

Portland State University
Systems Science Program
Spring 2004

SySc 510/610 ECE 510/610
MW 2:00-3:40 PM

INFORMATION THEORY II: TOPICS IN LINEAR CODES

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Text: *Information Theory, Inference, and Learning Algorithms*, by David MacKay.

SYLLABUS

- Week 1** Review channel coding and error correction codes.
(MacKay chapters 10 & 11)
- Week 2** Finish review, hash codes.
(MacKay chapter 12)
- Week 3** Binary codes.
(MacKay chapter 13)
- Week 4** Existence of very good linear codes, message passing framework.
(MacKay chapters 14 - 16)
- Week 5** Applications of message passing, midterm review.
(MacKay chapter 17)
- Week 6** Midterm Exam, intro to exact marginalizations.
(MacKay chapters 23 & 24)
- Week 7** Exact marginalizations in trellises and graphs.
(MacKay chapters 25 & 26)
- Week 8** Low-Density Parity-Check Codes.
(MacKay chapter 47)
- Week 9** Turbo codes, repeat-accumulate codes.
(MacKay chapters 48 & 49)
- Week 10** Memorial Day, Digital fountain codes, final review.
(MacKay chapter 50)
- Week 11** Final Exam (Monday June 7).