

Syl I abus

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Course 1	() Name in Chinese	AA			/ Academic Year/Sem	ester	103/1			
Course 1	() ourse Name in English Introduction to Probability									
Cc	urse Code	AI <u>VI</u> 2080AA	Department & Year							
	Туре	Program / Credit(s)/Hour(s) 3.0/3.0								
1	nstructor	/								
Pr	Prerequisite /# ()/# ()									
Course Description										
Probability is a foundation for scientific investigation under uncertainty. Besides, it is the backbone of statistics which is yet another important and powerful principle and tool box for data science. This course serves as the first course to probability. The topics can be categorized into 1. Probability 2. Discrete Distributions 3. Continuous Distributions 4. Bi variate Distributions 5. Distributions of Functions of Random Variables 6. Limiting Theorem										
Course Objectives										
The objective of this course is to help students learn the basic concepts and the theoretical development in probability theory, and get necessary background to take further courses in probabilities and statistics. The contents focus on basic materials, including following important topics: axioms of probability, conditional probability and independence, random variables, expectation, variance, discrete random variables and probability distributions, continuous random variables and probability distributions.										
Correlation between Course Objectives Basic Learning Outcomes and Dept.'s Education Objectives										
A capa	Have well-founded background in mathematics and be capable of logical reasoning.									
B stat	B Have the knowledge of probability and statistics and the related field, and the corresponding application ability.									
C Be a	Be able to use computer software for statistical computation in real applications.									
	Illustration Highly correlated Moderately correlated									
	Teachi ng Schedul e & Content									
Week			Subj ect/Topi d	CS			Remarks			

1	1. Overview of Probability,	Stati st	ics, Pr	opertie	Subject to minor change for better learning results					
2	Overview of Probability-2: Conditional Probability, Independence, Bayes Theorem									
3	2. Discrete Distributions-1: Randomvariables of discrete type, mean and variance,									
4	2. Discrete Distributions-2: Bernoulli distribution and related theorems, moment generating function, Poisson Distribution									
5	3. Continuous Distributions-1: Continuous type data, EDA and descriptive stat recap,									
6	3. Conti nuous Di stri buti ons-2: randomvari abl e of conti nuous type,									
7	3. Continuous Distributions-3: uniformand exponential distributions, normal distribution									
8	Sel ected topics									
9	Midterm Exam									
10	4. Bi vari ate di stri buti ons-1: Di stri buti ons of two vari abl es, correl ati on									
11	4. Bivariate distributions-2: conditional distribution									
12	4. Bi variate distributions-3: bi variate normal distribution									
13	5. Distributions of functions of random variables-1: Functions of one variable, transformations of two r.v.'s,									
14	5. Distributions of functions of randomvariables-2: several independent r.v.s', moment generating function technique,									
15	5. Distributions of functions of random variables-3: functions of normal r.v.s',									
16	6. Limiting Theorems-1: Some theorems of limiting distributions,									
17	6. Limiting Theorems-2: Lawof Large Number and Central Limiting Theorem									
18	Fi nal Exam									
				Tea	achi ng :	Strateg	i es			
Lecture Group Discussion Field Trip								rip		
Mis	Miscel I aneous:									
Grading & Assessments										
Assessments										
I tems		Percentage								
General Performance		5%								
Midter m Exam		35%								
	Fi nal Exam	35%								
Homework and/or Assignments		25%								And Quizess
Mscel	l aneous)									

Grading & Assessments Supplemental instructions
Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)
Probability and Statistical Inference. Hogg and Tanis (2014), 8th Edition, Prentice-Hall (Text Book. earlier versions borrowable at AM office Library)
Teaching Aids & Teacher's Website (Personal website can be listed here.) http://faculty.ndhu.edu.tw/~chtsao/edu/14/i2p/i2p.html
(Suppl emental instructions)