

## EC 332 Electronic Devices (2)

### COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EE 232 EC 233	3	5	2	2	2	3

### COURSE AIM

Studying: Semiconductor amplifying and switching devices - Effects of structure and geometry on electrical characteristics. Introducing the idea of amplification and switching. Applications of different electronic devices (BJT – Four Layer Devices – FET).

Studying theoretically and experimentally both transistor types:

- BJT: Bipolar junction transistor.
- FET: Field effect transistor.
- Studying theoretically the 4 layer devices (Thyristors).

### COURSE WEEKLY CONTENTS

- 1 Operation of BJT
- 2 Biasing Methods
- 3 Biasing Methods Cont'd – BJT Base Width Modulation
- 4 AC Equivalent Circuits of BJT
- 5 Common Emitter, Collector, and Base Amplifiers
- 6 BJT as a Switch
- 7 Operation of JFET – DC and AC Analysis + Midterm Exam
- 8 MOS-Structure, Operation of MOSFET
- 9 Depletion/Enhancement Mode MOSFETs, DC Analysis of MOSFET
- 10 Channel Length Modulation, Body Effect, and MOSFET Capacitances
- 11 AC Equivalent Circuits of MOSFET
- 12 Common Source, Drain, and Gate Amplifiers
- 13 MOSFETs Amplifiers using Active Loads
- 14 Shockley, Diac, SCR, Triac Circuits
- 15 UJT and PUT Circuits

### STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	20 Midterm	←	10	MARKS		→	30
			To be freely distributed among possible assessments				
8 to 12	←		20	MARKS		→	20
13 to 15	←		10	MARKS		→	10
16 or 17	40 Final						40
<b>Total</b>	<b>Exams</b>	<b>Assign.</b>	<b>Quizzes</b>	<b>Reports</b>	<b>Present.</b>	<b>Lab.</b>	<b>100</b>

### REFERENCES

**Textbook** ▪ Sedra-Smith, Microelectronic Circuits, Oxford Pub., 5<sup>th</sup> ed, 2004.

**Other**

- J.Singh, "Semiconductor Devices", 1994.
- J.Millman, "Microelectronics", 1983.
- C.J.Savant, M.S.Rooden and G.L.Carpenter, "Electronic Design", 1991.