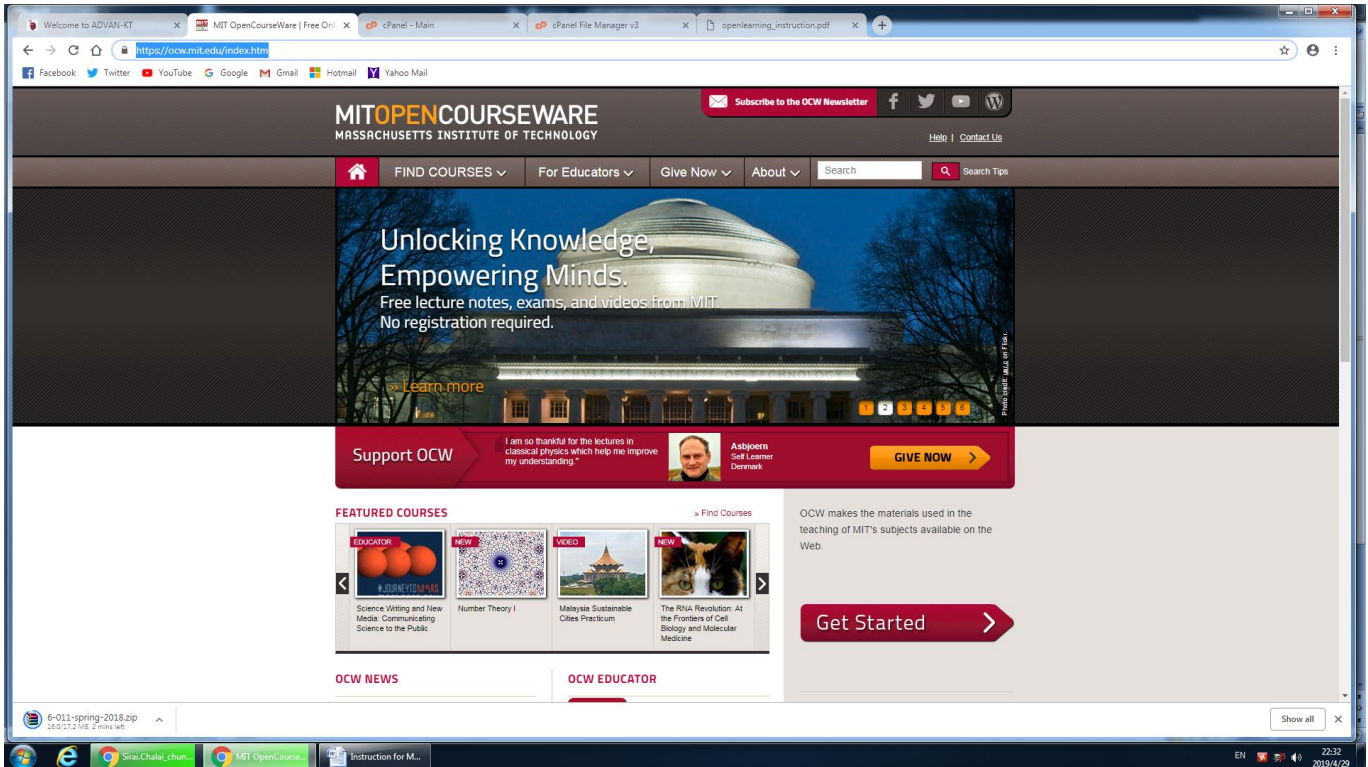
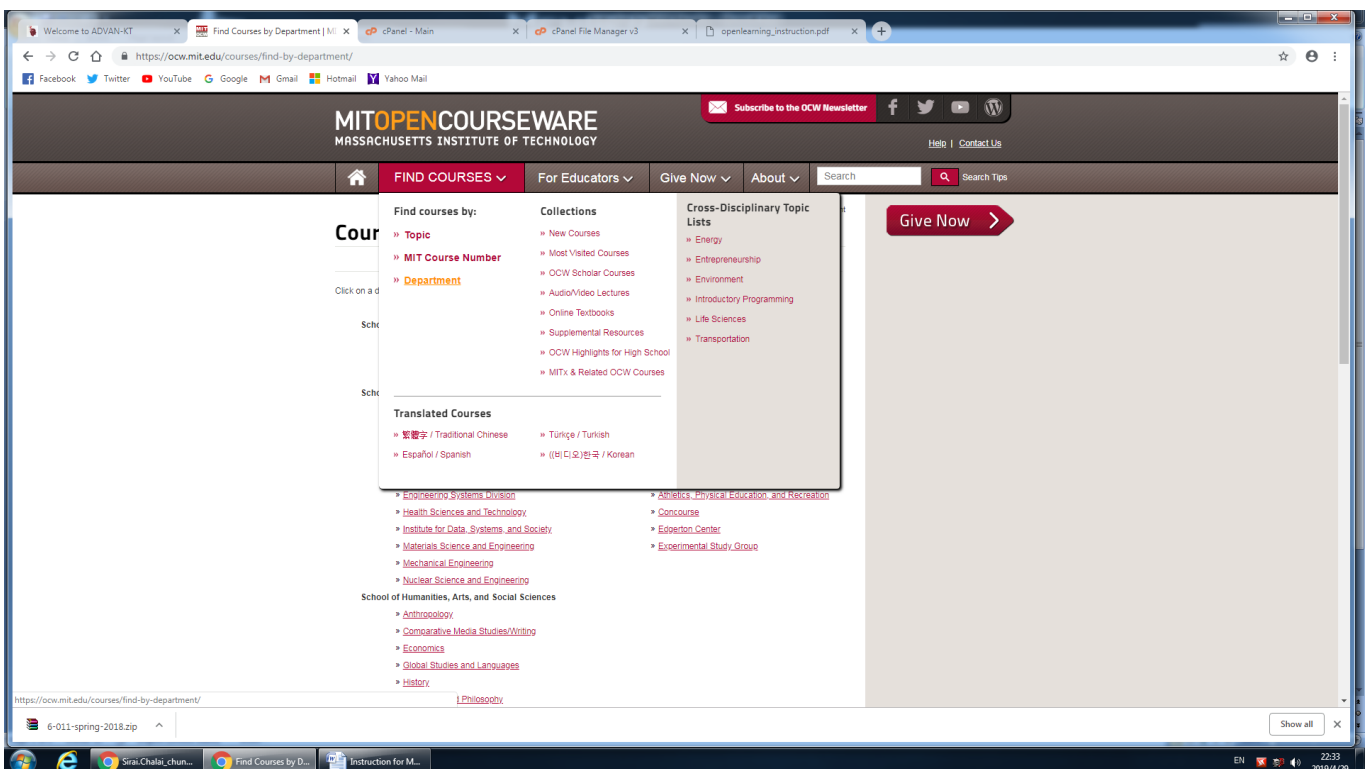


Instruction for MOOC Education

1) Go to <https://ocw.mit.edu>



2) Click "FIND COURSES" and then click Department



3) Select from COURSE FINDER. For example, I choose “Electrical Engineering and Computer Science”

The screenshot shows the MIT OpenCourseWare website. The main heading is "Electrical Engineering and Computer Science". Below the heading is a large image of a circuit board. To the right, there is a sidebar with "DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE LINKS" and a list of links: "Electrical Engineering and Computer Science Website", "Department Curriculum", "Learn more about MIT Engineering", and "Introductory Programming Courses on OCW". Below the sidebar is a portrait of a man. The main content area features "FEATURED COURSES" with four cards: "Mathematics for Computer Science", "Computer Systems Security", "Introduction to Probability", and "Probabilistic Systems Analysis and Applied Probability". At the bottom, there is a yellow banner that says "Need help getting started?".

4) Click from the list for “Underactuated Robotics”

The screenshot shows the MIT OpenCourseWare website for the "Underactuated Robotics" course. The main heading is "Underactuated Robotics". On the left, there is a sidebar with social media icons and a list of course sections: "COURSE HOME", "SYLLABUS", "CALENDAR", "READINGS", "ASSIGNMENTS", "EXAMS", "PROJECTS", "VIDEO LECTURES", and "DOWNLOAD COURSE MATERIALS". The main content area features a large image of a red flying robot and a black legged robot. To the right, there is a "WHY I GIVE" section with a quote: "... The lectures and the study materials from MIT professors are worth their weight in gold." and the name "Shailesh, Independent Learner". Below the images, there is a "Course Features" section. At the bottom, there is a yellow banner that says "Need help getting started?".

5) Click the “Video Lectures”

Course Features

- > [Video lectures](#)
- > [Assignments: problem sets with solutions](#)
- > [Exams \(no solutions\)](#)
- > [Projects \(no examples\)](#)
- > [Assignments: programming with examples](#)

Course Description

Robots today move far too conservatively, using control systems that attempt to maintain full control authority at all times. Humans and animals move much more aggressively by routinely executing motions which involve a loss of instantaneous control authority. Controlling nonlinear systems without complete control authority requires methods that can reason about and exploit the natural dynamics of our machines.

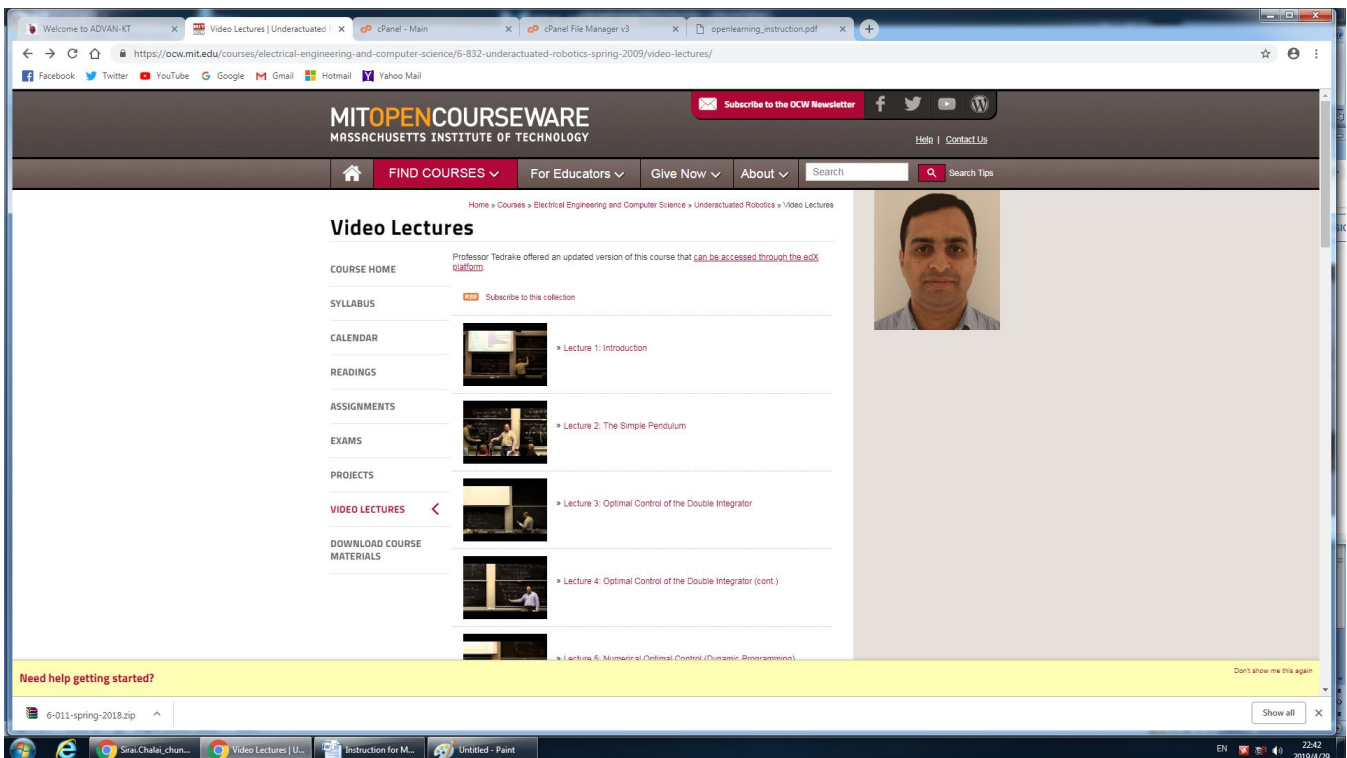
This course discusses nonlinear dynamics and control of underactuated mechanical systems, with an emphasis on machine learning methods. Topics include nonlinear dynamics of passive robots (walkers, swimmers, flyers), motion planning, partial feedback linearization, energy-shaping control, analytical optimal control, reinforcement learning/approximate optimal control, and the influence of mechanical design on control. Discussions include examples from biology and applications to legged locomotion, compliant manipulation, underwater robots, and flying machines.

Professor Tedrake offered an updated version of this course that [can be accessed through the edX platform](#).

Acknowledgements

Professor Tedrake would like to thank John Roberts for his help with the course and videotaping the lectures.

6) Click the “Video Lectures”



The screenshot shows a web browser displaying the MIT OpenCourseWare website. The page is titled "Video Lectures" and is part of the course "Underactuated Robotics" in the "Electrical Engineering and Computer Science" department. The page features a navigation menu with options like "FIND COURSES", "For Educators", "Give Now", and "About". A search bar is also present. The main content area includes a "COURSE HOME" section with a link to the updated version of the course on the edX platform. Below this, there is a "SYLLABUS" section with a "Subscribe to this collection" button. The "CALENDAR" section lists five video lectures: "Lecture 1: Introduction", "Lecture 2: The Simple Pendulum", "Lecture 3: Optimal Control of the Double Integrator", "Lecture 4: Optimal Control of the Double Integrator (cont.)", and "Lecture 5: Numerical Optimal Control (Dynamic Programming)". A profile picture of Professor Tedrake is visible on the right side of the page. At the bottom, there is a yellow banner that says "Need help getting started?" and a "Show all" button.

7) Click the "Lecture 1" and enjoy learn it

The screenshot displays the MIT OpenCourseWare website interface. At the top, the MIT OpenCourseWare logo is visible, along with navigation links for 'Home', 'Contact Us', and 'Subscribe to the OCW Newsletter'. Below the logo, there are several menu items: 'FIND COURSES', 'For Educators', 'Give Now', and 'About'. A search bar is also present.

The main content area features a breadcrumb trail: 'Home > Courses > Electrical Engineering and Computer Science > Underactuated Robotics > Video Lectures > Lecture 1: Introduction'. The title 'Lecture 1: Introduction' is prominently displayed. To the left of the main content is a sidebar with a list of course-related links: 'COURSE HOME', 'SYLLABUS', 'CALENDAR', 'READINGS', 'ASSIGNMENTS', 'EXAMS', 'PROJECTS', 'VIDEO LECTURES', and 'DOWNLOAD COURSE MATERIALS'. The 'VIDEO LECTURES' link is highlighted with a red arrow and a 'Next >' button.

The central focus is a video player showing a lecture. The video frame depicts a person standing in front of a chalkboard, writing mathematical equations. The equations include a matrix $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and a vector $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$. Below the video player, there are three buttons: 'About this Video', 'Playlist', and 'Download this Video'. Underneath these buttons, the text reads: 'Topics covered: Introduction' and 'Instructors: Russell Tedrake'.

At the bottom of the page, there is a yellow banner with the text 'Need help getting started?' and a 'Show all' button. The browser's address bar shows the URL: 'https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-832-underactuated-robotics-spring-2009/video-lectures/lecture-1-introduction/'. The browser's taskbar at the very bottom shows several open applications, including a file explorer window for '6-011-spring-2018.zip' and a document titled 'Instruction for M...'. The system tray in the bottom right corner shows the date and time as '22:45 2019/4/29'.