Development of a Blended edX Resource for Face-to-Face and Online Learning in Physics 100

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The Problem

Physics 100 has…

•Lots of course components with marks: Lectures, Labs, Tutorials, Homework, Exams.
•Lots of due dates.
•Different sites for homework, discussions, notes - all with registration.

The Solution

One place for all course materials:

- Homework
- Reading quizzes
- Interactive learning modules
- Lecture, lab, and tutorial worksheets
- Notes and instructions
- Videos
- Lab homework/project submission

Immediate access to all materials

- without complicated registration.

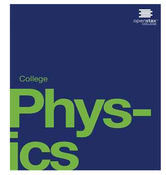
No cost: all materials free to students.

Our Approach

edX edge

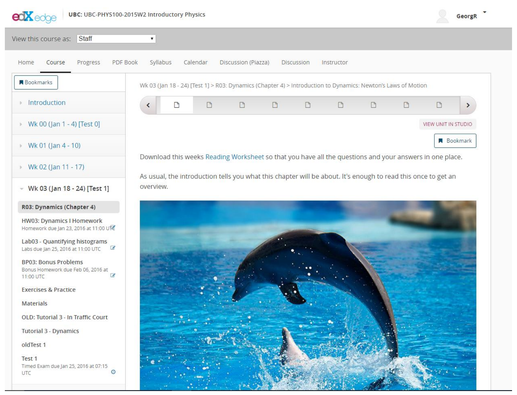
One Resource for F2F and Online Sections

•Online interactive “Learning Modules” as self-study tool for conceptual learning.
•Online Labs now used in F2F course: same learning with fewer resources.
•Online “End-of-Module” tests replace midterms in F2F sections; enable frequent testing.
•Combined human resources – can do more and better.



Resources for Theoretical Part (“Lecture”)

- Open text: chapters divided by week or complete as pdf
- reading quiz
- Learning modules
- In-class worksheets (pdf)
- Homework database
- Test question database:
  - Frequent testing structure (with automatic grading)
  - Bonus tests for Mastery approach

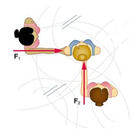


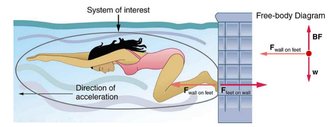
Resources for Hands-on Part (“Lab”)

- Interactive lab modules with questions
- Instructional videos, instruction manual
- Self-assessments
- Project/proposal submission and peer assessment of proposal
- Lab homework submission

Open-Stax Textbook

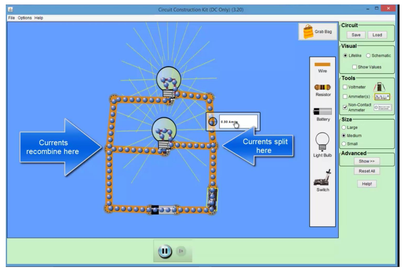
- Good algebra-based book.
- Ideal for integration with edX:
- Available as pdf, xml, or printed copy
- Features self-study tools, multiple-choice, and end-of-chapter questions.
- Additional resources such as concept coach.





Next on Physics 100 edX

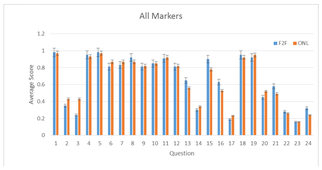
- Animated worked examples support homework.
- Video introductions of “big picture” idea.
- Interactive worksheet solutions.



Online Labs

- Hands-on activities at home with everyday materials (watches, rulers, smartphones, etc.)
- Focus on understanding experimental data and graphs.
- Inquiry-based format.
- End-of-term final project:

✓ Online submission
✓ Main assessment of lab
✓ Assessed by TAs (24 question rubric)
✓ Same learning as in F2F labs.



Acknowledgements

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Student Feedback

- not much yet
- students appreciate no cost resources
- Focus groups/surveys this summer.