

Advanced Topics in Data Science (ADS)- Syllabus

You can download the Syllabus in PDF form by clicking [\[this link\]](#).

Logistics

- **Instructor:** Dr. Robin Donatello (Dr. D, she/her/hers)
- **Office Location:** Holt 202
- **Telephone:** 898-5767
- **E-mail:** rdonatello@csuchico.edu
- **Office Hours:** TBD Week 2
- **Meeting time and locations:** TR 2-3:30 pm Holt 155
- **Prerequisites:**
 1. Introduction to Data Science (MATH/CSCI 385).
 2. Math 456 (*or co-requisite*)
 3. Or instructor permission
- **Course Website:** <http://norcalbiostat.github.io/MATH485/>
- **Slack Channel** <http://csuc-ads.slack.com> You will be sent an email invitation to your campus email.
- **Google Drive** You will be added to the ADS Google drive using your campus email.

Course Description

This course aims to help students navigate the evolving field of Data Science. We do so by not only providing training in advanced programming and technical skills, but also by providing opportunities for collaboration and reflection on how Data Science impacts human society. The overarching themes of the class include:

Collaboration

- Team collaboration tools (Slack, Zoom, Github)
- Joint project with Political Science Graduate students
- Community Coding
- DATAFEST!!!
- What's your Data Science Profile?

Computation

- Identifying and applying appropriate methods to answer a business or research need.
- Introduction to Statistical learning techniques (predictive modeling using Supervised and Unsupervised Machine Learning).
- Cross Validation
- Parallel Processing
- Neural Networks, Deep Learning, Image Classification

Communication

- Dissemination of transparent research.
- Writing instructional materials (tutorials) for others to learn from your work.
- Reflections and discussion on readings, interesting findings
- Peer review

Community

- Building a professional online presence
- Social Media for #DataScientists
- Who's out there doing cool things?
- Keeping current with a fast moving field. What's next on the Hype Cycle?

Conscience

- Ethics of predictive analytics (Weapons of Math Destruction)
- Protecting privacy in the age of open data
- Playing with the emotions of the electorate / Facebook 2016 / Election 2020?
- Role of Tech in controlling/spreading fake news

Cloud based resources

- Introduction to current scalable technologies to handle and analyze Big Data.
- Managing large relational databases using SQL
- Options: Google, Amazon, Microsoft

Career

- Cos we gotta make munny!
- What are your options?
- Money, Location, Satisfaction -> Can we get all 3?

Note: Due to time constraints, not all items on the above list will be able to be covered.

Interdisciplinary Collaboration

We will be doing a joint project with Political Science Graduate students (POLS 624). The project will be a twitter analysis of public opinion. You will work with a team of PolSci students, where you will provide technical and coding support and they are the content experts.

More details can be found on the Project page of the course website.

Required Materials

- **Computer**
 - A laptop is nearly invaluable, bring to class every day.
 - Loaner laptops will be available during class time only.
 - A solid internet connection is a must. We will be using a lot of online resources.
 - **Computer Software:** R, R Studio, LaTeX. Make sure everything is up to date. May need Python at a later point.
 - **Textbooks**
 - Introduction to Statistical Learning <http://www-bcf.usc.edu/~gareth/ISL/> (free)
 - Weapons of Math Destruction, Cathy O'Neil 2016 (ISBN-10 0553418815) - Available for checkout in the library.
 - Doing Data Science, Cathy O'Neil, Rachel Schutt (2014) ISBN-10 978-1-449-35865-5
 - **Accounts (Free)** Github, Slack, Twitter
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Grading

The *approximate* contributions per category are: Discussions XX%, Peer review XX%, Assignments XX%, and Project XX%.

Letter Grade Conversion: 100-90%: A, 89-80%: B, 79-70%: C, 69-60%: D, 0-59%: F

Policies

Adding and Dropping the course

The last day to add or drop classes without special permission by the instructor is 1/31/20. No adds or drops are allowed after 2/14/20 without a serious and compelling reason approved by the instructor, department chair, and college dean.

Americans with Disabilities Act

If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations

and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.

Accessibility Resource Center
530-898-5959
Student Services Center 170
arcdept@csuchico.edu

Chico State Basic Needs Project

The **Hungry Wildcat Food Pantry** provides supplemental food, fresh produce, CalFresh application assistance and basic needs referral services for students experiencing food and housing insecurity.

All students are welcomed to visit the Pantry located in the Student Service Center 196, open Monday-Friday, 11am-4pm or call 530-898-4098.

Please visit the Chico State Basic Needs website <http://www.csuchico.edu/basic-needs> for more information.

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