

# Experimental Methods in Systems Biology

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**About this course:** Learn about the technologies underlying experimentation used in systems biology, with particular focus on RNA sequencing, mass spec-based proteomics, flow/mass cytometry and live-cell imaging. A key driver of the systems biology field is the technology allowing us to delve deeper and wider into how cells respond to experimental perturbations. This in turn allows us to build more detailed quantitative models of cellular function, which can give important insight into applications ranging from biotechnology to human disease. This course gives a broad overview of a variety of current experimental techniques used in modern systems biology, with focus on obtaining the quantitative data needed for computational modeling purposes in downstream analyses. We dive deeply into four technologies in particular, mRNA sequencing, mass spectrometry-based proteomics, flow/mass cytometry, and live-cell imaging. These techniques are often used in systems biology and range from genome-wide coverage to single molecule coverage, millions of cells to single cells, and single time points to frequently sampled time courses. We present not only the theoretical background upon which these technologies work, but also enter real wet lab environments to provide instruction on how these techniques are performed in practice, and how resultant data are analyzed for quality and content.

**Created by:** Icahn School of Medicine at Mount Sinai

Basic Info	Course 2 of 6 in the <a href="#">Systems Biology and Biotechnology Specialization</a> .
Commitment	6-8 hours/week
Language	English
How To Pass	Pass all graded assignments to complete the course.
User Ratings	4.6 stars
	Average User Rating 4.6 <a href="#">See what learners said</a>



## Syllabus

### WEEK 1

#### Introduction

Description goes here

5 videos, 6 readings

**Graded:** Quiz 1

### WEEK 2

#### Deep mRNA Sequencing

Description goes here

5 videos, 4 readings

**Graded:** Quiz 2

## WEEK 3

### Mass Spectrometry-Based Proteomics

Description goes here

6 videos, 3 readings

**Graded:** Quiz 3

## WEEK 4

### Midterm Exam

Description goes here

**Graded:** Midterm Exam

## WEEK 5

### Flow and Mass Cytometry for Single Cell Protein Levels and Cell Fate

Description goes here

7 videos, 4 readings

**Graded:** Quiz 4

## WEEK 6

### Live-cell Imaging for Single Cell Protein Dynamics

Description goes here

5 videos, 4 readings

**Graded:** Quiz 5

## WEEK 7

### Integrating and Interpreting Datasets with Network Models and Dynamical Models

Description goes here

3 videos, 4 readings

**Graded:** Quiz 6

## WEEK 8

### Final Exam

**Graded:** Final Exam

## FAQs

## How It Works



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