



MIMO Wireless Communications

Syllabus

陳彥銘

Basic Information

- Teacher: 陳彥銘
Office: EC 8038
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Email: emerychen.cm@gmail.com
- Time: Wed. 13:10-16:00
- Location: EC 3013
- Course materials:
<http://mx.nthu.edu.tw/~ymchen/course.htm>

Required Background Knowledge

- Linear algebra
- Probability theory
- Random vector
- Communication theory

Reference books

- E. Biglieri, R. Calderbank, A. Constantinides, A. Goldsmith, A. Paulraj, H.V. Poor, *MIMO Wireless Communications*, Cambridge Press, 2007.
- T. M. Duman, A. Ghrayeb, *Coding for MIMO Communication Systems*, Wiley, 2007.
- A. Paulraj, R. Nabar, D. Gore, *Introduction to Space-Time Wireless Communications*, Cambridge Press, 2003.
- D. Tse, P. Viswanath, *Fundamentals of Wireless Communications*, Cambridge Press, 2005.

Syllabus

- Introduction
- Wireless fading channels & Diversity Techniques
- Capacity limit of MIMO systems
- Precoding design
- Space-time coding
- Receiver design
- Multiuser MIMO System
- Further issues

週次	日期	授課內容及主題
1	2017/09/18~2017/09/24	Chap 1: Introduction
2	2017/09/25~2017/10/01	Chap 2: Wireless fading channels & Diversity Techniques (2.1-2.2)
3	2017/10/02~2017/10/08	中秋節(放假一天)
4	2017/10/09~2017/10/15	Chap 2: Wireless fading channels & Diversity Techniques(2.3-2.5) 4
5	2017/10/16~2017/10/22	Chap 3: Capacity limit of MIMO systems(3.1-3.3)
6	2017/10/23~2017/10/29	Chap 3: Capacity limit of MIMO systems (3.3-3.5)
7	2017/10/30~2017/11/05	Midterm(1)
8	2017/11/06~2017/11/12	Chap 4: Precoding design (4.3-4.5)
9	2017/11/13~2017/11/19	Chap 4: Precoding design (4.1-4.3)
10	2017/11/20~2017/11/26	Chap 4: Precoding design (4.5-4.7)
11	2017/11/27~2017/12/03	Chap 5: Space-time coding (5.1-5.3)
12	2017/12/04~2017/12/10	Midterm(2)
13	2017/12/11~2017/12/17	Chap 5: Space-time coding (5.4)
14	2017/12/18~2017/12/24	Chap 6: Receiver design (6.1-6.3)
15	2017/12/25~2017/12/31	Chap 6: Receiver design (6.4-6.6)
16	2018/01/01~2018/01/07	Chap 7: Multiuser MIMO System (7.1-7.2)
17	2018/01/08~2018/01/14	Project report
18	2018/01/15~2018/01/21	Project report

Grading

- **Midterm(1): 30%**
One-page note is allowed. (A4 size)
- **Midterm(2): 30%**
One-page note is allowed. (A4 size)
- **Project Report: 40%**