Textbook: [Y&G] R. D. Yates and D. J. Goodman, Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers, 2nd ed., Wiley, 2004. Call No. QA273 Y384 2005.

Topics	[Y&G]
1. Probability and You	
a. Randomness	
b. Background on Some Frequently Used Examples	
i. Coins	
ii. Dice	
iii. Cards	
c. A Glimpse at Probability Theory	
i. Random experiment	p. 7-8
ii. Outcomes and Sample space	p. 8
iii. Event	p. 8-9
iv. Relative Frequency	p. 12-13, 67
v. Law of Large Numbers	p. 12-13, 67
vi. Using MATLAB to generate and analyze the sequence of coin flipping	p. 40 [Y&G] uses the `rand` and `hist` commands.
2. Review of Set Theory	Section 1.1 Set Theory
a. Venn diagram, basic set operations /identities (e.g. de Morgan Laws)	p. 2
b. Disjoint sets	p. 5
c. Partition	p. 10-11 (This is called **event space** in [Y&G])
d. Cardinality, Finite set, Countable Sets, Countably Infinite Sets, Uncountable Sets, Singleton	
i. Useful for checking whether a random variable is discrete or continuous	
e. Terminology of set theory and probability.	p. 9
3. Classical Probability	
a. Assumptions	
b. Basic properties	
4. Enumeration / Combinatorics / Counting	Section 1.8 Counting Methods
a. Four Principles	
i. Addition	
ii. Multiplication	p. 28
iii. Subtraction	
iv. Division	
b. Four Kinds of Counting Problems	
i. Ordered sampling with replacement	p. 31-32
ii. Ordered sampling without replacement (*r*-permutation)	p. 29
1. Factorial and permutation	p. 29

2. Permutations with types and multinomial coefficient	p. 33-34
iii. Unordered sampling of without replacement (r-combinations)	p. 29-31 [Y&G] also defines the formula for *r* that is not between 0 and *n*.
iv. Unordered sampling with replacement	
1. bars and stars argument	
c. Binomial Theorem and Multinomial Theorem	
d. Famous Example: Galileo and the Duke of Tuscany	
e. Application: Success Runs	
5. Probability Foundations	Section 1.3 Probability Axioms Section 1.4 Some Consequences of the Axioms
a. Kolmogorov's Axioms for Probability	p. 12 In [Y&G], the probability measure P( ) is represented by P[ ].
b. Consequences of Axioms	p. 13, 15-16 Note that in [Y&G] with is pointed out that we can write P[AB] or P[A,B] to represent P[$A \cap B$]
c. Connection to classical probability	p. 14
6. Event-based Independence and Conditional Probability	
a. Event-based Conditional Probability	Section 1.5 Conditional Probability p. 16-21
i. Tree diagram	Section 1.7 Sequential Experiments and Tree Diagrams p. 24-28
1. Compact form	
b. Event-based Independence	Section 1.6 Independence p. 21-24
c. Bernoulli Trials	Section 1.9 Independent Trials p. 35-36