

## **CACHE Modules on Energy In the Curriculum: Fuel Cells**

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In this work we describe the development of modules that can be used to introduce fuel cells into existing chemical engineering courses. Course specific modules have been developed that apply fundamental chemical engineering principles to the analysis of fuel cell systems. The modules are currently located at the following website: [http://www.chem.mtu.edu/~jmkeith/fuel\\_cell\\_curriculum](http://www.chem.mtu.edu/~jmkeith/fuel_cell_curriculum), and after beta testing, will be available through the CACHE website <http://www.cache.org>. Each module contains a problem motivation, reference to material from textbooks widely used in the chemical engineering curriculum, an example problem statement, example problem solution, home problem statement, and home problem solution. To date modules have been developed for the following chemical engineering core courses: mass and energy balances, thermodynamics, fluid mechanics, heat and mass transfer, and kinetics and reaction engineering. In addition to presenting the modules, we will present some preliminary assessment on these educational modules.