**DATA 300: Statistical Machine Learning**

Fall 2023 Syllabus

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| **Instructor** | Kennedy Odongo |
|  | [odongok@dickinson.edu](mailto:odongok@dickinson.edu) |
| **Time**  **/Room** | Monday/Thursday 3:00 pm – 4:15 pm EST  Tome 121 |
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| **Office hours/**  **Room** | Monday 11:00 am-12:00pm  Wednesday 4:00 pm-5:00pm  Thursday 11:00 am -12:00 pm  Althouse 219 and over Zoom  <https://dickinson.zoom.us/j/82562301909?pwd=N3VHaDBxUjlhZThMblFFYkN4TGttdz09>   * Zoom ID: 825 6230 1909 * Passcode: 199942   I am always only an email away for extra appointments! |
| **Course material** | **Textbook (required, free pdf via the website)**  An Introduction to Statistical Learning: with applications in Python (R)  <https://www.statlearning.com/> . |
|  | The Elements of Statistical Learning  <https://hastie.su.domains/Papers/ESLII.pdf> |

**Course Goal**

Statistical machine learning refers to a set of tools for understanding datasets. As the scale and scope of datasets keeps increasing, the variety of statistical machine learning models is ever-growing. DATA 300 focuses on the most fundamental models, from their mathematical details to implementations. Upon successful completions of this course, a student is expected to 1) comprehend the mainstream statistical machine learning models, including Generalized Linear Models (GLM), Tree-based methods, Support Vector Machines (SVM), etc.; 2) identify and implement the appropriate model for basic data analytical tasks; 3) employ proper techniques to simplify complex data analytical tasks, including sampling, variable selection, and others.

**This syllabus includes:**

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2. [Course Components](#_Course_Components)
   1. Participation
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   3. Homework
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   1. Attendance policy
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## Grading Criteria

## Course Components

**Participation (10%)**

I expect you to attend and participate in class, including but not limited to actively asking questions, participating in class discussions, etc. The level of your class engagement contributes to 10% of your final grade.

**Project (15%)**

There is a final project in this class, in lieu of a final exam. The final project will be due during the Finals week, and details of the project will be announced later in class. The project will be done via GitHub.

**Presentation, report, and discussion (20%)**

Each of you will have an assigned topic. After each topic being discussed in class:

* the ones assigned with this topic will submit a summary on this topic. This summary will be an individual work. It includes a 2-page executive summary and a 5-minute presentation.
* If it is not your assigned topic, you are expected to participate in the discussion and submit short feedback for the presentations.

Your grade on this section consists of two parts:

1. Presentation/Report (10%): the quality of your presentation and executive summary.
2. Participation (10%): your level of participation in discussion and quality of feedback.

**Homework (25%)**

There will roughly be weekly homework. You are encouraged to work together on the assignments, but your answers must be written up individually in your own words. Late assignments will not be accepted without a signed medical excuse. This course will also use DataCamp.com. You will be enrolled in our course group on the DataCamp website and should receive an e-mail to your Dickinson account with a link to register on their site.

**Exams (30%)**

This class will have two exams. The tentative dates are:

* Exam 1: Thursday 10/12 in-class
* Exam 2: Thursday 11/30 in-class\*\*

The instructor does reserve the right to change the exam dates. Should the date be changed, the instructor will announce in class at least one week in advance. Both exams may not be missed for the convenience of the student. See the [Make-up Exam Section](#_Make-up_exams) below for exceptions.

## Course-Specific Policies and Guidelines

**Late homework**

Late work is NOT accepted in this class. Please consult with the instructor as soon as possible if you have a college-allowed excuse (medical, death in the immediate family, legal entanglement, authorized College business).

**Rectifying scores**

After you get your homework or test report back, you have a week to discuss it with the instructor. Beyond this period, I will not entertain any complaints or changes to the scores.

### **Make-up exams**

In-class tests or the final exam may not be missed for the convenience of the student. If you must miss an exam and you have a college excused absence (medical, death in the immediate family, legal entanglement, or authorized college business trips), you may seek permission to take a make-up test/exam ASAP and no later than 48 hours prior to the test. You should know that I scrutinize these requests very carefully and prior notice of the absence is an important element in the decision.

If you are granted a make-up test/exam, make sure that you show up during the scheduled make-up exam date, otherwise you will get a zero for the missed test/exam.

## Academic Resources

**Quantitative Reasoning Center**

Dickinson College provides additional support for students taking courses with quantitative content across the curriculum through the [Quantitative Reasoning (QR) Center](https://www.dickinson.edu/info/20525/quantitative_reasoning_center/2962/quantitative_reasoning_center). This class relies on DATA 180 and MATH 225 as the prerequisites. Please schedule appointments with the QR Center if you need to refresh on the prerequisites.

**SOAR: Academic Success Support and More**

Students can find a wealth of strategic academic success tools (like weekly planners, semester calendars, and much more) by going online to [www.dickinson.edu/SOAR](http://www.dickinson.edu/SOAR) or to Old West's Lower Level (aka "the OWLL"). SOAR stands for Strategies, Organization, & Achievement Resources, and there you'll find apps, tips, and other resources related to organization, study skills, memory strategies, note-taking, test-taking, and more. You’ll find strategies for managing your time and well-being, as well as information about academic success workshops offered throughout the semester. If you’d like to attend a workshop or request one-on-one assistance with developing a strategy for a manageable and academically successful semester, email [SOAR@dickinson.edu](mailto:SOAR@dickinson.edu).

## College Policies and Guidelines

**Accommodating Students with Disabilities**

Dickinson values diverse types of learners and is committed to ensuring that each student is afforded equitable access to participate in all learning experiences. If you have (or think you may have) a learning difference or a disability – including a mental health, medical, or physical condition– that would hinder your access to learning or demonstrating knowledge in this class, please contact Access and Disability Services (ADS). They will confidentially explain the accommodation request process and the type of documentation that Dean and Director Marni Jones will need to determine your eligibility for reasonable accommodations. To learn more about available supports, go to www.dickinson.edu/ADS, email access@dickinson.edu, call (717)245-1734, or go to the ADS office in Room 005 of Old West, Lower Level (aka "the OWLL"). If you’ve already been granted accommodations at Dickinson, please follow the guidance at www.dickinson.edu/AccessPlan for disclosing the accommodations for which you are eligible and scheduling a meeting with me as soon as possible so that we can discuss your accommodations and finalize your Access Plan. If you will be using any test-taking accommodations in this class, be sure to enter all test dates into your Access Plan in advance of our meeting.

**Academic Misconduct**

The most common form of academic dishonesty in this course is cheating. As noted in Dickinson College’s Community Standards, “cheating involves deception or the provision or receipt of unauthorized assistance. Students are expected neither to receive nor to provide unauthorized assistance with academic work.” In this course, it is expected that you complete all exams independently and any form of cheating will not be tolerated. All homework assignments may be completed with classmates, but copying another classmate’s homework is a form of cheating. Other forms of academic misconduct include plagiarism and falsifying documents. More information about Dickinson College’s views on academic misconduct can be found in the community standards at: <https://www.dickinson.edu/download/downloads/id/11821/community_standards.pdf>

**Educational Equity**

Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are NOT tolerated in this course.

**Title IX Statement**

As a faculty member at Dickinson College, I am committed to facilitating a safe and inclusive learning environment for students. It is my goal that you feel able to share information related to your experiences during class discussions, in your written work, or in meetings with me. I will keep the information you share with me as private as possible; however, as part of my job responsibilities, I am required to share information about sexual misconduct or other crimes with the college. Students may speak with someone confidentially by contacting Dickinson’s Wellness Center at 717-245-1663 or the 24/7 YWCA Advocate hotline at 717-831-8850.

**Religious Holiday Policy**

Students must make arrangements with their faculty members in advance when an exam (including quizzes), papers, and other work are due on major religious holidays. A student will not be penalized for missing class or not handing in work on a holiday due to religious observance. However, students must notify faculty, in writing, reasonably in advance of the holiday if they will be absent from class for religious observance. Faculty members are expected to make reasonable arrangements for students to complete missed work; students must make up the work.