Course Code: EE-907

Title: Micro and Nano Fabrication

Credit hours: (3-0)

1. **Objectives**. This course will cover principles and practices of fabrication technologies in micro and nano domains, which nowadays are the foundation of not only ICs and MEMS but also other state-of-the-art devices in diversified fields such as inkjet printing heads, flat panel displays, HDD, and medical sensors and implants. The course will address a wide range of processes and their present and future contribution.

2. Text Books: No specific text book will be followed. Few reference books have been mentioned at para 5 below.

3. Course Outline

Topics	Periods
Material and process selection	3
IC fabrication and next generation lithography	6
Bulk and surface micromachining	6
Electro-discharge machining	6
Mechanical systems	6
Ultra short pulse laser	3
3d rapid prototyping	6
Nano structuring and replication.	6
Applications to MEMS and other emerging devices	6
Total	48

4. **Course Outcomes**. After successful completion of this course, a student will demonstrate the following abilities:

- Come up with a process flow for his/her own design;
- Judge a fabrication facility for its suitability for the implementation of his/her process flow;
- Work in a fabrication facility with only facility-specific, local information left to learn;
- Prepare a research proposal in an interdisciplinary field

5. Recommended Reading

- Marc Madou, Fundamentals of Microfabrication,

- Introduction to Microelectronic Fabrication, 2nd edition, Richard C. Jaeger, Prentice Hall (ISBN 0201444941)
- Fabrication Engineering at the Micro and Nanoscale, 3rd edition, Stephen A. Campbell, Oxford University Press 2008 (ISBN-10: 0195320174)