

PME 4352 微機電系統導論

Spring 2007

Credits : 3

Time : F5F6F7

Place : 工一館 217 室

課程內容

1. Introduction

2. Basic IC fabrication processes

3. Fabrication techniques for MEMS

- **Bulk micromachining**
- **Surface micromachining**
- **LIGA process**

Midterm exam

4. Applications

5. Mechanics issues on MEMS

Final project

Instructor : 方維倫

Office : 工一館 522 室 (分機 42923)

Lab : 工一館 532 室 (分機 33742)

Email: fang@pme.nthu.edu.tw

Grading : Homework 10%, Midterm 50%, Final project 40%

Reference books

- MEMS general concept
 - (1) Fundamentals of microfabrication by M. Madou, 1997
 - (2) Micromechanics and MEMS edited by W.S. Trimmer, 1997
 - (3) Microsystem technology and microrobotics, S. Fatikow and U. Rembold, 1997
 - (4) MEMS and MOEMS Tech. and Applications, edited by P. Rai-Choudhury, 2001
- Microsensors and microactuator
 - (1) Microactuators by M. Tabib-Azar, 1998
 - (2) Micromachined transducers by G.T.A. Kovacs, 1998
 - (3) Microsensor by J.W. Gardner, 1994

- (4) Semiconductor sensors by M. Sze, 1994
- (5) Microsensor edited by R.S. Muller et. al., 1991
- (6) Silicon Sensors, S. Middelhoek and S.A. Audet, 1989
- (7) Biosensor: Microelectrochemical devices by M. Lambrechts and W. Sansen, 1992

- Microsensors and microactuator

- (1) Microsystem design by S.D. Senturia, 2001

- Fabrication technology and material properties

- (1) VLSI 製造技術 莊達人 編著, 1994
- (2) Thin film process edited by J.L. Vossen and W. Kern, 1978
- (3) Semiconductor IC processing technology by W. R. Runyan and K. E. Bean, 1990
- (4) The materials science of thin films by M. Ohring, 1991
- (5) VLSI technology by S.M. Sze, 1988

Journal

- (1) Journal of Micromechanics and Microengineering
- (2) IEEE/ASME Journal of Microelectromechanical Systems
- (3) Sensors and Actuators A/B
- (4) Microsystem Technology
- (5) Journal of Vacuum Science and Technology
- (6) IEEE/ASME Transactions on Mechatronics
- (7) IEEE Transactions on Electron Devices

Conference proceeding

- (1) IEEE/ASME International Workshop on MEMS
- (2) Transducers
- (3) Solid-state Sensor and Actuator Workshop
- (4) IEEE/LEOS Optical MEMS
- (5) ASME International Mechanical Engineering Congress and Exhibition (IMECE)
- (6) Eurosensors
- (7) μ TAS
- (8) HARMST
- (9) BioMEMS
- (10) Microsystem Technologies
- (11) SPIE Symposium on Micromachining and Microfabrication
- (12) Micromechanics Europe