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Physical Education and Sports Science
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SPORT SCIENCE & MANAGEMENT
SS2327 PERFORMANCE ANALYTICS IN SPORT

Academic Year	2025-26	**Semester**	2
Course Coordinator			
Course Code	SS2327		
Course Title	Performance Analytics in Sport		
Pre-requisites	-		
No of AUs	3		
Contact Hours	39		

Course Aims

This course aims to provide you with a sound understanding of performance analytics in sport and physical activity. The course will focus on applying the latest theoretical knowledge about performance analysis to meaningful and impactful reporting to athletes, teams, coaches or institutional entities that would benefit from an objective analysis of their performance. Particular attention will be placed on the use of modern technologies and advanced data processing. Topics related to individual sports, team sports, artificial intelligence, big data, visualisation and reporting will be covered and applied in real conditions across various sports.

Intended Learning Outcomes (ILO)

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

1. explain basic concepts and definitions in Performance Analysis.
2. collect and analyse relevant data to investigate concepts and ideas from diverse sports and physical activities with dedicated material.
3. develop relevant key performance indicators (KPI) to understand performance in a specific sport or physical activity.
4. combine the latest knowledge on the theory of performance analysis with applied knowledge on specific sport and physical activity.
5. summarise complex analysis/results into clear messages understandable by various stakeholders in the sports industry.

Course Content

The following topics will be covered:

1. Theoretical aspects of sport performance analysis
2. Methods and evaluation in sport performance analysis
3. Sport performance data analytics and information

4. Applied sport performance analysis for individual sports
5. Applied sport performance analysis for team sports

NTU Competencies & Graduate Attributes

NTU Competencies	
Character	
Competence	√
Cognitive agility	√

NTU Graduate Attributes	
Graduate Attributes	Level (i.e., basic, intermediate, advanced)
1. Communication	advanced
2. Creative thinking	intermediate
3. Digital Fluency	advanced
4. Critical thinking	intermediate

Assessment (includes both continuous and summative assessment)

Component	**ILO Tested**	**Weighting**	**Team/ Individual**	**Assessment Rubrics**
1. Group Presentation	2 & 3	20%	Team	Appendix 1
2. Individual Assignment	3, 4 & 5	40%	Individual	Appendix 2
3. Class test	1, 3, 4 & 5	40%	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 techniques and apply yourselves to problems related to analysing individual and team performance in sport.

During the completion of the Group Presentation, 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 have the opportunity to use existing data sets and create new ones to apply performance analytics in various sports. During the learning process, you will receive verbal feedback on the techniques and mistakes in performance analysis. 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. Existing materials (e.g., reports, data sets) from the industry will be presented regularly as applied examples.
Online Learning	Time will be given for learning from online materials as a part of flip teaching approach. These materials will support key concepts covered in lectures and laboratories (e.g., podcasts).
Laboratories	Laboratories will: - Give hands-on experiential learning to support key theories and information provided in class. - Provide data to apply what is covered in class and to analyse the performance of players/athletes. - Give space and time for small group activities and discussion to allow you to assimilate the content and share learning. - Allow opportunity for verbal feedback from the instructor to you on techniques and material.

Reading and References

NIE Research and Publications

1. He, Q., Komar, J., Kee, Y., H. (2023). Key considerations in the week-to-week forecasting of individual match actions in football. International Journal of Sports Science & Coaching, 17479541221147764.

2. Guignard, B., Karcher, C., Reche, X., Font, R., Komar, J. (2022). Contextualizing Physical Data in Professional Handball: Using Local Positioning Systems to Automatically Define Defensive Organizations. Sensors, 22(15), 5692.

3. Lefèvre T, Guignard B, Karcher C, Reche X, Font R, Komar J (2023) A deep dive into the use of local positioning system in professional handball: Automatic detection of players' orientation, position and game phases to analyse specific physical demands. PLoS ONE 18(8): e0289752. https://doi.org/10.1371/journal.pone.0289752

Other Readings and References

4. Passos, P., Araujo, D. and Vossolovitch, A. (2016). Performance Analysis in Team Sports. Routledge, London, pp252.

5. Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015). Routledge Handbook of Sports Performance Analysis. Routledge, London, pp512.

6. Araujo, D., Couceiro, M., Seifert, L., Sarmento, H. and Davids, K. (2022). Artificial Intelligence in Sport Performance Analysis. Routledge, London, pp220.

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.

(4) Attire and safety

You are expected to participate in practical laboratory activities. Some of these activities involve exercise. 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 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 to Performance Analysis in Sport	1	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 1
2	Field-based and lab-based performance analysis	2	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 2
3	Theoretical aspects in performance analysis I	4	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 1
4	Quantify Performance in individual sports II	3	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 3
5	Quantify Performance in individual sports II	3	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 3
6	Quantify Performance in team sports I	3	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 3
7	Quantify Performance in team sports II	3	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 3
Recess Week			
8	Theoretical aspects in performance analysis II	4	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 1
9	Group Presentation	2 & 3	
10	Data Analytics for performance analysis	2	Araujo, D., Couceiro, M., Seifert, L., Sarmento, H. and Davids, K. (2022)
11	Data Analytics for performance analysis	2	Araujo, D., Couceiro, M., Seifert, L.,

			Sarmento, H. and Davids, K. (2022)
12	Reporting of relevant KPIs to coaches and athletes I	5	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 5
13	Reporting of relevant KPIs to coaches and athletes II	5	Mc Garry, T., O`Donoghue, P. and Sampaio, J. (2015) – Section 5

Appendix 1: Assessment Criteria for Group Presentation (20% Final Grade – marked out of 100)

	A+, A, A-	B+, B	B-, C+, C	D+, D	F
Quality of presentation (max 25)	Information provided clearly answers the question set out. Presentation is clear and the flow is coherent and logical. Pace is appropriate.	Information mostly answers the question set. Presentation is mostly clear and the flow generally coherent and logical.	There are weaknesses or absences in the information provided, and the flow of presentation is unclear at times.	Much of the information provided does not answer the question, and the flow is difficult to understand.	Little relevant information and unclear flow.
Demonstration of material (max 40)	Able to clearly demonstrate and thoroughly explain the technology used for performance analysis and data analytics in sport. Able to answer questions in a poised and articulate manner with a high level of confidence.	Good demonstration and explanation of the technology used for performance analysis and data analytics in sport. Able to answer most of the questions clearly and with confidence.	Clear but basic demonstration and explanation of the technology used for performance analysis and data analytics in sport. Able to answer some of the questions clearly but lacks confidence at times.	Poor demonstration and weak explanation of the technology used for performance analysis and data analytics in sport. Has difficulty answering questions and lacks confidence.	Unable to demonstrate or explain the technology used for performance analysis and data analytics in sport. Unable to answer questions.
Use of technology (max 10)	Uses relevant technology very well to supplement and enhance the quality of presentation.	Good use of technology to improve the presentation.	Some use of technology to help improve the presentation.	Little use of relevant technology in the presentation.	No clear use of technology in the presentation.
Communication and teamwork* (max 25)	Communication is very clear and easy to understand. All members of the team	Communication is clear and easy to understand most of the time. Most members of	Communication is unclear at times. Varied contributions of different	Communication is unclear and there and difficult to understand. Most	Communication is unclear and not possible to understand. No team member

	make active contributions .	the team make good contributions .	team members.	contributions provided by a single team member.	makes an active contribution.
*All individuals within the group are expected to contribute to work involved in the planning, data collection and output. An individual's score may vary from that of the team based on feedback and observations in this area.					

Appendix 2: Assessment Criteria for Individual Assignment (40% Final Grade – marked out of 100)

	A+, A, A-	B+, B	B-, C+, C	D+, D	F
Presentation and definition of the concepts (max 40%)	Explanation of the theory is very clear and coherent.	Explanation of the theory is mostly clear, and the flow is generally coherent.	Explanation of the theory is somewhat clear, and the flow is somewhat coherent.	There are weaknesses or absences in the theoretical constructs provided, and the flow of presentation is unclear at times.	Much of the information provided does not help to define the concept, and the flow is difficult to understand.
Application of theoretical knowledge to practical contexts (max 60%)	Very Clear demonstration of how theory can be applied to practice.	More than adequate evidence to show how theory can be applied to practice.	Adequate evidence to show how theory can be applied to practice.	Inadequate evidence to show how theory can be applied to practice.	Little evidence to show how theory can be applied to practice.