

Course 1/ Energy in Iceland		Course 2/ Electrochemical energy conversion	
Module	Content	Module	Content
Introduction to energy in Iceland	How natural forces have influenced the development of Iceland and its inhabitants. The lecture highlights and creates an understanding of the interplay between human activity and the environment.	Electrochemical energy converters	Fundamentals of electrochemical energy converters. How can electrochemical energy converters be integrated in the energy system? Electrochemical energy devices: from lab to market
Geothermal energy – Introduction	A broad overview of geothermal energy How geothermal energy is explored and utilized in Iceland and worldwide.	Membrane fuel cells	This course presents an overview of fuel cells and their relation to sustainable management of resources. Ion exchange membranes. Proton exchange membrane fuel cells (PEMFC).
Geothermal energy – Advanced	Types of geothermal systems. Classification of geothermal systems. Electricity generation processes. Challenges for geothermal electricity generation. Worldwide geothermal generation and geothermal jobs.	Static Power System Simulation using Python	How to use Jupyter Notebook and Python to simulate the static power flow behaviour of power systems build around conventional and renewable electrical energy generators. How to use already defined models for the European Network of Transmission System Operators and how to check the viability and find the optimal state of your defined networks.
Hydropower resources	Hydrologic cycle, electricity production, hydropower design, and types of hydropower plants and turbines.	Hydrogen production by electrolysis	Hydrogen production. Electrolysis- introduction and basic principles Electrodes: working electrode, reference electrode, counter electrodes. Electrochemical measurements.
Energy policy and entrepreneurship	The main themes driving energy policymaking by focusing on the why from a political, economic, and planning perspective and environmental perspectives through the lens of environmental resource economics.	Phenomenological study of electrolysis of water	Hydrogen production from renewable resources. Experimental part. Video
Electric power systems & renewable generation	Fundamental laws of physics that govern power systems. Structure and major components of a modern power system. Characteristics of different types generation. Concepts in reliability and resilience. Power system architectures and microgrids.	Remote laboratory	Role of the electrolyte solutions in the electrolyze process and the utility of reference electrode in electrochemical measurements.

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