

Course Content

Course Title (English)	Digital Communications (II)
Course Title (Chinese)	數位通信 (二)
Credit	3
Instructor	Prof. Hsuan-Jung Su 蘇炫榮 教授
Outline	<p>1.Review of key results from Digital Communications I.</p> <p>2.Introduction to Information Theory</p> <p>Entropy, mutual information, channel models, channel capacity.</p> <p>3.Source Coding</p> <p>Lossless source coding, lossy data compression.</p> <p>4.Channel Coding</p> <p>Linear block codes, trellis and graph based codes, trellis-coded modulation, automatic repeat request.</p> <p>5.Fading Channels</p> <p>Channel characterization, diversity techniques, receiver signal processing, ergodic and outage capacity, coding for fading channels.</p> <p>6.Spread spectrum and wideband communications</p> <p>Direct-sequence spread spectrum, frequency-hopped spread spectrum, multi-channel and multi-carrier communications.</p> <p>7.Multiple-Antenna Systems</p> <p>Channel models, capacity, coding and decoding.</p> <p>8.Multiuser communications</p> <p>Multiple access techniques (TDMA, CDMA, FDMA, random access methods), multiuser detection, multiuser MIMO.</p>

Goal	<p>The goal is to get students familiar with source and channel coding related aspects of modern digital communication system design and their applications.</p> <p>The algorithms and mathematical background for these design aspects will be introduced which will be useful for jobs involving communication system, algorithm and IC design.</p>
English Teaching	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Teaching Material	<input checked="" type="checkbox"/> English <input type="checkbox"/> Chinese