University of Tehran
School of Electrical and Computer Engineering

Course:	**8101xxx (Course code) – Energy Devices**
Course type:	<table><tr><td></td><td colspan="6">EE*</td><td colspan="3">CE*</td><td rowspan="2">Credit: 3</td></tr><tr><td></td><td>Com</td><td>E</td><td>P</td><td>B</td><td>Con</td><td>D</td><td>SW</td><td>HW</td><td>IT</td></tr><tr><td>Required</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>Elective</td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr></table>
Level:	Undergraduate ☐ Graduate ■
Co-requisite(s):	None.
Prerequisite(s):	None.
Prerequisite by topic:	None.
Textbook(s):	Selected Readings from: [1] John Newman, Karen E. Thomas-Alyea, "Electrochemical Systems", 3rd Edition, ISBN: 978-0-471-47756-3, 672 pages, 2004. [2] Robert Huggins, "Advanced Batteries", Springer, 2009. [3] Stuart R Wenham, Martin A Green, Muriel E Watt, Richard Corkish, "Applied Photovoltaics", 2nd Edition, 2007. [4] David Linden, Thomas B. Reddy "The Handbook of Batteries" 3rd Edition, 2002.
Coordinator:	Z. Sanaee, Assistant Professor, School of ECE
Goals:	This course covers the main aspects of the energy devices with a strong focus on batteries, solar cells, fuel cells and supercapacitors.
Outcome:	Upon successful completion of the course, students will be able to 1. Become familiar with the physics of energy storage and energy conversion devices. 2. obtain knowledge on the benefits of micro and nanotechnology for power generation and energy conversion 3. be able to identify the limitations, challenges and opportunities related to the field
Topics:	1) Primary Energy Sources: - Depleting energy - Renewable energy with emphasis on solar cells. 2) Batteries 3) Fuel Cells 4) Super Capacitor 5) Solar Cells 6) Energy Harvesting Devices

Computer usage:	-
Assignments:	2 to 4 homework assignments
Projects:	Students will participate by developing an oral presentation about modern energy devices.
Grading:	Assignments: 10 % Projects: 15% Quizzes: - % Midterm exams: 25 % Final exam: 50 %
Further readings:	[1] P. Atkins and J. de Paula. W.H. Freeman, "Atkin's Physical Chemistry", 8TH Edition, 2006 [2] A. Luque and S. Hegedus "Handbook of Photovoltaic Science and Engineering", Wiley, 2011. [3] A. V. da Rosa, "Fundamentals of Renewable Energy Processes", Academic Press, 2005. [4] A. Korkin, P. S. Krsti´c, J. C. Wells, "Nanotechnology for Electronics, Photonics, and Renewable Energy", Springer, 2010. [5] J. Garcia-Martinez, "Nanotechnology for the Energy Challenge," WILEY, 2010. [6] T. Osaka, M. Datta, Y. S. Diamand, "Electrochemical Nanotechnologies", Springer, 2010 [7] A. Mitsos and P. I. Barton, "Microfabricated Power Generation Devices", WILEY, 2009. [8] Scientific journals [9] Conferences Elechtrochemical Society (ECS) [10] Material Research Society (MRS)…
Prepared by:	Z. Sanaee, Assistant Professor, School of ECE
Date:	September 2017

*EE: Electrical Engineering		CE: Computer Engineering	
Com	Communications	SW	Software
E	Electronics	HW	Hardware
P	Power	IT	Information Technology
B	Bioelectronics		
Con	Control		
D	Digital System		