ELEC 4004 RADIO AND SATELLITE COMMUNICATION

Credit Points 10

Legacy Code 300489

Coordinator Ragbir Bhathal (https://directory.westernsydney.edu.au/search/name/Ragbir Bhathal/)

Description This unit is offered in alternate years. This unit will develop an understanding of the theory and practice of radio and satellite communication techniques and measurements and provide an introduction to space communication systems. It will complement the general communication engineering units, addressing advanced topics important and specific to radio and satellite communications.

School Eng, Design & Built Env

Discipline Communications Technologies

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 4 subject

Pre-requisite(s) ELEC 3001 OR
ELEC 4001

Equivalent Subjects LGYA 3699 - Satellite Communication

Assumed Knowledge

Physics and Materials, Mathematics for Engineers 1 and 2, Astrophysics.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Explain the special challenges and techniques of radio and satellite communications
2. Explain the launch, maintenance and operation of communication satellites and associated telescopes
3. Demonstrate practical knowledge of tracking stations, earth station equipment, telescopes and communication gateways
4. Explain the techniques and use of radio and optical telescopes and associated equipment used in ground based and space stations
5. Demonstrate an understanding of the different architectures and applications of low earth orbit, medium earth orbit and geostationary earth orbit satellite systems
6. Plan, conduct, interpret and document experiments performed in the laboratory

Subject Content

Satellite systems, orbits and launch methods
Radio wave propagation and polarization
Radio antennas, receivers and aperture synthesis
Analog and digital signals
The space link, interference, link budget calculation
Satellite access and services and mobile satellite systems
CCD, photometric systems and adaptive optics
Robotic observatories and space telescopes
Remote sensing of planetary systems and image processing and analysis

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/ Group Task
Practicals/ tutorials	Average contact hours per week 4 hr (made up of 2h lectures + 2h prac/ tutorial per week)	30	N	Individual
Presentation and report	Each oral presentation 10 minutes per student. Report 2,000 words	10	N	Individual
Final Exam	3 hours	60	N	Individual

Teaching Periods