



Course Syllabus: Solid State - EE 103

Division	Computer, Electrical and Mathematical Sciences & Engineering
Course Number	EE 103
Course Title	Solid State
Academic Semester	Fall
Academic Year	2018/2019
Semester Start Date	08/26/2018
Semester End Date	12/11/2018
Class Schedule (Days & Time)	01:00 PM - 02:30 PM Sun

Instructor(s)

Name	Email	Phone	Office Location	Office Hours
Talal Al Attar	talal.attar@kaust.edu.sa	+966128080415		

Teaching Assistant(s)

Name	Email

Course Information

Comprehensive Course Description	
Course Description from Program Guide	This course covers the physics of microelectronic semiconductor devices for Silicon integrated circuit applications. The main contents are: semiconductor fundamentals, p-n junction, metal-oxide semiconductor structure, metal semiconductor junction, MOS field-effect transistor, and bipolar junction transistor. The course emphasizes physical understanding of device operation through energy band diagrams and MOSFET device design. Issues in modern device scaling are also outlined. Includes weekly laboratory.
Goals and Objectives	
Required Knowledge	
Reference Texts	
Method of evaluation	
Nature of the assignments	
Course Policies	
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Sun 08/26/2018	
2	Sun 09/02/2018	
3	Sun 09/09/2018	
4	Sun 09/16/2018	
5	Sun 09/23/2018	
6	Sun 09/30/2018	
7	Sun 10/07/2018	
8	Sun 10/14/2018	
9	Sun 10/21/2018	
10	Sun 10/28/2018	
11	Sun 11/04/2018	
12	Sun 11/11/2018	
13	Sun 11/18/2018	
14	Sun 11/25/2018	
15	Sun 12/02/2018	
16	Sun 12/09/2018	
17		
18		

Note

The instructor reserves the right to make changes to this syllabus as necessary.

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Instructor(s)				
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Talal Al Attar	talal.attar@kaust.edu.sa	+966128080415		TBD

Teaching Assistant(s)	
Name	Email
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Goals and Objectives	After completing this course, the student should have a firm grasp on: <ul style="list-style-type: none"> •The physical understanding of device operation of diodes •The physical understanding of device operation of MOS transistors
Required Knowledge	Familiarity with the basic properties of solids
Reference Texts	Semiconductor Device Fundamentals, Robert F. Pierret
Method of evaluation	25.00% - Final exam 15.00% - Homework /Assignments 35.00% - Midterm exam 15.00% - Quiz(zes) 10.00% - Others - Please specify
Nature of the assignments	Homework: Homework assignments are due on Wednesday in the class. The Solutions will be provided by the end of the day homeworks are due. If you need more time for your homework, you have to inform the Instructor or the TA in advance. Quizzes: There will be at least one Quiz every week starting the 2nd week and will be based on a 0-10 point scale. The worst few quizzes will be dropped (If any). If you are keeping up with the problem sets, they should be relatively easy. Exams: There will be two midterm exams and one final exam You are free to use your text book, course notes and any provided figures and handouts

Course Policies	<p>All homework assignments, quizzes, and exams are required. Students who do not show up for a Quiz or an exam should expect a grade of zero on that exam. If you dispute your grade on any homework, quiz, or exam, you may request a re-grade (from the TA for the homeworks and quizzes or from the instructor for the exams) only within 48 hours of receiving the graded exam.</p> <p>Incomplete (I) grade for the course will only be given under extraordinary circumstances such as sickness, and these extraordinary circumstances must be verifiable. The assignment of an (I) requires first an approval of the dean and then a written agreement between the instructor and student specifying the time and manner in which the student will complete the course requirements.</p>
Additional Information	<p>Engineers are required to practice “continuous” or “life-long” learning. This course will cover a lot of material which will require the students to do a lot of self-study, reading of the textbooks and handouts, learning how to use equipment and software, etc...Although the instructor and the TAs are committed to help the students in this course, the students are also expected to take initiatives and to get used to this notion of self-study that will be anyway (i) expected from them in their future careers and (ii) imperative to their success and survival in the real engineering and academic worlds.</p> <p>Please don't hesitate to ask if you have any question or concern about the course.</p>

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Wed 08/29/2018	Introduction
2	Wed 09/05/2018	Semiconductors (1)
3	Wed 09/12/2018	Semiconductors (1)
4	Wed 09/19/2018	Carrier Modeling
5	Wed 09/26/2018	Energy Band Model
6	Wed 10/03/2018	Carrier Concentrations
7	Wed 10/10/2018	Carrier Action (1)
8	Wed 10/17/2018	Carrier Action (2)
9	Wed 10/24/2018	Carrier Action (3)
10	Wed 10/31/2018	Minority Carriers
11	Wed 11/07/2018	pn Diodes
12	Wed 11/14/2018	pn Diodes (2)
13	Wed 11/21/2018	pn Diodes (3)
14	Wed 11/28/2018	pn Diodes (4)
15	Wed 12/05/2018	MOSFET (1)
16		
17		
18		

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