HONG KONG BAPTIST UNIVERSITY
Department of Economics, School of Business, MScDABE Programme
Course Outline for Semester B of 2019/2020
ECON7960 User Experience and A/B Testing

GENERAL INFORMATION

Instructor: *Adjunct Associate Prof. Victor HUNG*
Phone: 90511427
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Course web site: https://github.com/cmivictorius/ECON7960
Course Hour: WED: 6:30pm- 9:20pm
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Course Descriptions:
The course focuses on applying business statistical analytic tools and applications, with emphasis on experimentation approach, in investigating data collected about customer/user responses to company strategies and product designs.

First the course discusses the integration of data collection and experiment designs using A/B testing and multivariate testing (MVT). By illustrating solutions of A/B testing and MVT running controlled experiments online such as comparing alternative versions of the same page or element running simultaneously on your website by randomly assigning visitors to increase conversion rate, to gain practical experience.

Second it introduces the concept of landing web page optimization, helping students to using tools and design solutions to search for better user experience, to uncover unique perspectives and to test against biases when dealing with landing page optimization based on statistical principles.

Third, the course also investigates the theoretical study of the Multiarmed Bandit Problem. It prepares students to develop novel algorithms for solving the Bandit problem with a better understanding of existing work to be able to follow the literature on the Multiarmed Bandit Problem.

COURSE OBJECTIVES
1. To provide students with an understanding about the method and statistical principles of A/B Testing, Multivariate Testing and Algorithms to simple Multiarmed Bandit Problem.
2. To prepare students to apply data analytics tools and solutions, such as Google Analytics and Optimizer, enhancing user experience in web site design, mobile solution design and business applications.
3. To prepare students to develop analytical solutions in A/B Testing, Multivariate Testing and Algorithms to simple Multiarmed Bandit Problem using Python.

SYLLABUS

Content of the courses draw heavily from the following books.

Jaime Levy (2015) *UX Strategy: How to Devise Innovative Digital Products that People Want*. O'Reilly Media Inc. (Levy)

Rochelle King, E.F. Churchill and C Tan (2017) *Designing with Data: Improving the User Experience with A/B Testing* O'Reilly Media Inc. (King)

Wendel, Stephen (2020) *Designing for Behavior Change: Apply Psychology and Behavioral Economics* O'Reilly Media Inc. (Wendel)

White, John M (2012) *Bandit Algorithms for Web Optimization* O'Reilly Media Inc. (White)

Topic 1: A Data Mindset

Background: King Chapter 1 (Introducing a Data Mindset) and 2 (The Diversity of Data)

Workshop: A Simple A/B Testing Example on Landing Page

- Data Driven
- Data Awareness
- Online Experiment

Topic 2: Experience versus Experiment: Explore-Exploit Dilemma

Background: King Chapter 3. Wendel Chapter 1

Workshop: Another A/B Test Application on Pricing

- Role: A Scientist or A Businessman
- Formulate a Framework of Experimentation
- Understand the Decision Mind

Topic 3: Know User Experience

Background: Wendel Chapter 2-3

Workshop: Google Analytics for Beginners Unit 1 & 2 (Using Google Analytics)

- A Model of Behavior Change
- How to Learn about Your Customer from the Experiment
- Strategies for Making Behavior Change

Topic 4: User Experience Strategy

Background: Levy Chapter 1 and 2 and Wendel Chapter 3.

Workshop: Google Analytics for Beginner Units 3&4 (Using Google Analytics)

- The Four Principles of UX Strategy
- A SEO Introduction
- The Importance of Landing Page in Digital Business

Topic 5: Formulate A/B Test

Background: Levy Chapter 3 and King Chapter 4

Workshop: Imai Chapter 7.1 Estimation (Using Python)

- Types of User Experience Metrics
- Building Value Hypothesis/Proposition to Identify the User Experience Issues
- Target Sampling and Random Sampling

Topic 6: Executing A/B Test

Background: King Chapter 5

Workshop: Danish Harron: "Python Machine Learning Case Studies" Chapter 5. 2017

- Design to Learn
- Actionable Learning in Experiments
- Statistical Issues to be Considered

TAKE HOME TEST – HACKATHON

Topic 7: Getting the Impact from the A/B Test

Background: King Chapter 6 and Wendel Chapter 4-5

Workshop: Learn Optimizely with Python

- Respect what the Right Data Says
- Discovering the Right Outcome, Right Action and Right Actor
- Case Study: Netflix

Topic 8: Creating the Right Environment for Data-Aware Design

Background: King Chapter 7

Workshop: Learn Google Optimize

- Assembling the Team and Getting Buy In
- Principles to build a UX Digital Services
- Avoiding the Pitfalls of Experiment

Topic 9: Bandit Problem and Greedy Algorithm

Background: White Chapter 2 and 3

Workshop: Jupyter Notebook Bandit program

Topic 10: Bandit Softmax Algorithm and UCB Bounded Algorithm

Background: White Chapter 4 and 5

Workshop: Jupyter Notebook Bandit program

Topic 11: Bandit Applications

Background: White Chapter 6

Workshop: Jupyter Notebook Bandit program

Topic 12: Development in UX Research

Microsoft direction https://medium.com/microsoft-design/the-future-of-ux-research-14fe63743c1d

Google UX Research https://userresearch.google.com/

VR and AR Impact on Customer Experience
https://business.cornell.edu/hub/2018/01/11/virtual-reality-consumer-experience/

Workshop: Experiment on Augmented Reality Application

COURSE LEARNING OUTCOMES (CLOs)

CLO1. Able to apply concepts of A/B Test data analytics to evaluate business strategies, service designs and product designs
CLO2. Able to use some market tools identify trends, misconception and bias in different digital sectors
CLO3. Able to know important experiment principles in enhancing user experience
CLO4. Able to program and design algorithms to tackle the user experience problems faced by business in product/service designs

COURSE TEACHING AND LEARNING ACTIVITIES

Course Teaching and Learning Activities	**Expected contact hours**	**Study Load (% of study)**
T&L1. Lectures	26 hours	20%
T&L2. Classes or Workshop	13 hours	35%
T&L3. Exercises	13 hours (Outside class)	15%
T&L4. Revision for Exam	13 hours (Outside class)	30%

PROCESS FOR EVALUATION

Assessment Methods	**Weight**	**Aligned Course Learning Outcomes**
A1. Class Participation/Discussion	10%	1, 3
A2. Workshop Assignments	40%	1, 2, 4
A3. Take Home Test	20%	1, 2, 3
A3. Final Exam	30%	1, 2, 3
Total	100%	

STANDARDS OF ASSESSMENT
Overall grades are given using the following criteria approximately:

Grade	Performance
A-, A, A+	> 85
B-, B, B+	75-85
C-, C, C+	60-74
D, D+	50-59
F	< 50

6th January 2020