



JOINT INSTITUTE
交大密西根学院

Ve311 Electronic Circuits Summer 2020

(Last Updated on September 6, 2020)

Instructor:

TU, Chang-Ching, Ph.D.

Email: changching.tu@sjtu.edu.cn

Office Hour: **Mon 10:00-12:00** at JI Building Room 508

Teaching Assistant:

LI, Minhao

Email: minhao.li@sjtu.edu.cn

FAN, Jiawen

Email: fanjiawen_alice@sjtu.edu.cn

LI, Tianjun

Email: tinallee@sjtu.edu.cn

TA Office Hour:

Wed 18:30-20:30 at JI Building YLM Center Room XXX

TA Recitation:

One 2-hour session before each exam

One 2-hour session after each chapter is finished

(Time and location to be announced on Canvas)

Lecturing:

Mon 8:00 to 9:40

Wed 8:00 to 9:40

Fri 10:00 to 11:40 (week 2, 6 and 8 only)

Location: East Upper Hall Room 211 for Mon and Wed and Room 201 for Fri

Lab Sessions:

Lab manuals posted on Canvas one week in advance, so that students have enough time to do simulation using Proteus before the lab.

Thu 18:20 to 21:50 or **Fri 12:00 to 15:30** (week 6, 7, 12 and 13)

Location: JI Building Room 310A (Circuits Lab)



Homework Assignments:

8 homework assignments in total

Posted on Canvas on Wednesday and due next Wednesday in class

Textbooks:

1. Microelectronic Circuit Design, Richard C. Jaeger and Travis N. Blalock
2. Design of Analog CMOS Integrated Circuits, Behzad Razavi

Course Description:

1. Lecturing: Working principles of nonlinear semiconductor devices, including diode, BJT and MOSFET (with emphasis), and analog circuits associated with those devices. Particularly, voltage regulators, rectifiers, single stage amplifiers, current mirrors and differential pair amplifiers (if time allows).
2. Homework Assignment: Circuit analysis by hand-calculation with proper approximations. Comparison of hand-calculation results with Pspice simulation results.
3. Lab: Learning how to establish and analyze circuits on simulation tool (Proteus) and breadboard by using power supply, function generator, oscilloscope and multimeter.

Course Outcomes:

1. Able to reduce a nonlinear circuit into its small-signal equivalent and analyze it.
2. Able to determine the small-signal model of a transistor from its data sheet and lab measurements using oscilloscopes and function generators.
3. Able to design and physically implement a transistor amplifier having a stable biasing circuit and meeting given design specifications such as gain and node impedances.

Course Outline:

- Diode
Microelectronic Circuit Design (4th edition), page 42 to 95 and page 130 to 133
- Diode Circuit
Microelectronic Circuit Design (4th edition), page 96 to 129
- BJT
Microelectronic Circuit Design (4th edition), page 217 to 255
- BJT Circuit
Microelectronic Circuit Design (4th edition), page 786 to 814
- MOSFET
Design of Analog CMOS Integrated Circuits (1st edition), page 9 to 46
- MOSFET Single Stage Amplifier



Design of Analog CMOS Integrated Circuits (1st edition), page 47 to 99

- MOSFET Current Mirror

Design of Analog CMOS Integrated Circuits (1st edition), page 135 to 165

- MOSFET Differential Amplifier (if time allows)

Design of Analog CMOS Integrated Circuits (1st edition), page 100 to 134

Course Schedule:

	Sep				Oct				Nov					Dec			
Mon	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28
Tue	8	15	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29
Wed	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30
Thur	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31
Fri	11	18	25	2	9	16	23	30	6	13	20	27	4	11	18	25	1
Sat	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2
Sun	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3
JI Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14			

Yellow: lectures

Blue: midterm and final exams

Grading Policy:

- 8 × Homework Assignments (with Pspice) (12%)
- 4 × Lab Reports (12%)
- 4 × Quizzes (4%)
- 1 × Midterm Exam (32%)
- 1 × Final Exam (40%)

Course Policy:

- Honor Code: All students in the class are bound by the Honor Code of the Joint Institute (<http://umji.sjtu.edu.cn/academics/academic-integrity/honor-code/>). You may not seek to gain an unfair advantage over your fellow students; you may not consult, look at, or possess the unpublished work of another without their permission; and you must appropriately acknowledge your use of another's work.
- Exam: The rule will be announced prior to each exam. Anyone violating the rule will be given an 'F' as the score.



JOINT INSTITUTE

交大密西根学院

- Participation: Active participation in course meetings is expected for all students. With each submitted assignment, students should be prepared to explain their solutions to the class.
- Homework Assignments: Students are encouraged to discuss course topics and homework assignments with each other. However, all submissions must represent your own work. Duplicated submission is not allowed and will trigger an honor code violation investigation.