Study plan

Name of study plan: Erasmus Mundus Master Course - SpaceMaster II

Faculty/Institute/Others: Faculty of Electrical Engineering
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Cybernetics and Robotics
Type of study: Follow-up master full-time
Required credits: 120
Elective courses credits: 0
Sum of credits in the plan: 120
Note on the plan:

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 120
The role of the block: P

Code of the group: 2016_SPACEMASTER_2_P
Name of the group: Compulsory subjects of the programme
Requirement credits in the group: In this group you have to gain 120 credits
Requirement courses in the group: In this group you have to complete 13 courses
Credits in the group: 120
Note on the group:

Code	**Name of the course / Name of the group of courses** ***(in case of groups of courses the list of codes of their members)*** *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
BE3M35CSP	**CanSat-Projekt**	Z,ZK	9	2P+2S	Z	P
BE3M35CSA	**Control Systems for Aircraft and Spacecraft** *Martin Hromčík* ***Martin Hromčík*** *Martin Hromčík (Gar.)*	Z,ZK	7	2P+2L	Z	P
BE3M35DIP	**Diploma Thesis** ***Martin Hlinovský***	Z	30	22S	L	P
BE3M35ELS	**Electronics in Space**	Z,ZK	8	2P+2S	L	P
BE3M35IDP	**Individuální projekt** *Martin Hlinovský* ***Martin Hlinovský*** *Martin Hlinovský (Gar.)*	Z	8	0P+6S	Z	P
BE3M35ISP	**Introduction to Space Physics**	Z,ZK	8	2P+2S	Z	P
BE3M35ORO	**Optic- and Radar-based Observations**	Z,ZK	8	2P+2S	L	P
BE3M35ORC	**Optimal and robust control design** *Zdeněk Hurák* ***Zdeněk Hurák*** *Zdeněk Hurák (Gar.)*	Z,ZK	8	2P+2C	L	P
BE3M35SDY	**Space Dynamics**	Z,ZK	5	2P+2S	Z	P
BE3M35SPP	**Space Plasma Physics**	Z,ZK	7	2P+2S	Z	P
BE3M35SSM	**Space systems, modeling and identification** *Petr Hušek* ***Petr Hušek***	Z,ZK	7	4P+2C	Z	P
BE3M35SSD	**Spacecraft System Design**	Z,ZK	8	2P+2S	Z	P
BE3M35SEI	**Spacecraft Environment Interactions**	Z,ZK	7	2P+2S	L	P

Characteristics of the courses of this group of Study Plan: Code=2016_SPACEMASTER_2_P Name=Compulsory subjects of the programme

BE3M35CSP	CanSat-Projekt	Z,ZK	9
BE3M35CSA	Control Systems for Aircraft and Spacecraft	Z,ZK	7

System Approach. Object, System, Model. Dynamic Systems Continuous and Discrete Time, Qualitative Analysis of Systems. Poincare Map, Chaos. Linear Systems. System Stability, Uncertainty and Robustness. Controllability and Observability. State Feedback, State Injection, Duality. Stochastic Systems, Realization of Stochastic Processes.

BE3M35DIP	Diploma Thesis	Z	30

Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination.

BE3M35ELS	Electronics in Space	Z,ZK	8
BE3M35IDP	Individuální projekt	Z	8

Independent work in the form of a project. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The project will be defended within the framework of a subject.

BE3M35ISP	Introduction to Space Physics	Z,ZK	8
BE3M35ORO	Optic- and Radar-based Observations	Z,ZK	8
BE3M35ORC	Optimal and robust control design	Z,ZK	8
This advanced course on control design will cover modern methods for optimal and robust control design. Emphasis will be put on practical computational design skills. Unifying idea of the course is that of minimization of a system norm. Depending on which norm is minimized, different properties of the resulting controller are guaranteed. Minimizing H2 norm leads to the celebrated LQ/LQG optimal control trading off the performance and the effort, while minimizing Hinf norm shifts the focus to robustness against uncertainties in the model. Mu-synthesis as an extensions to Hinf optimal control design that take the structure of the uncertainty into consideration represents a very powerfull tool for robust control design. Standing a little bit aside yet being useful in space missions are the methods for time-optimal and suboptimal control. As a self-contained add-on to the course, introduction to the topic of semidefinite programming and linear matrix inequalities (LMI) will be made, as these constitute a very elegant theoretial and a powerful computational tool for solving all the previously introduced tasks in optimal and robust control.			
BE3M35SDY	Space Dynamics	Z,ZK	5
BE3M35SPP	Space Plasma Physics	Z,ZK	7
BE3M35SSM	Space systems, modeling and identification	Z,ZK	7
BE3M35SSD	Spacecraft System Design	Z,ZK	8
BE3M35SEI	Spacecraft Environment Interactions	Z,ZK	7

List of courses of this pass:

Code	Name of the course	Completion	Credits
BE3M35CSA	Control Systems for Aircraft and Spacecraft	Z,ZK	7
System Approach. Object, System, Model. Dynamic Systems Continuous and Discrete Time, Qualitative Analysis of Systems. Poincare Map, Chaos. Linear Systems. System Stability, Uncertainty and Robustness. Controllability and Observability. State Feedback, State Injection, Duality. Stochastic Systems, Realization of Stochastic Processes.			
BE3M35CSP	CanSat-Projekt	Z,ZK	9
BE3M35DIP	Diploma Thesis	Z	30
Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination.			
BE3M35ELS	Electronics in Space	Z,ZK	8
BE3M35IDP	Individuální projekt	Z	8
Independent work in the form of a project. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The project will be defended within the framework of a subject.			
BE3M35ISP	Introduction to Space Physics	Z,ZK	8
BE3M35ORC	Optimal and robust control design	Z,ZK	8
This advanced course on control design will cover modern methods for optimal and robust control design. Emphasis will be put on practical computational design skills. Unifying idea of the course is that of minimization of a system norm. Depending on which norm is minimized, different properties of the resulting controller are guaranteed. Minimizing H2 norm leads to the celebrated LQ/LQG optimal control trading off the performance and the effort, while minimizing Hinf norm shifts the focus to robustness against uncertainties in the model. Mu-synthesis as an extensions to Hinf optimal control design that take the structure of the uncertainty into consideration represents a very powerfull tool for robust control design. Standing a little bit aside yet being useful in space missions are the methods for time-optimal and suboptimal control. As a self-contained add-on to the course, introduction to the topic of semidefinite programming and linear matrix inequalities (LMI) will be made, as these constitute a very elegant theoretial and a powerful computational tool for solving all the previously introduced tasks in optimal and robust control.			
BE3M35ORO	Optic- and Radar-based Observations	Z,ZK	8
BE3M35SDY	Space Dynamics	Z,ZK	5
BE3M35SEI	Spacecraft Environment Interactions	Z,ZK	7
BE3M35SPP	Space Plasma Physics	Z,ZK	7
BE3M35SSD	Spacecraft System Design	Z,ZK	8
BE3M35SSM	Space systems, modeling and identification	Z,ZK	7

For updated information see http://bilakniha.cvut.cz/en/f3.html
Generated: day 2024-05-21, time 01:14.