

# Recomended pass through the study plan

## Name of the pass: SpaceMaster - Passage through study

Faculty/Institute/Others: Faculty of Electrical Engineering

Department:

Pass through the study plan: Erasmus Mundus Master Course - SpaceMaster II

Branch of study guaranteed by the department: Welcome page

Guarantor of the study branch:

Program of study: Cybernetics and Robotics

Type of study: Follow-up master full-time

Note on the pass:

Coding of roles of courses and groups of courses:

P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):

KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of semester: 1

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, <b>authors</b> and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
XE35CSP	CanSat-Projekt	Z,ZK	8	2P+2S	Z	P
XE35ISP	Introduction in Space Physics	Z,ZK	8	2P+2S	Z	P
XE35SDY	Space Dynamics	Z,ZK	4	2P+2S	Z	P
XE35SSD	Spacecraft System Design	Z,ZK	8	2P+2S	Z	P
2016_SPACEMASTERPV1	<b>Compulsory optionally subjects</b> <i>XE35ADT, XE35ITG,..... (see the list of groups below)</i>	Min. cours. 1 Max. cours. 3	Min/Max 3/11			PV

Number of semester: 2

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, <b>authors</b> and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
XE35ELS	Electronics in Space	Z,ZK	7	2P+2S	L	P
XE35ORO	Optic- and Radar-based Observations	Z,ZK	8	2P+2S	L	P
XE35SPP	Space Physics	Z,ZK	8	2P+2C	Z	P
XE35SEI	Spacecraft Environment Interactions	Z,ZK	7	2P+2S	L	P

Number of semester: 3

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, <b>authors</b> and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
XE35CSA	Theory of Dynamic Systems	Z,ZK	7	3P+1S	Z	P
XE35IDP	Individual design project	Z	8	6S	Z	P
XE35SSM	Space systems, modeling and identification	Z,ZK	7	3P+1S	Z	P

Number of semester: 4

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
XE35DIP	Diploma Thesis	Z	30	14S	L	P
XE35ORC	Optimal and robust control design	Z,ZK	8	3P+1C	L	P

### List of groups of courses of this pass with the complete content of members of individual groups

Kód	Name of the group of courses and codes of members of this group (for specification see here or below the list of courses)	Completion	Credits	Scope	Semester	Role
2016_SPACEMASTERPV1	Compulsory optionally subjects	Min. cours. 1 Max. cours. 3	Min/Max 3/11			PV
XE35ADT	Advanced Databases	XE35ITG	Internet Technologies	XE35OOA	Object-oriented approach and Jav ...	

### List of courses of this pass:

Code	Name of the course	Completion	Credits
XE35ADT	Advanced Databases	ZK	3
XE35CSA	Theory of Dynamic Systems 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.	Z,ZK	7
XE35CSP	CanSat-Projekt	Z,ZK	8
XE35DIP	Diploma Thesis 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.	Z	30
XE35ELS	Electronics in Space	Z,ZK	7
XE35IDP	Individual design project 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.	Z	8
XE35ISP	Introduction in Space Physics	Z,ZK	8
XE35ITG	Internet Technologies	Z,ZK	4
XE35OOA	Object-oriented approach and Java programming	Z,ZK	4
XE35ORC	Optimal and robust control design 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.	Z,ZK	8
XE35ORO	Optic- and Radar-based Observations	Z,ZK	8
XE35SDY	Space Dynamics	Z,ZK	4
XE35SEI	Spacecraft Environment Interactions	Z,ZK	7
XE35SPP	Space Physics	Z,ZK	8
XE35SSD	Spacecraft System Design	Z,ZK	8
XE35SSM	Space systems, modeling and identification	Z,ZK	7

For updated information see <http://bilakniha.cvut.cz/en/f3.html>

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