

Sisteme energetice hibride la bordul aeronavelor si rachetelor

Hybrid power systems on board aircraft and rockets

Obiectiv principal

Transmite studentilor la Master informatii referitoare la sistemele energetice hibride la bordul aeronavelor si rachetelor, modele matematice, elemente de calcul si proiectare a acestor sisteme, analiza proceselor dinamice, constructia si functionarea acestora.

Course Objective

It sends students to the Master information on hybrid energy systems on aircraft and missiles, mathematical models, computational elements and design of these systems, analysis of dynamic processes, their construction and operation.

Curs

1 ora pe săptămână, total 14 ore

- Consideratii generale asupra sistemelor energetice ale aeronavelor si rachetelor;
- Pile de combustie: bazele termodinamice, calcul, tipuri, utilizare;
- Aplicatii ale pilelor de combustie in industria aerospatiala;
- Sistem de putere cu pile de combustie pentru aviatia comerciala;
- Tipuri de combustibil revolutionar; Cerinte si definitii; Starea tehnologiei;
- Vehicule aeriene fara pilot; PEMFC – pentru aplicatii UAV; SOFC-uri pentru aplicatii UAV; Exemple de aplicatii a pilelor de combustie pe UAV-uri;
- Conceptul "Aeronave mai mult electrice (MEA)"
- Actionarea electrica la bordul aeronavelor;
- Conceptul "Aeronave Total-Electrice (AEA)".

Course

1 hours weekly, total 14 hours

- General considerations regarding the energy systems of aircraft and rockets;
- Fuel cells: thermodynamic bases, calculation, types, use;
- Applications of fuel cells in the aerospace industry;
- Combustion engine power system for commercial aviation;
- Types of revolutionary fuel; Requirements and Definitions; State of technology;
- Unmanned aerial vehicles; PEMFC - for UAV applications; SOFCs for UAV applications; Examples of Fuel Cells Applications on UAVs;
- The concept of "More Electric Aircraft (MEA)";
- Electric action on board aircraft;
- The concept of "All-Electric Aircraft (AEA)".

Laborator

1 ora pe săptămână, total 14 ore

- Modelari matematice ale sistemelor energetice bazate pe pile de combustie la bordul aeronavelor;
- Modelari matematice ale sistemelor energetice bazate pe pile de combustie la bordul rachetelor;
- Modelarea matematica a unei pile de tip PEM-FC;
- Modelarea matematica a unei pile de tip SOFC;
- Modelarea matematica a unui sistem de distributie a energiei electrice;
- Exemple de aplicatii ale pilelor de combustie pe UAV-uri.

Laboratory

1 hour weekly, total 14 hours

- Mathematical modeling of energy systems on board aircraft based on fuel cells;
- Mathematical modeling of energy systems on rockets based on fuel cells;
- Mathematical modeling of a PEM-FC type pile;
- Mathematical modeling of a SOFC type cell;
- Mathematical modeling of a power distribution system;
- Examples of Fuel Cells Applications on UAVs.