

ECE5884 Wireless Communications

Assignment Project Exam Help

Week 0: Introduction

Saman Atapattu

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ARC Future Fellow at The University of Melbourne
Sessional Lecturer at Monash University

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Welcome to the wireless world 😊

About me

- [Saman Atapattu](#) (Saman Udaya Bandara Atapattu, Atapattu Mudiyanseelage)
- [Studies](#): BSc: University of Peradeniya, Sri Lanka; MEng: Asian Institute of Technology (AIT), Thailand; and PhD: University of Alberta, Canada
- [Researcher](#): University of Alberta (2013-2014); Monash University (2014-2016); and The University of Melbourne (2016-To date)
- [Visiting Researcher](#): CentraleSupélec, University of Paris-Saclay, France (2017) and Beijing Jiaotong University, China (2019)
- [Research Interest](#): Wireless Communications and Signal Processing
- [Awards/Grants in AUS](#):
 - ARC DECRA Fellowship 2016- Green Radio: Increasing Spectral and Energy Efficiency of Wireless Networks
 - ARC Future Fellowship 2021- Smart Wireless Radio Environments for the 6G Era
 - ARC Discovery Project 2021- Sensing and Communications for Tactical Radio: Mapping the RF Weather

- **Unit Coordinator:** Saman Atapattu

- Email: saman.atapattu@monash.edu

- In person @ Office B72/Room 231 on Monday 9.00 am-12.30 pm by appointments

- Zoom in weekdays by appointments

- **Teaching team:**

- **Lecturer:** Dr. Gayathri Kongara (gayathri.kongara@monash.edu or Zoom)

- **Demonstrators:** Three PhD students @ G13/B35

- Shravan Das (shravan.das@monash.edu)

- Amit Bora (amit.bora@monash.edu)

- Mojtaba Ghermezcheshmeh (mojtaba.ghermezcheshmeh1@monash.edu)

- **Also Contact:** via the "Discussion Forum" - highly recommended!!!

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Course Information - Time and Location

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You MUST go through recorded lectures before 12:59:59 pm

Monday	Tuesday
ECE5884 CL S2 ON-CAMPUS Laboratory JTU01, OnCampus Hybrid OnCampus Class - CL All R, Eng 35, G13 Spe-High (64) 25/7/22 to 20/9/22, 4/10/22 to 18/10/22	ECE5884 CL S2 ON-CAMPUS Laboratory JTU01, OnCampus Hybrid OnCampus Class - CL All R, Eng 35, G13 Spe-High (64) 25/7/22 to 20/9/22, 4/10/22 to 18/10/22
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- **Lectures:** Online videos ($\approx 90 - 120$ mins)
 - Recorded videos will be available in the previous week
- **Workshops:** 1-2 pm on Monday via Zoom @ Real Time
 - Summary/Q&A/Problem solving/etc...
- **Labs:** On Campus @ G13/B35 and Online only for offshore students
 - For more info, please visit Labs tile in the Moodle

- The assessments in this unit are divided into **two** parts:
 - Continuous assessment (Quizzes, Assignments and Labs)**, which accounts for 50% of the mark.
 - Final assessment**, which accounts for the rest 50% of the mark.

- This unit contains **hurdle** requirements that you must achieve to be able to pass the unit. You are required to achieve at least 45% in the total continuous assessment component and at least 45% in the final assessment component. The consequence of not achieving a hurdle requirement is a fail grade (NH) and a maximum mark of 45 ($= 2 \times 22.5$) for the unit.

Assessment Item	Weight	Due Date
Weekly Quizzes ($\times 12$)	12	End of each week
Assignments ($\times 3$)	18	Each (roughly) fourth week
Labs ($\times 5$)	20	Each second week, excl. Week 1
Final Exam	50	TBA

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Figure 1: A wireless network with base stations and mobile users.

- **Week 1:** Overview of Wireless Communications

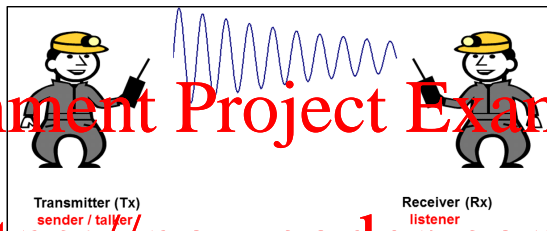


Figure 2: A simple wireless communications system (point-to-point).

- Week 2: Wireless Channel (Path Loss and Shadowing)

- Week 3: Wireless Channel Models

- Week 4: Capacity of Wireless Channels

- Week 5: Digital Modulation and Detection

- Week 6: Performance Analysis

- Week 7: Equalization

- Week 8: Multicarrier Modulation (OFDM)

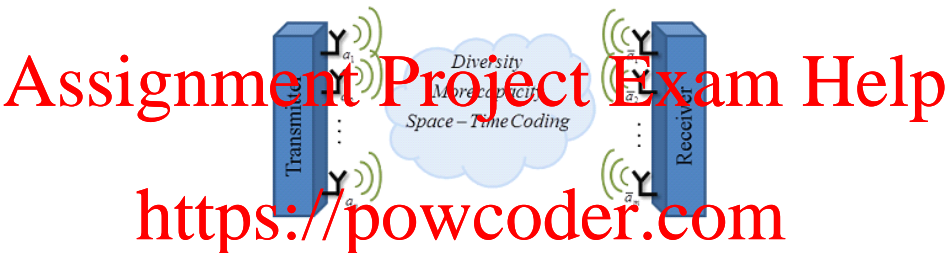


Figure 3: Multiple antennas <http://wcsp.eng.usf.edu/research.html>

- Week 9: Diversity Techniques
- Week 10: Multiple-Antenna Systems (MIMO Communications)
- Week 11: Multiuser Systems (Figure 1)
- Week 12: Guest Lecture (Emerging 5G/6G Technologies)
- Then! Final Exam



Andrea Goldsmith. 2005. *Wireless Communications*. Cambridge University Press, USA.
(Chapters 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 14)

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http://web.stanford.edu/class/ee359/doc/WirelessComm_Chpl-16_March32020.pdf

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Thank You!

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See you soon ☺

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