ECE 313: Lecture 4
Binomial coefficients (cont.)
Study guide for ECE 313

$\binom{n}{k}$ = "n choose k"

$$= \frac{n!}{k!\,(n-k)!} = \frac{n(n-1)\cdots(n-k+1)}{1\cdot 2\cdots k}$$

$$= \binom{n}{n-k}$$

$$(a+b)^n = \underbrace{(a+b)\cdot(a+b)\cdots(a+b)}_{n}$$

$$= \sum_{k=0}^{n} \binom{n}{k} a^k b^{n-k}$$

Ex: $(a+b)^2 = 1\,a^2 + 2\,ab + b^2 = a^2 + ab + ab + b^2$

$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

SAQ (Short Answer Question)

(1.4).2. "ILLINI" randomly ordered, all likely

What prob no position has the same letter as original order

$E =$

$$P(E) = \frac{|E|}{|\Omega|}$$

$$|\Omega| = \frac{6!}{3!\,2!}$$

$\{I_1, I_2, I_3\}$ $\{L_1, L_2\}$

$|E| = 3$

$$P(E) = \frac{3 \cdot 3! \cdot 2!}{6!}$$

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Study Guide for ECE 313:

1. Attend lectures
2. Study textbook
3. Solve SAQ (Short Answer Questions) on the textbook,
THEN watch the video (links in the textbook) for the explained answer
4. Solve even numbered problem on the textbook,
THEN check the solutions at the end of the textbook

Working on #3 and #4 are homework assignments. Check the course webpage for specific assignment each week. If still stuck or not clear about #3 and #4 then

5. Go to office hours and guided study sessions, asking instructor/TA for direct explaination