

## **Be a Data Science and AI Health Detective: Discover What Your Body's Telling You Through Data!**

### **Course Overview:**

Have you ever wondered what the numbers on your smartwatch or fitness tracker reveal about your health? In this fun, hands-on course, you'll get to be a "Health Detective" and unlock hidden messages and patterns in your everyday health data, like activity levels, sleep patterns, and heart rate. No smartwatch or wearables? No problem! We'll show you easy ways to collect your own data. Each day, you'll learn to turn your data into colorful visuals that reveal what's going on inside your body. By the end of the week, you'll build a personal "health dashboard" to show off what you've discovered - just like the ones used by athletes and scientists. You'll also get a sneak peek into the world of artificial intelligence, discovering how data can be used to make predictions and gain insights. Throughout the course, you'll extract patterns from your health data and learn how small changes in your routine can help you feel healthier and more energized.

Imagine heading into the next school year, ready to show off the healthy habits you've built! This course is your chance to see how engineering, health, data, and cool visuals come together to tell a story about your health. So, get ready to dive in, become a "Health Detective," and see what your body's data has to say!

### **Learning Outcomes:**

By the end of this mini-course, students will be able to:

- Identify and describe different types of personal health data.
- Collect, clean, and organize personal health data.
- Apply artificial intelligence techniques to analyze personal data.
- Design and develop effective visual presentations of personal health data for exploration and communication.
- Draw insights from data to reflect on personal health habits.

**Tentative Course Outline:**

Day	Topics	Activity/Guest Lectures/ Lab Visit
Day 1: April 28th  Introduction to Personal Health Data	Introduction to data science and its application to health data  Discussion on different types of health data (e.g., activity, sleep, heart rate, mood)  Exploring insights from tracking personal health data	Find your group and plan for the Data Visualization Hackathon  Setting up a personal Health Data notebook
Day 2: April 29th  Cleaning, Organizing & Sketching	Overview of methods for data collection  Introduction to data cleaning: how to handle errors, missing values, and duplicates  Data organization in Excel (tables, filtering, sorting)	Collect data from peers using Google Forms  Organize and clean the collected data in Excel  Sketch visualizations based on collected data  Visit Abilities Living Laboratories
Day 3: April 30th  Introduction to AI for data analysis	Basics of AI, ML, and NLP in health data  Applications of AI in electronic health records and text generation  Introduction to machine learning in healthcare	Guest Lecture: Prof. Green on AI in healthcare  Analyze text data using NLP  Analyze tabular data using ML
Day 4: May 1st  Health Dashboards: Digital & Physical	Introduction to visualization dashboard design and storytelling with data  Best practices in creating visualizations  Introduction to physical data visualizations	Create visualizations using Tableau  Create physicalizations using physical materials
Day 5: May 2nd  Final Projects & Presentations	Presenting your health data story through visualizations  Data Visualization Hackathon  Final reflections on what you've learned	Work on final dashboard projects (digital or physical)  Present final projects and share insights  Peer feedback and group discussions

**Notes:**

**Assignment:** There is one main assignment throughout the course: collecting personal health data every day. You will be required to track various health metrics such as steps, sleep, heart rate, and mood. This data will be essential for your final project and the activities throughout the week. Please refer to the *Assignment document* for detailed instructions and guidelines.

**Hackathon:** On the final day, we will hold a half-day Data Visualization Hackathon. This hackathon will give you the opportunity to apply everything you've learned throughout the course. Each day, we will focus on developing the skills necessary to succeed in the hackathon, from data collection and cleaning to visual storytelling and presentation. Be sure to check the *Hackathon document* for all the important details and requirements.

**Group Work:** Collaboration is essential in this course. You will be grouped with peers throughout the week to work on different activities and tasks. Particularly for the Data Visualization Hackathon, it is crucial to communicate openly, contribute equally, and share responsibilities. Remember, teamwork should be fun and productive! By working together, you will be able to achieve better results and learn from each other.

**Guest Lectures and Lab Visits:** Throughout the course, you will have the opportunity to attend guest lectures and lab visits. These sessions provide a chance to learn from experts in the field and explore real-world applications of the concepts you're studying. Make sure to take notes, ask questions, and engage during these lectures and visits.

**Communication and Support:** If you encounter any challenges, have questions, or want to provide feedback, please feel free to reach out to me. I'm here to support you throughout the course, and I encourage open communication. Don't hesitate to ask for help when needed!