Study program: Communication technologies

Course title: Satellite Communications

Professor/assistant: Nikola Sekulović

Type of course: compulsory/elective

ECTS credits: 6

Pre-requisites: attended course of Wireless telecommunication systems

Aims of the course:

Introducing students to architecture, elements and transmission principles in contemporary satellite communication systems. Acquiring theoretical and practical knowledge for system performance evaluation and acquaintance with commercial application of satellite systems.

Learning outcomes:

Students are trained to define and determine performance of satellite communication systems and estimate parameters for receiving equipment.

Syllabus

Theoretical part

Overview and classification of satellite communication systems. Architecture of satellite communication systems. Satellite orbits. Analysis of satellite links. Detrimental effects in satellite systems. Modulation techniques in satellite systems. Error control codes in satellite systems. Multiple access techniques in satellite systems. Mobile satellite systems. VSAT systems. Architecture of Earth station. Satellite navigation systems. Trends in further development of satellite communication systems.

Practical part

Assessment of antenna system parameters in satellite communications. Determining position of satellite with respect to geographic position of user and estimation of angles of satellite receiving antenna. Budget of satellite link.

Literature

1. T. Prat, C. W. Bostian, J. E. Allnutt, *Satellite communications*, John Wile & Sons, 2003.
2. O. Pronic-Rancic, *Satelitski komunikacioni sistemi* - skripta, Elektronski fakultet, Niš, 2012.
3. G. Maral, M. Bosquet, *Satellite communication systems*, John Wile & Sons, 1996.
4. *GPS, Essentials of Satellite Navigation*, u-blox, 2009.

Number of active classes 60			Other forms of teaching:
Lectures: 30	Practical classes: 30	Research work:	

Teaching methods

Lectures, computational exercises and exercises in laboratory on practical examples, consultations.

Grading system (maximum 100 points), **grading scale** from 5 to 10: below 51 points grade 5, grade 6 from 51-60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91-100 points.

Pre-exam obligations	**points**	**Final exam**	**points**
activity during theoretical lectures	**10**	written exam	**20**
practical training		oral exam	**20**
colloquium(s)/seminar papers	**50**		
Sum	**60**	**Sum**	**40**