Teaching Wireless Networks with GENI

why, and how

Fraida Fund
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19th GENI Engineering Conference

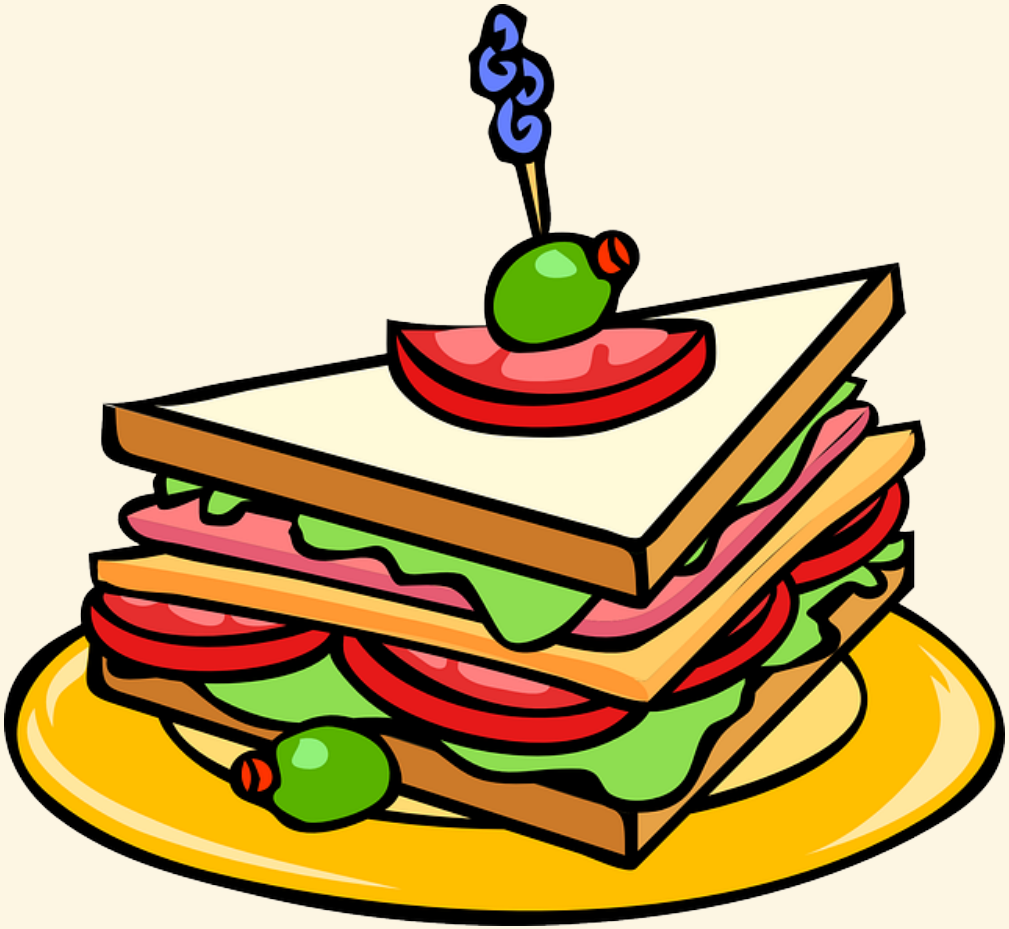
GENI WiMAX
Classroom-as-a-Service

A **fully hosted** lab component to supplement classes in computer networks and wireless communications.

Tried and tested

Used with **5** student cohorts at **3** universities
(including over **180** students).

Educational philosophy



Why include wireless in your class?

- The network is reliable.
- Latency is zero.
- Bandwidth is infinite.
- The network is secure.
- Topology doesn't change.
- There is one administrator.
- Transport cost is zero.
- The network is homogeneous.

- The world is flat.
- A radio's transmission area is circular.
- All radios have equal range.
- If I can hear you, you can hear me (symmetry).
- If I can hear you at all, I can hear you perfectly.
- Signal strength is a simple function of distance.
- The RF hardware is perfect.

Example

Must the same modulation and coding profile be used for **traffic from base station to mobile** as for traffic **from mobile to base station**? Explain your reasoning.

What's in the box?

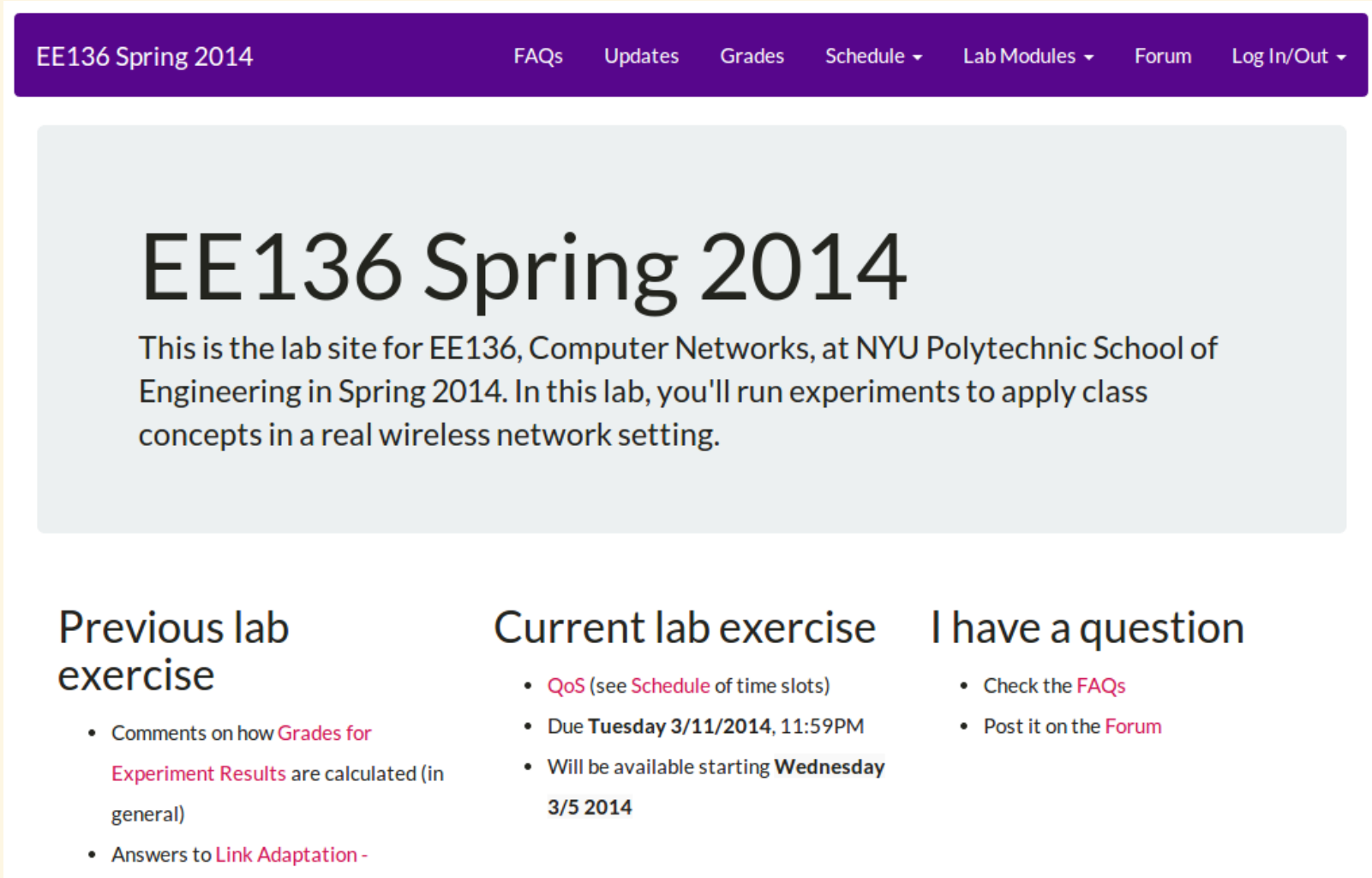
Classroom-as-a-service

Offered as a **fully hosted** service

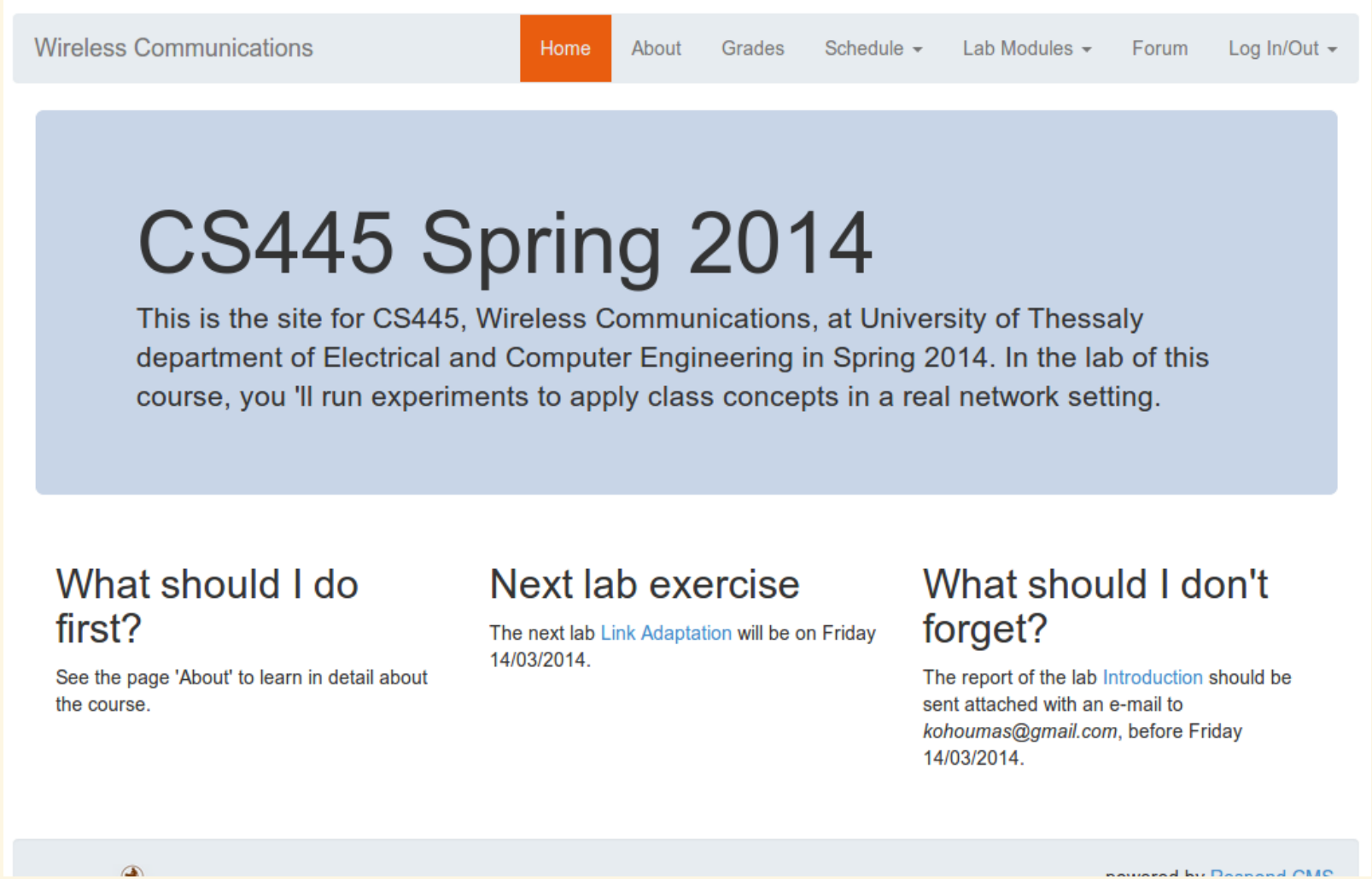
Menu

Module	*Students*
Introduction and Lab Orientation	159
DASH Video Delivery	98
Link Adaptation (Modulation and Coding)	91
QoS of Wireless Networks	85
SCTP	50
Mobility (Vertical Handover)	48
Write Your Own Experiment Script (WSN)	38
Outdoor Wireless Propagation	31
Indoor Wireless Propagation	8
TCP	0
RF Hardware	0

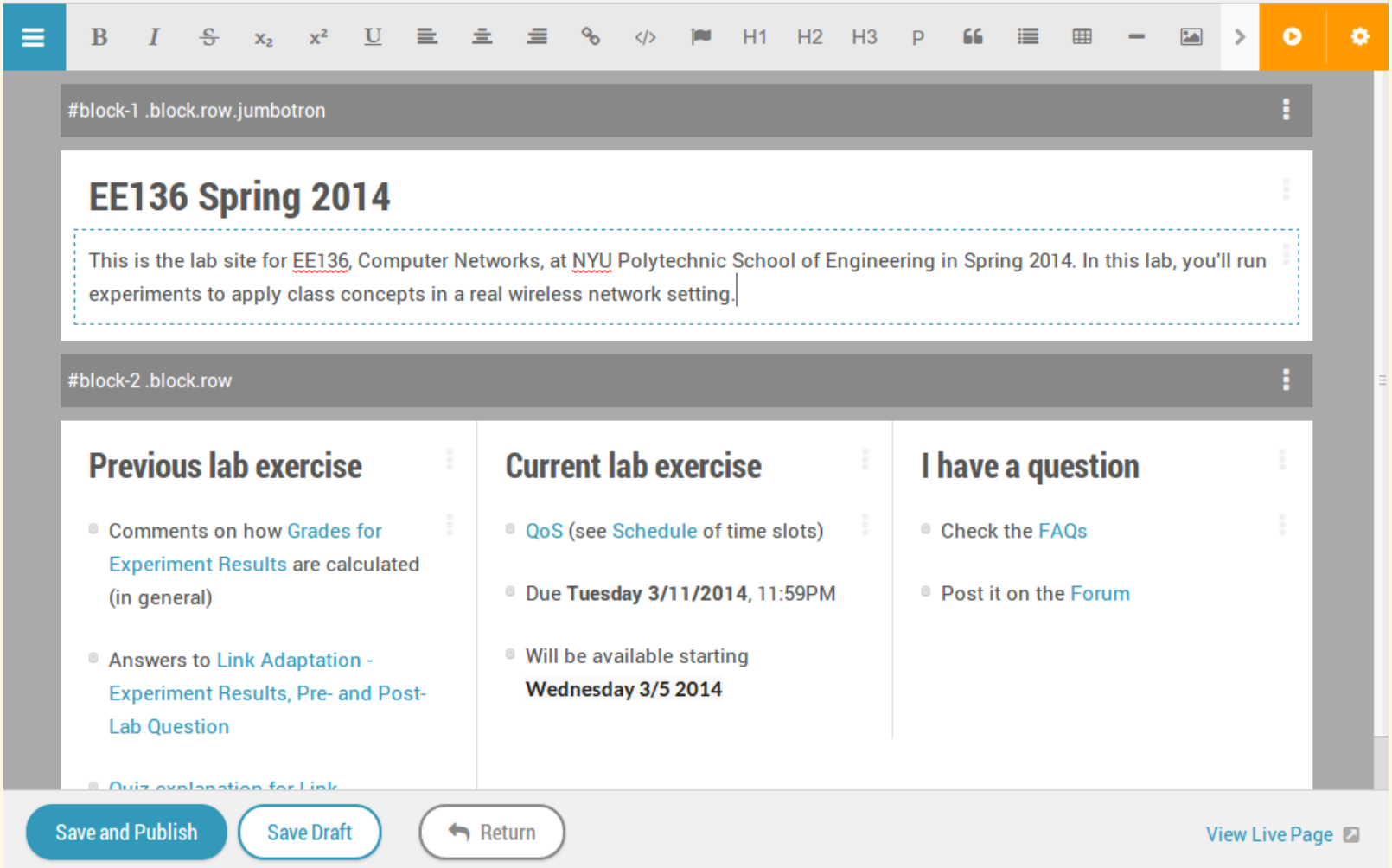
Your own course site



Your own course site



CMS access

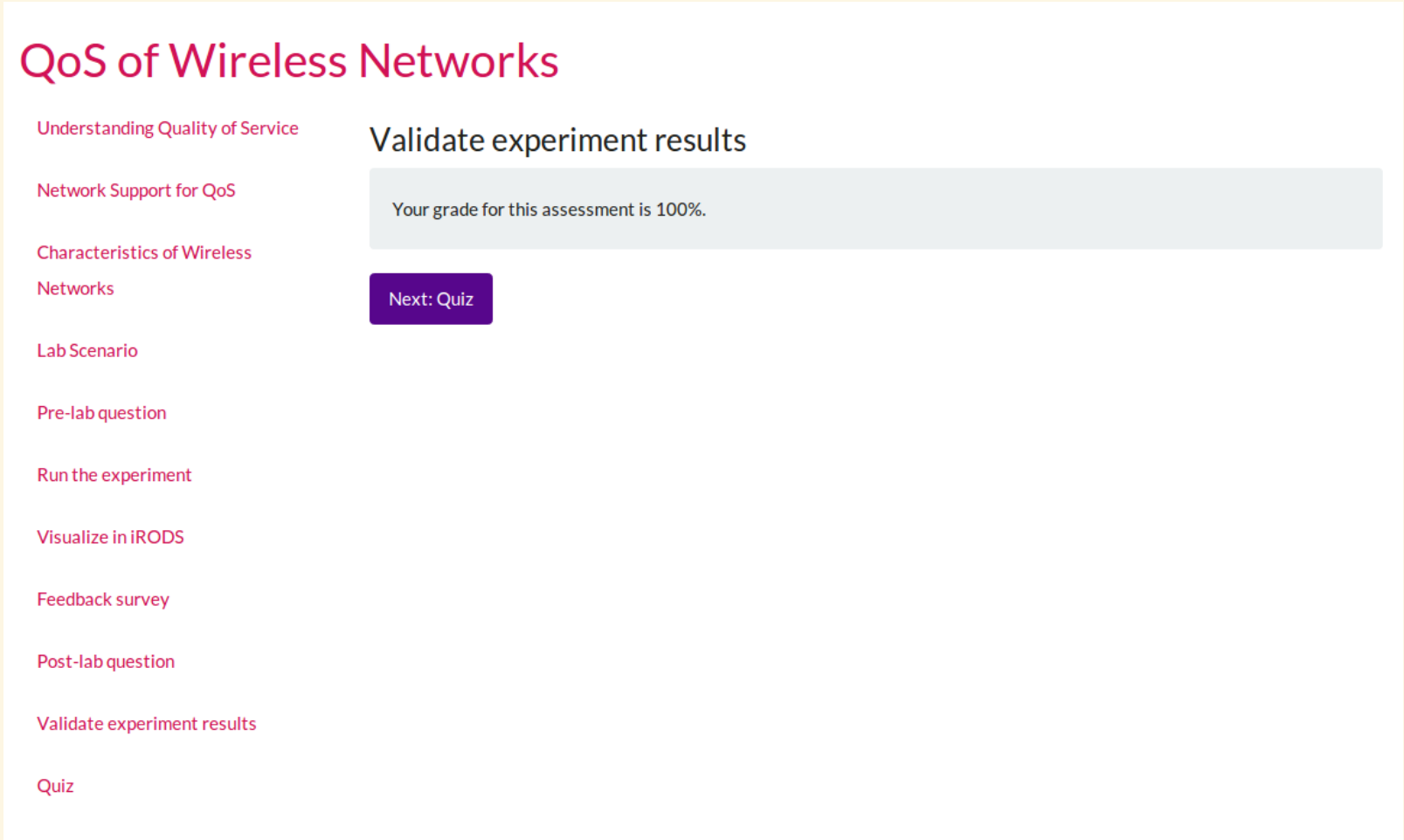

H1 H2 H3 P
#block-1 .block.row.jumbotron
EE136 Spring 2014
This is the lab site for EE136, Computer Networks, at NYU Polytechnic School of Engineering in Spring 2014. In this lab, you'll run experiments to apply class concepts in a real wireless network setting.
#block-2 .block.row
Previous lab exercise
Comments on how Grades for Experiment Results are calculated (in general)
Answers to Link Adaptation - Experiment Results, Pre- and Post-Lab Question
Current lab exercise
QoS (see Schedule of time slots)
Due Tuesday 3/11/2014, 11:59PM
Will be available starting Wednesday 3/5 2014
I have a question
Check the FAQs
Post it on the Forum
Save and Publish
Save Draft
Return
View Live Page

Student account creation

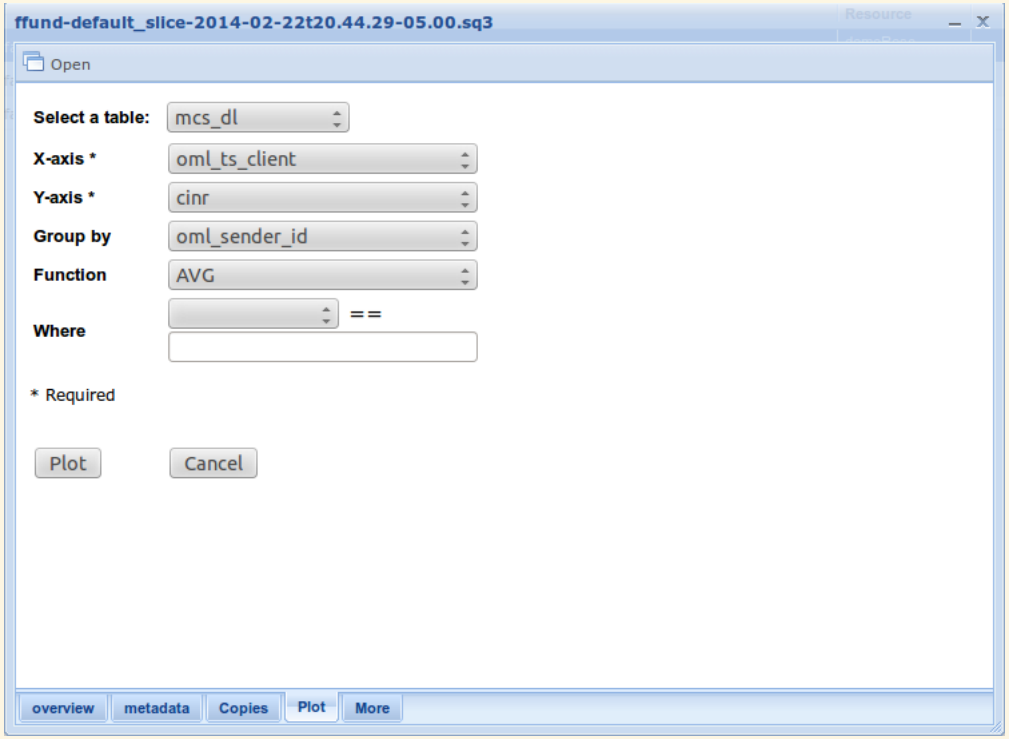
Submit a **spreadsheet** with student names, emails, IDs, we create NYU WiMAX & iRODS accounts for them.

Live monitoring

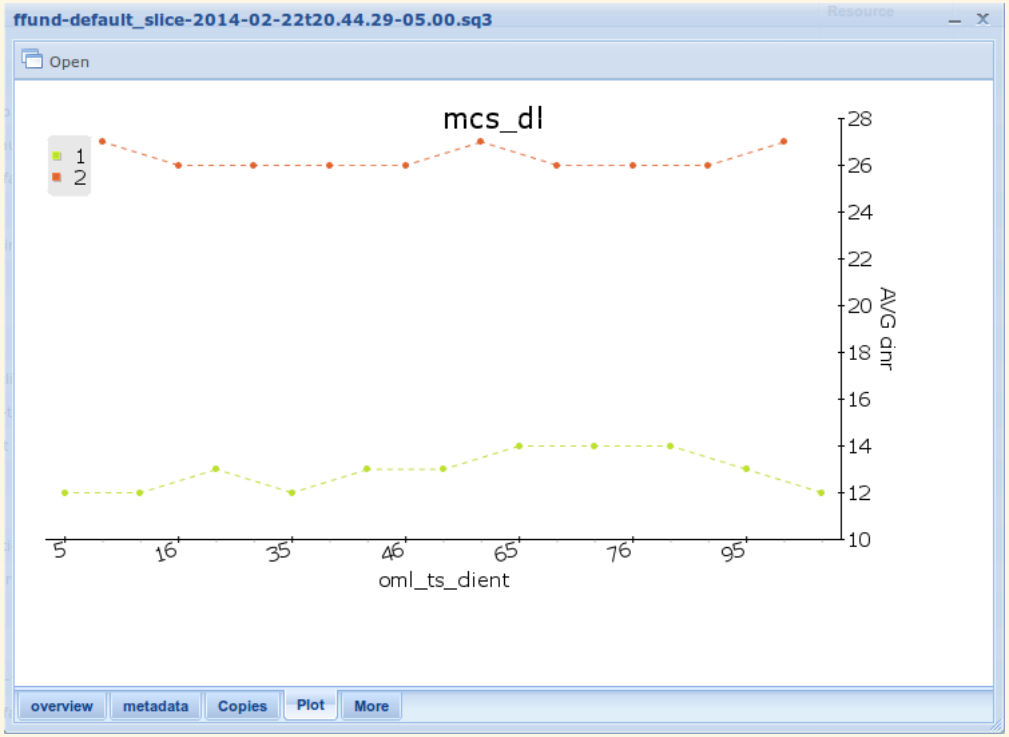
Instant student feedback



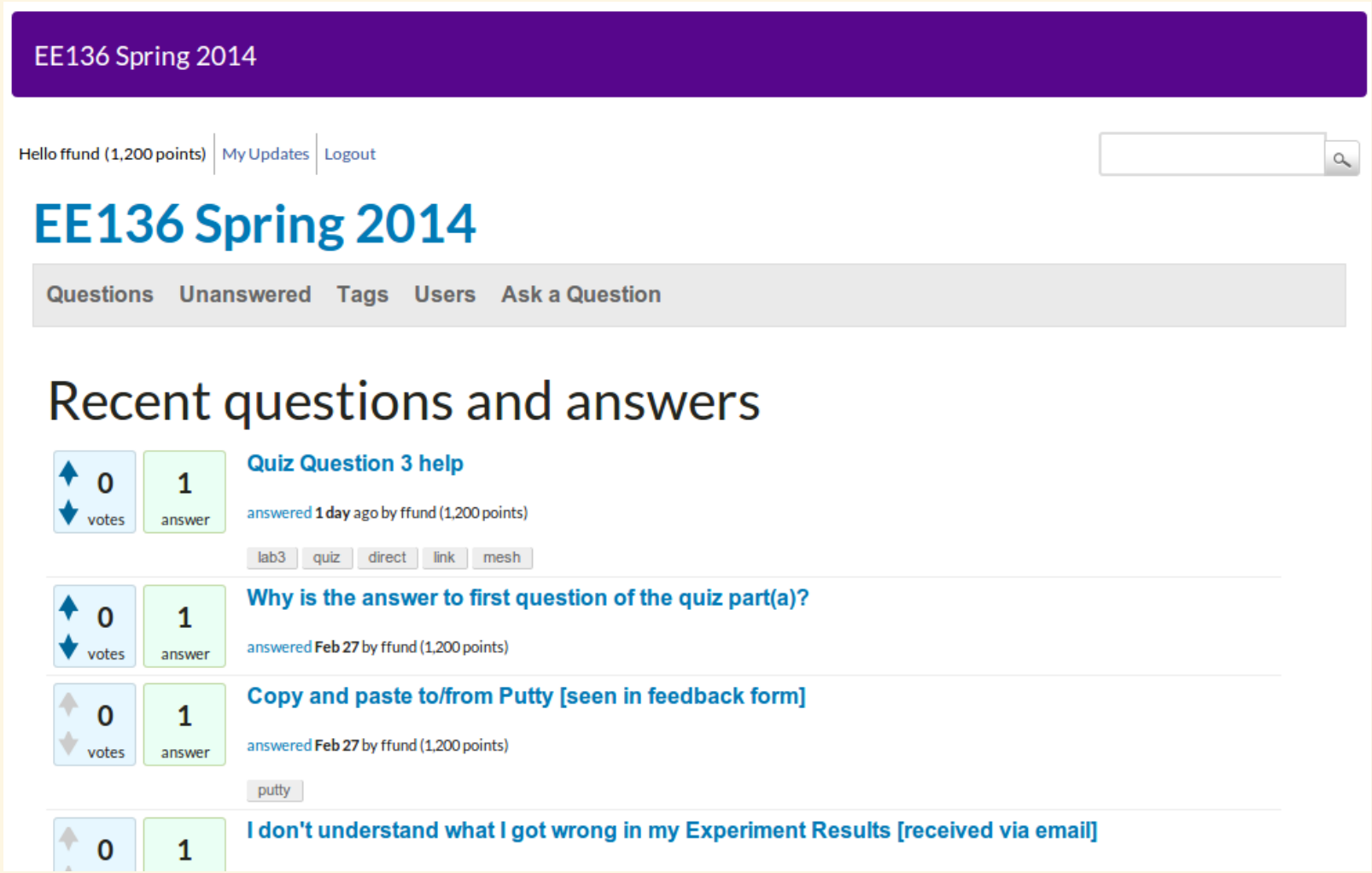
Explore experiment results



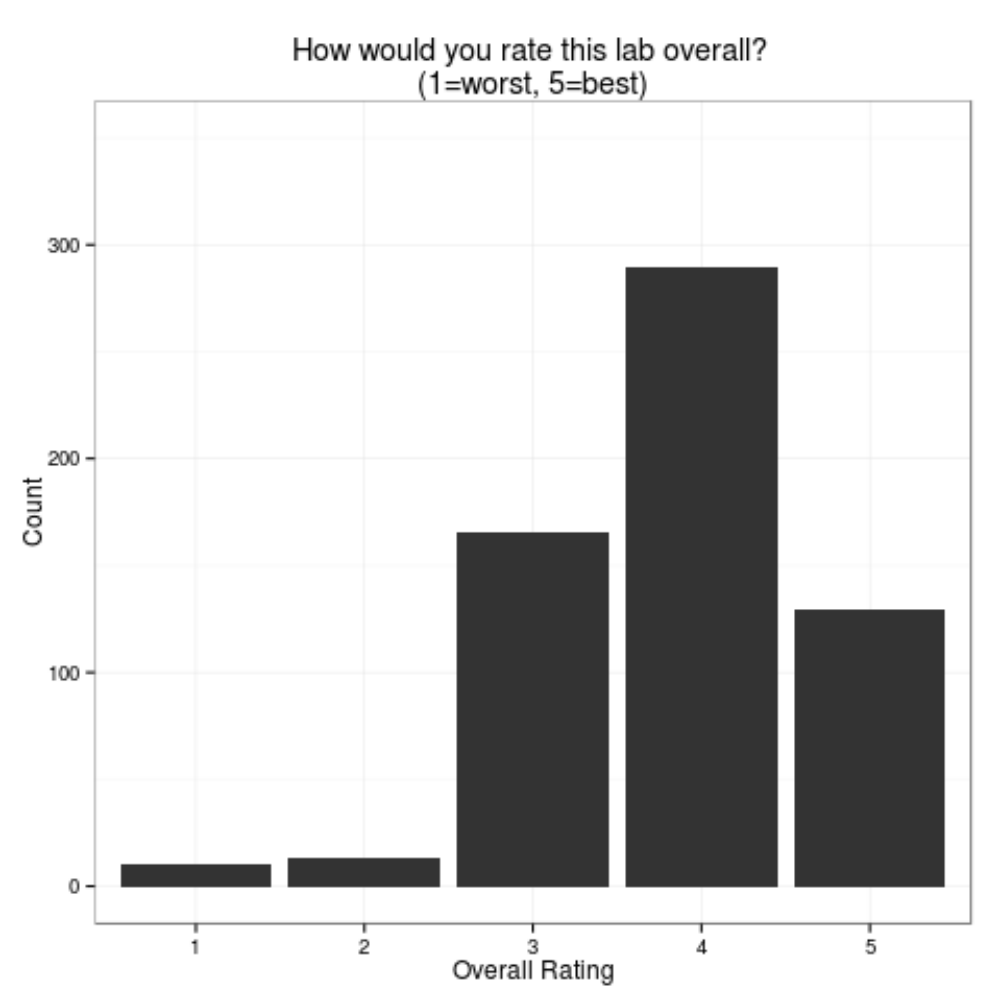
Explore experiment results

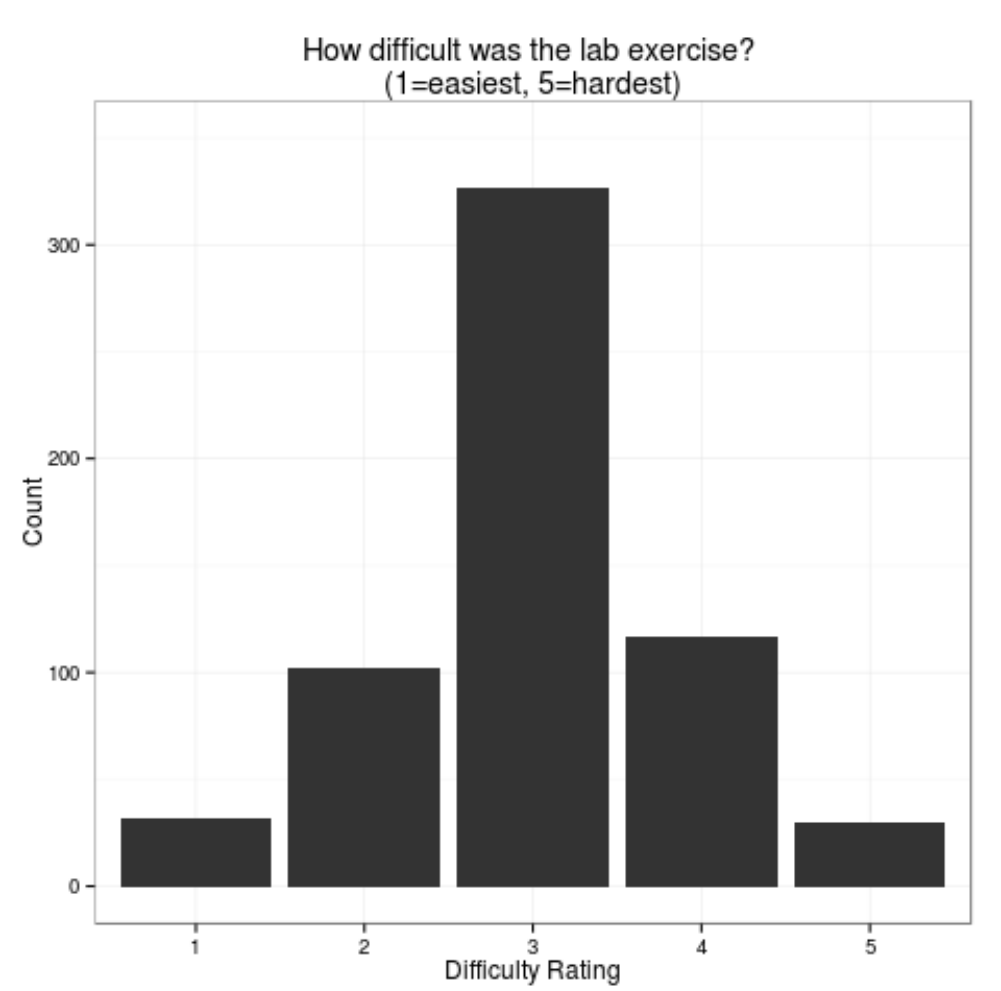


Q&A forum


EE136 Spring 2014
Hello ffund (1,200 points)
My Updates
Logout
EE136 Spring 2014
Questions
Unanswered
Tags
Users
Ask a Question
Recent questions and answers
0
votes
1
answer
Quiz Question 3 help
answered 1 day ago by ffund (1,200 points)
lab3
quiz
direct
link
mesh
0
votes
1
answer
Why is the answer to first question of the quiz part(a)?
answered Feb 27 by ffund (1,200 points)
0
votes
1
answer
Copy and paste to/from Putty [seen in feedback form]
answered Feb 27 by ffund (1,200 points)
putty
0
1
I don't understand what I got wrong in my Experiment Results [received via email]

Student feedback


How would you rate this lab overall?
(1=worst, 5=best)
Count
300
200
100
0
1
2
3
4
5
Overall Rating


How difficult was the lab exercise?
(1=easiest, 5=hardest)
Count
300
200
100
0
1
2
3
4
5
Difficulty Rating

''Very interesting to see with real data how a soft handover can be achieved via socket modification.''

''Real time measurements give a better understanding of the wireless networks and how they work.''

"The lab was very interesting since I had no experience with LINUX before ."

''I like that I am actually working with a real testbed and real cellular tech.''

"I enjoyed being able to download and view the video upon lab completion."

GENI MOOC

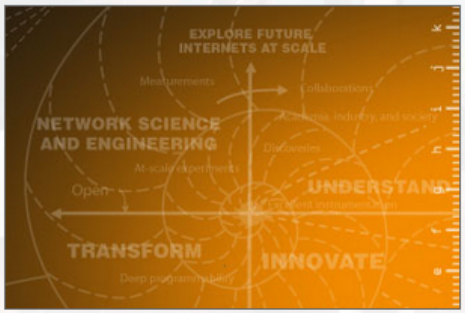
Use GENI to educate the **Internet users**, not the Internet creators.

No **programming** required.

FIND COURSES

ffund

GENI01: Internet and networking: a lab-based introduction *GENI*



YOU ARE REGISTERED FOR THIS COURSE GENI01

VIEW COURSEWARE

overview

ABOUT THIS COURSE

Course Number **GENI01**