Sisteme adaptive cu retele neuronale pentru conducerea zborului	Adaptive systems with neural networks for flight command
Obiectiv principal	**Course Objective**
Contribuie la perfectionarea inginerilor de profil aerospatial, familiarizându-i cu principalele aspectele teoretice şi practice legate de proiectarea si implementarea software a sistemelor de control adaptiv a zborului aeronavelor.	It contributes to the improvement of aerospace engineers, familiarizing them with the main theoretical and practical aspects related to the design and implementation of software for adaptive aircraft flight control systems.
Curs	**Course**
2 ore/săptămână, total 28 ore	2 hours weekly, 28 hours total
• Structuri de conducere adaptiva • Structuri ierarhizate de comanda neuro – adaptiva • Algoritmi de estimare a sistemelor liniare si neliniare • Identificarea modelelor dinamice ale aparatelor de zbor folosind retele neuronale • Inversarea dinamica a sistemelor neliniare • Controllere adaptive neliniare cu compensatoare dinamice liniare si retele neuronale • Sisteme de comanda adaptiva a miscarii longitudinale a aparatelor de zbor folosind retele neuronale • Sisteme de comanda adaptiva a atitudinii si vitezei de zbor cu retele neuronale • Comanda automata a aparatelor de zbor folosind observere de stare adaptive	• Adaptive driving structures • Hierarchical structures of neuro - adaptive control • Algorithms for estimating linear and nonlinear systems • Identifying dynamic flight models using neural networks • Dynamic inversion of nonlinear systems • Nonlinear adaptive controllers with linear dynamic compensators and neural networks • Adaptive command systems for longitudinal flight movements using neural networks • Adaptive command systems for attitude and flight speeds with neural networks • Automatic Flight Control using Adaptive Status Observers
Seminar	**Laboratory**
1 ora/săptămână, total 14 ore	1 hour weekly, 14 hours total
Laborator	**Laboratory**
1 ora/săptămână, total 14 ore	1 hour weekly, 14 hours total
• Estimarea parametrica on-line si comanda odaptiva discreta a aparatelor de zbor • Proiectarea asistata de calculator a controllerelor adaptive cu compensatoare dinamice liniare si retele neuronale • Proiectarea asistata de calculator a sistemului de comanda adaptiva a miscarii longitudinale a aeronavelor folosind retele neuronale • Proiectarea asistata de calculator a unui sisteme de comanda automata a aeronavelor folosind inversarea dinamica si observere de stare adaptive • Proiectarea asistata de calculator a sistemului de comanda a unghiului de tangaj al unui elicopter folosind principiul inversarii dinamice • Proiectarea asistata de calculator a unui sistem de comanda adaptiva a atitudinii si vitezei de zbor folosind principiul inversarii dinamice • Proiectarea asistata de calculator a unui sistem de comanda adaptiva a miscarii unei rachete fata de linia de semnal egal	• Parametric on-line estimation and discreet discrete command of flight machines • Computer-aided design of adaptive controllers with linear dynamic compensators and neural networks • Computer-aided design of the adaptive command system for longitudinal aircraft movement using neural networks • Computer-aided design of automated aircraft control systems using dynamic reversal and adaptive status observers • Computer-aided design of the helicopter pitch control system using the dynamic inversion principle • Computer-aided design of an adaptive flight attitude and speed control system using dynamic inversion • Computer-aided design of an adaptive command system for rocket motion versus signal line