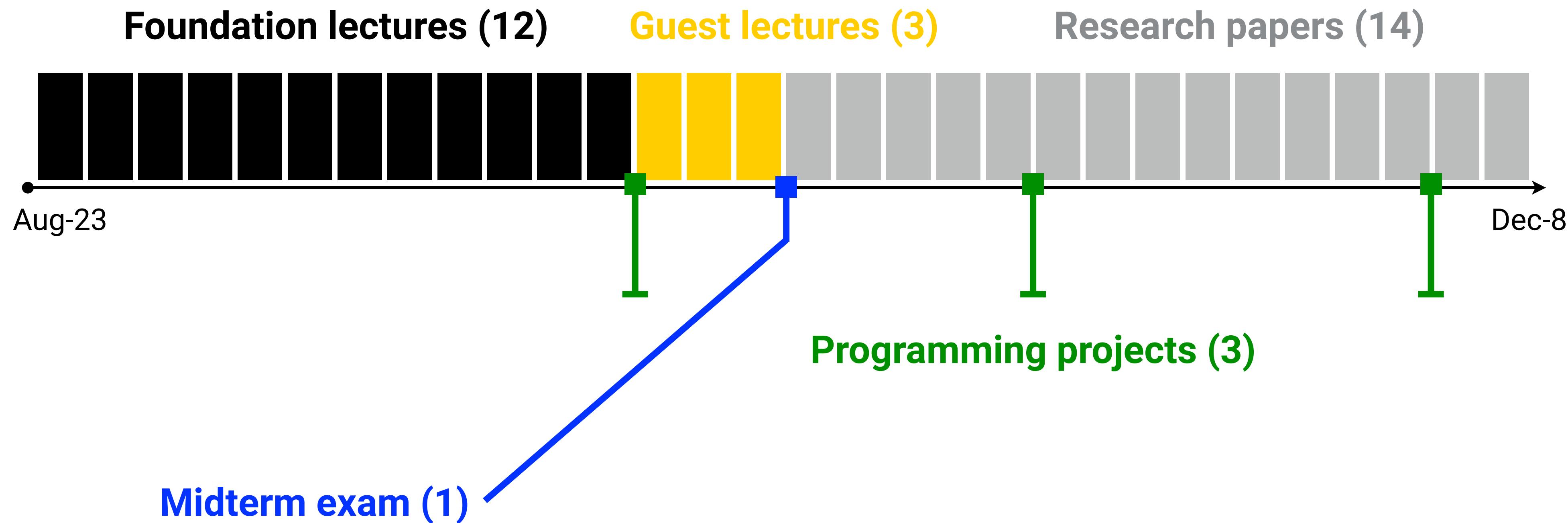
Research papers

Understanding the (past/future) evolution of cloud services and infrastructure

Guest lectures

Hear first hand from cloud experts, and interact with them live

Course Structure



Foundation lectures

Overview

Technical introduction to cloud computing

Twelve lectures focusing on *how the cloud works* and *how to use the cloud*

Cloud provider perspective

Design and operation of datacenters

Four lectures based on Google's experience in building and managing their datacenters

Cloud user perspective

Focus topic this year: data analytics on the cloud

Six lectures covering the basic use of cloud: data, compute, security, and performance

Guest lectures



Prof. David Irwin
UMass Amherst
Area: cloud and sustainability



Dr. Jayashree Mohan
Microsoft Research
Area: machine learning



Prof. Mohammad Shahrad
University of British Columbia
Area: serverless computing

Research papers

Cloud is still active research and development phase

There are no established textbooks/courses for cloud computing

An effective way to understand its evolution (past/present) is to read research papers

Reading research papers is a useful skill

Any advanced job (in engineering or research) would require you to do this

In this course, I expect you all to read and digest ~15 papers

Modalities

Students (in groups of two) will present a research paper to the class

You will lead the discussion, answer all the questions, and submit a review of the paper

Programming projects

(tentative list)

Project-1

Infrastructure-as-a-service (IaaS)

Learning to configure and use AWS EC2 VMs; benchmarking its performance

Project-2

Data analytics frameworks

Install, configure, and use Hadoop for a simple data analysis task

Project-3

Data analysis on the cloud

Use AWS Elastic MapReduce (EMR) to perform the same data analysis at scale

Grading

Grade allocations

Type	Number	Weight
Spot quizzes (in class)	20	20%
Written exam	1	20%
Research paper	1	20%
Programming Projects	3	40%

Course grades

Final Grade	Cutoff
A	90%
B	80%
C	70%
D	60%
F	<60%

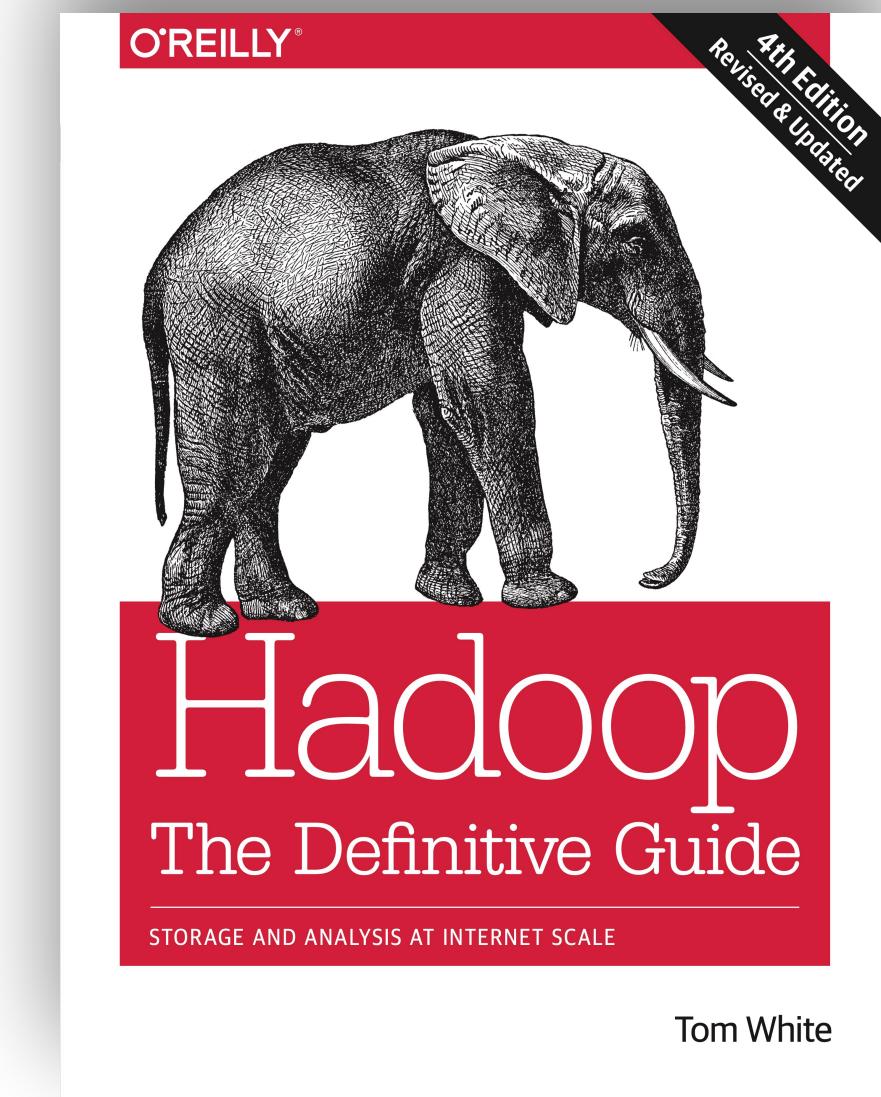
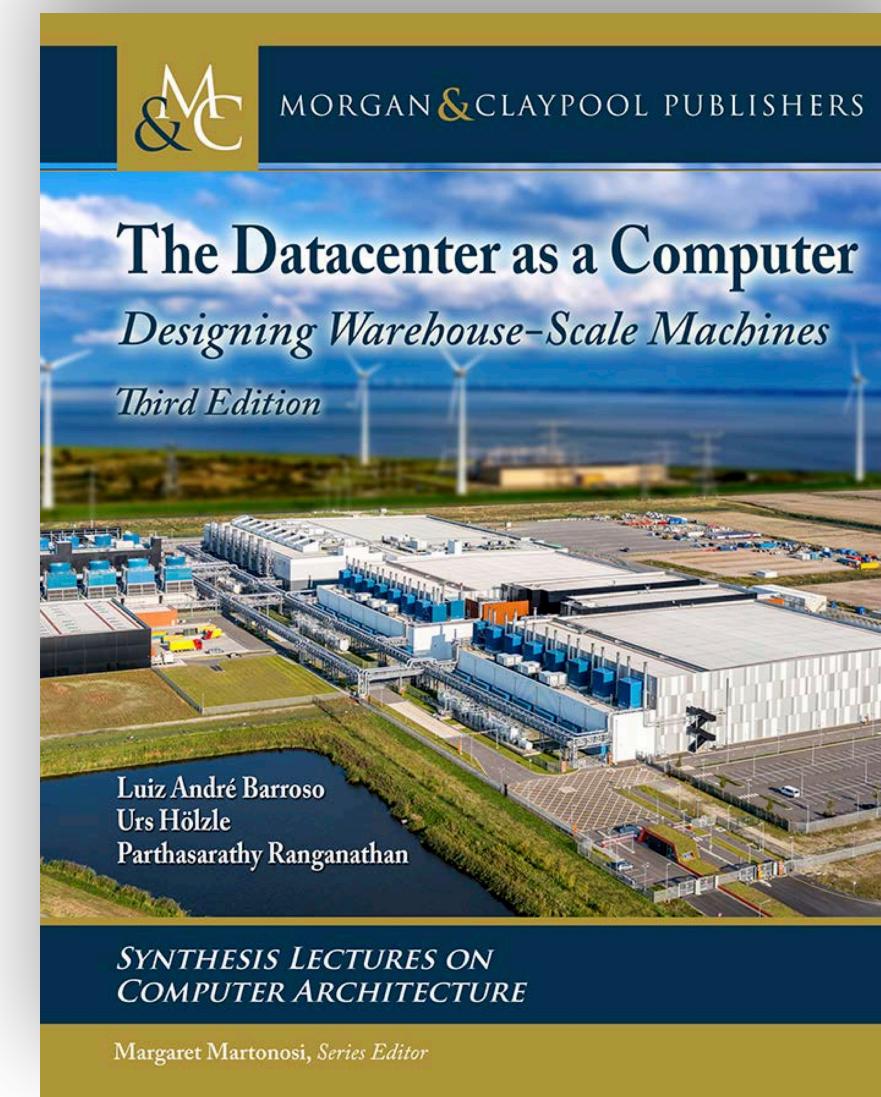
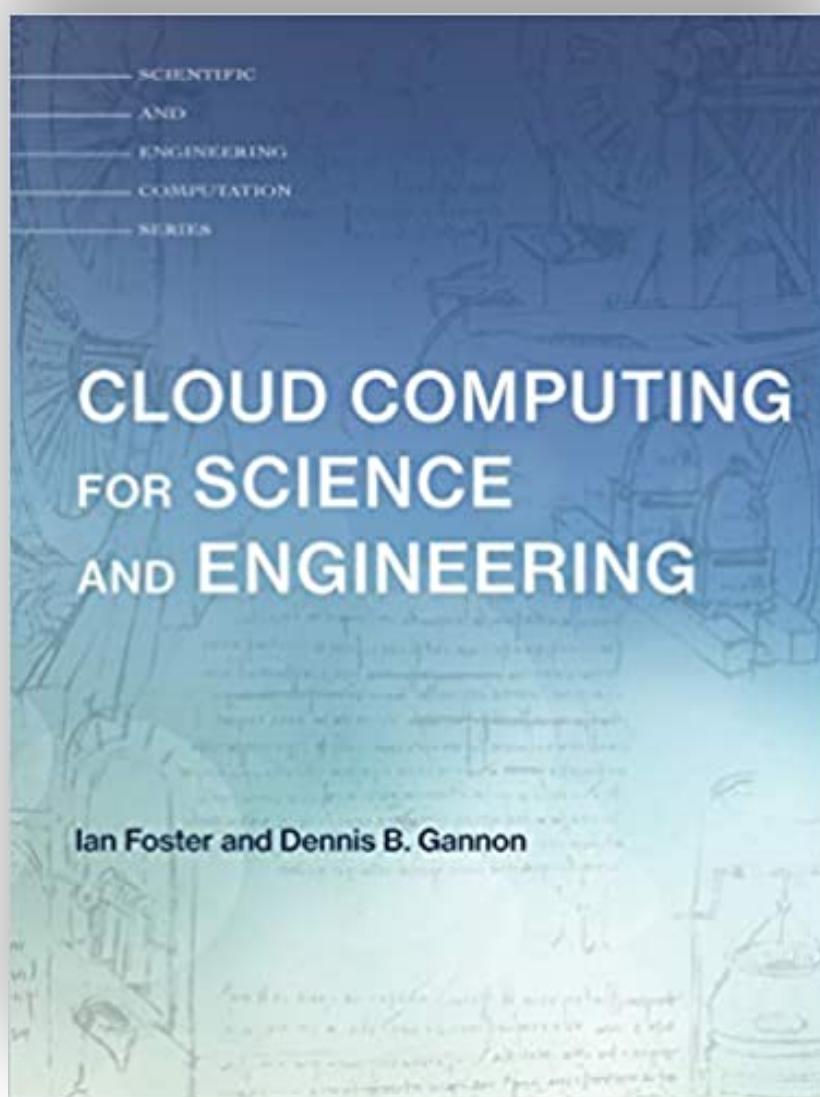
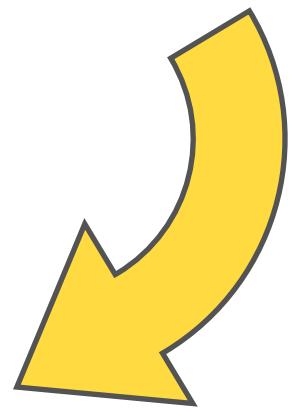
I expect most of you to be in this range

- We will use +/- grading
- We will not curve the grades

No required textbook!

- *Cloud is a new area and is fast evolving*
- *Cloud builds on multiple CS sub-disciplines: OS, networking, distributed systems, economics, database systems, and a variety of application areas (e.g., NLP, vision)*

That said, there are books that I do recommend (and have used in this course)



Ground rules and policies⁺

Attendance and absence

Attend classes regularly; contribute to classroom/Slack discussions; participate in spot quizzes

CLAS policy for excused absences



Academic integrity

Read the policy, and read it again. We are really serious about it.

First offense gets a score of zero. Repeated violation gets F for the course and will be reported to the Dean's office.

Late submissions

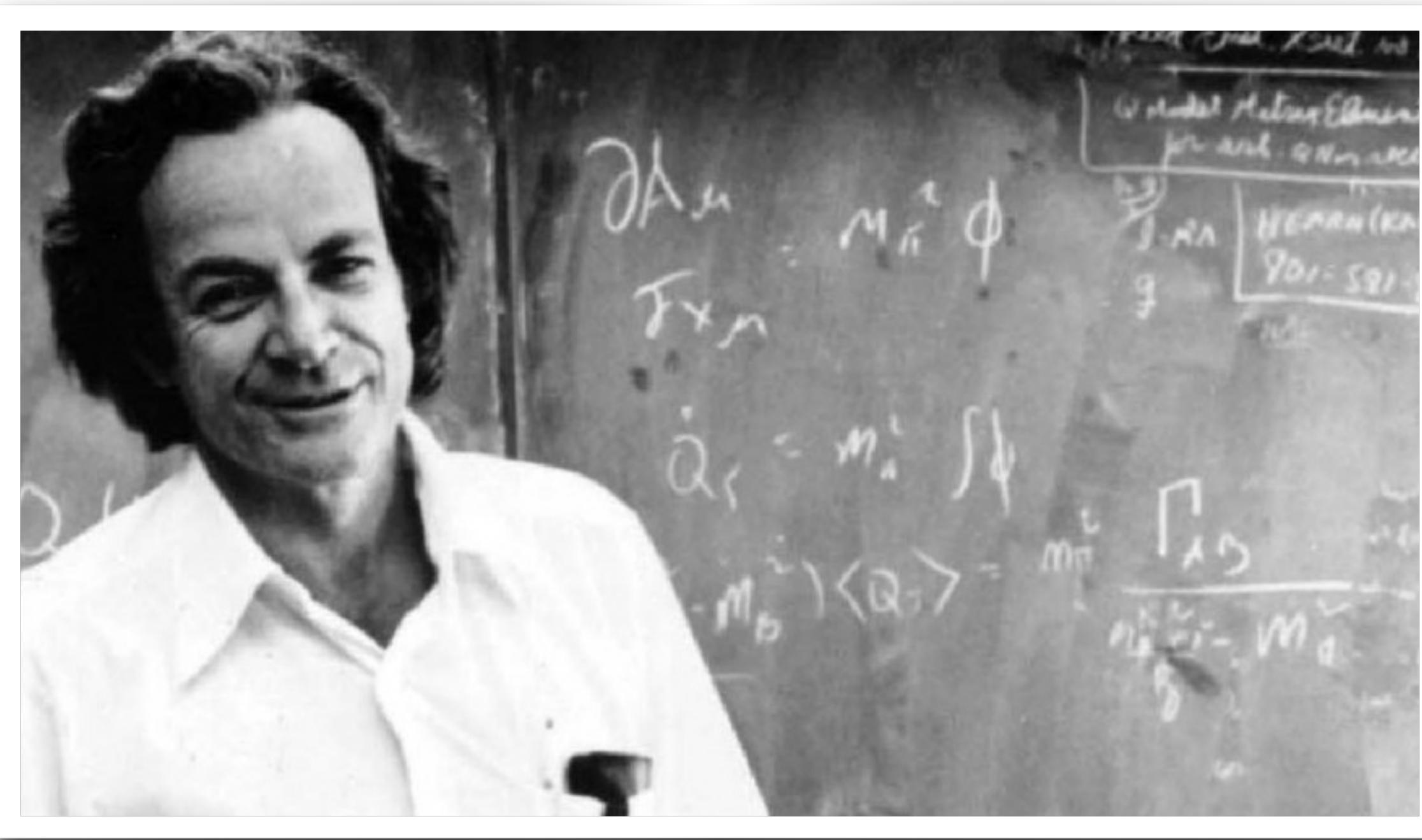
All submissions are due midnight on the specified date.

We will not accept any late submissions. However, you can turn in partial solutions (for partial credits).



If you have a COVID-19 related situation, please reach out

My teaching philosophy



“ Students don't need a perfect teacher. Students need **a happy teacher**, who is going to make them excited to come to school and grow a love for learning ”

– Richard Feynman

Spot Quiz (ICON)

Next Lecture

A comprehensive overview of cloud computing

- *What, why, and how of the cloud*
- *Technical and economic foundations*
- *Challenges and opportunities*

Above the Clouds: A Berkeley View of Cloud Computing



*Michael Armbrust
Armando Fox
Rean Griffith
Anthony D. Joseph
Randy H. Katz
Andrew Konwinski
Gunho Lee
David A. Patterson
Ariel Rabkin
Ion Stoica
Matei Zaharia*

Electrical Engineering and Computer Sciences
University of California at Berkeley

Technical Report No. UCB/EECS-2009-28
<http://www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.html>

February 10, 2009