

Orly Alter	Spring 2024, 3 Credits Mondays and Wednesdays, 11:50am–1:10pm, LCB 115 and Zoom
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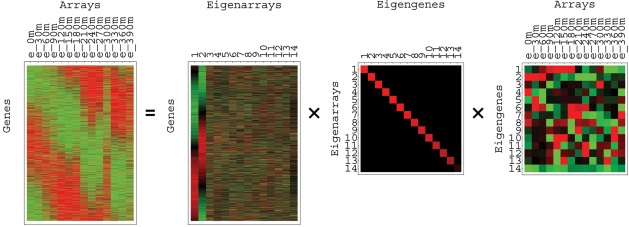
BME 6770: Genomic Signal Processing
<https://alterlab.org/teaching/BME6770/>

- For postdoctoral, graduate, and advanced undergraduate students in Engineering, Sciences, and Medicine, and professionals in industry.
- Prerequisites: Some experience programming and instructor approval.

100% grade = 30% labs, 30% presentation, 30% class project, 10% class participation; late assignments are not accepted; class attendance is required.

Topics:

We will cover concepts in artificial intelligence, data science, and machine learning and their applications in the integration and comparison of different types of high-throughput omic and other data acquired by different technologies and from different studies toward discovery, verification, and validation of biomedical principles.

<p style="text-align: center;">Technologies</p> <p>Such as whole genome-sequencing, for high-throughput acquisition of different types of molecular biological data and patient clinical information.</p>	
<p style="text-align: center;">Databases</p> <p>Such as the Cancer Genome Atlas (TCGA) at the Genomic Data Commons (GDC).</p>	
<p style="text-align: center;">Algorithms</p> <p>From the singular value decomposition (SVD) and principal component analysis (PCA) to multi-tensor decompositions, neural networks, and deep learning.</p>	
<p style="text-align: center;">Applications</p> <p>Toward better understanding of biology and practice of medicine, e.g., personalized cancer diagnostics, prognostics, and therapeutics.</p>	<p>MUTATIONS OF BACTERIA FROM VIRUS SENSITIVITY TO VIRUS RESISTANCE^{1,2}</p> <p>S. E. LURIA¹ AND M. DELBRÜCK²</p> <p><i>Indiana University, Bloomington, Indiana, and Vanderbilt University, Nashville, Tennessee</i></p> <p>Received May 29, 1943</p>

Skills:

- Proving mathematical theorems and programming symbolic computations.
- Designing algorithms and programming numerical computations.
- Working with databases and modeling biomedical data.

Activities:

- In-class presentations of scientific journal articles and patents.
- Participation in guest lectures and seminars on campus and discussions of conference reports.
- End-of-class celebration.

- Spring 2024 Calendar:
<https://registrar.utah.edu/academic-calendars/spring2024.php>
- COVID-19:
<https://coronavirus.utah.edu/>
- Safety:
<https://dps.utah.edu>
- Health:
<https://studenthealth.utah.edu>
- Wellness:
<https://wellness.utah.edu>
- Counseling:
<https://counselingcenter.utah.edu>
- Student Code:
<https://regulations.utah.edu/academics/6-400.php>

University Policies.

COVID-19 Campus Guidelines.

Students are required to self-report if they test positive for COVID-19. To report, please contact: COVID-19 Central @ The U 801-213-2874

<https://coronavirus.utah.edu/>

To reduce the spread of COVID-19 on campus, face coverings are required in all in-person classes for both students and faculty. Based on CDC guidelines, the University requires everyone to wear face coverings in shared public spaces on campus. If you repeatedly fail to wear a face covering in class, you may be referred to the Dean of Students for a possible violation of the Student Code. Some courses may require attendance due to hands-on coursework. Please read the syllabus and attendance requirements for the course thoroughly.

Some students may qualify for accommodations and exemptions from these guidelines through the Americans with Disabilities Act (ADA). Accommodations should be obtained prior to the first day of class.

If you believe you meet these criteria, contact:

Center for Disability and Access

801-581-5020

<https://disability.utah.edu/>

162 Union Building

200 S. Central Campus Dr.

Salt Lake City, UT 84112

The Americans with Disabilities Act (ADA) Statement.

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, reasonable prior notice needs to be given to the Center for Disability and Access at 162 Union Building, 801-581-5020. The Center for Disability and Access will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability and Access.

University Safety Statement.

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a safety escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit <https://safeu.utah.edu/>

Addressing Sexual Misconduct.

Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 Student Services Building, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677 (COPS).

PRICE COLLEGE OF ENGINEERING GUIDELINES

<https://www.price.utah.edu/students/current/semester-guidelines>

Spring Semester 2024

Appeals Procedures

See the [Code of Student Rights and Responsibilities](#), located in the [General Catalog](#).

Appeals of Grades and other Academic Actions

If a student believes that an academic action is arbitrary or capricious, they should discuss the action with the involved faculty member and attempt to resolve. If unable to resolve, the student may appeal the action in accordance with the following procedure:

1. Appeal to Department Chair (in writing) within 40 business days; chair must notify student of a decision within 15 days. If faculty member or student disagrees with decision, then,
2. Appeal to Academic Appeals Committee (see <https://www.price.utah.edu/students/academic-affairs/academic-appeals> for members of committee). See II Section D, Code of Student Rights and Responsibilities for details on Academic Appeals Committee hearings.

Americans with Disabilities Act (ADA)

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you need accommodations in a class, reasonable prior notice needs to be given to the instructor and to the Center for Disability & Access, 162 Olpin Union, 801-581-5020 (V/TDD) to make arrangements for accommodations. All written information in a course can be made available in alternative format with prior notification to the Center for Disability & Access.

Adding Classes-Full Term

Please read carefully: All classes must be added by the add/drop deadline: Friday, January 19, 2024. Late adds will be allowed January 22-26, requiring only the instructor's signature. Any request to add a class after the census deadline will require signatures from the instructor, department, and Dean, and need to be accompanied by a petition letter to the Dean's office.

A \$50 FEE WILL BE ASSESSED BY THE REGISTRAR'S OFFICE FOR ADDING CLASSES AFTER THE CENSUS DEADLINE ***

****Before you elect to take a class CR/NC you should check with your Advisor. Core classes used to compute your Engineering GPA need letter grades.

Withdrawal Procedures

For more, see the [Withdrawal Policy](#) and information on [Drop Deadlines](#) provided by the Office of the Registrar ** Please note the difference between the terms "drop" and "withdraw". Drop implies that the student will not be held financially responsible, and a "W" will not be listed on the transcript. Withdraw means that a "W" will appear on the student's transcript and tuition will be charged. **

Drop Period for Full Term Classes– No Penalty

Students may DROP any class without penalty or permission up until Friday, January 19, 2024.

Withdrawal from Full Term Length Classes

Students may WITHDRAW from classes without petition until **Friday, March 1, 2024**. Beginning January 20 until March 1, a "W" will appear on the transcript AND **tuition will be charged**. Refer to Class Schedule, Tuition and Fees for tuition information.

Drop/Withdrawal from Session I & Session II

Visit the academic calendar for more detail.

<https://registrar.utah.edu/academic-calendars/spring2024.php>

Withdrawals for term length classes after March 1 will only be granted due to compelling, nonacademic emergencies. A petition and supporting documentation must be submitted to the Dean's Office, 1704 Warnock Engineering Building. Petitions must be received before the last day of classes (**April 23, 2024**).

Repeating Courses

When a Price College of Engineering class is taken more than once, only the grade for the second attempt is counted. Grades of **W, I, or V** on the student's record count as having taken the class. Departments enforce these guidelines for other courses as well (e.g., math, physics biology, chemistry). Attempts of courses taken at transfer institutions count as one attempt. This means a student may take the course only one time at the University of Utah. Courses taken at the University of Utah may not be taken a second time at another institution. If a second attempt is needed, it must be at the University of Utah. Please work with your department advisor to determine the value of repeating courses. Students should note that anyone who takes a required class twice and does not have a satisfactory grade the second time may not be able to graduate. It is the responsibility of the student to work with the department of their major to determine how this policy applies in extenuating circumstances.

Important Safety Information

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-581-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit <https://safeu.utah.edu>

If you are experiencing interpersonal violence, sexual assault, domestic violence, and/or stalking, please connect with one of the resources below.

Resource	Phone #	Hours	Affiliation
McCluskey Center for Violence Prevention Email checked daily: cvp@utah.edu	801.587.3982	NA	University
Center for Campus Wellness, Victim Survivor Advocate:	801.581.7776	8-5	University
Office of Equal Opportunity	801.581.8365	9-5	University
University Department of Public Safety	801.585.2677	24 hrs	University
Crime Victim Advocate (ask to speak to the on-call Victim Advocate) For less urgent matters, email checked M-F 9-5: crimevictimsadvocates@utah.edu	801.585.2677	24hrs	University
Huntsman Mental Health Institute	801.583.2500	24hrs	University
Utah Crisis Line	800.273.8255		
Utah Domestic Violence Coalition	800.897.5465	24hrs	State
Rape Recovery Center	801.467.7282	(M-Th) 9-5	State
Utah Coalition Against Sexual Assault 24 hour crisis line	801.736.4356	24hrs	State
Stalking Helpline	800.621.4673	24hrs	State

Mandatory reporters are university employees, including students in paid leadership positions who are required to report sexual misconduct to the Office of Equal Opportunity and Affirmative Action per university regulations. Examples of mandatory reporters include:

- Professors and other faculty
- Administration and staff (non-mental health)
- Resident Advisors
- Student employees
- Campus Police or Campus Security officials
- Athletic Coaches/Assistants