ENS 216: Information Systems: A Historical Perspective

Instructor:
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Class Schedule:
Tuesday 16:40-18:30 (FENS G035)
Wednesday 16:40-17:30 (FENS G035)

Recitation Schedule:
Wednesday 17:40-18:30 (FENS G035)

Tentative Course Outline:

- Complex systems, partitioning a complex problem, principles of hierarchy and decomposition, applications in engineering design,
- Signals – waves – transmission: basic principles of radio, analog vs. digital, continuous- time vs. discrete-time,
- What is "data"?: binary representations, history of signal processing, digital signal processing in discrete-time, multiple dimensions: image processing and video processing,
- Boolean logic: origin and fundamentals, how to build a basic switch: "herding" electrons, logic gates / switch networks, memory: how to "store" data?, connecting to the "cloud": Internet fundamentals, data networks – routers – servers – data farms,
- Communication – modulation – channels – noise, wireless communication: Marconi to iPhone,
- Photonics: Lasers and fiber optics, semiconductor technology: 50 years of revolution, imaging and image sensors: basic principles, history of display technologies, LED, TFT,
- Power / energy dissipation, energy storage: battery technologies, resources: energy and raw materials, energy policy / energy utilization and conservation,
- Impact on society: how technology influences humanity, social responsibilities of scientists and engineers, looking into the future.

Grading Policy:

The grading will be based on a written semester project report (which will be assigned to each individual student by the 6th week of the Spring semester) and the oral presentation of the report in class, during the last two weeks of the semester. There will be no final examination.

Written Report: 50%

Oral Presentation: 30% (instructor evaluation) + 20% (class peer evaluation)

Grading of the written report will be based on the quality and accuracy of the contents. The students may use any and all sources / references without restriction, to create their reports.

Course Policies:

1. Regular class attendance is not mandatory - but heavily encouraged because most of the course material will be presented / discussed in class, using the blackboard.

2. Recitation hours may occasionally be used to cover course content.

3. Lecture slides (if available) and additional lecture material will be posted regularly on the course web site.

4. In extreme cases (when the instructor cannot be available during regular lecture days/hours), make-up lectures may be arranged during the weekends, to be announced at least one week ahead of the lecture.