



Course Description	
Course title	Hydrogen Technologies and Fuel Cells
Course code	PHYS 278
College	Engineering
Department / Program	Electrical/Renewable Energy
Year/ Level	4/7
Course Type	<p>A.</p> <p><input type="checkbox"/> University</p> <p><input type="checkbox"/> College</p> <p><input type="checkbox"/> Department</p> <p><input checked="" type="checkbox"/> Program</p> <p><input type="checkbox"/> Others</p> <p>b.</p> <p><input type="checkbox"/> Required</p> <p><input checked="" type="checkbox"/> Elective</p>
Credited Hours	(2 Cr. Hrs)
Contact Hours	(LT:2, LB:0 ,TR:0)
Pre-requisites (if any)	PHYS 103 and CHEM 103
Co-requisites (if any)	---
Course description	The candidate will have knowledge of the fundamental's characteristics of hydrogen. Techniques for hydrogen production, storage, and utilization. The basic electrochemical principles of hydrogen fuel cells. Basic fuel cell design concepts and fuel cell systems concepts. How fuel cells are used for everyday purposes: in portable and stationary use. The various terminologies used in



	hydrogen and fuel cell technologies. Hydrogen and fuel cell safety issues, environmental analysis, market introduction, economy, and policy framework
Course Main Objectives	By the end of the module students should be able to: Present and critically evaluate the potential, benefits, boundary conditions, and prospects of employing fuel cell and hydrogen technology today and in future markets;
Learning Outcomes	Knowledge and Understanding <ul style="list-style-type: none">Comprehensively describe the Physics, Chemistry and Engineering of fuel cell and hydrogen technologies
	Skills: <ul style="list-style-type: none">Establish a mathematical model of the hydrogen and fuel cell technologies and analyze their performance using mathematical and computational techniques.
	Values: <ul style="list-style-type: none">Describe how hydrogen and fuel cell technology can be used to complement renewable energy technologies when faced with a complex engineering design task.Communicate information, concepts, problems and solutions to specialists and non-specialists.
References	Hydrogen and Fuel Cell; Johannes Töpler, Jochen Lehmann, 2016, ISBN: 978-3-662-44971-4 Hydrogen and Fuel Cells: Fundamentals, Technologies and Applications, Detlef Stolten, ISBN: 978-3-527-32711-9 August 2010 908 Pages Hydrogen and Fuel Cells: Emerging Technologies and Applications 2nd Edition, Bent Sorensen, ISBN: 0123877091, Edition: Illustrated, November 27, 2011