

August 2012 Newsletter

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Current Events in Context: The Mars Rover Curiosity



Artist's concept depicts the moment that NASA's Curiosity rover touches down onto the Martian surface. Image courtesy of [NASA](#).

At first it sounds like some villainous MIT final exam question: Design a system to oh-so-gently lower the equivalent of a one-ton Mini Cooper, loaded with highly sensitive computer equipment and a nuclear reactor, onto the Mars surface using a hovering "skycrane" that's only kept suspended in midair by rocket boosters? But this August, a team of NASA scientists pulled off precisely such an engineering feat in the highly celebrated, successful landing of the Mars rover Curiosity.

More engineering marvels are still to come. The perfectly intact, plutonium-powered rover is chock full of powerful instruments, and resting at the bottom of one of the deepest craters on the Mars surface, closest to where water might once have been found. Over the next two years, it will perform a variety of experiments looking for further clues to the existence of past life on the planet.

With past missions providing evidence that the planet once held water, scientists in this round of exploration are particularly interested in finding carbon-based molecules, the second most essential ingredient for life.

To strengthen your background knowledge on this complex

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We hope you learned something new or refreshed your memory on a topic you've previously studied.

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undertaking, OCW has a number of courses that cover various aspects of the science behind the Mars rover missions:

- [16.412J/6.834J Cognitive Robotics](#) addresses autonomous robotic systems that possess artificial reasoning skills, like the Mars Rover vehicles.
- [16.842 Fundamentals of Systems Engineering](#) covers the principles and methods of designing, testing, and building complex space systems.
- [STS.471J/16.895J/ESD.30J Engineering Apollo: The Moon Project as a Complex System](#) presents a detailed technical and historical analysis of early moon missions as an engineering case study.
- [16.346 Astrodynamics](#) focuses on space navigation calculations and maneuvers that governed the Apollo, Space Shuttle, and Mars exploration missions.
- [12.400 The Solar System](#) reviews the properties of our solar system, based on the latest data from interplanetary spacecraft, including the possibility of life in the solar system.



New Courses

- [CMS.S61 Special Subject: The Rise of Film Noir](#)
- [SP.341 History and Philosophy of Mechanics: Newton's Principia Mathematica](#)

Supplemental Resource

- [How to Process, Analyze and Visualize Data](#)

Updated Courses

- [11.124 Introduction to Education: Looking Forward and Looking Back on Education](#)
- [11.165 Infrastructure and Energy Technology Challenges](#)
- [18.152 Introduction to Partial Differential Equations](#)
- [21A.750J Social Theory and Analysis](#)
- [24.251 Introduction to Philosophy of Language](#)
- [ESD.83 Doctoral Seminar in Engineering Systems](#)

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OCW Course Champion Ewa Abraham

Thank you for your gift on behalf of
Sarah Abraham in support of OCW and the
Architecture course - 4.301

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Highlights for High School



ChemLab Boot Camp follows 14 MIT freshmen as they face the challenges of learning chemistry the MIT way.

Every January, the MIT Chemistry Department runs a four-week laboratory "boot camp" for freshmen (also known as [5.301 Chemistry Laboratory Techniques](#)), and those who pass are guaranteed a job in an MIT research lab.

Beginning next month, you can follow along as 14 students learn everything from column chromatography to protein assays.

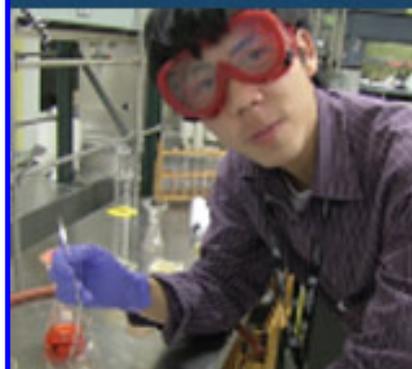
Watch as teams compete to grow the biggest crystal. Smell the stench as students synthesize their very own antibiotics, and hold your breath as they give presentations to the whole class.

Cringe as horror stories are told and made, and discover whether MIT students have love lives.

> [See the ChemLab Boot Camp trailer](#)

> [Sign up for e-mail notifications of episode releases and special content.](#)

Leading open learning projects create a massive online course that combines best-of-breed open offerings



5.301 ChemLab Boot Camp

a new video series on
MIT OpenCourseWare

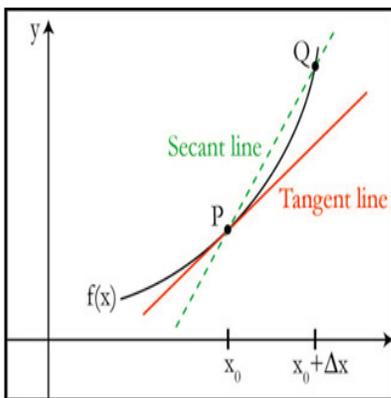
[▶ Watch the trailer now](#)

A group of leading open education projects is announcing the launch of a new Python programming massive open online course (MOOC) in October 2012 with no instructor involved. This so-called "mechanical" MOOC will combine the offerings of three leading open education projects--MIT OpenCourseWare, OpenStudy and Codecademy--loosely linked together by an e-mail list managed by Peer 2 Peer University to create a free and open course on introductory Python Programming.

Philipp Schmidt, Executive Director of Peer 2 Peer University, describes the project: "The mechanical MOOC is an attempt to leverage the power of the open web--by *loosely joining* together a set of independent building blocks. Rather than developing a new platform that does everything--deliver content, support community, provide feedback--we are simply connecting some of the most interesting applications out there, and letting each take care of a particular aspect of the overall learning experience."

> [Learn more at mechanicalmooc.org](http://mechanicalmooc.org).

Views from Supporters



"Wow, thanks so much for providing these videos!

I am a life-long learner and its so great to be able to have courses like this available to keep my mind active!

I dropped out of a prestigious engineering school 30+ years ago, partly as I had not had the high school math background to

be able to keep up (it wasn't available at my high school). I became a software engineer, however never felt like I had the math background to become really first class.

I think that if a high school student or struggling college student had access to these courses, and was driven to work on their own, it would really help them to succeed.

Anyway, I am now re-taking the classes I struggled with in engineering school and can spend as much time as I like to get the math skills solid. I'm having a great time. Thanks again so much for this wonderful resource."

- Anonymous, Independent Learner, US

> [Read more](#)

Tell us what you think of OCW at ocw-feedback@mit.edu.



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MIT OpenCourseWare is located at: One Broadway, Cambridge, MA 02142