



University of Tehran
School of Electrical and Computer Engineering

Course:	8101648 – Large-Area Electronics									
Course type:	EE*						CE*			Credit: 3
	Com	E	P	B	Con	D	SW	HW	IT	
	Required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Elective	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Level:	Undergraduate <input type="checkbox"/> Graduate <input checked="" type="checkbox"/>									
Co-requisite(s):	-									
Prerequisite(s):	Electronics 3 , Physics of Electronics									
Prerequisite by topic:	Analysis and Design of Basic Integrated Circuits, Operation and Physics of MOS transistor									
Textbook(s):	[1] C. Kagan, P. Andry, <i>Thin-Film Transistors</i> , Marcel Dekker 2003 [2] E. Lueder, <i>Liquid Crystal Displays: Addressing Schemes and Electro-Optical Effects</i> , Wiley-SID 2003. [3] Y. Kuo, <i>Thin Film Transistors: Material and Processes</i> , Kluwer Academic Publishers, pp. 98-198, 2003 [4] D. Cristaldi, S. Pennisi, F. Pulvirenti, <i>Liquid Crystal Display Drivers</i> , Springer 2009. [5] K. Iniewski, <i>Medical Imaging: Principles, Detectors, and Electronics</i> , John Wiley & Sons, 2009									
Coordinator:	Shahin Jafarabadi Ashtiani									
Goals:	Introduction to large-area electronics devices, circuits, and systems. It comprises LCD and OLED flat panel displays and flat panel X-ray and optical sensors.									
Outcome:	Upon successful completion of the course, students will be able <ol style="list-style-type: none"> 1. Understand the operation and physics of large-area electronics devices and technologies (TFT, LCD, OLED, Imaging Sensors) 2. Circuit-level design and implementation of a drivers in TFT and CMOS for large-area applications 									
Topics:	<ol style="list-style-type: none"> 1. Introduction to large-area electronics 2. Operation and modeling of TFTs 3. LCD Displays <ul style="list-style-type: none"> - Liquid crystal Device - LCD addressing schemes and driver circuits 									

	<p>4. OLED Displays</p> <ul style="list-style-type: none"> - OLED technology - OLED addressing schemes, pixel design, and driver circuits <p>5. X-ray and optical Imagers</p> <ul style="list-style-type: none"> - Devices - Readout circuits 						
Computer usage:	HSPICE and MATLAB						
Assignments:	3 to 4						
Projects:	One simulation project in MATLAB and/or HSPICE						
Grading:	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Assignments:</td> <td style="text-align: right;">10%</td> </tr> <tr> <td>Projects</td> <td style="text-align: right;">20%</td> </tr> <tr> <td>Final exam:</td> <td style="text-align: right;">70%</td> </tr> </table>	Assignments:	10%	Projects	20%	Final exam:	70%
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Projects	20%						
Final exam:	70%						
Further readings:	<p>Fundamentals of Liquid Crystal Devices, D. Yang, S. Wu, Wiley-SID 2006.</p> <p>IEEE-OSA Journal of Display technology</p> <p>Journal of the Society for Information Display</p> <p>IEEE Transactions on Electron Devices</p>						
Prepared by:	Shahin Jafarabadi Ashtiani						
Date:	Updated : September 2017						