# 강 의 계 획 서(Syllabus)

## [1] 기본 정보(Basic Information)

■ 강의 정보(Course Information)

| 교과목명<br>(Course Title) | 다변량통계분석<br>(Multivariate Statistical Analysis) | 강의유형<br>(Course Type) | 이론 (Theory) |
|---|---|---|---|

## [2] 학습 목표/성과(Learning Objectives/Outcomes)

■ 과목 설명(Course Description)

This course introduces basic concepts, theory, and applications of multivariate statistical methods that include multivariate normal distributions, tests on normal mean vectors, multivariate regression, multivariate analysis of variance (MANOVA), linear discriminant analysis (LDA) and classification analysis, principal component analysis (PCA), factor analysis, and some graphical methods.

■ 학습 목표(Learning Objectives)

Students will learn (1) how to graphically and numerically summarize multivariate data, (2) multivariate distributions and classical multivariate techniques, (3) how to statistically analyze real data using statistical software R, and (4) how to interpret the results.

■ 학습 성과(Learning Outcomes)

By the end of this semester, students will be able to (1) understand fundamental theory and concepts of multivariate statistical methods, (2) visualize multivariate data using statistical software R, (3) appropriately analyze multivariate data, (4) statistically extract information from complex structured data

## [3] 강의 진행 정보(Course Methods)

■ 강의 진행 방식(Teaching and Learning Methods)

| 강의 진행 방식 | 추가 설명 |
|---|---|
| 비대면 온라인 강의 (Online Lecture) | 강의동영상과 강의자료 이클래스 업로드 (Lecture material ia uploaded in eClass) |
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■ 수업 자료(Textbooks, Reading, and other Materials)

| 수업 자료 | 제목 | 저자 | 출판일/게재일 | 출판사/학회지 |
|---|---|---|---|---|
| (Textbook) | Applied Multivariate Statistical Analysis | R. Johnson,<br>D. Wichern | 2014 | Pearson |

## [4] 수업 일정(Course Schedule)

| 차시 | 강사명 | 수업주제 및 내용 | 제출 과제 | 추가 설명 |
|---|---|---|---|---|
| 1 | Wonkuk Kim | Introduction and exploring multivariate data, Matrix algebra | | 다변량 자료 시각화와 기본행렬연산 |
| 2 | Wonkuk Kim | More matrix algebra, spectral decomposition, inequalities | | 행렬, 스펙트럴분해, 부등식 |
| 3 | Wonkuk Kim | Multivariate normal distribution | | 다변량정규분포 |
| 4 | Wonkuk Kim | Sampling distributions and assessment of multivariate normality assumption | | 샘플링분포와 다변량정규분포가정 |
| 5 | Wonkuk Kim | One-sample multivariate hypothesis tests | | 일표본 다변량 가설검정 |
| 6 | Wonkuk Kim | Two-sample multivariate hypothesis tests | | 이표본 다변량 가설검정 |
| 7 | Wonkuk Kim | MANOVA | | 다변량분산분석 |
| 8 | Wonkuk Kim | Discriminant analysis and classification analysis | | 판별분석 및 분류분석 |
| 9 | Wonkuk Kim | Principal component analysis | | 주성분분석 |
| 10 | Wonkuk Kim | Factor analysis | | 요인분석 |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |

## [5] 수강생 학습 안내 사항

This course requires theoretical background of Calculus, linear algebra, mathematical statistics I and II, and regression analysis.