Welcome New Master's Students!

- Getting started – including what’s new this year
- "Advisors": MSBI faculty members, student advisor, project advisors, and program coordinators
- Program requirement review
- Technical writing
- GPA and grad standing
- Writing project and research topics (project advisors introduce their topics)
- Academic honesty
Getting Started

• We're glad you're here!
• Have you registered for classes?
  • Make sure to do this as soon as possible.
  • If a course you like starts full, remember people often drop after a few days, so be persistent.
• Have you found your class meeting info?
  • Because of Covid-19 classes are online.
  • Faculty either are listing how to join class meetings (usually Zoom) on Canvas, via directly e-mailing you, on their syllabus, by giving the details to the CS Office, or a combination of these.
Getting Started

• If you are looking for a class you are not currently enrolled in, check if the faculty has left the meeting details generally visible on Canvas. If not, look at the online syllabus for the class. If not, use your phone/email-a-friend lifeline. If not, try directly emailing the faculty or CS office.

• Make sure to check your SJSU email and Canvas at least daily. You should probably keep a separate offline file with the meeting info for each of your classes.

• If you are in a different time zone, make sure to take account for the difference in time and double check for annoyances like daylight savings time.
Other Resources to Started

• Keep track of what's happening in the department on the Department Web Page.
• Master's program rules can be found at the MSBI website.
• Meet your advisor.
• "Advisors": MSBI faculty members, student advisor, project advisors,

• MSBI faculty members: CS Professors Andreopoulos, Heller, Lee, Wesley, and Prof. Ouverney (Biology).
• MSBI Student Advisor: Prof. Lee.
• Master Project (297/298) Advisors:
• You need to meet with an advisor... now, and once every semester.
• You can only register after your advisor removes the advising hold.
• Things to talk about:
  • What classes you plan to take this semester.
  • How you are currently doing (GPA-wise).
  • What's your plan for classes in future semester.
  • Any questions you have about the program.
Beyond Advisors

- Program Coordinators: M. Moh (CS) and Ouverney (Biology)
- You can contact us to talk about getting signatures on MSBI Program Forms.
- For many typical situations, you can just fill out the form and send it to the Lauren Elliott of the CS office to set up a DocuSign for one of us to sign it.
- CS Department Chair: M. Moh.
- College of Graduate Studies
Program Requirement Review

• Go to the MSBI website.
Technical Writing

• The typical way to pass the Graduate Writing Assessment requirement is to take either CS200w.
• The Computer Science Department policy is that students should complete the GWAR requirement in their first year in the MS program and must complete it two semesters before graduation.
• The writing requirement is required by the Cal State system.
• The only substitutes are:
  • Passing the WST at waiver level
  • Getting special permission from Graduate Studies (e.g. if you wrote a Ph. D. thesis in another subject)
• To obtain a waiver you would also need to fill out the [GWAR Waiver Petition Form](#) and get the relevant signature (not easy).
  • If you get a waiver, you still need to take 31 total units for our program, so you will need to choose an additional three-unit elective course to take in the place of CS200w, and get a course substitution form approved by the Program Coordinator.
GPA and Grad Standing

• If your total GPA is less than 3.0, you will end up on academic probation.
• You can score less than 3.0 (a B) on a course and not be on probation. However, you cannot use any course whose grade was less than or equal to a C- towards graduation.
• Being on probation means you cannot graduate until you're off probation.
• It also means you will be disqualified from the MSBI program if your GPA is not above 3.0 in the next semester.
• More information on this can be found on the [MSBI FAQ](#).
The Writing Project

• To finish your master's degree you need to complete one of two culminating experiences:
  • A writing project course sequence such as CS297/CS298 and successful defense.
  • A thesis course sequence such as CS297/CS299 and successful defense.
• The thesis (299) has stricter requirements and a faster timeline. The writing and formatting is checked by the Graduate Studies in addition to by your thesis advisor and committee.
• For both a writing project and a thesis, you need to find a project advisor (to take 297 and 298 or 299 from) and two committee members (this should be done by 298).
The Writing Project or Thesis

• You should try (this is a suggestion not a requirement) to take a course from the person who you want as your advisor before starting work under that person.
• You will probably have a better project experience if you choose an advisor that doesn't have too many students.
• Usually, it is the advisor that comes up with project suggestion in consultation with what the student is interested in.
• Let’s look at possible project advisors.
Bill Andreopoulos
Projects with a publishing potential

• Build machine learning models of 90 carbohydrolytic-active enzymes that were published in Science (Hess et al., 2011)
  • Use ML models to predict action of 28,000 putative enzymatically active genes
• RNA-Seq analysis of Phaeodactylum tricornutum: a diatom algae found in oceans
  • Find differentially expressed genes in transcriptomic samples from different conditions (oilfield water vs. normal)
• Cyanobacteria metagenomic samples across multiple temperatures (JGI)
  • Find new strains through 16S assemblies and translocation events between genomes
• Separation of thousands of plasmid sequences from soil microbes with machine learning
Phil Heller  philip.heller@sjsu.edu

Traditional Metagenomics

Metagenomics + Deep Learning

Bioinformatic Astronautics
The Uncultured Majority

Cleber Ouverney

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We are 10% human, 90% microbes

$10^{13}$ Human cells and $10^{14}$ bacterial cells, hence 10% human and 90% bacteria

http://www.miller-mccune.com/science-environment/bacteria-r-us-23628/
Uncultured bacteria associated with human diseases

- Periodontitis
- Chronic Gastritis
- Vaginosis
- Acute Necrotizing Ulcerative Gingivitis
- Acute Inflammatory Bowel Disease
- Preterm Birth Delivery
- Skin Rashes

Access to human samples imposes a challenge.
Mixed Community

Cell shape, size, density, target molecules, autofluorescence

Single Cell

Pure Culture or Enrichment

Cell lysis

WGA

Novel Lactase

Deinococcus pimensis

E.coli express heterologous lactase

Oral sample
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Leonard Wesley: Areas Of Bioinformatics R&D

• **R&D With Funds For Students:**
  
  • **MCI-DTI:** Earlier MCI (Mild Cognitive Impairment) and dementia detection leads to better outcomes, lower costs, and better clinical trials. Project involves predicting MCI from genome wide analysis and diffusion-tensor image (DTI) analysis of MRI brain images.

  • **Pancreatic Cancer (PC):** Involves using Nanopore & Ion Torrent NSG technologies to sequence real pancreatic DNA/RNA, genome assembly of sequence results, and evidence-based analysis to predict PC sooner than currently achievable.

• **Additional R&D Areas Of Interest:**

  • Protein Structure Prediction & Protein Structure Scoring:

  • Small Chemical Molecule Affinity and Activity Prediction With Protein Targets:

  • Genotypic and phenotypic pattern analysis using statistical and evidence-based methods to identify novel drug targets.
Academic Honest

• Academic Honesty is taken very seriously at SJSU.
• Make sure that any homework assignments, reports, etc. are written in your own words, use your own programming code.
• All CS298/CS299 reports will be checked against turnitin.com and it would be a pity to not complete your master's when you are very close to finished.
Questions?

• Hopefully, this orientation was helpful.
• Good luck to everyone here at SJSU!
Thank you!