



**FACULTY OF HEALTH SCIENCES AND SPORTS**  
**BACHELOR OF SCIENCE IN SPEECH-LANGUAGE THERAPY**  
**LEARNING MODULE OUTLINE**

|                       |                              |               |  |
|-----------------------|------------------------------|---------------|--|
| Academic Year         | 2024 / 2025                  | Semester      | 1  |
| Module Code           | STST2101                     |               |  |
| Learning Module       | Statistics                   |               |  |
| Pre-requisite(s)      | Nil                          |               |  |
| Medium of Instruction | Chinese / English            |               |  |
| Credits               | 2                            | Contact Hours | 30 hrs   |
| Instructor            | Dr Xin Wang, Amy             | Email         | <a href="mailto:amywang@mpu.edu.mo">amywang@mpu.edu.mo</a> |
| Office                | MingTek Building, Room M713A | Office Phone  | 8599 3478  |

**MODULE DESCRIPTION**

This is a necessary course for year two speech-language therapy students. There are total 30 hours in 15 lectures for this course. The course will focus on the data collection, management and analysis and other statistic application. The students will get more understanding theoretically and practically in the statistics which include statistical tables, index, probability concepts and distributions, statistical hypothesis, correlation, regression, chi-square, t-test, ANOVA, multiple regression and non-parametric analysis etc.

**MODULE INTENDED LEARNING OUTCOMES (ILOS)**

On completion of this learning module, students will be able to:

|     |  |
|-----|--|
| M1. | Understand and apply statistical methods for the design of biomedical research and analysis of biomedical research data                                    |
| M2. | Understand and use mathematical and statistical theory underlying the application of biostatistical methods  |
| M3. | Use and interpret results from specialized computer software for the management and statistical analysis of research data                                  |
| M4. | Learn to participate in a research team setting in study design, data coordination and management, and statistical analysis and reporting of study results |
| M5. | Participate in a research team in the development and evaluation of new and existing statistical methodology   |



These ILOs aims to enable students to attain the following Programme Intended Learning Outcomes (PILOs):

| PILOs  | M1 | M2 | M3 | M4 | M5 |
|--|----|----|----|----|----|
| P1. To demonstrate understanding of knowledge in behavioural sciences, speech and hearing sciences, as well as speech and hearing disorders                                | ✓  | ✓  | ✓  | ✓  | ✓  |
| P2. To demonstrate understanding of knowledge in assessment, treatment, counselling and other professional knowledge related to speech, language and swallowing impairment | ✓  | ✓  | ✓  | ✓  | ✓  |
| P3. To employ professional techniques in assessment and intervention in language, speech and swallowing disorders  | ✓  | ✓  |    | ✓  | ✓  |
| P4. To demonstrate effective communication and teamwork skills   |    |    |    | ✓  | ✓  |
| P5. To demonstrate a high standard of professional ethics and attitudes of holistic care, respect and compassion   | ✓  | ✓  | ✓  | ✓  | ✓  |
| P6. To recognise the international trend of speech and hearing disorders and develop the spirits of social involvement and lifelong learning                               | ✓  | ✓  | ✓  | ✓  | ✓  |

#### MODULE SCHEDULE, COVERAGE AND STUDY LOAD

| Week | Content Coverage   | Contact Hours |
|------|--|---------------|
| 1    | Introduction to Medical Statistics; Concepts of biostatistics (population, sample, variables, types of data)   | 2             |
| 2    | Descriptive statistic (Frequency distribution, graphics, percentile, central tendency and dispersion)  | 2             |
| 3    | Normal distribution; Probability; Definition of statistical hypothesis, its classification and testing; Errors (Type I errors, Type II errors); Powers | 2             |
| 4    | Confidence interval; Sample size calculation   | 2             |
| 5-6  | SPSS basic and data management (1-2)   | 4             |
| 7    | t test   | 2             |
| 8    | Chi-square test  | 2             |
| 9    | Analysis of Variance   | 2             |
| 10   | Linear regression and correlation coefficient  | 2             |
| 11   | SPSS practice (1)  | 2             |
| 12   | Multiple regression and Logistic regression  | 2             |
| 13   | Non-parametric test  | 2             |
| 14   | SPSS practice (2)  | 2             |
| 15   | Group Project presentation   | 2             |



## TEACHING AND LEARNING ACTIVITIES

In this learning module, students will work towards attaining the ILOs through the following teaching and learning activities:

| Teaching and Learning Activities | M1 | M2 | M3 | M4 | M5 |
|----------------------------------|----|----|----|----|----|
| T1. Lecture                      | ✓  | ✓  | ✓  | ✓  | ✓  |
| T2. Computer applications        | ✓  | ✓  | ✓  | ✓  | ✓  |
| T3. Group oral presentation      | ✓  | ✓  | ✓  | ✓  | ✓  |

## ATTENDANCE

Attendance requirements are governed by the Academic Regulations Governing Bachelor's Degree Programmes of the Macao Polytechnic University. Students who do not meet the attendance requirements for the learning module shall be awarded an 'F' grade.

## ASSESSMENT

In this learning module, students are required to complete the following assessment activities:

| Assessment Activities | Weighting (%) | ILOs to be Assessed |
|-----------------------|---------------|---------------------|
| A1. Group Project     | 100%          | M1,M2,M3,M4,M5      |

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 being the passing score.

Any students scoring less than 35% of the total mark in the final examination will be given an "F" grade for the module even if the overall grade is 50% or higher.

The assessment will be conducted following the University's Assessment Strategy (see [www.mpu.edu.mo/teaching\\_learning/en/assessment\\_strategy.php](http://www.mpu.edu.mo/teaching_learning/en/assessment_strategy.php)). Passing this learning module indicates that students will have attained the ILOs of this learning module and thus acquired its credits.

## MARKING SCHEME

### The requirement of the mid-term, final and skill exam

Both the mid-term and final exam are close-book exams which composed of multiple-choice questions, calculations and case studies.

|   | Task          | Criteira  | Excellent<br>(A, A-) | Very good,<br>Good<br>(B+, B, B-) | Satisfactory<br>(C+, C, C-) | Pass<br>(D+, D) | Fall                         |
|---|---------------|---|----------------------|-----------------------------------|-----------------------------|-----------------|------------------------------|
| 1 | Mid-term exam | Demonstrate the ability to identify and apply appropriate concepts, methods, and analysis | High                 | Significant                       | Moderate                    | Basic           | Not reaching marginal levels |



|   |            |   |      |             |          |       |                              |
|---|------------|---|------|-------------|----------|-------|------------------------------|
| 2 | Final exam | Demonstrate the ability to identify and apply appropriate concepts, methods, and analysis | High | Significant | Moderate | Basic | Not reaching marginal levels |
|---|------------|---|------|-------------|----------|-------|------------------------------|

The requirement of the group oral presentation

| Areas of Assessment        | Marking criteria  | Weight | Score |
|----------------------------|---|--------|-------|
| 1. Presentation contents   | <p>Based on height and weight, create a new variable: BMI (5%)</p> <p>Based on the systolic and diastolic blood pressure, create a new categorical variable: Hypertension (1=yes, 2=no) (10%)</p> <p>Do univariate analysis of all the data that can be done (Including maximum, minimum, mean, standard deviation, 95% confidence interval, percentage, frequency, etc). (20%)</p> <p>Do bi-variate of all the data that can be done (t test, chi-square test, analysis of variance, correlation analysis, etc. and explain the results. (25%)</p> <p>Do multivariate analysis, and explain the results. (20%)</p> | 80%    |       |
| 2. Format requirements     | <p>The report must be submitted in the form of a word file. (2%)</p> <p>The report should have a reasonable layout and be easy to read. (8%)</p> <p>A table of key results must be attached to each data analysis. (5%)</p>   | 15%    |       |
| 3. Additional requirements | <p>The report submission date is the day before the official report. (5%)</p> <p>Students will have 50% of their marks deducted in the following cases: Those who did not attend the presentation; those who were complained by group members that they did not actively complete their homework.</p>   | 5%     |       |
| Total                      |   | 100%   |       |



## REQUIRED READINGS

李康, 賀佳. (2018). *醫學統計學 (第七版)*. 北京: 人民衛生出版社 ISBN: 9787117266765

Tokunaga, H. T (2018). *Fundamental statistics for the social and behavioral sciences (Second Edition)*. SAGE Publications. ISBN-13: 9781506377483.

## REFERENCES

- Agresti, A. 1996. *An Introduction to Categorical Data Analysis*. John Wiley; Sons, New York.
- Andersen, Per K., Ornulf Borgan, Richard D. Gill, and Niels Keiding. 1996. *Statistical Models Based on Counting Processes*. Springer Series in Statistics.
- Andrews, D. F., and A. M. Herzberg. 1985. *Data*. Springer-Verlag.
- Chance, Beth, and Allan Rossman. 2018. *Investigating Statistics, Concepts, Applications, and Methods*. 3rd ed. <http://www.rossmanchance.com/iscam3/>.
- Hastie, T., R. Tibshirani, and J. Friedman. 2001. *The Elements of Statistical Learning*. Springer.
- Kuiper, Shonda, and Jeff Sklar. 2013. *Practicing Statistics*. Pearson. <http://web.grinnell.edu/individuals/kuipers/stat2labs/>.
- Kutner, Nachtsheim, Neter, and Li. 2004. *Applied Linear Statistical Models*. 5th ed. McGraw-Hill.
- Legler, Julie, and Paul Roback. 2019. *Broadening Your Statistical Horizons: Generalized Linear Models and Multilevel Models*.
- Schulz, K, and D Grimes. 2005. "Multiplicity in Randomized Trials II: Subgroup and Interim Analyses." *Lancet* 365: 1657–61.

## STUDENT FEEDBACK

At the end of every semester, students are invited to provide feedback on the learning module and the teaching arrangement through questionnaires. Your feedback is valuable for instructors to enhance the module and its delivery for future students. The instructor and programme coordinators will consider all feedback and respond with actions formally in the annual programme review.

## ACADEMIC INTEGRITY

The Macao Polytechnic University requires students to have full commitment to academic integrity when engaging in research and academic activities. Violations of academic integrity, which include but are not limited to plagiarism, collusion, fabrication or falsification, repeated use of assignments and cheating in examinations, are considered as serious academic offenses and may lead to disciplinary actions. Students should read the relevant regulations and guidelines in the Student Handbook which is distributed upon the admission into the University, a copy of which can also be found at [www.mpu.edu.mo/student\\_handbook/](http://www.mpu.edu.mo/student_handbook/).



**Appendix 1** Timetable of Biostatistics Class **SPEECH-LANGUAGE THERAPY**

| Session | Date             | Time        | Teacher | Topic  |
|---------|------------------|-------------|---------|--|
| 1       | 22/8/2024 (Thu)  | 11:00-13:00 | Wang    | Introduction to Medical Statistics; Concepts of biostatistics (population, sample, variables, types of data)   |
| 2       | 05/9/2024 (Thu)  | 11:00-13:00 | Wang    | Descriptive statistic (Frequency distribution, graphics, percentile; central tendency and dispersion)  |
| 3       | 11/9/2024 (Wed)  | 11:00-13:00 | Wang    | Normal distribution; Probability; Definition of statistical hypothesis, its classification and testing; Errors (Type I errors, Type II errors); Powers |
| 4       | 12/9/2024 (Thu)  | 11:00-13:00 | Wang    | Confidence interval; Sample size calculation   |
| 5       | 12/9/2024 (Thu)  | 14:30-16:30 | Wang    | SPSS basic and data management (1)   |
| 6       | 16/9/2024 (Mon)  | 11:00-13:00 | Wang    | SPSS basic and data management (2)   |
| 7       | 16/9/2024 (Mon)  | 14:30-16:30 | Wang    | T test   |
| 8       | 19/9/2024 (Thu)  | 11:00-13:00 | Wang    | Chi-square test (1)  |
| 9       | 24/9/2024 (Tue)  | 11:00-13:00 | Wang    | Chi-square test (2) & Analysis of Variance   |
| 10      | 24/9/2024 (Tue)  | 14:30-16:30 | Wang    | Linear regression and correlation coefficient  |
| 11      | 25/9/2024 (Wed)  | 11:00-13:00 | Wang    | SPSS practice (1)  |
| 12      | 26/9/2024 (Thu)  | 14:30-16:30 | Wang    | Multiple regression and Logistic regression  |
| 13      | 27/9/2024 (Fri)  | 11:00-13:00 | Wang    | Non-parametric Test  |
| 14      | 27/9/2024 (Fri)  | 14:30-16:30 | Wang    | SPSS practice (2)  |
| 15      | 22/10/2024 (Tue) | 14:30-16:30 | Wang    | Group Project presentation   |