

<b>COURSE:</b> EECS 455. <b>TITLE:</b> Digital Communication Signals and Systems. <b>PREREQUISITES:</b> EECS 306 and 401.		<b>ELECTIVE.</b>
<b>TEXTBOOK:</b> J. Proakis and Salehi, Communications Systems Engineering, 2 <sup>nd</sup> ed., Prentice-Hall; on-line coursepack.		
<b>CATALOG DESCRIPTION:</b> Digital transmission techniques in data communications, with application to computer and space communications; design and detection of digital signals for low error rate; forward and feedback transmission techniques; matched filters; modems, block and convolutional coding; Viterbi decoding.		
<b>COURSE OBJECTIVES:</b> 1. To teach students the basic theory of signal representation using basis functions; 2. To teach students the basics of Gaussian detection theory: hypothesis testing, ROC curves; 3. To teach students how to design digital communications systems using source coding & error control; 4. To teach students how to design digital communications systems using channel coding & modulation.		<b>TOPICS COVERED:</b> 1. Signal theory (basis functions) 2. Gaussian detection theory: likelihood ratio, matched filter 3. Source (Huffman) coding 4. Channel (convolutional, error-correcting, and block) coding 5. Modulation and spread-spectrum 6. Viterbi decoding
<b>COURSE OUTCOMES [Program Outcomes Addressed]</b> 1. Ability to use source coding techniques (such as Huffman coding) in communications systems; [1,11] 2. Ability to use channel coding techniques (such as block & convolutional codes) in comm systems; [“] 3. Ability to use modulation techniques (such as frequency & phase-shift keying) in comm systems; [“] 4. Ability to design receivers (such as matched filters for additive Gaussian noise) [1,11,12,13,14]		<b>ASSESSMENT (Course outcomes)</b> 1. Weekly problem sets [1,2,3,4] 2. In-class exams [1,2,3,4]
<b>PROGRAM OUTCOMES ADDRESSED:</b> 1,11 <b>PROFESSIONAL COMPONENT ADDRESSED:</b> 12,13,14 <b>PREPARED BY:</b> Andrew E. Yagle on Nov. 25, 2004	<b>CLASS/LAB SCHEDULE:</b> <b>LECTURES:</b> 3 per week @ 50 minutes.	

**COURSE DESCRIPTION: University of Michigan, College of Engineering, ELECTRICAL ENGINEERING PROGRAM**