

Fall 2020: Outline of CSE Standard Course Syllabi

- **Course number:** ECSE 410
- **Course title:** Mobile Health (mHealth) Technology
- **Prerequisites:** An enrolled student is expected to have
 - 1) Strong Java programming skills.
 - 2) An Android smartphone for the course assignments and the final project.
- **Course objectives:**
 - 1) Draw the general model of a mobile health system, describe the function of each of the blocks, define technical terms relevant to the system, and apply data mining modules.
 - 2) Design mobile app to transmit medical and health data across wireless channels and understand the wearable sensor sensing, sampling, and communication principles.
 - 3) Survey state-of-art mHealth App design, wearable devices, and web services.
 - 4) Learn to search scientific literatures and use Latex for technical writing.
- **Course description:** Advances in communications, computer, and medical technology have facilitated the practice of personalized health, which utilizes sensory computational communication systems to support improved and more personalized healthcare and healthy lifestyle choices. The current proliferation of broadband wireless services, along with more powerful and convenient handheld devices, is helping to introduce real-time monitoring and guidance for a wide array of patients. Indeed, a large research community and a nascent industry is beginning to connect medical care with technology developers, vendors of wireless and sensing hardware systems, network service providers, and data management communities. Students in the course and labs will explore cutting-edge technologies in 1) mobile computing technologies and 2) healthcare/medical applications, through lectures, lab assignments, exams, presentations, and final projects. The overall course objectives are to introduce electrical engineering, computer engineering, and computer science students the fundamentals of wearable sensors, mobile health informatics, big data analysis, Internet of Things (IoT), and human computer interaction considerations.
- **Time and day of class meetings:** MW 12:45pm – 2:00pm
- **Class meeting location:** Web/Distance Learning
- **Instructor name:** Ming-Chun Huang

- **Instructor phone number and email and office location:**

TEL) 216.368.0397

Email) ming-chun.huang@case.edu

Office) Glennan 514B

- **Instructor office hours:** virtually by appointment
- **Grading policy (assignment, exam, presentation, project, late policy, percentage, etc.)**

Total 100 points (**Late policy: 1pt deduction every 2 hours late.**)

- Assignments (5 programming homework, 5%, 15%, 15%, 15%, 15%) – 65%
- Final Comprehensive Exam – 10%
- Special Topic Presentation: mHealth for COVID-19 – 10%
- Final Project Report – 15%

- **Planned topics**

- Overview mHealth Technology and Applications.
- Mobile Computing and Application Development using Android
- Android User Interface and Multimodality Data Collection
- GPS, Google Map, and Web Services
- Mobile-Health: Using Mobile Computing for Remote Monitoring
- Machine Learning Algorithms for Data Analysis
- Big Data Analysis Tool and Evaluation Metrics
- Vision-based Technologies for Human Computer Interaction
- Smartphone Communication
- Bless and Curse: Limitations of the Mobile and IoT Environment

- **Course Website**

You will need to download your slides, assignments, final projects, and any other necessary information (such tutorials and miscellaneous supplements) from the course website. **It is your responsibility to check the course website for any important announcement**

- **References**

Internet is a good source for quick info. Nevertheless, **all material must be properly referenced**. Plagiarism will not be tolerated. Check the materials section of the website for additional handouts that will be necessary to complete the projects.

- **Cheating**

Cheating in no form will be tolerated. All students found to be cheating will be reported.

Recommended readings:

- Android Developer: <http://developer.android.com/guide>
- Mehran Mehregany, "Wireless Health – Remaking of Medicine by Pervasive Technologies", Publisher: AuthorHouse, Dec. 10. ISBN 9781496934147
- R. Duda, P. Hart, D. Stork, "Pattern Classification", second edition, 2000.
- Fei Hu, "Tele-Healthcare Computing and Engineering: Principles and Design", Publisher: Science publishers, CRC Press, Apr 2013. ISBN 9781578088027

- **CSE Academic Integrity Statement**

Academic Integrity Policy: All students in this course are expected to adhere to University standards of academic integrity. Cheating, plagiarism, misrepresentation, and other forms of academic dishonesty will not be tolerated. This includes, but is not limited to, consulting with another person during an exam, turning in written work that was prepared by someone other than you, making minor modifications to the work of someone else and turning it in as your own, or engaging in misrepresentation in seeking a postponement or extension. Ignorance will not be accepted as an excuse. If you are not sure whether something you plan to submit would be considered either cheating or plagiarism, it is your responsibility to ask for clarification. For complete information, please go to

<https://students.case.edu/community/conduct/aiboard/policy.html>

Disability Resources: ESS Disability Resources is committed to assisting all CWRU students with disabilities by creating opportunities to take full advantage of the University's educational, academic, and residential programs. For further information, please go to

<https://students.case.edu/academic/disability/>