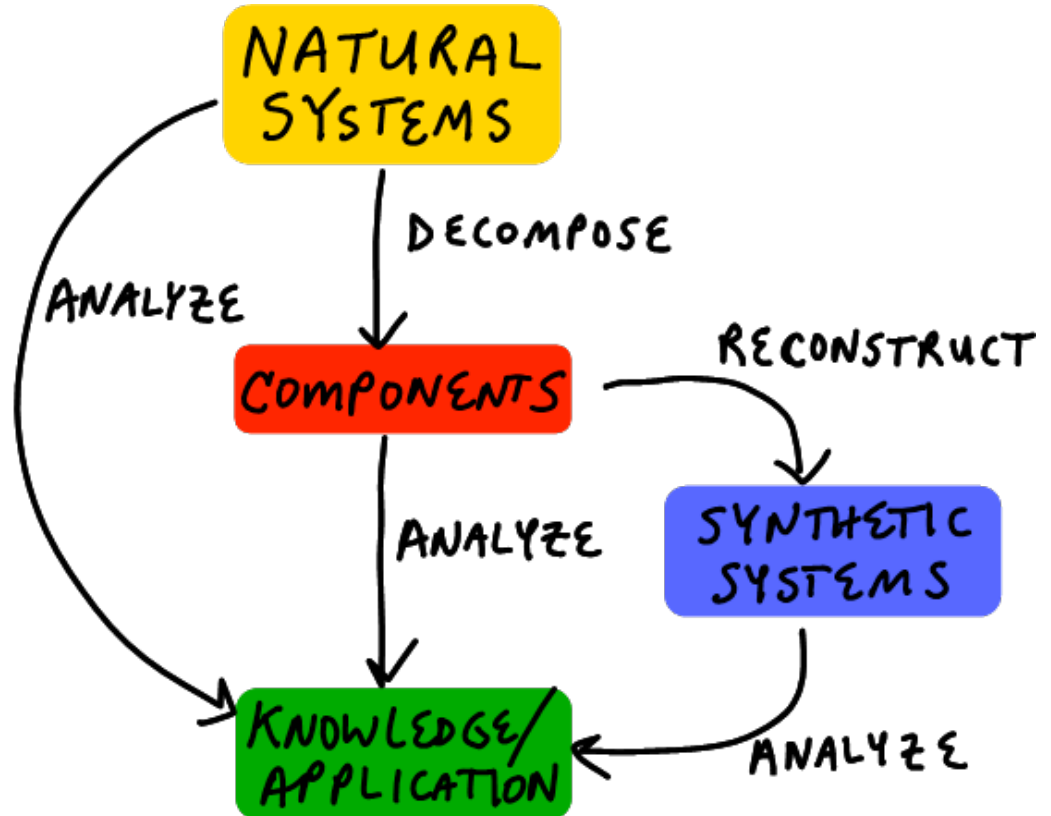


# Orientation: Welcome to 20.109!!

2/4/15

# What is biological engineering?

- Repurposing biology to solve problems
  - DNA
  - Systems
  - Biomaterials



# Lab business

1. Introductions and 20.109 mission
2. Semester overview (introduction to our wiki)
3. Daily operations
4. Laboratory notebook
5. Lab safety specifics
6. Lab tour (introduction to our space)


# 20.109 mission

- Aim 1: Novel investigations

Real Science

- Aim 2: Authentic communication
  
- Aim 3: Integrity-based collaboration
  - Contributions to team assignments
  - Independent completion of individual assignments

# Semester overview: hello, wiki



OpenWetWare  
Share your science.

Navigation

- Main Page
- Recent changes
- Help
- Contact OWW
- Add a Lab Notebook

Research


- Materials
- Protocols
- Resources

Search

Search Go ?

Quick nav

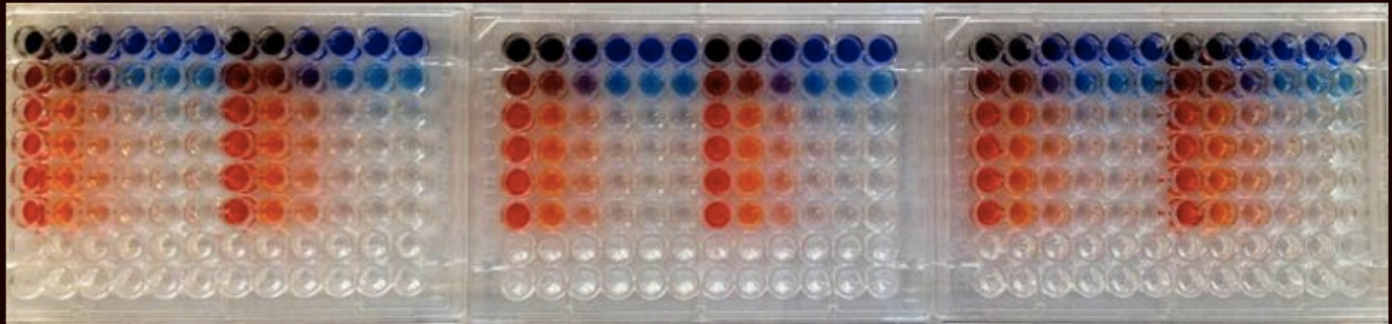
20.109(S15)



Toolbox

- What links here
- Related changes
- Upload file
- Special pages

## 20.109(S15): Laboratory Fundamentals of Biological Engineering



[Home](#)   [People](#)   [Schedule Spring 2015](#)   [Assignments](#)   [Lab Basics](#)   [OWW Basics](#)  
[DNA Engineering](#)   [System Engineering](#)   [Biomaterials Engineering](#)

### Welcome and Details for Spring 2015 [\[edit\]](#)

**Lecture:** T/R 11-12 (4-237)

**Lab:** T/R 1-5 or W/F 1-5 (56-322)

**People:** Instructor and student web pages may be found at the linked [People](#) page.

Welcome to 20.109! For some of you this will be the first time in a research lab and for others it will not; either way, it is our goal to make this class a useful and fun introduction to experiments and techniques in biological engineering. There is not time enough to show you everything you'll need to know if you go on to do research, but after taking this class you should feel confident and familiar with some fundamental experimental approaches and lab protocols. You will develop good habits at the bench, ones that will increase the likelihood of success in your

[openwetware.org/wiki/20.109\(S15\)](http://openwetware.org/wiki/20.109(S15))

# Semester overview: schedule

Share your science.

navigation

- Home Main Page
- ! Recent changes
- ? Help
  - Contact OWW
  - Add a Lab Notebook

research

- Materials
- Protocols
- Resources

search

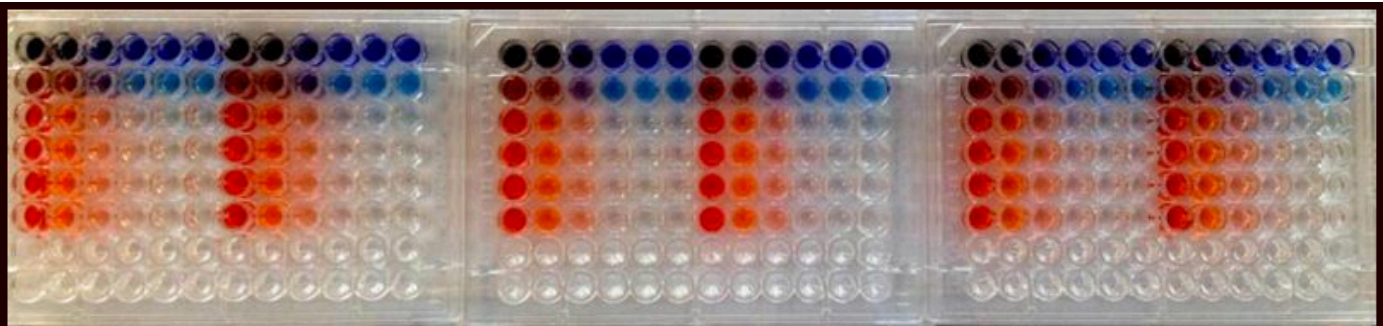
Search Go ?

quick nav

20.109(S15):\_Spr1

toolbox

- What links here
- Related changes
- Upload file
- Special pages
  - Permanent link
  - Cite this page



[Home](#)
[People](#)
[Schedule Spring 2015](#)
[Assignments](#)
[Lab Basics](#)
[OWW Basics](#)  
[DNA Engineering](#)
[System Engineering](#)
[Biomaterials Engineering](#)

MODULE	DAY	DATE	LECTURER	TA	LAB	Homework Due?	NOTES
		Tue/Wed Feb 3/4	SKH		Orientation		
1	1	Thur/Fri Feb 5/6	JR <a href="#">↗</a>	DB <a href="#">↗</a>	Microbial DNA extraction	Yes <a href="#">↗</a>	lab orientation quiz
1	2	Tue/Wed Feb 10/11	JR <a href="#">↗</a>	DB <a href="#">↗</a>	Diagnostic primer design	Yes <a href="#">↗</a>	
1	3	Thur/Fri Feb 12/13	JR <a href="#">↗</a>	DB <a href="#">↗</a>	16S PCR and paper discussion	Yes <a href="#">↗</a>	lab quiz
<b>President's Day Feb 16</b>						<b>No lab Feb 17 or Feb 18</b>	
1	4	Thur/Fri	JR <a href="#">↗</a>	DB <a href="#">↗</a>	DNA cloning	Yes <a href="#">↗</a>	

# Semester overview: assignments

- Major assignments (80%)

Assignment	% of Final Grade	Links to Description and/or Evaluation
Abstract and data summary	15	<a href="#">Assignment description</a>
Primer design memo	5	<a href="#">Assignment description</a>
Journal club presentation	10	<a href="#">Sign-up for article</a> <a href="#">Evaluation rubric (PDF download)</a>
Research article	25	<a href="#">Assignment description</a>
Research proposal presentation	20	<a href="#">Assignment description</a> <a href="#">Evaluation rubric (PDF download)</a>
Mini report	5	<a href="#">Assignment description and evaluation rubric</a>

- Daily work (20%)

- Notebook, quizzes, homework, participation and blog posts

# Daily operations

- Hand in homework, receive graded homework
- Lab treats...
  - 10 points
  - 10-12 minutes
- Pre-lab and discussion
- Fun stuff
- The wiki is your friend!!





# Laboratory notebooks

The screenshot shows a web-based laboratory notebook interface. The top navigation bar includes a search bar for notes, a 'New Note' button, and a 'New Chat' button. The left sidebar contains navigation options: 'Work Chat', 'SHORTCUTS' (Sp15 20.109, 20.109(S15)..., Weekly menus, Grocery Lists), 'RECENT NOTES' (Week of 2/2/15, Week of 1/26..., Leslie's edits..., S15 Mod 1 E..., Week of 1/25...), 'Notes', 'Notebooks', 'Atlas', 'Market', 'Premium', and 'Announcem...'. The main content area is divided into two sections: 'JANUARY 2015' and 'OCTOBER 2014'. The 'JANUARY 2015' section contains three notes: 'Leslie's edits to Wiki' (dated 1/29/15), 'Mod1 Assignment meeting' (dated 1/14/15), and 'FNT --> FNW conversion (Mod1)' (dated 1/8/15). The 'OCTOBER 2014' section contains one note: 'Pre-semester planning meeting; 10/31/14' (dated 10/31/14), which is highlighted with a blue border. The right-hand pane displays the content of the selected note, including a sharing status, the title 'Pre-semester planning meeting; 10/31/14', the semester '20.109 Spring 2015', a list of modules and their instructors, lecture dates, and a 'Major Assignment Plan (S14)' with a breakdown of tasks and percentages for Mod1 and Mod2.

Work Chat

20.109(S15)\_Instructors

SEARCH notes

SHORTCUTS

- Sp15 20.109
- 20.109(S15)...
- Weekly menus
- Grocery Lists

RECENT NOTES

- Week of 2/2/15
- Week of 1/26...
- Leslie's edits...
- S15 Mod 1 E...
- Week of 1/25...

Notes

Notebooks

Atlas

Market

Premium

Announcem...

JANUARY 2015

3

**Leslie's edits to Wiki**

1/29/15 Deleted Station 2: Introduction to our microscopes (Guided) Deleted Using the DU 640 ("old") spectrophotometer Corrected station numbers 01/26/15 Review of Links in Mod1 (c...

**Mod1 Assignment meeting**

1/14/15 Required figures for data summary: Schematic diagram Phylogenetic Tree of each bird in team (2) Up to 3 additional figures that must build a story Homework assignments: Assigne...

**FNT --> FNW conversion (Mod1)**

1/8/15 Current on the S15 wiki (the first FNW is the updated version from F14): For Next Week (Orientation Day) Review today's lab to prepare for the lab practical that you and your partner will...

OCTOBER 2014

1

**Pre-semester planning meeting; 10/31/14**

10/31/14 20.109 Spring 2015 Mod1 — Jon Runstadler; Gull microbiome Mod2 — Leona Samson; NHEJ efficiency Mod3 — ...

20.109(S15)\_INSTRUCTORS

20.109(S15)\_Instructors

click t...

Created: Oct 31, 2014 Updated: Oct 31, 2014

You are viewing a note that is shared with 1 person

**Pre-semester planning meeting; 10/31/14**

20.109 Spring 2015

Mod1 — Jon Runstadler; Gull microbiome  
Mod2 — Leona Samson; NHEJ efficiency  
Mod3 — Angie Belcher; Phage solar cell

First day of lecture: Tuesday, Feb 3rd (Shannon gives intro lecture)  
Last day of class: Thursday, May 14th  
(web.mit.edu/registrar/calendar/)

T/R Section: Shannon  
W/F Section: Noreen & Leslie

**Major Assignment Plan (S14):**

**Mod1:**

- Abstract & Data Summary (15%)
- Primer Design Memo (5%)
- Journal Club Presentation (10%)

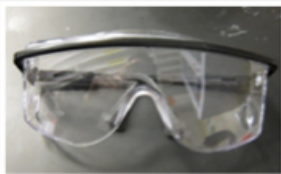


**Mod2:**

# Evernote

- See wiki page concerning your laboratory notebooks (Assignment tab)
- Register for an Evernote account (Homework assignment due M1D1)
- Create a 20.109 notebook
  - Use your name in the title - 20.109(S15)\_Noreen
  - Share your notebook with me ([nllyell@mit.edu](mailto:nllyell@mit.edu)), Leslie ([lesliemm@mit.edu](mailto:lesliemm@mit.edu)), and Djenet ([djenetb@mit.edu](mailto:djenetb@mit.edu)).

# Lab safety specifics: PPE

## Personal Protective Equipment (PPE)

Item	Required	Recommended
Safety glasses 	<ul style="list-style-type: none"><li>• At hood.</li><li>• When using ethanol burners.</li><li>• Add face shield at UV transilluminator.</li></ul>	<ul style="list-style-type: none"><li>• Large quantities of liquid or powder (even if not strictly hazardous) due to chance of irritation by splash, dust, etc.</li></ul>
Lab coat 	<ul style="list-style-type: none"><li>• At hood.</li><li>• In TC room.</li></ul>	<ul style="list-style-type: none"><li>• See above.</li></ul>
Gloves 	<ul style="list-style-type: none"><li>• Working with hazardous materials (w/r/t chem or bio).</li><li>• Nitrile for greater hazards (e.g., EtBr).</li></ul>	<ul style="list-style-type: none"><li>• Working with any material.</li><li>• Touching gloves-on equipment.</li></ul>

# Lab safety specifics: waste

## Managing Biological Waste

**Benchtop biowaste:**

- gloves
- tips
- plastics



**Sharps jar:**

- glass

**NO LIQUIDS!!!**

**Step-can:**

- plates



**Burn box:**

# Today

1. Make a friend, choose a bench, sign-up on the lab map up front!
2. Complete lab tour
  - Lab treat on M1D1
3. Read through Homework assignments
4. Watch for Office Hours poll
  - Will be sent via email tonight
  - Please respond as soon as possible