Construction Management and Project Engineering

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Course Overview

Disclaimer

- The “hidden” subtitle of this course is *“Construction Safety and Data Analytics.”* Please note that the contents of the course are designed toward this subtitle.

- This course is designed as a seminar-type course and involves a lot of self-learning work.

- This course can be greatly deviated from its syllabus. The instructor has a full authority to change the organization/topics.

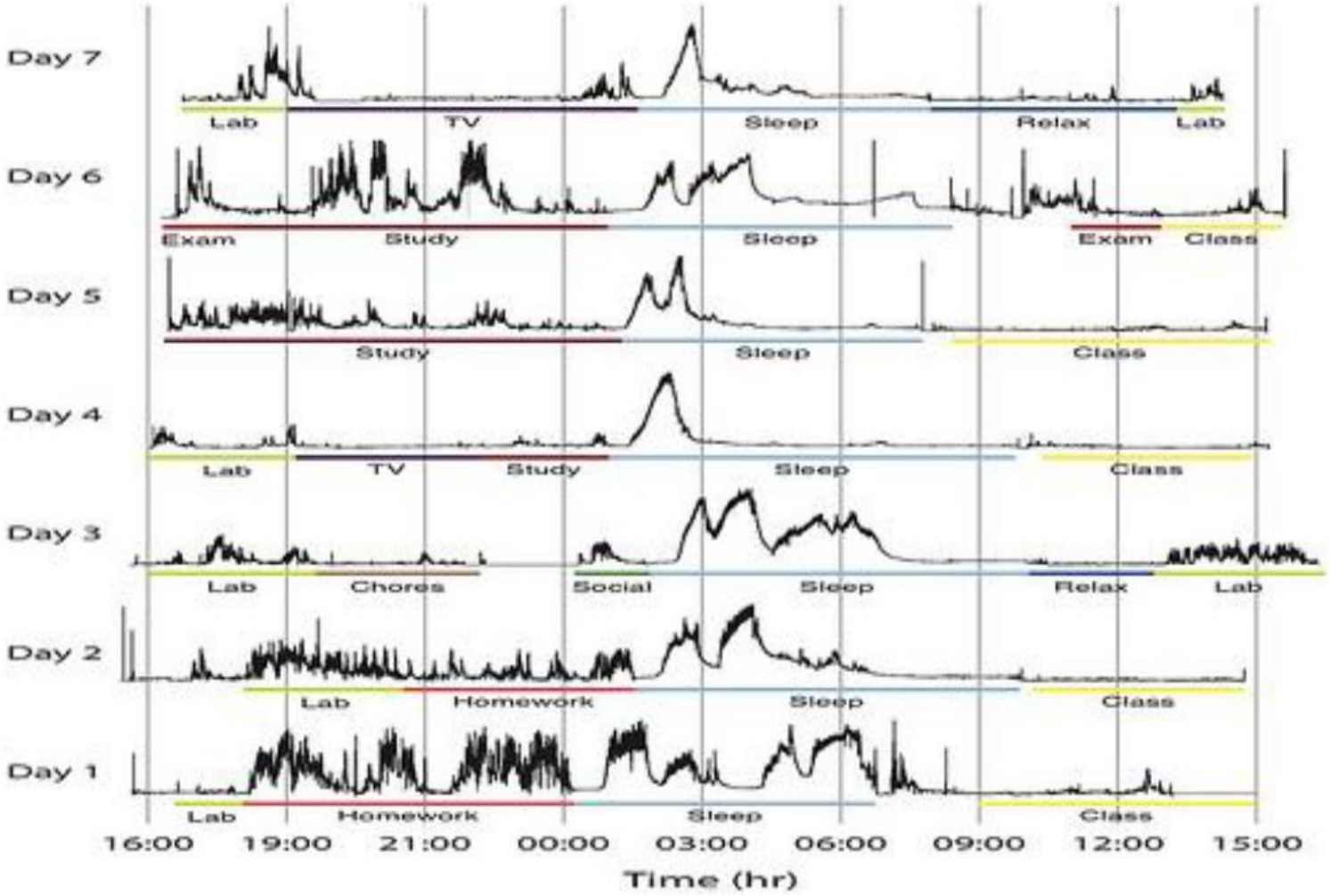
Disclaimer

- This course is delivered in English. While the majority of the course will be in English, some portion can be delivered in Korean based on the instructor's discretion.

- Students are required to engage in the course via English, but if you have a difficulty in articulating your idea in English, you can use Korean.

General Rule: Learning is most important!

What do you notice? What do you wonder?



n, N. C., & Picard, R. W. (2010). A wearable sensor for unobtrusive, long-term assessment of electrodermal activity. IEEE transactions on Biomedical engineering, 57

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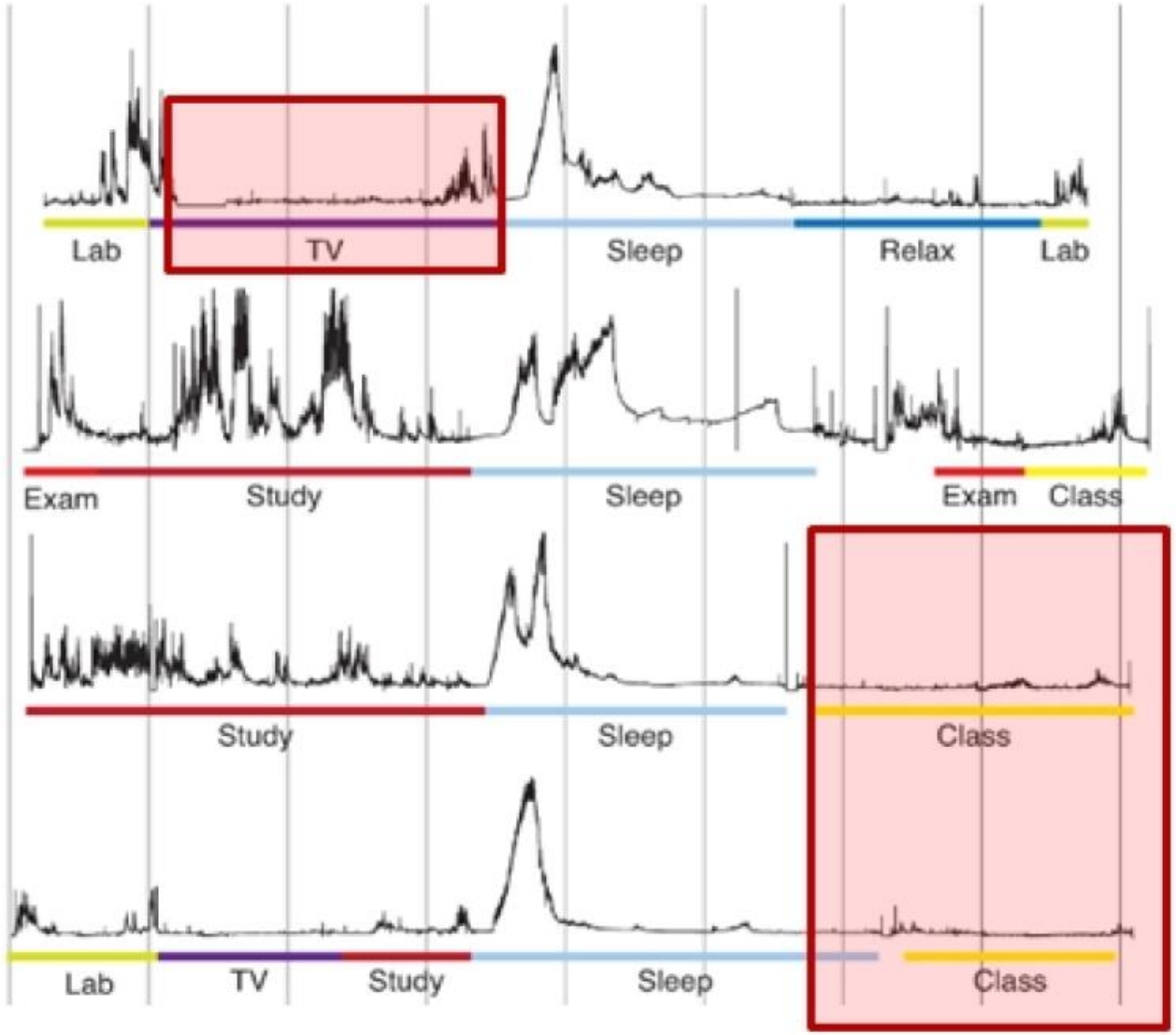

Ice Breaking

- Name (you prefer to be called)?
- Where are you from?
- A little bit about yourself?
  A. Why do you take this class?
  B. Any direct/indirect experience related to safety accidents (e.g., in construction or your daily life)?
  C. Any experience in data science or programming

What is this course about?

- Construction Safety and Data Analytics
  - Construction Safety Management: A systemic way of identifying hazards and managing risks related to the construction workplace *(Burger 2016)*
  - Data Analytics: the science of examining raw data with the purpose of drawing conclusions about that information *(Investopedia 2019)*

What is this course about?

- What are the common safety and health hazards in construction workplaces?
- Why are the accident caused?
- How can they be prevented?

What is this course about?

- Based on the view of Human System Engineering
  - View humans as a part of a complex system.
  - Combines engineering and psychology to design systems
  - A structured approach to influence the intangible reality in organizations in a desirable direction

Topics to be covered

- Practices and issues in construction safety management
- Theories and concepts of accident prevention
- Human factors and ergonomics in construction safety
- Wearable technologies and data science skills for construction safety and health applications

Data Science

- Statistics + Data analysis, Machine Learning, and other models
- Enable data-driven research, data-driven decision making, data-driven project management
- Must-have skills for 21st century engineer, researcher, scientist, and entrepreneur.

Data Science

- Project-based learning

  : The team project includes data collection. Experiments or any other types of activities can be required, depending on the topic you choose.

- Some level of programming skills, not required but strongly recommended (at least, you have a strong interest and desire to learn). If not, it is recommended to take external courses about programming (python) simultaneously.

Term Project

- Students will be required to work as a team on a semester-long engagement to develop the applications of data science techniques and/or wearable computing in construction safety and health.

- Student teams will be asked to identify a topic of interest, find or collect a related dataset, provide data analysis results, and discuss the implication of their results toward construction safety management

Term Project

- Expected final deliverables:
  - Presentation & Final report
- Grades will be based on
  - Assessments of the final deliverables by the instructor
  - Assessments of individual student contributions by fellow team members

Term Project

- Important Dates & Required Deliverables
  - ✓Week 1 Term Project Orientation
  - ✓Week 11 Proposal Presentation (20 mins)
  - ✓Week 15 Final Presentation (30 mins)

Case Study: Mini-Presentations

➢ Case Study: Mini-Presentations

These assignments will require student to consider the practical implications of the lecture materials. Students will be asked to develop a case study related the topic and deliver a short presentation.

- Case Study 1: Safety Accident Report (15 min/team)
- Case Study 2: Safety Management Practices (Site Visit Report) (15 min/team)
- Case Study 3: Emerging Technologies in Construction Safety and Health (15 min/team)

Case Study: Mini-Presentations

- Rule of Team Building
  - Promote diversity and learn professionalism in a short-lived team-up.
  - You cannot team up with one person more than one case study.
  - Any identical match across case study teams will result in a penalty.

Course Grading

Tasks	Weight
Attendance and Participation:	**10%**
Mini presentations (case study)	**30%**
Assignments (including in-class exercises)	**20%**
Term project presentation and paper	**40%**

* No exam, quizzes