Course Form for PKU Summer School International 2018

Course Title	**Computation, Economics and Data Science**
	计算、经济与数据科学
Teacher	CAI Yang
First day of classes	July 2, 2018
Last day of classes	July 27, 2018
Course Credit	2 credits

Course Description

Objective：

The course will present topics at the intersection of Algorithms, Game Theory, Economics, and Learning. We will mainly focus on the following three topics: (i) Fundamentals of Game Theory and their connection to duality theory and online learning; (ii) The basics and foundations of auctions and mechanism design, and also how to design good auctions and mechanisms using data through the lens of provably-approximately-correct (PAC) learning; and (iii) The basics of density estimation and its applications in Econometrics.

Topic (i) will cover the basics of strategic behavior, equilibria, duality theory, online learning, and the price of anarchy. Topic (ii) will present the basics of mechanism design, revenue optimization, and PAC learning, and apply these tools to study the simplicity, learnability, and approximation tradeoffs in mechanism design. Topic (iii) will present the basics of Econometrics and Statistics, with applications to inference in games and auctions. Most examples of this course will be based on applications in online advertising and online market design.

Pre-requisites /Target audience

Proceeding of the Course

Assignments (essay or other forms)

Evaluation Details
Text Books and Reading Materials
Academic Integrity (If necessary)

CLASS SCHEDULE
(Subject to adjustment)

Session 1：*Title*	Date:

【**Description of the Session**】(purpose, requirements, class and presentations scheduling, etc.)

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 2：*Title*	Date:

【**Description of the Session**】(purpose, requirements, class and presentations scheduling, etc.)

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 3：*Title*	Date:

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)**

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 4：*Title*	Date:

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)**

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 5：*Title*	Date:

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)**

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 6：*Title*	Date:

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)**

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 7：*Title*	Date:

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)**

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 8：*Title*	Date:

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)**

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 9：*Title*	Date:

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)**

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】

Session 10：*Title*	Date:

【**Description of the Session**】**(purpose, requirements, class and presentations scheduling, etc.)**

【**Questions**】

【**Readings, Websites or Video Clips**】

【**Assignments for this session (if any)**】