

**EC520            Satellite Communications.****COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EC422	5	10	2	2	0	3

**COURSE AIM**

To give an overall view on the different aspects concerning the satellite on a communication system, To describe different types of satellite orbits, to address the limitations and capabilities of the satellite communication system and to review different types of satellite communication systems.

**COURSE WEEKLY CONTENTS**

- 1 Introduction to satellite communications (historical background, comparison between terrestrial and satellite links, advantages and limitations of satellite communication, types of satellite services.
- 2 Satellite Orbits (Orbital parameters, circular orbits, Kepler laws, elliptical orbits)
- 3 Satellite Orbits "Cont." (GEO orbits calculations, MEO and LEO orbits)
- 4 Satellite Link (Link budget, atmospheric losses)
- 5 Satellite Link "Cont."(frequency bands, polarization effects)– Satellite Construction (platform)
- 6 Satellite Construction ( payload "transponder" and "Antennas")
- 7 7<sup>th</sup> week assesment + Midterm Exam
- 8 Radio System Technology (Multiple Access techniques for satellite "FDMA, SCPC, Guardbands and crosstalk)
- 9 Radio System Technology (TDMA "Frame structure, synchronization, frame design)
- 10 Radio System Technology (CDMA "DS-SS, FH-SS")
- 11 Earth Stations
- 12 12<sup>th</sup> week evaluaion and Fixed Satellite Services
- 13 Mobile Satellite Communications ( INMARSAT, ICO , VSAT )
- 14 Satellite Communication (Direct satellite broadcasting)
- 15 Examples of Satellite Communications Systems

**STUDENT GRADING & ASSESSMENT**

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	20 Midterm		5				30

		5						
<b>8 to 12</b>	1 0	5	5			→	<b>20</b>	
<b>13 to 15</b>	←		10	MARKS		→	<b>10</b>	
<b>16 or 17</b>	<b>40</b>	<b>Final</b>					<b>40</b>	
<b>Total</b>		<b>Exams</b>	<b>Assign.</b>	<b>Quizzes</b>	<b>Reports</b>	<b>Present.</b>	<b>Lab.</b>	<b>100</b>

#### REFERENCES

- 
- Textbook** • G. Maral, M. Bousquet, "Satellite Communication systems", John Wiley & sons
- 
- Other** • T. Pratt, C. W. Bostian, "Satellite Communications", John Wiley & Sons