

# Schedule

## Week 1 (September 30–October 4)

**Lecture 1:** Introduction to the course, lab safety, lab notebooks, the goals of lab.

**Mon/Tues Lab Sessions:** No lab.

**Wed/Thurs Lab Sessions:** (0) Notebooks and lab safety orientation with TAs.

**Assignments/Due Dates:**

- Bring lab coats to Lab 0.
- Complete [Lab Safety Fundamentals Training](#), and upload screenshot of worksafe transcript showing completion, before Lab 1.
- Fill out feedback form by Friday at noon.

## Week 2 (October 7–11)

**Lecture 2:** Reading, writing, and the goal of the scientific manuscript, cell culture.

**Mon/Tues Lab Sessions:** (1) Introduction to lab, measuring and microscopy.

**Wed/Thurs Lab Sessions:** (2) Replica molding and laser cutting demo, fluorescence microscopy.

**Assignments/Due Dates:** None.

## Week 3 (October 14–18)

**Lecture 3:** Data analysis and statistics fundamentals.

**Mon/Tues Lab Sessions:** (3) Bioconjugation.

**Wed/Thurs Lab Sessions:** (4) Microcontact printing, fluorescent microscopy of patterned proteins, and contact angle measurements.

**Assignments/Due Dates:** Case study 1: Rare cell variability ([Shaffer et al](#)) due on Friday at noon.

## Week 4 (October 21–25)

**Lecture 4:** Regression and standard curves, [Shaffer et al](#) review

**Mon/Tues Lab Sessions:** (5) Cell culture—Passaging and counting cells, introduction to sterile technique.

**Wed/Thurs Lab Sessions:** (6) Cell culture—Growth kinetics, cell counting (hemocytometer), observing cell density and gauging confluence.

**Review Session:** During Friday office hours.

**Assignments/Due Dates:** Reports for Labs 1–4 due on Thursday at noon.

## Week 5 (October 28–November 1)

**Lecture 5: Exam 1** (first hour), experimental design, guidelines for independent labs.

**Mon/Tues Lab Sessions:** (7) Growth kinetics, cell counting, lysis, protein content (BCA assay).

**Wed/Thurs Lab Sessions:** (8) Growth kinetics, MTS assay.

**Assignments/Due Dates:** None.

## Week 6 (November 4–8)

**Lecture 6:** Cell adhesion and migration, 3D cell culture and microenvironment.

**Mon/Tues Lab Sessions:** (9) 3D encapsulation, preparing substrates for cell studies.

**Wed/Thurs Lab Sessions:** (10) Live/dead, MTS assay on encapsulated cells, sterilizing substrates.  
**Assignments/Due Dates:**

- Reports for Labs 5-8 due on Thursday at noon
- Discuss independent project proposal with your TA during your lab session

## **Week 7 (November 11–15)**

**Veteran's Day, no class.**

**Mon/Tues Lab Sessions:** (11) Varying stiffness substrates and cell growth, seeding cells.

**Wed/Thurs Lab Sessions:** (12) Quantification and analysis of cell growth and morphology

**Assignments/Due Dates:**

- Case study 2: Focal adhesion and migration in 3D ([Fraley, et al](#)) due on Friday at noon
- Final Independent Project Proposals due on Friday at noon

## **Week 8 (November 18–22)**

**Lecture 7:** Cell mechanics, mechanical microenvironment, mechanotransduction.

**Mon/Tues Lab Sessions:** Lab Practical Exam

**Wed/Thurs Lab Sessions:** (13) Independent lab

**Assignments/Due Dates:**

- Reports for Labs 9-12 due on Thursday at noon.

## **Week 9 (November 25–29)**

**Lecture 8:** Hydrogel structure and chemistry, hydrogel mechanics, 3D micropatterning, review [Fraley, et al](#).

**Mon/Tues Lab Sessions:** (14) Independent lab

**Wed/Thurs Lab Sessions:** No lab (Thanksgiving); Make-up labs Wednesday if needed

**Review Session:** During Friday office hours.

**Assignments/Due Dates:**

- Case study 3: Substrate stiffness effect on MSCs ([Engler et al](#)) due on Thursday at noon.

## **Week 10 (December 2–6)**

**Lecture 9: Exam 2** (first hour), review [Engler et al](#).

**Mon/Tues Lab Sessions:** (15) Independent lab.

**Wed/Thurs Lab Sessions:** (16) Lab clean-up. Instron demonstration.

**Assignments/Due Dates:** Course evaluations must be completed online by Friday at noon.

## **Finals**

Final Lab Report due Thurs., December 12 by noon.