An Introduction to Coding Theory

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Abstract: The theory of error-correcting codes has played an essential role in the transmission of digital information for over sixty years. Whether it is used in telegraphs, artificial space probes, fax machines, computer hard drives, digital television or iPods, coding theory helps make the messages we read, the pictures we see and the music we hear clearer. Because all communication channels contain some degree of “noise”, some digits of a message may be affected. Coding theorists have developed algorithms that encode messages by adding redundancy digits, which can be sent across the channel and decoded by the recipient in a way that corrects errors. We will look at some examples of binary codes, which can be regarded as subspaces of vector spaces. We will also look at cyclic codes, which have a very nice algebraic structure.

Note: This talk also serves as a preview for a course on coding theory Professor Blackford will be teaching this summer. No special mathematical background will be assumed for either the talk or the course.

Refreshments will be provided.