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ST554 Analysis of Big Data Course Outline

COURSE INFORMATION

Course Website: wolfware.ncsu.edu

Course Credit Hours: 3

Course Description: Course discusses big data management, predictive analytics, and applications of big data. Literate programming and other good programming practices are covered. Regular access to a computer for homework and class exercises is required.

The prerequisite coursework requires that students have completed a programming course. This implies that students are expected to have a strong understanding of how computers function and the logic required to instruct them.

Often in homework assignments students will be asked a few questions that require outside of class material. This implies that students are expected to be able to search through online help forums, vignettes, and the like to distill and extract relevant information to solve problems.

Prerequisites/Corequisites: [ST 511, ST 513, ST 517, or equivalent] and [moderate computer programming experience]

COURSE DELIVERY AND STRUCTURE

- This online course delivers all learning materials, activities and assignments through **Moodle**, a secure and easy-to-use online learning platform.
- The course is **asynchronous**; students have no real-time class meeting requirements.
- Learning materials and activities include:
    - **Guided note outlines:** Contain key text and graphics for each topic; some topics may be broken into multiple note outlines. Definitions and examples will be filled in by students with the help of the online lectures. These outlines are a student's major resource in completing the weekly assignments and semester exams.
    - **Online lecture videos:** These narrated presentations take the place of face-to-face lecture. Students will use the content in these videos to

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complete the guided note outlines. These videos are intentionally kept short, so there will be multiple videos for each outline.
    - **Weekly assignments:** Administered through Moodle.
- University DELTA Testing Services (if applicable to your class). If you instructor plans to use the campus or remote proctor testing options, you can learn more about it by visiting the website (https://testing-services.delta.ncsu.edu/testing-services-remote/off-campus-submit-request/)

COURSE LEARNING OUTCOMES

Upon completion of this course, students will be able to:

1. explain the steps and purpose of python programs
2. efficiently read in, combine, and manipulate data in python
3. utilize help and other resources to customize programs
4. write programs using good programming practices
5. explore, manage, and solve common common problems with big data

COURSE TOPICS AND SCHEDULE

Topic List and Schedule

- Basic use of python
- Control flow and user-defined functions
- EDA
- Fitting and evaluating models
- SQL and database basics
- Pyspark
- Fitting models with scikit-learn and MLlib
- Streaming data concepts

Please note: course schedule is subject to change.

COURSE MATERIALS

Required Materials

- Software: Students in this course will use the R statistical software and the R Studio IDE. This software is open source, works on all major platforms, and is free to anyone. It is widely used in statistics and data science (behind python in data science but still quite popular).

Grading Scale: This course uses the standard NCSU letter grading scale. Percentage cutoffs are firm, and no rounding occurs; for example, a percentage of 86.99 would correspond to a B.

Low(percentage)	Letter
97 ≤	A+
93 ≤	A
90 ≤	A-
87 ≤	B+
83 ≤	B
80 ≤	B-
77 ≤	C+
73 ≤	C
70 ≤	C-
67 ≤	D+
63 ≤	D
60 ≤	D-
0 ≤	F

Exam and Testing Instructions

Exam proctoring: Your instructor may require proctored exams facilitated through DELTA Testing Services. A proctor is an impartial third-party who verifies the identity of the student and ensures the academic integrity of an exam.

1. **Local students** — DELTA Testing Services will offer the exam(s) for this course on campus. Please visit the DELTA Testing Services website for more information about on-campus testing.

    - **Step 1: Make an Appointment**. Exams at the DELTA Test Centers are by **appointment only**. To schedule your appointment, visit go.ncsu.edu/takemytest. Appointments must be made at least 24 hours in advances; however, the sooner – the better.

    - **Step 2: Come Prepared**

- Bring a photo ID
- Know your UnityID
- If you are a DUO user, bring your registered device.
- Arriving late for an appointment may result in the appointment cancellation; students can sign in for an appointment up to 15 minutes early.

2. **Students with Accommodations**— If you have approved accommodations with NC State's Disability Resources Office (DRO), DELTA Testing Services wants to ensure that you receive the appropriate accommodations when you go to the test center.

   - **Email Testing Services**. Send a PDF copy of your Accommodation Letter to delta_accommodations@ncsu.edu. Once we have received a copy of your accommodation letter, a confirmation email will be sent informing you that your accommodations have been processed. You will *then* be able to schedule an appointment.

3. **Remote students** — DELTA Testing Services will oversee the process of approving a remote proctor, sending all exam materials, and receiving any materials from your proctor.

   - **Step 1: Submit a Request**. To use a remote proctor for an exam, you must submit an online request and it must be approved by DELTA Testing Services. The request should be submitted at the start of the semester. The approval process takes at least 72 hours.
     - Pre-approved proctors are marked on the map and are selectable in a drop-down menu in the request form.
     - If you do not see a pre-approved option in your area, it is your responsibility to find a proctor who meets the guidelines. When submitting a request, if your proctor is not pre-approved, select "other" and fill in the remote proctor's information. (Please double-check the email address.)

Please note that the instructor does not communicate directly with proctors. Please refer all questions regarding proctoring to the distance proctoring center via deproctor@ncsu.edu or call 919.513.1513.

Optional Materials

- **Textbook:** we'll use some free online texts and articles

This document is not a contract. I reserve the right to make changes as necessary over the course of the semester with notice.

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