Educating Future Aviation Technologists on ASTM Turbine Fuel Standard Specifications

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Aviation industry’s vast and global nature demands future technologies who are able to handle a wide array of scientific, technical, economic, and political challenges. Thus, teaching techniques utilized by the educators should be well beyond the conventional “sage on stage”, transforming professors into rather a “guide on the side”.

Knowledge Economy  Thinking Economy

Objective – “Aviation Fuels” Course Implementation

✓ Learning by doing
✓ Industry centered
✓ ASTM D1655, ASTM D4054 and ASTM D7566

- Conventional Jet Fuel
- Fischer-Tropsch (FT)
- Hydroprocessed Esters and Fatty Esters (HEFA)
- Synthesized Iso-Paraffins (SIP)

Purdue Polytechnic Institute (PPI)
https://polytechhub.org/

Pedagogy and Methodology

* Guest lectures from industry
* Field trips to fuel manufacturing sites
* Lab projects - testing equipment & procedures

Learning Outcomes
1. Classify fuel properties and characteristics
2. Recognize conventional & alternative processes
3. Identify various grades and types of aviation fuels
4. Differentiate technologies specific to feedstock
5. Design fuel testing and interpret data
6. Predict “fuel readiness level”

ASTM D4054 Qualification Process

Reference
1. ASTM. (April 2010). D4054-09: Standard practice for qualification and approval of new aviation turbine fuels and fuel additives. DOI:10.1520/D4054-09
2. ASTM. (December 2013). D1655-13a: Standard specification for aviation turbine fuels. DOI:10.1520/D1655-13a
3. ASTM. (June 2014). D7566-14a: Standard specification for aviation turbine fuel containing synthesized hydrocarbons. DOI:10.1520/D7566-14a