

Global Learning Initiatives Program Course Syllabus

Course Information

Course Name	Radiation Effects in Electronics
Lecturer(s)	Chin-Han Chung
Course Description	<p>Radiation causes reliability issues in electronic devices not only in space applications but also during commercial usages. These issues can differ from one device to another based on the material, the device structure, and the application. In addition, as we enter the era of 5G, the communication system is expanding to the earth's orbit, which makes radiation-induced reliability issues more critical.</p> <p>In this course, basic mechanisms of radiation-induced effects in electronics devices will be introduced. Simulation tools will also be used to help understand and predict these effects.</p>
Course Objectives	To understand the hazardous effects and reliability issues caused by radiation in electronic devices and how to mitigate them.
Suggested Proficiencies (if any)	Fundamental knowledge on physics and electronic devices
Reading List (if any)	Terrestrial Radiation Effects in ULSI Devices and Electronic Systems, Eishi H. Ibe, Published by Wiley in 2015
Grading Criteria	<p>Midterm exam (open book) 30%</p> <p>Final exam (open book) 40%</p> <p>Final report: 30%</p>

Course Schedule

Class	Date (YYYY/MM/DD)	Course Topic	Lecturer
1	2020/3/5	Introduction	Chin-Han Chung
2	2020/3/12	Topic 1: Basic Knowledge on Radiation Effects and Soft Error	Chin-Han Chung
3	2020/3/19	Topic 2: Terrestrial Radiation	Chin-Han Chung
4	2020/3/26	Topic 3: Fundamentals of Radiation Effects	Chin-Han Chung
5	2020/4/2	Topic 3: Fundamentals of Radiation Effects	Chin-Han Chung
6	2020/4/9	Topic 4: Fundamentals of Electronic Devices and Systems	Chin-Han Chung
7	2020/4/16	Topic 4: Fundamentals of Electronic Devices and Systems	Chin-Han Chung
8	2020/4/23	Midterm exam	Chin-Han Chung
9	2020/4/30	Topic 5: Irradiation Test Methods	Chin-Han Chung
10	2020/5/7	Topic 6: Simulation Tool: PHITS	Chin-Han Chung
11	2020/5/14	Topic 6: Simulation Tool: PHITS	Chin-Han Chung
12	2020/5/28	Topic 6: Simulation Tool: PHITS	Chin-Han Chung
13	2020/6/4	Student Presentation	Chin-Han Chung
14	2020/6/11	Student Presentation	Chin-Han Chung
15	2020/6/18	Final exam	Chin-Han Chung