WEARABLE COMPUTING TECHNOLOGY

EBME 480U

COURSE DESCRIPTION: Learning about a broad range of cutting-edge technologies suitable for wearable computing. Understanding printed and flexible electronics technologies required for creating wearable computing, in particular organics for active components due to their flexibility or conformity. Examine the tradeoffs between flexible/conformal versus rigid electronics in the context of wearable computing. Reviewing the history of printed electronics used as conductors for membrane keypads, car windscreen heaters and RFID tag antennas—to name a few application examples. Reviewing the latest technology advances in functional components such as displays, lighting, transistors (p-type & n-type), memory, batteries, photovoltaics (PV), sensors, and conductors as well as integration/packaging steps. Understanding the market potential of these technologies by reviewing emerging products. (3 credit hours)

FACULTY: To be announced

TEXTBOOK: Reading references posted on the Blackboard site. There is no suitable, recent textbook.

COURSE OBJECTIVES: This course is designed to provide a strong foundation in technology topics that underpin wearable computing.

COURSE GRADE:

Exams (30%): 3 Exams, 1 every 3-4 weeks
Homework (40%): 4 assignment, ~ biweekly
Project (30%): Building on the homework to integrate and instill the learning experience.

WEEKLY COURSE SCHEDULE:
1. Overview of technologies for wearable computing
2. Flexible and conformal substrate technologies
3. Flexible and conformal device technologies
4. Tradeoffs between flexible and conformal versus rigid electronics technologies
5. Evolution of printed electronics technology
6. Large-area, printed electronics
7. Challenges with printed electronics technology
8. Development of augmented reality
9. Influence of augmented reality on wearable computing technology
10. Silicon devices on flexible substrates
11. Non-silicon devices on flexible substrates
12. Optical devices and displays on flexible substrates
13. Photovoltaics and batteries on flexible substrates
14. Sensors on flexible substrates, packaging & system integration
15. Interconnects on flexible substrates

University Student Ethics Policy

http://studentaffairs.case.edu/ai/policy.html

Violations of the Student Ethics Policy will result in failure in the assignment in question or the course, or referral to the academic integrity board as per university policy.

All forms of academic dishonesty including cheating, plagiarism, misrepresentation, and obstruction are violations of academic integrity standards. Cheating includes copying from another’s work, falsifying problem solutions or laboratory reports, or using unauthorized sources, notes or computer programs. Plagiarism includes the presentation, without proper attribution, of another’s words or ideas from printed or electronic sources. It is also plagiarism to submit, without the instructor’s consent, an assignment in one class previously submitted in another. Misrepresentation includes forgery of official academic documents, the presentation of altered or falsified documents or testimony to a university office or official, taking an exam for another student, or lying about personal circumstances to postpone tests or assignments. Obstruction occurs when a student engages in unreasonable conduct that interferes with another’s ability to conduct scholarly activity. Destroying a student’s computer file, stealing a student’s notebook, and stealing a book on reserve in the library are examples of obstruction.