

Course Content

Course Title (English)	Principles of Wireless Communications
Course Title (Chinese)	無線通信原理
Credit	3
Instructor	Prof. I-Hsiang Wang 王奕翔 教授
Outline	<ol style="list-style-type: none">1. Introduction2. Wireless Channel: physical models, input/output channel models, time and frequency coherence, statistical channel models, and fading.3. Point-to-Point Communication: detection in fading channels, diversity, degrees of freedom, and capacity of point-to-point fading channels.4. MIMO Systems: channel modeling, spatial multiplexing, space diversity, space-time codes, capacity of MIMO channels, and diversity-multiplexing tradeoff.5. Cellular Systems: multiple access, interference management, narrowband systems, wideband CDMA, and wideband OFDM.6. Multi-user Communication I – single-cell: capacity of uplink fading channels and downlink fading channels, multi-user diversity, opportunistic communications, and multi-user MIMO.7. Multi-user Communication II – multiple-cell: interference management revisited, capacity of interference channels, interference alignment, and open questions.8. Multi-user Communication III – relay networks: capacity of relay channels, cooperative diversity, general multi-hop relay networks, and open questions.
Goal	<ol style="list-style-type: none">1. Introduce the fundamental aspects of modern wireless communication

	<p>systems.</p> <p>2. Provide a unified view of the recent advances in physical-layer wireless communication and wireless network theory.</p> <p>3. Use implemented systems as examples to explain the theoretical concepts.</p>
English Teaching	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Teaching Material	<input checked="" type="checkbox"/> English <input type="checkbox"/> Chinese