

**SPORT SCIENCE & MANAGEMENT
SS3010 APPLIED STATISTICS**

Pre-requisites	Nil
No of AUs	3
Contact Hours	Total hours: 39 Lecture: 26 Laboratory: 13

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 the course, you should be able to:

1. Explain basic statistical concepts
2. Perform exploratory data analyses for descriptive statistics and to assess assumptions to determine the appropriate statistical methods for fundamental or common study designs in quantitative research
3. Report descriptive statistics in a professional manner
4. Perform the appropriate confirmatory data analyses for inferential statistics
5. Interpret and report the inferential statistics in a professional manner

Course Content

The course content will cover:

- Basic concepts in statistics
- 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

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

Contents

- Introduction, fundamental terminology and basic concepts
- Descriptive statistics and exploratory data analysis
- Inferential statistics and confirmatory data analysis
- Correlation
- Bivariate linear regression
- t Tests, Mann-Whitney U Test and Wilcoxon Signed-Rank Test

- Simple ANOVA and Kruskal-Wallis Test
- ANOVA with repeated measures and Friedman Test

Assessment (includes both continuous and summative assessment)

Component	Course ILO Tested	Related Programme LO or Graduate Attributes	Weighting	Team/ Individual	Assessment rubrics
1. Assignments	1-5	A1-3, B1-2, C1-2, D1-2, E1	40%	Team	Appendix 1
2. Examination	1-5	A1-3, B1-2, C1, E1	60%	Individual	
Total			100%		

Graduates of the SSM programme should show:

Competence	
A1: {Understanding}	process and interpret information, evidence and methodologies related to sport science or sport management
A2: {Self-discipline}	independently apply themselves to solve relevant problems
A3: {Modern Tool Usage}	use technology to communicate and provide feedback on sports activities, improve sports performance, monitor and increase physical activity, provide exercise prescription, solve problems for disadvantaged athletes/sportspeople, and commercialize and innovate sports products, events and services
Creativity	
B1: {Critical Thinking}	critically assess the applicability of sport science and sport management tools toward problems and in the workplace
B2: {Analytical Thinking}	critically analyse data from a multitude of sources
B3: {Interdisciplinary Thinking}	connect the subfields of sport science and sport management to tackle problems
B4: {Innovation}	be able to develop new applications or improve existing techniques

B5: {Entrepreneurship}	develop new ideas and plans for sport science, businesses and events
Communication	
C1: {Effective Communication}	present findings or ideas from sport science and sport management research logically and coherently at the appropriate level for the intended audience and in all forms of communication
C2: {Teamwork}	work in teams on projects that require sport science or sport management application, and communicate results via demonstration, verbally and in written form
Civic-Mindedness	
D1: {Professionalism}	act in a manner that respects the profession and meets the expectations of the sport science and sport management industry
D2: {Inclusiveness}	promote sport and physical activity in all individuals to bring people together and improve physical, social and psychological outcomes
Character	
E1: {Ethical behaviour}	act with integrity and in a socially responsible and ethical manner in line with societal and legal expectations in relation to collecting and analysing data of people and protecting personal data with appropriate computer security
E2: {Sportspersonship}	demonstrate appropriate safety, concern and good conduct in sport situations towards other individuals involved in the activity

Formative feedback

For lecture-based sessions, you will be asked key conceptual questions to help them understand the theoretical content. Verbal feedback for learning will be provided after each assignment

Learning and Teaching approach

Approach	How does this approach support students in achieving the learning outcomes?
Lectures	Lectures will provide information for key learning concepts and theories and support understanding of key concepts

Assignments	This approach supports you to research and learn independently. You will determine the appropriate exploratory and confirmatory data analyses to perform to answer the questions in the assignments. You will have the opportunity to use the computer software to perform the appropriate analyses and interpret and report the results. You will also learn to work in a team effectively. Requires understanding and application of the material taught in class.
Examination	Test the understanding and application of the various topics covered

Reading and References

Recommended Required Course Texts:

- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications

Supplementary Texts:

- Field, A. (2016). *An Adventure in Statistics*. SAGE Publications
- Vincent, W.J., & Weir, J.P. (2012). *Statistics in kinesiology* (4th ed.). Human Kinetics
- Howell, D. C. (2013). *Fundamental statistics for the behavioral sciences* (8th ed.). Wadsworth Cengage Learning

Course Policies and Student Responsibilities

General

You are expected to complete all assigned pre-class readings and activities, attend all laboratory classes punctually and take all scheduled assignments and 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 seminar sessions you have missed. You are expected to participate in all seminar discussions and activities.

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 lecturer via email prior to the start of the class.

Absence Due to Medical or Other Reasons

If you are sick and not able to attend a quiz or a midterm, you have to submit the original Medical Certificate (or relevant document) to the administration to obtain official leave. In this case, the missed assignment component will not be counted towards the final grade. There are no make-up quizzes or make-up midterm.

Attire and safety

You are expected to participate in practical laboratory activities. Some of these activities involve exercise. All of you are expected to wear appropriate attire for participation, obey laboratory safety rules, and take appropriate care of and return all equipment after use.

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 recognize 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 [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Collaboration is encouraged for your work in the class and laboratories because peer-to-peer learning helps you understand the subject better and working in a team trains you to better communicate with others. Working together and exchanging ideas and experiences will help improve the quality of your assessed presentation. It is important to credit others for their contribution to your work which promotes ethical practices and academic integrity.

Course Instructors

Instructor	Office Location	Phone	Email

Planned Weekly Schedule

Week	Topic	Course LO	Readings/ Activities
1	Introduction, fundamental terminology and basic concepts	LO1-5	Chapter XX, Pages XX-XX
2	Descriptive statistics and exploratory data analysis	LO1-5	Chapter XX, Pages XX-XX
3	Descriptive statistics and exploratory data analysis	LO1-5	Chapter XX, Pages XX-XX
4	Inferential statistics and confirmatory data analysis	LO1-5	Chapter XX, Pages XX-XX
5	Inferential statistics and confirmatory data analysis	LO1-5	Chapter XX, Pages XX-XX
6	Correlation	LO1-5	Chapter XX, Pages XX-XX
7	Bivariate linear regression	LO1-5	Chapter XX, Pages XX-XX

8	RECESS WEEK	LO1-5	
9	t Tests, Mann-Whitney U Test and Wilcoxon Signed-Rank Test Assignment 1 due	LO1-5	Chapter XX, Pages XX-XX
10	t Tests, Mann-Whitney U Test and Wilcoxon Signed-Rank Test	LO1-5	Chapter XX, Pages XX-XX
11	Simple ANOVA and Kruskal-Wallis Test	LO1-5	Chapter XX, Pages XX-XX
12	Simple ANOVA and Kruskal-Wallis Test	LO1-5	Chapter XX, Pages XX-XX
13	ANOVA with repeated measures and Friedman Test Assignment 2 due	LO1-5	Chapter XX, Pages XX-XX
14	ANOVA with repeated measures and Friedman Test	LO1-5	Chapter XX, Pages XX-XX

Appendix 1: Assessment Rubric for Assignment (1 or 2 assignments using the same rubric)

	A+, A, A-	B+, B	B-, C+, C	D+, D	F
Data analyses (max 20)	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 10)	Answers were very well structured and presented. Use of 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. 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)).

Peer Evaluation (10 max)	10, 9 Excellent work; was crucial component to group's success	8, 7 Very strong work; contributed significantly to group	6, 5 Sufficient effort; contributed adequately to group	4, 3 Insufficient effort; met minimal standards of group	2, 1 Little or weak effort; was detrimental to group
---------------------------------	---	--	--	---	---