Syllabus

(Spring 2019)

1. Course Title	Advanced Statistics for Management (고급경영통계)
2. Course Number	MSB500/ (ITM511 co-listed)
3. Professor	박명철(Myeong-Cheol Park) (Ph 6313)
4. *Lec:Exp:Cre	3 : 0 : 3
5. Lecture Times and Places	W(수) 16:00-18:45 동문창업관 101
6. Others	E-Mail: imcpark@kaist.ac.kr Office: 동문창업관(N22) Rm 503

* Lec : Lecture(강의시수), Exp : Experiment(실험시수) Cre : Credit(학점)

TA 1: ???

7.1. Course Description

This course discusses the probability and statistical analysis to analyze real data for ***graduate management student***. This course may assume that students have a basic knowledge in the undergraduate probability course. The course starts with discussing theoretical concepts of statistics, and developing various methods for analyzing statistical relationships.

The first part of semester focuses on the "*Probability and Statistical Theory*" and the second part on the "*Statistical Analysis Techniques*". Techniques studied in the course are useful for a variety of business applications in accounting, finance, marketing, production and others areas. The course emphasizes formulating models and using them for decision-making prediction. Topics include probability distribution, sampling distribution, estimation, hypothesis testing, regression analysis, analysis of variance, and some nonparametric methods. And, some more analysis methodologies such as factor analysis, cluster analysis would be discussed, if time permits. The course involves hands-on work with SPSS or other packages. For all the issues, both theoretical and practical aspects through case studies will be emphasized.

7.2. Course Objectives

Students will

- have fundamental quantitative analytical skills.
- be able to efficiently deliver their research ideas, analytical results, and academic contribution
- be able to analyze the new research ideas using qualitative or quantitative analytical skills.

7.3. Expected Course Outcomes

After completing this course, students are expected to understand the theoretical aspects of Statistics, make practical use of modern data analysis, and appreciate the need for, and limitations of, real world data.

- Completely understand probability theory and statistical analysis and utilize techniques in business cases.
- Develops further a well-integrated statement of the complex business cases by applying quantitative analytical skills.
- Methodologies are trendy and creatively utilized in business model.
- Shows complete understanding of statistical issues and overcome the statistical error.
- Shows strong understanding application of quantitative analysis tools, concepts, and techniques in various way.
- Enable to digest quantitative explanation clearly by using tools.
- Utilize analytical tools to real data in various way.
- Very strong connection between analysis and conclusions; there are no inconsistencies.
- The flow of analysis and final conclusions are reliable and convincing.
- Shows complete understanding of quantitative or qualitative analysis tools and knowledge to empirically estimate and interpret outcomes from econometric techniques.
- Identify business problems and develop proper hypotheses and utilize analysis tools.
- Integrates new ideas and analytical methods from other sources not directly presented in the problem with creative analytical methods.

8. Textbook and References

Required Textbook:

Mathematical Statistics with Applications, Wackery/Mendenhall/Scheaffer, Thomson

Learning, Inc.. 7th Edition. (2008)

Recommended Reading Materials

1. **For PhD students**: Read some advanced textbooks focused on theory and application models including mathematical statistics and/or linear and multivariate analysis.

2. **For Master students**: Read some other statistics books for business and economics students, focused on the application and case examples. Some example books are as follows, but not limited to:

[Eg.1.Anderson/Sweeney/Williams, "Statistics for Business and Economics", Thomson south-western.]

[Eg2. Newbold/Carlson/Thorne, "Statistics for Business and Economics", Prentice Hall]

3**. Computer Packages**: SPSS or SAS or Minitab or R …… (Whatever available)

9. Evaluation

Classification	Midterm Exam	Final Exam	Quiz/ Home Work	Term Paper	Attendance / Participation	Total
Percentage	**35%**	35%	**20%**	**0%**	10%	100%

10. Some Tips to Get a Good Grade

[English is an official language in this class. Thus, every student should use English in all questions and discussions in the class.]

In principle, we will cover most chapters in the textbook. Typically, it requires two semesters to cover all of them in detail, but we should study them a single semester based on BTM course design. Thus, we will skip some parts of the textbook. Students should read relevant materials before class time. Otherwise, students may have difficulties to finish this course successfully.

1) **Check the class web site** for the class materials in advance.

2) **Be ready to discuss topics in class**: I will expect that you have read the relevant material form the textbook prior to coming to class. Search for relevant references, papers and cases by yourself. All class attendance and active participation are required, and they will be evaluated.

3) **Homework should be submitted on due-date**, and pop-quiz could be done without pre-notice. Do not copy other's homework. If it is found, both parties will get F grades for whatever reasons.

4) *Please ask me some help, if you need, before you are left behind hopelessly*.

[Typically, the material seems straightforward in class. When you sit down to do the problems by yourself, however, you find that you are confused. This is normal. The way to overcome your confusion is to read and re-read the appropriate sections of your notes and of the textbook while working on the problems. Reading the material without doing the example problems by yourself often will not further your understanding.]

11. Academic Honor Code of BTM (School of Business and Technology Management)

Academic integrity and honesty are critical values of KAIST community. It is essential to the academic integrity of this community that students do their own work and properly acknowledge the ideas, sources, and assistance upon which that work is based. As a member of KAIST BTM community, all students including those who take BTM courses are expected to adhere to the principles of truth, integrity, and respect. Failure to comply with the Honor Code may result in disciplinary action including failure of the course.

Academic dishonesty includes but is not limited to the following:

- **Cheating**: Copying from another's examination paper, solutions, assignments, or allowing another to copy from one's own.
- **Plagiarism**: Using another person's original work without giving appropriate credit to or acknowledging the authors or sources
- **Self-plagiarism**: Submitting one piece of work in more than one course without the explicit permission of the instructors involved.

- **Misrepresentation of authorship**: Submitting work as one's own which has been prepared by or purchased from another.
- **Unpermitted collaboration or aid**: Giving or receiving unpermitted aid on exams or assignments.

Any member of the BTM community who believes that violation of academic dishonesty has occurred should bring the matter to the attention of the department chair. The department chair will assign members of Academic Review Committee (학사심의회) to conduct a thorough investigation and, if necessary, request a due process to university.

11. Weekly Schedule (tentative)

Week	Contents	Text
1	Basic Concept, Terminology	Chapter 1-3
2	Probability Distributions (Discrete)	Chapter 3
3	Probability Distributions (Continuous)	Chapter 4
4	Multivariate Probability Distributions	Chapter 5
5	Functions of Random Variables Sampling Distributions / Estimation	Chapter 6-7- 8
6	Estimation	Chapter 8-9
7	Estimation / Testing Hypothesis	Chapter 10
8	**Midterm**	
9	Testing Hypothesis	Chapter 10
10	Regression Analysis	Chapter 11
11	Regression Analysis	Chapter 11
12	Regression Analysis	Chapter 11
13	The Analysis of Variance	Chapter 13
14	The Analysis of Categorical Data	Chapter 14
15	Nonparametrics	Chapter 15
16	**Final Exam**	

% This schedule is subject to change without notice depending on the progress of the course and the enrolled students' background.