

# Advanced Mobile Communications

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Tue/Thu 11:00AM~12:15AM

- 1 Introduction to Mobile Communication (0.5)
- 2 Digital comm (PSK, GMSK, GFSK...) (1.0)
- 3 Fading environment and performance (1.5)
- 4 Performance enhancement in fading/jamming environments  
(Diversity, interleaving) (1.0)
- 5 Smart antennas (0.5) + Tx Diversity (0.5)
- 6 MIMO (2 or 3): fundamental, channel capacity, SVD, Waterfilling  
Multiuser diversity, Multi-user MIMO, Multi-cell MIMO  
Massive MIMO
- 7 DS-SS, FH-SS (0.5)
- 8 OFDM (2.0): fundamental, parameter design, ch est, power allocation
- 9 Multiple Access & Duplex (FDMA, TDMA, CDMA, OFDMA,...) (0.5)
- 10 Spread Spectrum (1 or 2): Performance analysis, spreading sequences,  
synchronization
- 11 Multi-User receiver (0.5)
- 12 Capacity of Fading Channel (0.5)
- 13 Next-generation mobile communications (Internet of Things, 5G,, )  
(0.5 or 1.0)

## Reference:

Fundamentals of Wireless Communication, Cambridge, D. Tse and P. Viswanath  
Elements of Information Theory, Wiley, T. Cover and J. Thomas  
Wireless Communications Principles and Practice, Prentice Hall, T.Rappaport  
Introduction to Spread Spectrum Communications, Prentice Hall,  
Roger Peterson, Rodger Ziemer, David Borth  
Communication Systems, Wiley, S. Haykin  
Communication Systems Engineering, J Proakis and M. Salehi

Research papers

**Tests:** 2 times (40%, 60%, bonus, attendance...)