Program:	**Electrical Engineering and Information Technology**
Module / Course Title:	**Fundamentals of Satellite Navigation**
No:	**MF-xx**
Semester:	EM1-3
Coordinator / Responsibility:	Prof. Dr. Birger Mysliwetz
Teacher:	Dr. Hans L. Trautenberg (EADS Astrium GmbH)
Language:	English
Position in Curriculum:	Elective course in EE/IT Master's program
Course Type / Weekly Hours:	70% lectures, 30% exercises, 2 hours per week
Workload:	Duration: 1 semester Lecture: 2 hours x 15 weeks = 30 hours Lecture follow-up/homework assignments: 40 hours Examination preparation: 20 hours Total workload: 90 hours
Credits:	3
Prerequisites:	• Basic linear algebra, analysis and statistics • Basics of electrodynamics (wave propagation) • Proficiency in a programming language to solve homework problems (mostly linear algebra problems)
Learning Objectives / Goals:	**Learning Objectives** at the end of this course, students will: • understand the principles of satellite navigation • know the limitations of satellite navigation **Goals** To enable students to assess the applicability of satellite navigation for a given task
Topics:	• History of satellite navigation • Positioning methods • Description of orbits • Range measurements with CDMA techniques • Signal propagation in ionosphere and troposphere • Multi path and interference problem • User equivalent range error budget and link budgets • System architecture of satellite navigation systems • GPS overview • Galileo overview • Integrity of position solutions • Integrity of navigation systems • Implementation of navigation algorithms
Grading / Examination:	Written test (60 minutes) at end of semester.
Material:	Lecture notes
Literature:	• Elliott D. Kaplan: Understanding GPS Principles and Applications; Artech House Publisher, • Bradford W. Parkinson, James J. Spliker: Global Positioning System: Theory and Applications; American Institute of Aeronautics and Astronautics • Gilbert Strand, Kai Borre: Linear Algebra, Geodesy, and GPS; Willesly-Cambridge Press • B. Hofmann-Wellenhof, H. Lichtenegger, J. Collins: GPS Theory and Practice; Springer