Some Topics on the Mathematics of Communication

Notes for the New Jersey Governor's School of Engineering and Technology, July 2003 of lectures given at the School of Engineering, Rutgers University, Piscataway, New Jersey Author: Stephen J. Greenfield, Department of Mathematics, Rutgers University E-mail greenfie@math.rutgers.edu Homepage http://www.math.rutgers.edu/~greenfie

Lecture and title	Pages
Introduction	0
#0: People and secrets	1-2
#1: Secret sharing	3-6
#2: Modular arithmetic	7-10
#3: Fermat and Euler	11-14
#4: Public key encryption	15-19
#5: How hard is arithmetic?	20-27
#6: Who owns ideas?	28-32
#7: More encryption	23-35
#8: Perfect cryptography	36-37
#9: Probably	38-40
#10: Gambling	41-45
#11: The transmission network	46-47
#12: Broadcasting – statement and heuristics	48-50
#13: Broadcasting – problem analysis	51-52
#14: Broadcasting – solution and discussion	53-55
#14 ¹ / ₂ : Intermezzo BIRTHDAY TIME!	56
#15: Pigeons and patterns	57-58
#16: Friends, strangers, and coloring graphs	59-63
#17: Ramsey and five	64-67
#18: Random graphs and real networks	68-69
#19: Coding theory	70

The last two lectures are just placeholders with scant references and discussion. I don't think I'll get to them in the 14 sessions that are scheduled.