Microelectronics and Experiments (II)

Offered in 114-2

Save Add Preselect

Serial Number
53653

Course Number
DBME2020

Course Identifier
508 22200

No Class

3 Credits

Elective
DEPARTMENT OF BIOMEDICAL ENG ...

TZU-CHIEH CHOU

Thu 7, 8, 9

Please contact the department office for more information

Type 2

30 Student Quota

Notes

The course is conducted in English。

Limits on Course Adding / Dropping

Restriction: within this department (including students taking minor and dual degree program)

NTU Enrollment Status

Enrolled	Remaining	Registered
0 / 30	30	0

Course Description

This elective course is designed for biomedical engineering undergraduate (second year and above) and graduate students who are interested in advancing their knowledge about microelectronics . As one of the foudational courses in bioelectronics and biophotonics, the course aims to introduce and analyze basic microelectronic designs and their implementation (through SPICE simulation), with

NTU 30

No Specialization Program

English

NTU COOL

Core Capabilities and Curriculum Planning

special focus on biomedical applications (for example, bioinstrumentation and digital health technology). The courses will cover selective topics in analog integrated circuit (IC) design, including active filtering and feedback. Case studies of actual chips will also be introduced to motivate students to get involved in emerging fields of IC design.

Course Objective

Analyze and implement basic microelectronic designs using hand calculations and software tools

Course Requirement

Prerequisite: Microelectronics and Experiments (I) or equivalent courses at instructor's discretion.

Expected weekly study hours before and/or after class

9 hours per week

Office Hour

Thu 17:20 - 18:00

Designated Reading

Microelectronic Circuits, 8 ed., Sedra, Smith, Carusone, and Gaudet (Oxford University Press)

References

CMOS Analog Circuit Design, 3 ed., Phillip E. Allen (Oxford University Press).

Lecture notes available at: https://aicdesign.org/2016-short-course-notes-2/

Grading

50%	**Homework**
50%	**Lab and participation**

1. NTU has not set an upper limit on the percentage of A+ grades.
2. NTU uses a letter grade system for assessment. The grade percentage ranges and the single-subject grade conversion table in the NATIONAL TAIWAN UNIVERSITY Regulations Governing Academic Grading are for reference only. Instructors may adjust the percentage ranges according to the grade definitions. For more information, see the Assessment for Learning Section。

Adjustment methods for students

Adjustment Method	**Description**
A2	以錄影輔助 Assisted by video
A3	提供學生彈性出席課程方式 Provide students with flexible ways of attending courses
B1	延長作業繳交期限 Extension of the deadline for submitting assignments

Adjustment Method	Description
B6	學生與授課老師協議改以其他形式呈現 Mutual agreement to present in other ways between students and instructors
C1	延後期末考試日期(時間) Final exam date postponement
D1	由師生雙方議定 Negotiated by both teachers and students

Make-up Class Information

Course Schedule

Week 1	Course introduction, review of BJT & MOSFETs, and LTSpice setup
Week 2	Discrete Circuit Amplifiers
Week 3	Current Mirrors & Gain Cells
Week 4	CG/CB/Cascode Amplifiers
Week 5	Source Followers & Review
Week 6	Differential Pairs
Week 7	CMR and DC offset
Week 8	Differential & Multistage Amplifier & Review

Week 9	High-freq. response (CS/CE)
Week 10	High-freq. response (CG/Cascode amp.)
Week 11	High-freq. response (Followers/Differential amp.)
Week 12	Feedback voltage amplifier
Week 13	Amplifier stability
Week 14	Two-stage/folded cascode Op-amps
Week 15	Noise, Filters & Oscillators
Week 16	Digital Integrated Circuits