# 60080079 Introduction to Statistical Methods
# Semester 2, 2023-2024

## I. Teaching Objectives and Requirements

The goal of this course is to help students in acquiring fundamental statistical literacy. In addition to being able to perform basic statistical analyses on their own, students who finish this course are expected to be able to read and understand journal publications or research reports that use these methods. This course also aims to provide students with the necessary foundation for taking more advanced statistical methods courses.

## II. Key Points and Main Areas of Difficulty of the Course

This course introduces the most commonly used statistical methods in educational and social science research. Topics covered in this course include descriptive statistics, graphical representations, correlation, regression, basic probability, sampling distributions, confidence intervals, one- and two-sample t-tests, chi-square test, and one-way analysis of variance. This course also introduces how to use SPSS for the basic data analysis. No prior knowledge of statistics is required, but essentials of arithmetic and basic algebra will be used throughout this course.

## III. Lab or Practical Work Required to Support the Course

This course introduces how to use SPSS for the basic data analysis and encourage students to learn and use SPSS to perform data analysis.
Please download and install SPSS on your PC.

## IV. Textbooks and References

Moore, D. S., McCabe, G. P., & Craig, B. (2017). *Introduction to the practice of statistics*. (9th ed). New York: W. H. Freeman.

## V. Grading System and Evaluation Methods

Homework assignment 50% + mid-term exam 15% + final exam 15% + report writing 10% + attendance 10% = 100%

Students will have to complete homework assignments for the materials covered in the 12 classes. An assignment will be given after each class, and will be due the class after, except for the last homework assignment, which will be due the week after. The homework assignments will consist of problems pertaining to computation, computer implementation, and interpretation of results. No late homework assignment will be accepted. Each homework assignment will be worth

5%. The lowest of the homework assignment scores will be dropped.

There will be mid-term and final exams, which will be open-book exams, in the classes of Weeks 6 and 12, covering materials from previous meetings. Quizzes cannot be made up. Each quiz will be worth 15%.

Students will solve statistical problems based on a specific data set or dataset chosen by themselves and write a report (about 1000 words) after all 12 meetings, which will be due two weeks after the last meeting and worth 10%.

Attendance will be worth 10%.

How to hand in your homework assignments and reports: submit to my postgraduate student. You can find her in the WeChat group.

Extra points: if you want to get extra points, you could work with your classmates (no more than 4 people in a group) and teach one of the classes (a whole class, including lecture and SPSS handout). The students in the group will get extra 8~10 points. Please contact me at least a week before the class.

## VI. Detailed Points of Teaching Contents

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| Week 1 | Looking at Data – Distributions<br>• Course Overview<br>• Lecture<br>• Introduction to SPSS |
| Week 2 | Looking at Data – Relationships<br>• Lecture<br>• SPSS lab experiment |
| Week 3 | Producing Data<br>• Lecture<br>• SPSS lab experiment |
| Week 4 | Probability<br>• Lecture<br>• SPSS lab experiment |
| Week 5 | Sampling Distributions<br>• Lecture<br>• SPSS lab experiment |
| Week 6 | Inference<br>• A mid-term class exam (30 min)<br>• Lecture<br>• SPSS lab experiment |
| Week 7 | Inference for Means<br>• Lecture<br>• SPSS lab experiment |
| Week 8 | Inference for Proportions and Two-Way Tables<br>• Lecture<br>• SPSS lab experiment |
| Week 9 | Inference for Simple Regression<br>• Lecture<br>• SPSS lab experiment |
| Week 10 | Inference for Multiple Regression |

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| | • Lecture<br>• SPSS lab experiment |
| Week 11 | One-Way Analysis of Variance<br>• Lecture<br>• SPSS lab experiment |
| Week 12 | Two-Way Analysis of Variance (Cont.)<br>• A final class exam (30 min)<br>• SPSS lab experiment<br>• Conclusion |