EE 379A Data Transmission Design – Winter 24 cioffi@stanford.edu

EE379A - Data Transmission Design (offered 23-24 winter) - is the first of a two-quarter sequence (leading to EE379B) in electrical engineering masters-degree communications depth sequence. Intended students are those interested in research or design of data transmission systems' lower layers. The course includes methods for transmission designs with and without coding and includes basic examples as well as their relationship to modern current/next-generation wireless and wireline transmission systems. The course also develops and uses information measures as generalizations of signal processing and minimum-mean-square-error estimation, developing design intuition. Basic phase-locking and synchronization methods also appear. EE379B progresses to multidimensional modulation methods and their use in modern and next-generation multiuser MIMO networks, along with network-design strategies. Instructor: Cioffi

Prerequisites: EE102B and EE278 (or equivalents). EE279 is helpful but not required.

Terms: Win | Units: 3 | Grading: Letter or C/NC Instructor: John M. Cioffi EE Communications Depth Sequence



John M. Cioffi - BSEE, 1978, Illinois; PhD EE, 1984, Stanford; Bell Laboratories, 1978-1984; IBM Research, 1984-1986; EE Prof., Stanford, 1986-present, now recalled emeritus. Cioffi founded Amati Com. Corp in 1991 (purchased by TI in 1997) and was officer/director from 1991-1997. He currently also is on the Board of Directors of ASSIA (Chair and CEO), PhyTunes (Chair), and the Marconi Foundation, and the Advisory Boards of Technology Innovation Institute, Vector Machine Learning, and Zenith Aerospace. Cioffi's specific interests are in the area of highperformance digital transmission.



Cioffi received the 2023 United States Medal of Technology from President J. Biden. Cioffi is the recipient of the IEEE's Kirchmayer Medal (2014) for Outstanding Graduate Teaching, IEEE Women in Communications Outstanding Mentor Award (2018), as well as Alexander Graham Bell and Millennium Medals (2010 and 2000); Economist Magazine 2010 Innovations Award; International Marconi Fellow (2006); Member, US National and UK Royal Academies of Engineering (2001, 2009); IEEE Kobayashi Medal (2001); IEEE Fellow (1996); IEE JJ Tomson Medal (2000); 1999 and 2010 U. of Illinois Outstanding Alumnus, 1991 and 2007 IEEE Comm. Mag. best paper; 1995 ANSI T1 Outstanding Achievement Award; NSF Presidential Investigator (1987-1992); and numerous Conference Best-Paper awards. He also was inducted into the 2014 Internet and 2018 Consumer Electronics Halls of Fame, and the IEEE Communications Society's Armstrong Medal in 2013. Cioffi has published over 800 papers and holds over 200 patents, of which many are heavily licensed including key necessary patents for the international standards in wireline DSL and cable, Dynamic Spectrum Management, Wi-Fi, and Cellular.

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