

# ELEC 7009 PERSONAL COMMUNICATION SYSTEMS

**Credit Points** 10

**Legacy Code** 300196

**Coordinator** Ranjith Liyanapathirana ([https://directory.westernsydney.edu.au/search/name/Ranjith Liyanapathirana/](https://directory.westernsydney.edu.au/search/name/Ranjith%20Liyanapathirana/))

**Description** This subject covers the design fundamentals of cellular systems, including frequency reuse, channel assignments, radio wave propagation in mobile environments, modulation techniques, coding techniques, spread spectrum and multiple access. It includes topics from emerging wireless technologies, and third-generation mobile communication systems and standards.

**School** Eng, Design & Built Env

**Discipline** Communications Technologies

**Student Contribution Band** HECS Band 2 10cp

Check your fees via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Postgraduate Coursework Level 7 subject

## Restrictions

Students must be enrolled in a postgraduate program

## Assumed Knowledge

Communications Systems. Digital Communications.

## Learning Outcomes

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

1. Demonstrate an understanding of current wireless communication systems including GSM, CDMA, PCS, and 3G systems.
2. Describe coding and modulation techniques used in wireless systems.
3. Demonstrate at an advanced level understanding of implementation issues such as bit error rates, receiver complexity, spectral occupancy and antenna diversity.

## Subject Content

Evolution of mobile radio communication  
 The cellular system; design fundamentals  
 Frequency reuse, channel assignment strategies, handoff  
 Interference and System capacity  
 Mobile radio propagation; multipath fading, Rayleigh and Ricean distributions  
 Modulation techniques for mobile radio  
 Equalization, diversity and channel coding  
 Multiple access techniques  
 Wireless systems and standards

## 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.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Applied Project	Seminar (15 min) and Paper (7500 words)	20	N	Individual	Y
Numerical Problem Solving	1 hour	20	N	Individual	Y
End-of-session Exam	3 hours	60	N	Individual	Y

Teaching Periods

## Autumn (2025)

### Parramatta City - Macquarie St

#### On-site

**Subject Contact** Ranjith Liyanapathirana ([https://directory.westernsydney.edu.au/search/name/Ranjith Liyanapathirana/](https://directory.westernsydney.edu.au/search/name/Ranjith%20Liyanapathirana/))

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=ELEC7009\\_25-AUT\\_PC\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC7009_25-AUT_PC_1#subjects))