The Online Revolution: Learning without Limits

Daphne Koller
Massive Open Online Course

100,000

400
Coursera

Take the world's best courses, online, for free.

What would you like to learn about?

Join 3,214,124 Courserians.
Learn from 334 courses, from 62 universities.

How it works »

Social entrepreneurship
Pedagogical foundations
Broad range of courses
Partnership with universities
• 30 of the top 60 universities worldwide (Academic Ranking of World Universities)
• The #1 or #2 ranked university in 14 countries.
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Duration</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E-learning and Digital Cultures</strong></td>
<td>Jeremy Knox, Sian Bayne, Hamish Macleod, Jen Ross, Christine Sinclair</td>
<td>Jan 28th 2013</td>
<td>5 weeks long</td>
</tr>
<tr>
<td><strong>Introduction to Philosophy</strong></td>
<td>Dave Ward, Duncan Pritchard, Michela Massimi, Suilin Lavelle, Matthew Christman, Allan Haslett, Alasdair Richmond</td>
<td>Jan 28th 2013</td>
<td>7 weeks long</td>
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<tr>
<td><strong>The Social Context of Mental Health and Illness</strong></td>
<td>Charmaine Williams</td>
<td>Jan 28th 2013</td>
<td>6 weeks long</td>
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<tr>
<td><strong>Critical Thinking in Global Challenges</strong></td>
<td>Celine Caquineau, Mayank Dutla</td>
<td>Jan 28th 2013</td>
<td>5 weeks long</td>
</tr>
<tr>
<td><strong>Introduction to Computer Networks</strong></td>
<td>Arvind Krishnamurthy, David Wetherell, John Zaharjan</td>
<td>Jan 28th 2013</td>
<td>10 weeks long</td>
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<tr>
<td><strong>Grow to Greatness: Smart Growth for Private Businesses, Part I</strong></td>
<td>Edward D. Hess</td>
<td>Jan 28th 2013</td>
<td>5 weeks long</td>
</tr>
</tbody>
</table>
Entry level courses:

- 20+ entry level courses on Coursera
- Spanning broad base of topics: math, bio, writing, physics, psych, chem, CS, accounting
- Hosting 7 of 11 Gates funded entry-level MOOCs
- 5 ACE-accredited classes
MSJC won a Gates grant to produce a remedial English writing MOOC

Purpose of this course: preparing students for a high-stakes English 101 placement exam; poor test performance adversely affects degree completion time

Currently, only 15% of students pass English 101

Course is free for the first five years

Paid peer tutors will assist students through feedback and forum monitoring
Coursera changed my life....If I would have never taken the sociology course I would have never met some amazing people including one who helped me step out of my daily me and her and I would have never co-founded an NGO together. Now both of us take Coursera courses to help us in our NGO work. (Jolene Campbell)
I grew a lot from answering the longer quizzes and wrestling with the complex essay grading rubrics… you are not only allowing autistic people to learn, but actually diminishing the severity of the illness itself. (Daniel Bergmann)
The student experience
Modern Genomics

Genes and alleles (10 min)

Mendelian inheritance (13 min)

What is DNA? (12 min)

Modern sequencing methods (11 min)

Genomic economics (8 min)

Personalized medicine (13 min)

History: The Human Genome Project (12 min)

Commercial Genomics (OPTIONAL)

Genetic testing in the commercial world (11 min)

Protecting privacy (9 minutes)

Case study: direct-to-consumer genetics (12 min)

Case study: family planning (13 min)

Basic Genetics Refresher (OPTIONAL)

Personalized Learning
In Lecture Interaction
Innovative Lecture Formats

1. Sustainability
2. Health Policy & the Affordable Care Act
3. Introduction to Sociology
4. Gamification
Multiple choice

Which of these is a reasonable definition of machine learning?

- Machine learning is the science of programming computers.
- Machine learning is the field of allowing robots to act intelligently.
- Machine learning is the field of study that gives computers the ability to learn without being explicitly programmed.
- Machine learning means from labeled data.

Short answer (regular expression)

Who discovered the theory of general relativity?

Albert Einstein

Math expressions

**Question 1**

What is the derivative of \( \frac{\sin(x)}{x} \) w.r.t. \( x \)?

\( \frac{(x \cos(x) - \sin(x))}{x^2} \)

Your submission is equivalent to: \( \frac{x \cos(x) - \sin(x)}{x^2} \)
For students of similar current performance, mastery-based score improvements correlate with future performance.
Peer Grading
Analysis by:
Matthew Salganik & Mitch Duneier
Princeton University Sociology Dept.
Creative, open-ended assignments via peer grading
Decision matrix

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No tags yet. + Add Tag

Jenny Barthold · 4 days ago

Hilarious.
I found myself backing into the numbers that would give me the outcome I desired—a trip to the beach. I have learned from experience that my regrets are almost always for things not done, so I came up with numbers that would ensure my decision to go.

All this was pretty unconscious until I got the answer I wanted with a burst of realization that I had “intended” it from the beginning.

I understand that most decisions are made before we reason out their justifications, so why not skip the pretense of reasoning and just go with the gut from the start?

Liana Besenghi · 4 days ago

I think it is within our nature to attempt to justify our decisions, particularly if they are in conflict with what we may think we ought to be doing instead, or what we think others might think we ought to be doing. We have always reasoned and justified...
Randomization

No programming required

Instant Feedback

Rich formatting, mathematical expressions, JavaScript, etc

Authoring tools: As easy to use as Google docs
Identity Verification & Academic Integrity

Earn a Verified Certificate.

Duke University
Introduction to Genetics and Evolution
Mohamed Noor

Regular price: $99.99
Introductory price: $49.00
JOIN SIGNATURE TRACK

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Link your coursework securely to your real identity using your photo ID and unique typing pattern.

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Earn official recognition from Duke University and Coursera for your accomplishment with a verifiable electronic certificate.

Share Your Success
Share your course records with employers, educational institutions, or anyone else through a unique, secure URL.

Digital webcam proctoring
Wrong student answers

Detailed Analytics Improve Teaching
These lessons have been much harder to focus on (at least for me), because there was no talking face.
Enables rich ecosystem of educational apps, with shared data model

- Physics simulators
- Multi-student games
- Note taking tools, student organization tools, ….
- Advanced auto-graders, adaptive learning software, ….

**Seamless integration**

- Integration via APIs
- We help scale up from 1 to 100,000 students

**Supports experimentation**

- Instructors can build their own tools for their class
• Support small, closed study groups within a larger course:
  • On-campus class announcements
  • Closed forums
  • Notes and note-taking tools
  • Instructor access to grades for the students in the section
• Facilitate closer interactions between instructors, TAs and students
• … while benefiting from the richness of interaction in a larger community
College is a place where a professor’s lecture notes go straight to the students’ lecture notes, without passing through the brains of either.

—Edwin Emery Slosson
"Improved Learning in a Large-Enrollment Physics Class."

Active Learning in the Classroom
• High-quality online content
• Produced locally or adopted from another institution

• High-touch interaction with local instructor
• Active learning, problem solving, personal attention to students

The Best of Both Worlds
• Self-selected level of guidance
  – E.g. if a student is stronger in Math than English, she may elect to enroll in a lower-touch Math, but a higher-touch English
  – Students might pay according to the level of ‘touch’ they receive in the course

• Multi-campus or multi-section enrollment
  – One large course offers economies of scale, richer community
  – Smaller groups embedded within course allow individualized attention from instructor
  – Group composition can be based on location, ability, interests, …
A New Frontier for Education

Student Learning

High

Office hours

Traditional instruction

Low

MOOCs

Old frontier

New frontier

Faculty Productivity

High

Low

improve learning

decrease costs

Terwiesch, 2012

decrease costs
Learning without Limits

- North America: 35.2%
- Europe: 28.2%
- Asia: 21.4%
- South America: 8.8%
- Africa: 3.6%
- Oceania: 2.8%