Physical Education and Sports Science
Email: ssm@nie.edu.sg

SPORT SCIENCE & MANAGEMENT
SS3021 APPLIED STATISTICS

Academic Year	2026-27	Semester	2
Course Coordinator			
Course Code	SS3021		
Course Title	Applied Statistics		
Pre-requisites	-		
No of AUs	3		
Contact Hours	39		

Course Aims

The objectives of this course are to 1) provide you with a well-rounded and solid foundation in statistics for sport and exercise science and 2) prepare you for more advanced or graduate statistical courses.

Intended Learning Outcomes (ILO)

By the end of this course, you should be able to:

1. explain basic statistical concepts.
2. compute exploratory data analyses, including descriptive statistics assumptions, to determine the appropriate statistical methods for fundamental or common study designs in quantitative research.
3. professionally report descriptive statistics.
4. compute the appropriate confirmatory data analyses for inferential statistics.
5. professionally report inferential statistics.

Course Content

The following topics will be covered:

1. Introduction, fundamental terminology and basic concepts
2. Descriptive statistics and exploratory data analysis
3. Inferential statistics and confirmatory data analysis
4. Application and interpretation of descriptive and inferential statistics for quantitative research, including considerations for test selection, exploratory data analysis and assessment of inferential test assumptions.

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Concepts will be taught without being heavy on mathematical equations and modelling as conventionally required of students majoring in statistics or mathematics. Instead, the emphasis will be on using examples and datasets relevant to sport and exercise science. You will utilise computer-based statistical programme(s) for data analyses.

NTU Competencies & Graduate Attributes

NTU Competencies	
Character	
Competence	√
Cognitive agility	√

NTU Graduate Attributes	
Graduate Attributes	Level (i.e., basic, intermediate, advanced)
1. Communication	intermediate
2. Decision Making	advanced
3. Digital Fluency	advanced

Assessment (includes both continuous and summative assessment)

Component	ILO Tested	Weighting	Team/ Individual	Assessment Rubrics
1. Group Assignment	2, 3, 4	40%	Team	Appendix 1
2. Final Examination	1, 2, 3, 4, 5	60%	Individual	NA
Total		100%		

Formative Feedback

Feedback for learning will be verbally provided during each laboratory class session, where you have the opportunity to learn statistical techniques and implement them using generic statistical software.

During the completion of the Group Assignment, you will be provided with verbal feedback as a group pertaining to your assessed performance. Generic verbal and written feedback will be provided to the class for the test.

Throughout the course, you will be able to use existing data sets to analyse them using diverse statistical software. During the learning process, you will receive verbal feedback on the techniques and mistakes to be used to perform statistical analysis on sports data. Suggestions for improvement will be provided.

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?

Lectures	Lectures will provide information for key learning concepts and theories and support understanding of key concepts. Real examples will be presented to highlight how data were analysed and why.
Online learning	Time will be given for learning from online materials as a part of the flip teaching approach. These materials will support key concepts covered in lectures and laboratories and their applications using the dedicated software.
Laboratories	Laboratories will: - Give hands-on experiential learning to support key theories and information provided in class. - Provide data for you to apply what you covered in class and to perform statistical tests. - Give space and time for small group activities and discussions to allow you to assimilate the content and for sharing learning. - Allow opportunity for verbal feedback from the instructor to you on techniques and material.

Reading and References

NIE Research and Publications

Nil

Other Readings and References

Recommended Required Course Texts:
1. Goss-Sampson, M., A. (2018). Statistical Analysis in JASP: A guide for students. https://static.jasp-stats.org/Statistical%20Analysis%20in%20JASP%20-%20A%20Students%20Guide%20v1.0.pdf

Supplementary Texts:
2. Field, A. (2016). *An Adventure in Statistics*. SAGE Publications *(ebook or hard copy available from agent*)*

3. Vincent, W.J., & Weir, J.P. (2012). *Statistics in kinesiology (4th ed.).* Human Kinetics *(contact agent for ebook or hard copy or purchase ebook from Human Kinetics or Amazon*)*

4. Howell, D. C. (2013). *Fundamental statistics for the behavioral sciences* (8th ed.). Wadsworth Cengage Learning *(eBook available from agent*)*

Course Policies and Student Responsibilities

(1) General

You are expected to complete all assigned pre-class readings and activities, attend all classes – lecture and laboratory – punctually, submit all scheduled assignments and take tests by due dates. You are not allowed to swap laboratory groups without express

permission from the course coordinator. You are expected to take responsibility to follow up with course notes, assignments and course-related announcements for sessions they have missed. You are expected to participate in all discussions and class activities unless there is a valid medical reason not to do so.

(2) Absenteeism

Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling sick, supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies.

If you miss a lecture, you must inform the course instructor via email prior to the start of the class.

(3) Absence Due to Medical or Other Reasons

If you are sick and not able to complete a test or submit an assignment, you have to submit the original Medical Certificate (or another relevant document) to the Sport Science & Management (or Home School) administration to obtain official leave. Without this, the missed assessment component will not be counted towards the final grade. There are no make-ups allowed.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognise your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion, and cheating. If you are uncertain of the definitions of any of these terms, you should go to the NTU Student Academic Integrity Policy and Procedures link in the Student Portal for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Special note: Generative AI tools will be allowed to the extent stipulated for each assignment in the assignment instructions, and any such use must be duly referenced or disclosed.

Course Instructors

Instructor	Office Location	Phone	Email
TBA			

Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	Introduction, fundamental terminology and basic concepts	1	Vincent, W.J., & Weir, J.P. (2012) – chapter 1
2	Descriptive statistics and exploratory data analysis I	2 & 3	Goss-Sampson, M., A. (2018) – chapter 3
3	Descriptive statistics and exploratory data analysis II	2 & 3	Goss-Sampson, M., A. (2018) – chapter 3
4	Inferential statistics and confirmatory data analysis I	3 & 4	Goss-Sampson, M., A. (2018) – chapter 7
5	Inferential statistics and confirmatory data analysis II	3 & 4	Goss-Sampson, M., A. (2018) – chapter 7
6	Correlation	4 & 5	Goss-Sampson, M., A. (2018) – chapter 10
7	Bivariate linear regression	4 & 5	Goss-Sampson, M., A. (2018) – chapter 11
Recess Week			
8	t Tests, Mann-Whitney U Test and Wilcoxon Signed-Rank Test I	4	Goss-Sampson, M., A. (2018) – chapter 8
9	t Tests, Mann-Whitney U Test and Wilcoxon Signed-Rank Test II	5	Goss-Sampson, M., A. (2018) – chapter 9
10	Simple ANOVA and Kruskal-Wallis Test I	4	Goss-Sampson, M., A. (2018) – chapter 12
11	Simple ANOVA and Kruskal-Wallis Test II	5	Goss-Sampson, M., A. (2018) – chapter 12
12	ANOVA with repeated measures and Friedman Test I	4	Goss-Sampson, M., A. (2018) – chapter 13
13	ANOVA with repeated measures and Friedman Test II	5	Goss-Sampson, M., A. (2018) – chapter 14 & 15

Appendix 1: Assessment Criteria for Group Assignment (40% Final Grade – marked out of 100, including the peer evaluation)

Grade	A+, A, A-	B+, B	B-, C+, C	D+, D	F
Data analyses (max 60)	Appropriate data analysis applied and interpretation of results	Good data analysis and interpretation of results with few errors.	Incorrect data analysis in parts and interpretation of results incorrect or inappropriate in parts.	Poor data analysis and interpretation of results.	Inappropriate or very poor data analysis and interpretation of results.
Quality of writing and presentation (max 30)	Answers were very well structured and presented. Use the appropriate output from computer software to support the answers.	Some improvement in structure or use of output from the computer software to support the answers possible	Improvement in structure or use of output from the computer software to support the answers needed	Poor structure or use of output from the computer software to support the answers	Coherent structure absent or inappropriate use of output from the computer software to support the answers

For the peer evaluation component, group members within each group will be asked to rate each of their peers, and the score received for each group member will be the average of the scores from their peers round to the nearest integer (e.g., the student gets a score of 9, 8 and 8, respectively from the 3 other group members and will receive a score of 8 (average of 8.3).

Marks (does not relate to grade bands)	10, 9	8, 7	6, 5	4, 3	2, 1
Peer Evaluation (10 max)	Excellent work; was a crucial component of the group's success	Very strong work; contributed significantly to the group	Sufficient effort; contributed adequately to the group	Insufficient effort; met minimal standards of the group	Little or weak effort; was detrimental to the group