

**MATH 1180**  
**MATHEMATICS FOR LIFE SCIENTISTS**  
**Spring Semester, 2022**

Time and Place: MWF 9:40-10:30 a.m., lectures on zoom  
Topic: Math 1180 Lecture Time: beginning Jan 10, 2022 09:30 AM Mountain Time  
Every week on Mon, Wed, Fri, until Apr 25, 2022, 46 occurrence(s)  
zoom link: <https://utah.zoom.us/j/91346946321>  
Meeting ID: 913 4694 6321  
Passcode: 933810

Lectures will be recorded and lecture notes and the recorded lecture will be posted on Canvas.

Instructor: Professor J. Keener  
Office: 314 LCB  
Phone: 1-6089 (office, but I'm rarely there)  
Web: We're on Canvas!  
email: [keener@math.utah.edu](mailto:keener@math.utah.edu) (Please do **NOT** use my UU email address)

Office Hours: Monday 11:00am-12:00noon on zoom  
Time: beginning Jan 10, 2022 11:00 AM Mountain Time  
Every week on Mon, until Apr 25, 2022, 16 occurrence(s)  
Zoom link: <https://utah.zoom.us/j/98296068558>  
Meeting ID: 982 9606 8558  
Passcode: 887816

Computer Lab: Section 002: Tuesdays 8:35-9:25 am in LCB 115  
Section 003: Tuesdays 9:40-10:30 am in LCB 115  
Lab TA: Alex Beams [alex.beams@hsc.utah.edu](mailto:alex.beams@hsc.utah.edu)  
Text: F. R. Adler, *Modeling the Dynamics of Life: Third Edition*

**The Course.** Math 1180 is the second semester of a full year calculus sequence designed to teach the mathematics necessary to do biology in this quantitative age.

**Computer Labs.** We will meet for one hour weekly for a computer lab in LCB 115. Lab assignments will be due promptly at the beginning of lab the next Tuesday (late labs will **not** be accepted!) and will account for 20% of your grade. The material covered in labs will be fair game for tests.

**Homework.** Written homework will be due weekly, usually on Tuesdays at the lab, with selected problems from the current sections. The problems are listed below and changes will be posted on the web page. **Late homework will not be accepted.**

**Exams.** There will be three mid-terms (each with three or four problems), and a comprehensive final (five problems, weighted toward Chapter 8).

|                                                     |                          |
|-----------------------------------------------------|--------------------------|
| Midterm 1 (Chapter 6)                               | Monday, February 7       |
| Midterm 2 (Beginning of chapter 7 and new material) | Friday, February 25      |
| Midterm 3 (Most of chapter 7)                       | Monday, March 28         |
| Final Exam (Chapters 6-8)                           | Tuesday May 3, 8:00 a.m. |

**Grading.** Grades will be weighted according to the following scheme. You can drop your lowest midterm or give the final only half weight.

|                        |     |
|------------------------|-----|
| Each midterm           | 10% |
| Final Exam             | 30% |
| Written homework       | 20% |
| Computer lab write-ups | 20% |

### **Regarding Covid**

All students are required to be vaccinated against Covid.

Vaccination is proving highly effective in preventing severe COVID-19 symptoms, hospitalization, and death from coronavirus. Vaccinations are available to everyone 12 years and older. Appointments are open in the U of U Health system for patients as well as additional vaccine providers throughout Utah. For up-to-date campus vaccination information go to:  
<https://alert.utah.edu/covid/vaccine/>

All students are encouraged to take advantage of university COVID-19 testing services:  
<https://alert.utah.edu/covid-19-testing/>. Voluntary asymptomatic testing will continue to be available weekly for all members of the campus community. To schedule a COVID-19 test, go to  
<https://alert.utah.edu/covid-19-testing/>.

Students must self-report if they test positive for COVID-19 via this website: <https://coronavirus.utah.edu/>.

**ADA policy** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, please provide prior notice to the Center for Disability Services, 801-581-5020. CDS will work with you and the instructor to make arrangements for accommodations.

**Accommodations policy.** The instructor does not grant content accommodation requests as the course content fulfills legitimate pedagogical goals

| Date        | Sections covered      | Homework Problems                       | Due      |
|-------------|-----------------------|-----------------------------------------|----------|
| January 10  | Stats experiment      | Handout                                 | Jan 18   |
| January 12  | 6.1                   | 4, 8, 10, 14, 18, 22, 28                | Jan 18   |
| January 14  | 6.2                   | 2, 4, 10, 16, 24, 28, 38                | Jan 25   |
| January 17  | MLK Day               |                                         |          |
| January 19  | 6.3                   | 2, 6, 10, 22, 32, 40                    | Jan 25   |
| January 21  | 6.4                   | 2, 8, 10, 14, 28, 30, 34, 38            | Feb 1    |
| January 24  | 6.5                   | 4, 6, 10, 16, 22, 24, 26                | Feb1     |
| January 26  | 6.6                   | 4, 8, 20, 24, 28, 30, 34, 38            | Feb 1    |
| January 28  | 6.7                   | 4, 10, 16, 24, 28, 34, 40               | Feb 8    |
| January 31  | 6.8                   | 4, 12, 14, 16, 28, 30, 40, 44           | Feb 8    |
| February 2  | 6.9                   | 4, 16, 22, 30, 32, 36, 42               | Feb 8    |
| February 4  | Review                |                                         |          |
| February 7  | Midterm Exam 1        |                                         |          |
| February 9  | 7.1                   | 2, 6, 16, 24, 26, 30, 36                | Feb 15   |
| February 11 | 7.2                   | 2, 6, 10, 22, 24, 34, 36                | Feb 22   |
| February 14 | Vectors               | 1.1; 1.2c,d; 1.3b; 1.5c,d; 1.8c,d; 1.12 | Feb 22   |
| February 16 | Vector dynamics       | 2.1b,d; 2.3b; 2.4b,d; 2.5               | Feb 22   |
| February 18 | Matrices              | 3.1; 3.4; 3.5c,d; 3.6; 3.7              | Feb 29   |
| February 21 | President's Day       |                                         |          |
| February 23 | Markov Chains/Review  | 4.1; 4.2; 4.4                           | Feb 29   |
| February 25 | Midterm Exam 2        |                                         |          |
| February 28 | 7.3                   | 2, 6, 10, 34, 36                        | March 15 |
| March 2     | 7.4                   | 4, 10, 20, 24, 36, 46, 48               | March 15 |
| March 4     | 7.5                   | 2, 6, 22, 24, 26, 40                    | March 15 |
| March 14    | 7.6                   | 2, 8, 12, 16, 40, 50, 58                | March 22 |
| March 16    | 7.7                   | 2, 6, 12, 16, 20, 24, 42, 46, 50        | March 22 |
| March 18    | Birth/death processes | New material                            | March 29 |
| March 21    | 7.8                   | 4, 8, 10, 32, 36, 38                    | March 29 |
| March 23    | 7.9                   | 4, 10, 12, 28, 32, 38, 40               | March 29 |
| March 25    | Review                |                                         |          |
| March 28    | Midterm Exam 3        |                                         |          |
| March 30    | 8.1                   | 10, 14, 20, 30, 36, 40                  | April 5  |
| April 1     | 8.2                   | 6, 10, 14, 20, 40, 46                   | April 12 |
| April 4     | 8.3                   | 4, 8, 12, 16, 20, 24, 40, 44            | April 12 |
| April 6     | 8.4                   | 8, 14, 18, 20, 22, 24                   | April 12 |
| April 8     | 8.5                   | 2, 6, 10, 14, 30, 32                    | April 19 |
| April 11    | 8.6                   | 6, 10, 14, 18, 22, 42, 44               | April 19 |
| April 13    | 8.7                   | 2, 18, 32, 40                           | April 19 |
| April 15    | 8.8                   | 6, 12, 22, 28, 32                       | April 26 |
| April 18    | 8.9                   | 2, 4, 6, 8, 10, 12, 14, 32              | April 26 |
| April 20    | More regression       | New material                            | April 26 |
| April 22    | Giant review          |                                         |          |
| April 25    | Last class day        |                                         |          |
| May 3       | Final Exam            | 8:00 - 10:00 a.m.                       |          |