WEARABLE COMPUTING MANUFACTURING

EECS 480W

COURSE DESCRIPTION: Learning about the supply chain and manufacturing processes for flexible electronics, sensors, and other technologies contributing to the development of wearable products. Understanding supply chain issues in low mobility materials, multilevel substrates, nanocomposites, materials for low power sensors, and inks suitable for direct printing. Identifying the tradeoffs involved in various manufacturing methods such as roll-to-roll manufacturing a mature coating technology yet to be proven for full device integration. Studying other manufacturing techniques such as plate-to-plate, direct printing, 3D printing, and screening techniques for their applicability to the manufacturing and integration of flexible electronics. Understanding the use of lithography and vapor deposition techniques in the context of flexible electronics. Examining the issues of systems integration and packaging of the manufactured 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 manufacturing of 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. Review of microelectronics fabrication technology
2. Fabrication of flexible electronics: challenges & solutions
3. Materials used in flexible electronics
4. Fabrication techniques used in printed electronics
5. Materials used in printed electronics
6. Fabrication techniques used in non-printed electronics
7. Materials used in non-printed electronics
8. Value chain from materials to products
9. Supply Chain for flexible electronics
10. Transferring from lab to fab
11. Manufacturing techniques and integration
12. Roll-to-Roll and plate-to-plate techniques
13. Printing tools, including three-dimensional (3D) printing, screen printing
14. Testing and verification
15. Packaging and reliability

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.