

Deliverable D2.2 Implementation Handbook for both courses

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Key words

Description

This deliverable consists of a comprehensive and structured curriculum, accompanied by clear implementation guidelines for each of the delivered courses. It is specifically designed to support higher education educators in implementing the developed weekly lectures effectively and consistently.

This curriculum serves as a pedagogical framework to ensure high-quality, learner-centred delivery across different learning environments and national contexts. It enables educators to adapt content appropriately while maintaining consistency in learning outcomes and assessment standards. The curriculum and study guide will be distributed digitally to all educational partners and made available in open format for wider dissemination and use.



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Project Consortium

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Definitions, Acronyms and Abbreviations

GDPR	General Data Protection Regulation
HEI	Higher Education Institution
I+E	Innovation and Entrepreneurship
SSPA	Sport Science and Physical Activity
WP	Work Package
WPL	Work Package Leader



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Basic Digital Tools Course (5 ECTS)

Training Manual (Implementation Handbook) for Higher Education Instructors

1. Strategic Relevance to WP2 (SPIEP):

This course supports SPIEP's objective to create an inclusive and accessible educational content that promotes digital skill development, particularly for underrepresented young people in sport, including those with fewer opportunities. It incorporates the SPIEP methodology for inclusive digital empowerment and serves as a pilot digital learning module for broader dissemination through WP4.

1.1 Description:

This course is part of the implementation strategy of Work Package 2 (WP2) of the SPIEP project and aims to improve basic digital literacy among youth athletes and students in the sports field. The training contributes directly to Activity A2.2 – Design of Training Pathways and Digital Skills Building Blocks and Activity A2.3 – Online Learning Pathway and Pilot Testing.

Participants will engage with practical modules focusing on word processing, spreadsheets, presentations, cloud collaboration, digital communication, and data management – all adapted to sports science contexts. Through project-based learning, students will build the foundational digital skills necessary to thrive in digitally supported sports careers, including coaching, health promotion, or management.

2. Course Outline

Course Information	
Mode of Delivery:	Asynchronous online learning
Course Title:	Basic Digital Tools
Credits (ECTS):	5 (Equivalent to 125 hours of total student workload)

Main Content
The Basic Digital Tools Course is a foundational digital skills training module designed specifically for undergraduate students in Sports Science. In today's data-driven and technologically integrated sports environment, the ability to confidently navigate digital tools is an essential academic and professional competency. This course addresses this need by equipping students with the practical digital literacy required for success in sport-specific education, training, performance analysis, coaching, and research.



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Students are introduced to a range of commonly used productivity and communication tools including word processors, spreadsheets, presentation software, and cloud-based collaboration platforms. Emphasis is placed on applying these tools in real-world sports science contexts—such as preparing training reports, analysing athletic performance data, designing sport-specific presentations, and collaborating on team-based projects.

Throughout the course, students engage in structured weekly units that combine conceptual understanding with applied digital practice. The modular design facilitates gradual skill development, allowing students to progressively integrate digital tools into their academic tasks and sports science learning activities. A final digital project requires students to synthesize their learning into a professional output—such as a digital athlete profile, an injury tracking spreadsheet, or a coaching presentation—tailored to their area of interest within sports science.

Learning Objectives of the course

Upon successful completion of this course, students will be able to:

- Apply word processing tools to compose structured sport-specific documents such as training plans, logs, and reports.
- Organize, calculate, and interpret performance-related data using spreadsheet applications and basic statistical techniques.
- Design multimedia presentations that communicate sport science concepts clearly and visually.
- Collaborate using digital platforms to co-create shared documents and manage team-based tasks in a sports context.
- Demonstrate effective digital communication by applying principles of netiquette and ethical practice in online environments.
- Produce and present a sport-related digital project that integrates multiple digital tools and includes critical self-reflection on digital tool use and effectiveness.

Learning Outcome	Dimension	Mapped Descriptor	Justification
1. Apply word processing tools to compose structured sport-specific documents such as training plans, logs, and reports.	Skills	Apply a range of cognitive and practical skills to solve abstract problems	Demonstrates applied use of digital tools for contextual (sports) problems
	Knowledge	Broad knowledge in a field of work or study	Builds understanding of formatting, structure, and purpose in documentation
	Responsibility & Autonomy	Exercise supervision and some responsibility for the evaluation and improvement of work	Students plan, revise, and improve documents independently



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2. Organize, calculate, and interpret performance-related data using spreadsheet applications and basic statistical techniques.	Skills	Select and apply appropriate methods, tools, and materials	Students apply digital techniques for data manipulation and interpretation
	Knowledge	Knowledge of facts, principles, processes, and general concepts	Understands data types, structures, and presentation methods in sports
	Responsibility & Autonomy	Take responsibility for own learning and work	Responsible for handling, analyzing, and reporting data results
3. Design multimedia presentations that communicate sport science concepts clearly and visually.	Skills	Develop creative solutions using digital tools	Applies creative principles to deliver structured, engaging sport content
	Knowledge	Understanding of design elements and communication principles	Knowledge includes layout, visual hierarchy, and digital media usage
	Responsibility & Autonomy	Review and develop performance of self and others	Encourages critical evaluation of presentation structure and content
4. Collaborate using digital platforms to co-create shared documents and manage team-based tasks in a sports context.	Skills	Communicate and cooperate in both familiar and new contexts	Demonstrates teamwork, tool use (e.g. Google Docs), and task coordination
	Knowledge	Knowledge of digital collaboration platforms and group dynamics	Acquired through practical teamwork experience and online coordination
	Responsibility & Autonomy	Supervise and adapt behaviour to circumstances in solving problems	Students adjust based on project needs, timelines, and peer input
5. Demonstrate effective digital communication by applying	Skills	Communicate information, ideas,	Applies professional tone, digital etiquette,



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principles of netiquette and ethical practice in online environments.		problems, and solutions to peers and superiors	and safe communication protocols
	Knowledge	Understanding of communication standards, privacy, and ethics	Includes GDPR awareness, tone, appropriateness, and platform conventions
	Responsibility & Autonomy	Take responsibility for behavior and ethical digital engagement	Reflects independence in communication and digital citizenship
6. Produce and present a sport-related digital project that integrates multiple digital tools and includes critical self-reflection on digital tool use and effectiveness.	Skills	Integrate knowledge and tools to generate outputs	Combines tools (e.g. Word, Excel, Slides) for an applied, final project
	Knowledge	Synthesis of technical knowledge into a comprehensive solution	Knowledge includes digital fluency, decision-making, and relevance to context
	Responsibility & Autonomy	Evaluate and improve own performance; act with limited supervision	Final reflection and presentation support metacognitive awareness and independence

Suggested Textbooks | References

- The suggested textbooks and references can be found in each week/unit

Additional Readings (Optional)

- The additional readings can be found in each week/unit

Weekly Breakdown

Week	Topic
1	Introduction to Digital Literacy and Productivity Tools



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2	Word Processing and Document Formatting (MS Word/Google Docs)
3	Spreadsheets for Data Management (Excel/Google Sheets)
4	Presentation Tools and Visual Communication (PowerPoint/Google Slides)
5	Digital Collaboration Tools (Google Workspace, Microsoft Teams)
6	Data Analysis Basics for Sports Science (Excel, Google Sheets)
7	Digital Communication and Netiquette
8	Project Work and Peer Collaboration
9	Assessment and Feedback
10	Final Project Presentation and Reflection

Assessment Methods	
Description	Percentage
Weekly assignments and quizzes	40%
Participation in discussions and peer reviews	20%
Final digital project and presentation	40%



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Week 1: Introduction to Digital Literacy and Productivity Tools

Summary

To engage effectively in both academic and professional environments, students in sports science must develop a foundational understanding of digital literacy and the practical use of productivity tools. This week introduces the concept of digital literacy and its significance in navigating the digital world, especially in sports education, coaching, and performance analysis.

Students will explore the core components of digital environments—such as operating systems, file types, cloud storage, and common office software—and reflect on how these tools are applied in their field. Emphasis is placed on building awareness and confidence in using digital technologies to manage information, collaborate with peers, and perform daily academic and professional tasks.

By understanding the role of productivity tools (word processing, spreadsheets, presentations, calendars, and communication apps), students will learn how to select appropriate technologies to meet their goals. The week concludes with self-assessment activities to evaluate students' baseline digital skills and highlight areas for growth throughout the course.

Introductory Remarks

In today's digital world, sports professionals, researchers, and students rely on technology for communication, data management, training planning, and administrative tasks. Digital literacy is the ability to confidently and critically use digital tools to access, manage, evaluate, and create information.

In the context of sports science, this may involve designing training programs using templates, evaluating athlete progress through digital spreadsheets, presenting tactical plans using visual aids, or collaborating with teammates and coaches through online platforms.

This week provides the basis for understanding the digital expectations in modern academic and sporting environments. Students will reflect on their existing digital habits and explore how core productivity tools—such as cloud-based documents, file-sharing systems, and basic software navigation—can support learning and performance in real-world situations.

By the end of the week, students will have built the awareness and motivation to use technology purposefully and responsibly in both independent and collaborative settings. This week is crucial for establishing the confidence required for more advanced tasks that follow in the course.

Lecture Objectives and Learning Outcomes



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Knowledge:

- Define key concepts related to digital literacy and digital safety.
- Identify digital productivity tools based on their primary functions.
- Explain the main components of a digital work environment.

Skills:

- Adapt a digital interface and configure basic settings.
- Demonstrate the ability to access, organize, and store files using cloud storage.
- Use introductory techniques to work with multiple applications.

Attitudes:

- Demonstrate willingness to engage in new digital learning tasks.
- Discuss the importance of digital safety and responsibility.
- Challenge on one's current digital competence and areas for development.

Keywords

Digital tools, productivity, sports science, collaboration, formatting, visualization, data, netiquette, reflection

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<https://doi.org/10.31893/multirev.2024spe051>
- Mills, K.A., Unsworth, L. and Scholes, L. (2023) *Literacy for Digital Futures*. Routledge.
<https://directory.doabooks.org/handle/20.500.12854/122348>

Digital Multimodal Educational Material



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- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 2:58: Digital Literacy - Explained in 3 Minutes!
<https://www.youtube.com/watch?v=3uLLivFGIfE>
- Duration: 44:31: The Importance of Digital Literacy for the Health Sciences
<https://www.youtube.com/watch?v=TRvJVx2KNt0>

Supplementary Material

- Swim, N., Presley, R., & Thompson, E. (2024). Digital Development and Technology in Sport: A Course to Improve Digital Literacy in the Sport Management Curriculum. *Sport Management Education Journal*, 18(1), 87-93. Retrieved Jul 21, 2025, from <https://doi.org/10.1123/smej.2022-0021>
- Ng, W., & Nicholas, H. (2021). Exploring digital literacy practices in higher education: Beyond basic competency. *Australasian Journal of Educational Technology*, 37 (5), 56-72.

Exercises / Self-Assessment Activities

- Activity 1.1: Digital assignment (e.g., create a document, spreadsheet, or presentation):
- Activity 1.2: List the productivity tools you currently use and describe how they support your academic or sports-related activities.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 1	Reading	3-4
	Digital Multimodal Educational Material	4-6
	Exercises / Self-Assessment Activities	3-4
	Quiz and Submission	1-2
Total		10-14 hours



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Week 2: Word Processing and Document Formatting (MS Word / Google Docs)

Summary

This week focuses on building foundational competencies in word processing, with an emphasis on tools such as Microsoft Word and Google Docs. Word processing is an essential digital skill for students and professionals across all fields, especially in sports science, where written communication is used to document performance reports, training schedules, policy documents, research reflections, and event planning.

Students will learn how to efficiently format documents using features like styles, headings, tables, bullet points, page layout, and referencing tools. They will also explore the collaboration features offered by cloud-based platforms, such as real-time commenting and editing. Through guided practice and applied exercises, students will produce well-structured documents that adhere to formatting standards and serve specific academic or professional functions.

This week will highlight the importance of clarity, structure, and consistency in digital written communication and how properly formatted documents contribute to professional credibility, particularly in the sports and health sectors.

Introductory Remarks

Effective written communication is a key professional requirement in the field of sports science. Whether preparing athlete progress summaries, drafting training instructions, reporting findings from field research, or submitting assignments, the ability to produce clear and structured documents is essential. This week introduces students to basic word processing techniques and formatting principles that help create impactful and professional documents.

Using Microsoft Word and Google Docs as core platforms, students will explore practical features such as paragraph formatting, tables, header/footer design, page breaks, styles, and automatic referencing. They will understand how to structure content for clarity, align with institutional or organizational guidelines, and present data in a readable and visually coherent format. In sports science, this can be particularly useful when sharing performance reviews with athletes, coaches or summarizing data for interdisciplinary collaboration.

Additionally, students will be introduced to the concept of collaborative editing, which enables multiple contributors to co-author documents and provide feedback efficiently—a valuable skill in team-based academic or coaching environments. This week's activities promote both individual competence and collaborative engagement with word processing tools.



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By the end of the week, students will not only be familiar with document formatting tools, but also understand how digital text production contributes to the effective dissemination of ideas, knowledge, and practical information in the sports sector.

Lecture Objectives and Learning Outcomes

Knowledge:

- Identify the core functionalities of word processing tools.
- Explain the role of formatting in academic and professional documents.
- Differentiate between various document layout structures.

Skills:

- Build a document using appropriate styles, spacing, and headings.
- Construct elements such as tables, images, and bullet lists.
- Design templates to suit specific document purposes.

Attitudes:

- Practise responsibility for producing clear, organized written outputs.
- Follow academic conventions and copyright rules when creating content.
- Judge own work for clarity and consistency before submission.

Keywords

Word processing, formatting, document layout, cloud collaboration, styles, templates, tables, commenting.

Bibliography

- Gaskins, J. (2022). *Google Workspace for Education: Mastering Docs, Drive, and Collaboration Tools*. TechPress.
- Ellis, J.J. (2025). *Microsoft Office 365 Bible for Beginners: Learn from Scratch and Master All Office Suite Software*. TechLabOM LLC



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Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 03:25: What Is Considered Proper Documentation? - Sports Jobs
https://www.youtube.com/watch?v=KNjwrEZPJ_s
- Duration: 03:09:55: Google Docs Full Course Tutorial (3+ Hours)
<https://www.youtube.com/watch?v=X7ShcCxOmns>
- Duration: 43:15: Microsoft Word for Beginners - The Complete Course
<https://www.youtube.com/watch?v=2MCmn2L50o>

Supplementary Material

- Blau, I., & Hameiri, M. (2019). Collaborative writing in Google Docs environments: Disciplinary differences as reflected in students' writing products. *Computers in Human Behavior*, 96, 296–303.
- Gerard, L. (2021). *Digital Literacy for Students: Navigating Word Processing, Online Collaboration, and Academic Writing*. Sage.

Exercises / Self-Assessment Activities

- Digital assignment (e.g., create a document, spreadsheet, or presentation):
- Activity 2.1: Download the provided template and create a two-page training program using proper headings, bullets, and tables.
- Activity 2.2: Collaborate with a peer to edit a sample document using commenting and suggestion mode. Submit a short reflection on the experience.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 2	Reading	3-4
	Digital Multimodal Educational Material	7-8
	Exercises / Self-Assessment Activities	5-8
	Supplementary material review (optional)	1- 2
Total		14-20 hours



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Week 3: Spreadsheets for Data Management (Excel / Google Sheets)

Summary

This week introduces students to the essential functions and real-world applications of spreadsheet tools, focusing on Microsoft Excel and Google Sheets. In the context of sports science, spreadsheets are crucial for organizing performance data, designing training logs, tracking fitness progression, managing schedules, and analysing test results.

Students will explore how to create, format, and organize data in spreadsheets, use formulas for basic calculations, and apply sorting and filtering to extract meaningful insights. They will also gain familiarity with functions commonly used in sports performance analysis, such as averages, conditional formatting, and visual data presentation with charts.

The ability to manage and analyse data effectively is central to evidence-based practice in sports science. By developing core spreadsheet skills, students will become better equipped to track patterns, interpret data trends, and support informed decision-making.

Introductory Remarks

Data management is an integral part of modern sports science. Whether you are assessing athlete performance, logging injury reports, or planning training cycles, the ability to organize and interpret data efficiently can significantly influence outcomes. Spreadsheet tools like Microsoft Excel and Google Sheets provide a flexible and powerful way to manage large volumes of information with precision and clarity.

In this week's module, students will begin by learning the fundamentals of spreadsheet structure—rows, columns, cells—and how to input and manipulate data. They will then explore how formulas and functions can be used to automate calculations, reducing error and saving time. These skills are critical when preparing summaries of physical test results, calculating workloads, or monitoring progress across a training season.

Sports professionals and coaches often use spreadsheets not only to collect data but also to visualize it. Therefore, this week will also cover the basics of chart creation and formatting—skills that support better communication of findings to colleagues, athletes, or research stakeholders.

By the end of the week, students will feel confident creating their own data sheets and using them to support planning, evaluation, and presentation tasks. The lecture promotes analytical thinking and introduces key data literacy principles that will be expanded upon in later modules.



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Lecture Objectives and Learning Outcomes

Knowledge:

- Define of spreadsheets in data entry and processing.
- Describe common functions and formulas used in sports performance tracking.
- Explain the structure of cells, ranges, and formulas.

Skills:

- Arrange and organize sport-related data into structured tables.
- Use basic formulas (e.g., SUM, AVERAGE, COUNT) to analyse performance.
- Build and format tables with clear labels and colour coding.

Attitudes:

- Justify data with accuracy and attention to detail.
- Judge ethical handling of data (e.g., confidentiality).
- Practise with peers when working on shared datasets.

Keywords

Spreadsheets, data entry, formulas, functions, charts, analysis, performance tracking, digital data.

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- Carter, L. (2021). *Google Sheets: A Step-by-Step Guide to Spreadsheet Mastery*. Routledge. TechLabOM LLC.
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- Smith, A., & Jones, K. (2020). *Enhancing sports science education with spreadsheet tools: A case study in undergraduate curriculum*. *Journal of Teaching in Physical Education*, 39(3), 237–245.
- Walkenbach, J. (2023). *Excel 2023 Bible: The Comprehensive Tutorial Resource*. Wiley.



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Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 1:13:11 Excel Essentials for Coaches and Sports Scientists (Office 365)
<https://www.youtube.com/watch?v=leymY5GKh1k&t=173s>
- Duration: 01:38:46 Excel Beginner Tutorial
<https://www.youtube.com/watch?v=310z5K14JXw>
- Duration: 03:10:59 Google Sheets Full Course Tutorial
<https://www.youtube.com/watch?v=8mIVgA1iFJ4>

Supplementary Material

- Analyse, understand, and visualize your data with ease
<https://support.microsoft.com/en-us/excel>
- How to Build an Effective Workout Template in Google Sheets
<https://getfiledrop.com/how-to-build-an-effective-workout-template-in-google-sheets/>
- Google Sheets Time Tracking: Free Template & Best Solutions
<https://www.memtime.com/blog/google-sheets-time-tracking-solutions>

Exercises / Self-Assessment Activities

- Activity 3.1: Create a 7-day fitness tracking sheet using Excel or Google Sheets, with conditional formatting based on target thresholds.
- Activity 3.2: Use provided data to calculate averages, totals, and generate two charts showing training volume trends.
- Activity 3.3: Complete a short quiz identifying formulas and interpreting spreadsheet output examples.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 3	Reading	2-3
	Digital Multimodal Educational Material	8-9
	Exercises / Self-Assessment Activities	6-7
	Supplementary material review (optional)	1- 2
Total		16-19 hours



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Week 4: Presentation Tools and Visual Communication (PowerPoint / Google Slides)

Summary

This week introduces the use of presentation software, focusing on Microsoft PowerPoint and Google Slides, to develop clear, engaging, and professionally formatted visual materials. In sports science, the ability to communicate ideas visually is essential—whether for presenting research findings, explaining training techniques, delivering workshops, or promoting events.

Students will learn how to plan and structure a presentation, apply design principles, use multimedia effectively, and present data in a visually compelling way. The week also explores how to align visual materials with audience expectations, maintain clarity in messaging, and use animation or transitions appropriately.

Presentation tools are more than visual aids—they are communication platforms. This module helps students use these tools with purpose and creativity, supporting their academic and field-based roles in sports education, performance analysis, and outreach.

Introductory Remarks

In both academic and professional contexts, effective communication often relies on strong visual presentation. For sports science students, this skill becomes critical when delivering tactical explanations, training briefings, athlete feedback sessions, or public talks. Creating compelling visual content ensures that ideas are understood, retained, and acted upon.

This week, students will explore how to build digital slide decks using Microsoft PowerPoint and Google Slides. They will begin by learning the foundational features of slide creation—layouts, text boxes, images, and transitions—and move toward more advanced practices, such as integrating video, creating graphs, embedding links, and using master slides for consistency.

A key part of this week's focus is not just how to use the software, but how to communicate effectively through design. Students will be introduced to basic visual communication principles, including balance, hierarchy, contrast, and minimalism, to ensure that presentations are both informative and aesthetically clear. In sports contexts, poorly designed visuals can reduce clarity or even cause misunderstanding—this lecture addresses those risks directly.

By the end of the week, students will be able to prepare a short presentation using evidence-based content and visuals, evaluate others' presentations for effectiveness, and feel more confident sharing information in both digital and in-person formats.



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Lecture Objectives and Learning Outcomes

Knowledge:

- Identify the components of an effective digital presentation.
- Describe visual communication principles (contrast, alignment, hierarchy).
- Differentiate between informative and persuasive presentation structures.

Skills:

- Build a multimedia presentation using templates, design tools, and embedded content.
- Deliver visual design principles to organize content and maintain audience engagement.
- Designing data visually through charts, diagrams, or infographics.

Attitudes:

- Synthesise creativity and professionalism in visual content creation.
- Justify the importance of audience-focused design in sports and educational communication.
- Demonstrate confidence in expressing ideas visually and presenting in digital environments.

Keywords

Presentation tools, visual communication, slide design, audience engagement, PowerPoint, Google Slides, multimedia, storytelling.

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- Kennedy, M. et al. (2021). *Visual communication in sports science education: Designing slides for impact and clarity*. *Journal of Sports Sciences Education*, 14(2), 112–121.
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Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Healthcare Data Visualization: Examples & Key Benefits
<https://demigos.com/blog-post/healthcare-data-visualization/>
- SlideGenius, Why It Matters to Have a Quality Healthcare PowerPoint
<https://www.slidegenius.com/articles/why-it-matters-to-have-a-quality-healthcare-powerpoint>
- AMWA Blog, Exploring Visual Communication in Health Care
<https://blog.amwa.org/exploring-visual-communication-in-health-care>
- Duration: 3:41: The Purpose of Visuals in Communication
<https://www.youtube.com/watch?v=xlaBYxZBjZc&t=130s>
- Duration: 3:54: What Are the Key Elements of Effective Visual Communication? | Graphic Design Nerd
<https://www.youtube.com/watch?v=2LOEJwXpKUU>
- Duration: 3:58:29: PowerPoint 2021 Full Course Tutorial (3+ Hours)
<https://www.youtube.com/watch?v=FI2IYiRPsVc>
- Duration: 4:49: How to Create a Presentation in Google Slides
<https://www.youtube.com/watch?v=Y5q-ObSGQFY>

Supplementary Material

- Communication Skills for Effective Teamwork in Sports
<https://thementalgame.me/blog/communication-skills-for-effective-teamwork-in-sports#:~:text=Effective%20communication%20ensures%20coordination%2C%20synchronization,flow%20of%20information%20between%20teammates.>
- Transform Your Health Presentations: Strategies for Clear, Engaging Slides
<https://hsph.harvard.edu/research/health-communication/resources/strategies-for-clear-engaging-slides/>
- Sport Presentation templates
<https://slidesgo.com/sport>
- Walker, S., & Lee, C. (2020). *Audience engagement and multimedia presentations: Best practices for digital sports science communication. International Journal of Sports Communication*, 13(3), 254–269.



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Exercises / Self-Assessment Activities

- Activity 4.1: Create a 5-slide presentation introducing a fitness program or event, using at least one visual chart and one embedded media element.
- Activity 4.2: Peer-review a classmate's presentation and provide structured feedback using the checklist provided.
- Activity 4.3: Complete a self-check quiz on slide layout principles and multimedia usage.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 4	Reading	2-4
	Digital Multimodal Educational Material	7-8
	Exercises / Self-Assessment Activities	4-7
	Supplementary material review (optional)	1- 2
Total		13-19 hours



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Week 5: Digital Collaboration Tools (Google Workspace, Microsoft Teams)

Summary

This week introduces students to digital collaboration platforms that support teamwork in academic, professional, and sports-related settings. Students will focus on Google Workspace (Docs, Drive, Calendar, Meet) and Microsoft Teams, two widely used ecosystems that enable real-time collaboration, communication, and task management.

Collaboration is a critical component of working in sports environments—whether coordinating training schedules, sharing reports, or running coaching sessions. This lecture will show students how to co-author documents, organize shared drives, schedule meetings, and communicate asynchronously or in real time using professional tools. The emphasis will be on teamwork, responsibility sharing, and digital etiquette when collaborating remotely.

Through simulations and group exercises, students will gain practical experience in managing virtual group tasks, reflecting real-world practices in academic group work and sports team operations.

Introductory Remarks

In both higher education and the world of sports, working as part of a team is fundamental to success. Collaboration is no longer limited to face-to-face interactions—increasingly, students, researchers, coaches, and practitioners rely on digital platforms to work together across distances and schedules. Mastering these tools can streamline workflows, improve communication, and enhance productivity in sports science practice.

This week provides an in-depth introduction to Google Workspace and Microsoft Teams. Students will begin by learning how to create and organize shared documents and folders using Google Drive and explore how to collaboratively edit content using Docs and Sheets. They will then move on to managing calendars, scheduling group meetings, and using chat and video features in Google Meet and Microsoft Teams.

The emphasis is not just on using these tools technically but also understanding the soft skills associated with collaboration—setting roles, maintaining respectful communication, and documenting shared responsibilities. This is particularly relevant in sports team environments, where coordination, planning, and follow-up are essential for successful outcomes.

Students will reflect on the value of transparency, accountability, and coordination, all while learning how digital tools can strengthen team-based project work and reduce misunderstandings or duplication of effort.



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Lecture Objectives and Learning Outcomes

Knowledge

- Identify the features and functions of digital collaboration platforms such as Google Workspace and Microsoft Teams.
- Explain the benefits and challenges of remote collaboration in academic and sports settings.
- Describe the principles of digital organization and role delegation in group work.

Skills

- Use shared folders, co-author documents, and manage permissions in cloud platforms.
- Operate calendar and task management tools to coordinate group schedules and responsibilities.
- Arrange virtual meetings using professional video and chat tools, following digital etiquette.

Attitudes

- Demonstrate accountability and transparency in digital collaboration.
- Practise shared tasks and respect in peer input.
- Challenge the role of effective communication and coordination in team success.

Keywords

Collaboration, cloud tools, Google Workspace, Microsoft Teams, shared documents, scheduling, team roles, virtual meetings.

Bibliography

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- Ellis, J.J. (2025). *Microsoft Office 365 Bible for Beginners: Learn from Scratch and Master All Office Suite Software*. TechLabOM LLC
- Hughes, J., & Thomas, M. (2023). *Mastering Microsoft Teams for Collaboration and Productivity*. Packt Publishing.
- Gaskins, J. (2022). *Google Workspace for Education: Mastering Docs, Drive, and Collaboration Tools*. TechPress.



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- Raes, A., Detienne, L., Windey, I., & Depaepe, F. (2020). A systematic literature review on collaborative learning with technology: How different tools support learning and collaboration. *Computers & Education*, 143, 103682.
- Taylor, N., & Green, J. (2021). *Collaborative digital tools in sports science education: Enhancing teamwork and communication*. *International Journal of Sports Science and Coaching*, 16(1), 36–45.

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 33:48 Get ready for the future of work with Microsoft Teams | Enterprise Connect 2024 Keynote
<https://www.youtube.com/watch?v=xBuRVG7ujQM>
- Duration: 02:04 Discover, prepare, and recap your meetings in one place with Meet in Microsoft Teams
<https://www.youtube.com/watch?v=JBxI4qiBPdk>
- Duration: 17:37 Enabling a smart workplace with Microsoft Teams webinar
<https://www.youtube.com/watch?v=QVxKVBSosXU>
- Duration: 24:56 How to use the NEW Microsoft Teams: Beginner's Tutorial
https://www.youtube.com/watch?v=hWK4CgrJ_fm
- Duration: 11:28 [2024] Google Workspace Beginners Guide | Tips on Getting Started (from an Expert)!
https://www.youtube.com/watch?v=FwT6_JFAk5Y

Supplementary Material

- Davis, R., & Collins, S. (2021). *Digital Teamwork: Principles and Practices for the Modern Workplace*. Wiley.
- Collaborate on files in Microsoft Teams
<https://support.microsoft.com/en-us/office/collaborate-on-files-in-microsoft-teams-9b200289-dbac-4823-85bd-628a5c7bb0ae>
- Sync file libraries to SharePoint in Microsoft Teams
<https://support.microsoft.com/en-us/office/sync-file-libraries-to-sharepoint-in-microsoft-teams-67a90549-4741-46df-8ae6-c6e2004f5b95>
- Share files in Microsoft Teams
<https://support.microsoft.com/en-us/office/share-files-in-microsoft-teams-0c4d34ee-5dd8-46d5-ab35-0d227b5e6eb5>
- Tips to collaborate in chats & spaces
https://support.google.com/a/users/answer/13647384?hl=en&ref_topic=9348682&sjid=3258665389276939645-EU



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- Switch from Microsoft Teams to Google Workspace
https://support.google.com/a/users/answer/9747451?hl=en&ref_topic=9348682&sjid=3258665389276939645-EU#related
- 10 Async Communication Best Practices to Scale Team Output
<https://www.chronoplatform.com/blog/what-is-asynchronous-communication>

Exercises / Self-Assessment Activities

- Activity 5.1: Form a virtual team with other students and create a shared Google Drive folder for a mock athlete performance project. Assign tasks and deadlines using shared documents between your group.
- Activity 5.2: Use Microsoft Teams or Google Meet to conduct a short virtual meeting with your group. Record your meeting notes and assign follow-up actions.
- Activity 5.3: Complete a self-reflection form on your group contribution and peer feedback experience.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 5	Reading	3-4
	Exercises / Self-Assessment Activities	6-10
	Digital Multimodal Educational Material	4-5
	Supplementary material review (optional)	2- 3
Total		13-19 hours



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Week 6: Data Analysis Basics for Sports Science (Excel / Google Sheets)

Summary

This week introduces foundational data analysis concepts using spreadsheet tools like Microsoft Excel and Google Sheets, with a focus on applications relevant to sports science. Students will explore how to collect, organize, analyse, and interpret basic datasets derived from physical testing, performance tracking, and training load monitoring.

The week will focus on practical analytical methods such as descriptive statistics, simple visualizations, conditional formatting, and filtering. Through guided exercises, students will analyse real or simulated sport-related data sets to extract insights that can support performance evaluation or decision-making in coaching, fitness, or academic contexts.

This week forms a bridge between digital skills and evidence-based practice, supporting the learner's ability to use technology for practical analysis in sport and physical education environments.

Introductory Remarks

In sports science, data is everywhere. From heart rate logs to sprint times and sleep tracking, quantitative information plays a vital role in understanding athlete performance, recovery, and adaptation. But collecting data is only the first step—knowing how to organize, interpret, and communicate that data is where value is created.

This week provides a starting point for data analysis using accessible spreadsheet tools. Students will build on their existing knowledge of Excel or Google Sheets by learning to apply statistical functions such as AVERAGE, MAX, MIN, STDEV, and use visual aids such as line graphs, bar charts, and scatter plots to detect patterns and trends.

Real-world examples, such as tracking a football player's training intensity across several weeks or comparing athlete test results before and after a conditioning cycle, will help students contextualize digital analysis in meaningful ways.

Importantly, students will begin to think critically about the data they collect—its reliability, limitations, and the ethical responsibility involved in storing and interpreting personal or sensitive data in sports contexts.

By the end of this lecture, students will have a basic toolkit to independently analyse small datasets and draw conclusions that inform planning, reporting, or reflection.



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Lecture Objectives and Learning Outcomes

Knowledge

- Define the role of data analysis in sports science and athlete monitoring.
- Analyse key functions and visualizations used in Excel and Google Sheets for basic analysis.
- Justify steps for creating basic graphs and charts.

Skills

- Use formulas to calculate descriptive statistics from a performance dataset.
- Build charts and graphs to summarize findings and support interpretation.
- Arrange and filter data sets to reveal performance patterns and outliers.

Attitudes

- Demonstrate a data-informed mindset when approaching sport-related problems.
- Dispute to transparent and accurate reporting of results.
- Justify confidentiality and integrity in managing personal or team data.

Keywords

Data analysis, descriptive statistics, performance tracking, graphs, spreadsheets, athlete monitoring, interpretation, ethics.

Bibliography

- Bhatnagar, R., & Babbar, M. (2019). *A systematic review of sports analytics*. https://www.researchgate.net/publication/332406802_A_systematic_review_of_sports_analytics
- Xu, X., Zhao, Q., Yang, T., & Liu, X. (2025). Sports information processing and physiological condition monitoring system based on multimedia computer. *Molecular & Cellular Biomechanics*, 22, 994. <https://doi.org/10.62617/mcb994>
- Ellis, J.J. (2025). *Microsoft Office 365 Bible for Beginners: Learn from Scratch and Master All Office Suite Software*. TechLabOM LLC

Digital Multimodal Material



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- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 8:56 EAF#1 - Create Fitness Programme with Excel
<https://www.youtube.com/watch?v=lylrxl4hW9M>
- Duration: 32:52 Excel Athlete Dashboard Tutorial | Strength Coach Tutorials | DSMStrength
<https://www.youtube.com/watch?v=WTB6peagZR8>
- Duration: 07:33 Easy SPSS Tutorial: Import Data from Excel into SPSS
<https://www.youtube.com/watch?v=KZONYnPGsWw>
- Interactive video/ case studies/ learning scenarios

Supplementary Material

- NBA Advanced Stats: While interactive, it shows how large datasets are presented
<https://www.nba.com/stats/>
- Sports Analytics: Your Guide to Turn Stats into Victory
<https://chartexpo.com/blog/sports-analytics#>

Exercises / Self-Assessment Activities

- Activity 6.1: Analyse a simulated pre/post test dataset for a group of athletes, calculating means, differences, and identifying improvements.
- Activity 6.2: Create a visual report with at least two graphs and accompanying bullet-point interpretation.
- Activity 6.3: Reflect on how digital analysis could support your future role (e.g., as a coach, teacher, therapist).

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 6	Reading	3-5
	Exercises / Self-Assessment Activities	5-8
	Digital Multimodal Educational Material	4-5
	Supplementary material review (optional)	1- 2
Total		12-18 hours



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Week 7: Digital Communication and Netiquette

Summary

This week focuses on developing effective and responsible digital communication practices, essential for students and professionals working in sports science, education, and team-based environments. As communication increasingly moves online, mastering appropriate tone, structure, and etiquette—often referred to as netiquette—becomes vital.

Students will explore various communication tools, including email, messaging apps, discussion forums, and video conferencing platforms, and learn how to adapt their communication style depending on the audience (e.g., coach, peer, academic advisor). The week also introduces principles of digital citizenship, privacy, and online behaviour, helping students to engage responsibly in virtual environments.

Through applied scenarios and exercises, students will practice writing and responding to professional messages, conducting respectful discussions, and using communication platforms effectively in both academic and sport-related contexts.

Introductory Remarks

Clear, respectful, and purposeful communication is a cornerstone of success in any field—and especially in sports science, where collaboration among students, athletes, coaches, medical staff, and researchers is frequent. In digital spaces, where facial expressions and tone of voice are often absent, written clarity and professional etiquette become even more important.

This week's unit introduces the concept of digital communication literacy: knowing how to select the right platform, craft appropriate messages, and demonstrate awareness of digital social norms. Whether writing an email to a coach, sharing data with a team, or posting in a university forum, the ability to express ideas clearly and professionally influences one's credibility and effectiveness.

Students will also learn about netiquette—the unwritten rules of respectful online behaviour—such as avoiding all caps (which may appear aggressive), acknowledging others' contributions, and responding in a timely manner. In the context of sports, this becomes essential when scheduling training sessions, delivering feedback, or collaborating across time zones.

Lastly, ethical considerations such as protecting personal data, respecting confidentiality, and avoiding miscommunication will be addressed. These are particularly relevant in health and sport settings, where trust and professionalism are paramount.

By the end of this lecture, students will feel more confident navigating digital communication environments and representing themselves professionally in virtual academic and athletic spaces.



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Lecture Objectives and Learning Outcomes

Knowledge

- Describe the key elements of professional digital communication across platforms.
- Recommend communication styles across different platforms (email, chat, forums).
- Justify the principles of netiquette and digital behaviour in academic and sports contexts.
- Justify privacy, safety, and ethical issues in online communication.

Skills

- Build structured, polite, and purposeful messages (emails, messages, forum posts).
- Use appropriate digital tools for communicating with peers, instructors, or team members.
- Operate constructively and professionally in group discussions or feedback exchanges.

Attitudes

- Challenge boundaries and tone when participating in online interactions.
- Follow a professional digital identity and behaviour online.
- Justify ethical communication and understand its impact on collaboration and trust.

Keywords

Digital communication, netiquette, email writing, online behaviour, professional tone, confidentiality, messaging tools, digital citizenship.

Bibliography

- Brown, L., & Fisher, S. (2019). *Digital etiquette and accountability in remote team communication*. *Journal of Workplace Communication*, 7(4), 409–425.
- Göksel, A., & Serarslan, M. (2015). Public relations in sports clubs: New media as a strategic corporate communication instrument. *International Journal of Physical Education, Sports and Health*, 2(4), 275–283.
https://www.researchgate.net/publication/298807810_Public_Relations_in_Sports_Clubs_New_media_as_a_Strategic_Corporate_Communication_Instrument
- Heitmayer, M., & Schimmelpfennig, R. (2023). Netiquette as digital social norms. *International Journal of Human–Computer Interaction*. <https://doi.org/10.1080/10447318.2023.2188534>
- Jiang, K., & Phakdeephrot, N. (2024). The impact of digital media on sports management. *Academic Journal of Science and Technology*, 10, 208–213.



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- <https://doi.org/10.54097/x2xxah70>
- Jones, M., & Hargie, O. (2022). *Digital Communication in Sport and Education: Theory and Practice*. Sage.
- Lee, C., & Benson, V. (2019). *Ethical issues in digital communication: Privacy, confidentiality, and trust in sport science contexts*. *International Journal of Sport Science and Coaching*, 14(5), 654–665.
- Taylor, L., & Thomas, R. (2020). *Professionalism in online communication: An exploratory study of sports science students' email and messaging styles*. *Journal of Sports Education*, 11(4), 321–335.
- Walden, J. (2023). *Professional Digital Communication: Writing and Netiquette for the Workplace*. Routledge.

Digital Multimodal Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 3:52 What is Netiquette?
<https://www.youtube.com/watch?v=CWbtbycHZok>
- Duration: 3:32 Netiquette: Don't send and offend | BUSINESS ETIQUETTE
<https://www.youtube.com/watch?v=bAyimiFGwZk>

Supplementary Material

- Brown, T., & Williams, H. (2019). *Ethical management of athlete data: Confidentiality and accuracy*. *Sports Medicine and Society*, 29(2), 145–158.
- Gomes, G., & Santos, R. (Eds.). (2024). *Guide: Online communication and netiquette*. UA Editora. <https://doi.org/10.48528/5941-hp68>
- Oral, U. (2023). Netiquette: Fundamentals of etiquette in digital communication. *European Journal of Theoretical and Applied Sciences*, 1(5), 833–847.
[https://doi.org/10.59324/ejtas.2023.1\(5\).70](https://doi.org/10.59324/ejtas.2023.1(5).70)
- Rosenberg, K., & Axtell, C. (2021). *Netiquette and Digital Citizenship: Essential Skills for Modern Communication*. Springer.

Exercises / Self-Assessment Activities

- Activity 7.1: Draft an email to a coach requesting feedback on your performance. Use the provided template to check tone, structure, and clarity.



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- Activity 7.2: Read the sports team case study and identify what went wrong in digital communication. Write a short reflection.
- Activity 7.3: Participate in a discussion forum (mock or real) and follow netiquette principles. Submit a screenshot with a short reflection.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 7	Reading	2-3
	Exercises / Self-Assessment Activities	4-7
	Digital Multimodal Educational Material	6-5
	Supplementary material review (optional)	1- 2
Total		12-14 hours



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Week 8: Project Work and Peer Collaboration

Summary

Week 8 marks a significant shift from guided tasks to integrated practice. Students are challenged to apply their accumulated digital knowledge in a collaborative mini-project, mirroring real-life teamwork scenarios found in sports science, coaching environments, or academic settings. By initiating, planning, and executing a group assignment, students will deepen their understanding of project development, digital communication, shared responsibility, and co-creation using collaborative platforms.

The project may take the form of a performance report, training intervention plan, awareness campaign, or any topic relevant to sport and physical education. This experience allows students to practice project management, divide responsibilities, and simulate real-world decision-making processes using digital tools like Google Workspace, Microsoft Teams, or Trello.

The week highlights the value of interpersonal digital collaboration, emphasizing accountability, constructive communication, and adaptability in achieving a shared outcome.

Introductory Remarks

Team-based projects are a core component of the professional landscape in sport, exercise, and health sciences. Whether coordinating a match-day strategy, producing a player report, or preparing a grant proposal, the ability to manage digital tasks collaboratively is now a fundamental skill.

This week's activities are designed to immerse you in a digital teamwork environment, where planning, communication, and shared responsibility are essential. Using familiar tools from previous weeks, your group will plan and deliver a final mini-project while managing roles, deadlines, and versions collaboratively.

You are encouraged to think critically, take initiative, and practice leadership where needed—but also to be a receptive and dependable team member. By balancing personal contribution with team dynamics, you will experience the collaborative nature of the sports profession while sharpening your digital agility and responsibility.

Lecture Objectives and Learning Outcomes

Knowledge

- Define the essential phases of collaborative digital project development.
- Differentiate between digital tools based on their functions in teamwork and file coordination.



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- Recommend examples of effective digital teamwork in sports-related projects.

Skills

- Dissect group tasks using cloud-based platforms (Google Docs, Teams, Trello).
- Operate shared content collaboratively, integrating multimedia and structured formats.
- Use collaborative documents based on peer input and agreed-upon criteria.

Attitudes

- Practise team discussions and participate in role assignment and planning.
- Follow deadlines, group decisions, and collaborative etiquette.
- Question one's individual contribution and support team performance constructively.

Keywords

Project management, teamwork, co-creation, shared responsibility, digital workflow, collaboration tools, peer feedback.

Bibliography

- Brown, K., & Wilson, P. (2021). *Peer Collaboration and Digital Co-Creation in Higher Education*. Springer.
- Harris, D., & Walsh, S. (2020). *Collaborative learning and project-based activities in sport education: Digital tools and student engagement*. *Journal of Active Learning in Sport*, 8(2), 123–136.
- Miller, A., & Thompson, R. (2021). *Digital teamwork for sport science students: enhancing collaboration through cloud platforms*. *International Journal of Sports Science Education*, 16(3), 277–288.
- Robinson, F., & Lee, J. (2022). *Collaborative Work in the Cloud: Managing Digital Teams with Google Workspace and Microsoft Teams*. Routledge.

Digital Multimodal Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 5:25 How to Collaborate on Projects
<https://www.youtube.com/watch?v=HM4jSlhPOXk>

Supplementary Material



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- Kerzner, H. (2023). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling* (14th ed.). Wiley.
- Peterson, L., & White, K. (2019). *Shared responsibility and peer feedback in digital sports science projects. Journal of Sports Education and Development*, 12(1), 54–68.

Exercises / Self-Assessment Activities

- Activity 8.1: Collaboratively draft a digital product (e.g., a short training intervention, infographic, or awareness campaign plan) using cloud-based tools.
- Activity 8.2: Submit a group reflection video or document detailing team roles, digital tools used, and lessons learned.
- Activity 8.3: Complete an individual peer-assessment form and self-assessment checklist evaluating participation, responsibility, and digital effectiveness.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 8	Reading	2-3
	Exercises / Self-Assessment Activities	8-12
	Digital Multimodal Educational Material	3-4
	Supplementary material review (optional)	1- 2
Total		13-20 hours



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Week 9: Assessment and Feedback

Summary

Week 9 prepares students to evaluate their learning progress, understand assessment criteria, and both receive and give feedback in a structured and constructive manner. The week introduces principles of digital assessment (formative and summative), peer review, and reflective practice in the context of sports science education and digital work.

Students will explore various types of assessment, such as quizzes, project-based rubrics, and peer-to-peer evaluation. They will also learn how to interpret feedback constructively and reflect on their own contributions and development using digital tools (e.g., feedback forms, self-assessment surveys, rubrics, annotated comments).

This week emphasizes personal growth, academic integrity, and the role of feedback in learning—a key skill in both academic and performance-based sports environments.

Introductory Remarks

Assessment in education is more than just receiving a grade. It is a process of measuring progress, identifying strengths and weaknesses, and using structured feedback to improve future performance. In sports science, feedback is essential—it informs athletes, coaches, trainers, and analysts about what is working and what needs to be adjusted.

This week, we shift the focus to how students can evaluate their own digital competence, reflect on the progress made throughout the lecture, and participate actively in feedback processes. You will review your own project work, offer constructive feedback to peers, and complete a digital self-assessment based on Lecture Objectives.

By understanding how digital feedback tools work (such as comment features, Google Forms, rubrics, and annotated PDFs), you will be better prepared to give and receive feedback in professional settings—whether that's in a training session, a scientific presentation, or an academic workshop.

Moreover, you will explore how reflective practice—thinking critically about your own learning—can build confidence, clarify learning goals, and enhance your ability to work independently and responsibly.

Lecture Objectives and Learning Outcomes

Knowledge

- Explain the purpose and types of digital assessment in academic and sport-related learning.



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- Identify the structure and use of feedback tools (e.g., rubrics, comments, reflection prompts).
- Justify the importance of feedback for self-improvement and lifelong learning.

Skills

- Use digital tools to submit work, give peer feedback, and engage in reflection.
- Sketch rubrics and feedback reports to identify areas of strength and growth.
- Perform feedback to revise or improve digital outputs and future strategies.

Attitudes

- Discuss constructive feedback as a tool for growth.
- Justify commitment to continuous improvement.
- Judge in honest self-evaluation.

Keywords

Assessment, feedback, self-assessment, rubric, peer review, reflection, digital evaluation, academic integrity.

Bibliography

- Hall, M., & O'Connor, D. (2019). *Reflective practice in sport and exercise science education: Digital tools and strategies*. *Active Learning in Higher Education*, 20(4), 301–312.
- Noren, L., & McCabe, J. (2020). *Using rubrics and digital tools for formative feedback in sport science education*. *Journal of Teaching in Physical Education*, 39(3), 275–286.
- Sadler, D. R. (2022). *How Students Learn to Evaluate Their Work: Formative Assessment and Feedback*. Routledge.

Digital Multimodal Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 07:01 Learn the Types of Feedback in Sport! Intrinsic vs Extrinsic
https://www.youtube.com/watch?v=R1_i3jXmx6k
- Duration: 22:00 Podcast: The Learning Experience Lab Podcast – FeedbackFruits:
<https://feedbackfruits.com/podcast>

Supplementary Materi

- Carless, D., & Boud, D. (2021). *The Handbook of Peer Feedback in Education: Enhancing Learning through Peer Assessment*. Springer.



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- Hattie, J., & Timperley, H. (2021). *The Power of Feedback*. *Review of Educational Research*, 93(1), 130–165.
- Nicol, D., & Macfarlane-Dick, D. (2020). *Formative Assessment and Self-Regulated Learning: A Model and Seven Principles of Good Feedback Practice*. Routledge.

Exercises / Self-Assessment Activities

- Activity 9.1: Review your Week 8 group project using the provided rubric. Identify at least two strengths and two areas for improvement.
- Activity 9.2: Provide structured written feedback to one peer group using the evaluation form.
- Activity 9.3: Complete a digital self-assessment form and write a short reflective entry on your learning journey in the course so far.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 9	Reading	2-3
	Digital Multimodal Educational Material	3-4
	Exercises / Self-Assessment Activities	6-10
	Supplementary material review (optional)	1- 2
Total		11-17 hours



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Week 10: Final Project Presentation and Reflection

Summary

In the final week, students will formally present their group project developed in Week 8, integrating feedback and applying the digital skills and collaboration strategies learned throughout the course. The week emphasizes digital presentation skills, self-evaluation, and reflective practice, marking the transition from learning to demonstration and consolidation.

Students will showcase their project using tools such as Google Slides or PowerPoint, supported by cloud platforms (e.g., Drive, Teams). They will also complete a final reflective report, highlighting personal progress in digital competence, collaboration, and professional communication.

The experience of preparing and presenting digital work in a semi-formal setting mirrors the academic and professional reality of sports science—whether in coaching meetings, research seminars, or team debriefings.

Introductory Remarks

Being able to present your work clearly and confidently is an essential skill—not only in the classroom but also in professional environments such as sports teams, clinics, federations, and conferences. Whether you are pitching a training plan to a coach, explaining results to a physiotherapist, or leading a debrief after a tournament, presentation and reflection are vital communication tools.

This final week is designed to simulate that experience. You will present the group project you developed in Week 8, integrating feedback received during Week 9. You will practice organizing information, using visuals effectively, and speaking clearly about your contribution and learning journey. This is your opportunity to demonstrate how you've applied digital tools in a purposeful, meaningful way.

In parallel, you will complete a structured reflection on your progress, highlighting how your knowledge, skills, and attitudes have developed across the 10 weeks. You will consider how these digital competencies might support your academic studies, professional goals, or personal development in sports and beyond.

This final step not only consolidates your learning—it also reinforces a mindset of continuous improvement, lifelong learning, and digital responsibility, all of which are fundamental in the rapidly evolving field of sport and health sciences.

Lecture Objectives and Learning Outcomes

Knowledge



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- Describe the components of a successful presentation.
- Explain the purpose of reflection in digital learning.
- Justify best practices for presenting in professional environments

Skills

- Construct key ideas into a coherent digital presentation.
- Display ideas clearly using visual and verbal techniques.
- Design a structured reflective report on learning experience.

Attitudes

- Discuss work confidently and responsibly to an audience.
- Challenge personal growth and areas for future development.
- Demonstrate ownership of digital competence progress.

Keywords

Presentation, reflection, self-evaluation, digital competence, public speaking, confidence, improvement, digital showcase.

Bibliography

- Hensel, N., & Froese-Germain, B. (2020). *Digital Reflection and Self-Assessment in Collaborative Learning Environments. Active Learning in Higher Education*, 21(3), 213–226.
- Lucas, S. E. (2022). *The Art of Public Speaking* (14th ed.). McGraw-Hill Education.

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 14:35 The 3 Magic Ingredients of Amazing Presentations | Phil WAKNELL | TEDxSaclay
<https://www.youtube.com/watch?v=yoD8RMq2OkU>

Supplementary Material

- Final Presentation Planning Guide
- Reflective Report (based on Knowledge/Skills/Attitudes)

Exercises / Self-Assessment Activities



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- Activity 10.1: Deliver your final group presentation (5–7 minutes), either live or recorded, using digital tools.
- Activity 10.2: Complete and submit a structured reflective report, using the provided template.
- Activity 10.3: Complete a final self-assessment of your course journey, including confidence levels in key tools (Excel, Docs, Slides, Teams, etc.).

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 10	Reading	2-3
	Exercises / Self-Assessment Activities	6-8
	Digital Multimodal Educational Material	2-3
	Supplementary material review (optional)	1- 2
Total		10-14 hours



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Advanced Tech in Sports Course (10 ECTS)

Training Manual (Implementation Handbook) for Higher Education Instructors

1. Strategic Relevance to WP2 (SPIEP):

This course supports SPIEP's mission to equip sports science students, especially those with fewer opportunities, with high-level digital competencies that are increasingly required in sport, exercise, and health sciences. As a direct contribution to Work Package 2 (WP2), this course expands the SPIEP framework from basic to advanced technological literacy, supporting Activities A2.2 and A2.3 by designing learning pathways that enable students to critically apply and adapt advanced technologies in real-world sport contexts.

The Advanced Tech in Sports Course also prepares students for Activity A2.4 (Testing and Feedback Collection) by fostering self-reflection, group project development, and applied learning—all with an inclusive and approach that aligns with SPIEP's commitment to innovation and accessibility.

1.1 Description:

The Advanced Tech in Sports Course introduces students to the advanced use of digital technologies within sport, physical education, and exercise science environments. Building on foundational knowledge from the Basic Digital Tools Course, this course enables students to engage meaningfully with the tools, methods, and systems that shape the digital transformation of modern sports practice.

The course is structured around four core areas of competence: sensor technologies and wearables, performance analysis and visualisation, sport-specific data analytics and programming, and the integration of emerging technologies such as artificial intelligence (AI), augmented reality (AR), and virtual reality (VR) in sport-related contexts. Within these areas, students will examine the technical functionality, practical applications, and usability of various technologies in elite sports, educational settings, and grassroots initiatives.

Students will gain practical experience using athlete monitoring systems, GPS trackers, heart rate monitors, and movement sensors. They will also work with video and motion analysis platforms to examine performance, as well as create interactive dashboards and visual reports to support coaching decisions and athlete development. Through guided activities, students will learn how to interpret and present data effectively to automate sport-specific analysis workflows.



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2. Course Outline

Course Information	
Mode of Delivery:	Asynchronous online learning
Course Title:	Advanced Tech in Sports
Credits (ECTS):	10 (Equivalent to 250 hours of total student workload)

Main Content
The Advanced Tech in Sports Course is a 13-week course designed to build advanced technological competence in sports science students. It introduces them to four key areas: wearable sensor technologies, performance and movement analysis, sports data analytics and digital workflows, and emerging digital innovations including AI, AR, and VR. Students will work with real and simulated tools used in contemporary sport contexts, including GPS trackers, video feedback systems, and accessible programming environments. Each week presents a structured blend of theory and practice, where students examine the use, function, and value of each technology while applying them in context-based learning activities. Assignments challenge students to analyse data, automate basic workflows, or produce visual outputs that support coaching or decision-making. The course concludes with a final exam assessing students' ability to analyse, apply, and critically evaluate sport technologies across real-world scenarios. This summative evaluation ensures students can demonstrate both conceptual understanding and applied competencies relevant to high-performance and grassroots sports contexts.

Learning Objectives of the course
Upon successful completion of this course, students will be able to: • Demonstrate a comprehensive understanding of the applications of new motion analysis technologies specific to sports and exercise medicine. • Evaluate the role of applications and wearable devices in monitoring athletes and data-driven health interventions. • Design strategies for integrating wearable technologies into athlete training programs and the well-being of free exercisers, respectively. • Analyse the impact of virtual reality and augmented reality on sports training, injury rehabilitation, performance analysis, and improvement. • Apply performance analysis tools to interpret and enhance athlete performance in various sports. • Utilise advanced statistical methods and analyses for data-driven decision-making in sports.



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- Evaluate the effectiveness of machine learning models in predicting athlete performance, analysing motion in exercise and sports, and managing the risk of injuries.

Learning Outcome	Dimension	Mapped Descriptor	Justification
Demonstrate a comprehensive understanding of the applications of new motion analysis technologies specific to sports and exercise medicine.	Skills	Apply a range of cognitive and practical skills to analyse and interpret motion analysis outputs.	Students assess motion data using video tools to make decisions.
	Knowledge	Broad knowledge of motion technologies and movement science.	Demonstrates understanding of kinematic variables, tools, and sport applications.
	Responsibility & Autonomy	Take responsibility for tool selection and assessment reliability.	Students critically choose and justify their motion analysis approach.
Evaluate the role of applications and wearable devices in monitoring athletes and data-driven health interventions.	Skills	Select and apply digital health monitoring tools.	Students analyse biometric feedback through digital means.
	Knowledge	Understand principles of athlete monitoring and health metrics.	Students interpret heart rate, load, recovery, and GPS data.
	Responsibility & Autonomy	Demonstrate autonomy in interpreting health-related sport data.	Encourages responsible use and ethical handling of sensitive information.
Design strategies for integrating wearable technologies into athlete training programs and the well-being of free exercisers.	Skills	Develop practical training strategies supported by wearables.	Students design context-sensitive plans.



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	Knowledge	Understand metrics captured by wearables and their implications.	Builds insight into exercise physiology and feedback loops.
	Responsibility & Autonomy	Adapt tech solutions based on population needs.	Students tailor approaches for athletes and the general population.
Analyse the impact of virtual reality and augmented reality on sports training, injury rehabilitation, performance analysis, and improvement.	Skills	Use digital immersive tools to simulate learning and rehab.	Students assess VR/AR effectiveness in motor skill acquisition.
	Knowledge	Understand the theoretical framework of immersive learning.	Covers simulation fidelity, realism, and motor representation.
	Responsibility & Autonomy	Evaluate when and where immersive tech is appropriate.	Students consider access, usability, and intended user outcomes.
Apply performance analysis tools to interpret and enhance athlete performance.	Skills	Operate motion capture or tagging software in sport settings.	Students perform notational/tactical assessments.
	Knowledge	Understand sport performance metrics and biomechanical indicators.	Encourages comprehension of efficiency, output, and movement quality.
	Responsibility & Autonomy	Lead small analyses and report findings responsibly.	Students explain decision-making and justify interventions.
Utilise advanced statistical methods and analyses for data-driven decision-making in sports.	Skills	Execute descriptive and inferential statistical tests.	Students summarise performance findings clearly.



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	Knowledge	Understand variance, correlation, and hypothesis testing in sport.	Solid foundation for evidence-based sport performance.
	Responsibility & Autonomy	Communicate insights to stakeholders effectively.	Encourages interpretation and reporting to coaches/teams.
Evaluate machine learning models in predicting athlete performance, analysing motion, and managing injury risk.	Skills	Critically assess outputs from automated models.	Students examine accuracy and false positives in sport data.
	Knowledge	Understand machine learning types and feature selection.	Includes regression, classification, and model training basics.
	Responsibility & Autonomy	Reflect on fairness, transparency, and model trust.	Supports responsible AI integration in sport context

Suggested Textbooks | References

- The suggested textbooks and references can be found in each week/unit

Additional Readings (Optional)

- The additional readings can be found in each week/unit

Weekly Breakdown

Week	Topic
1	Introduction to technology in sports and human motion science
2	Wearable Tracking Devices and Athlete Monitoring Systems
3	Applications of virtual and augmented reality in sport science
4	Foundations of sports performance analysis
5	Athlete profiling using sport analytics tools
6	Conducting research in performance analysis



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7	Roles and tools of the applied performance analyst
8	Training load management and athlete health monitoring
9	Tools and environments for applied data analysis in sport
10	Machine learning fundamentals in exercise and sports contexts
11	AI applications in performance prediction and rehabilitation
12	Interpreting and evaluating AI outputs in sport science
13	Final exam preparation and synthesis of course concepts

Assessment Methods	
Description	Percentage
Weekly Educational Activities	15%
Assignment 1	15%
Assignment 2	20%
Final exam	50%



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Week 1: Introduction to Technology in Sports and Human Motion Science

Summary

This week introduces students to the growing role of digital technologies in sport science and physical activity. It offers a foundational understanding of how digital tools have transformed the way athletes train, recover, and perform. Students explore the evolution of sport technologies—especially those related to human motion analysis—and reflect on how these tools enhance decision-making and performance across elite and grassroots contexts.

Introductory Remarks

The integration of technology into the world of sport has transformed everything from performance analytics to injury rehabilitation. In the 21st century, sports professionals rely not only on traditional coaching methods but also on a growing ecosystem of digital tools. These range from simple mobile apps used to record training progress to complex systems that combine motion sensors, AI algorithms, and biomechanical analysis.

This week's lecture introduces students to the major categories of digital technologies used in sport, with a focus on tools that measure or respond to human movement. We begin with an overview of the historical development of technology in sport and how this has led to new ways of observing, quantifying, and enhancing performance. The rise of smart textiles, wearable sensors, and AI-assisted movement capture has dramatically reshaped the ability of sport professionals to design individualized programmes and monitor progress in real time.

A second key focus of this week is on human motion science, which underpins how digital systems capture data related to kinematics (movement), kinetics (force), and coordination. Understanding the science behind human motion is essential for interpreting digital data accurately and responsibly.

As we introduce these technologies, we also consider issues of accessibility, inclusion, and cost. Not all sporting environments have equal access to advanced tools, and students will be invited to reflect on how digital solutions can be adapted for low-resource or community-based settings. By the end of the week, students will be able to identify key categories of sport technology, describe their functions, and critically reflect on their personal relationship to digital innovation in sport.



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Lecture Objectives and Learning Outcomes

Knowledge:

- Apply an understanding of the types, functions, and evolution of sport technologies.
- Explain basic biomechanical terms and concepts used in motion analysis.
- Justify how digital skills support learning, communication, and data analysis.

Skills:

- Dissect technologies based on use cases (e.g. monitoring, analysis, feedback).
- Arrange common movement data types (e.g. velocity, acceleration, joint angles).
- Build a digital readiness checklist and identify strengths and gaps

Attitudes:

- Judge on the societal and ethical implications of digital innovation in sport.
- Demonstrate awareness of the importance of accuracy and context in interpreting human movement digitally.
- Question personal goals for engaging with digital tools in a responsible and inclusive way.

Keywords

Sport technology, digital innovation, human motion, movement science, wearables, inclusion, biomechanics, data literacy

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<https://doi.org/10.1155/2021/6676297>
- Bartlett, R. (2023). *Introduction to Sports Biomechanics: Analysing Human Movement Patterns* (4th ed.). Routledge.
- Nalbant, K. G. & Aydin S. (2022). Literature review on the relationship between Artificial Intelligence Technologies with Digital Sports Marketing and Sports Management. *Indonesian Journal of Sport Management*, 2(2), 135-143.
<https://doi.org/10.31949/ijism.v2i2.2876>
- **Powell, D., & Williams, S. (2022). *Wearable Technology and Performance Measurement in Sports*. Springer.**



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Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 44:44 The Digital Future of Sport
<https://www.youtube.com/watch?v=osNtpsBR-4I>
- Duration: 37:46 Science & Technology Innovation and Sports Performance Developments
<https://www.youtube.com/watch?v=6o-CzwSjMMg>

Supplementary Material

- Anderson, T., & Peters, J. (2020). *Human Movement Science and Sport Technology Integration*. Elsevier.

Exercises / Self-Assessment Activities

- Activity 1.1: Comparative Analysis Reflection:
- Write a short reflective piece (250–300 words) comparing how technology is used in elite vs. grassroots sports. Consider access, affordability, and intended outcomes. How might your role as a future sport scientist help bridge this gap?
- Activity 1.2: Self-Assessment:
- Digital Confidence in Sport: Complete a structured self-assessment checklist (provided by the instructor or LMS) evaluating your current confidence level in using digital tools for:
 - Data recording and analysis
 - Research and decision-making
- Use a Likert scale (1–5), and conclude with a short paragraph setting one personal learning goal for the course.
- Activity 1.3: Group Forum Discussion:
- Topic: What role should technology play in coaching and training? Post your opinion and respond to at least two peers, using real-world examples.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 1	Reading	5-6



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	Digital Multimodal Educational Material	4-5
	Exercises / Self-Assessment Activities	5-8
	Supplementary material review (optional)	1- 2
Total		14-19 hours



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Week 2: Wearable Tracking Devices and Athlete Monitoring Systems

Summary

This week focuses on understanding how wearable technology is used in sport to monitor athlete performance, wellness, and recovery. Students explore key categories of wearable devices such as GPS units, heart rate monitors, accelerometers, and smartwatches. Emphasis is placed on how these tools are used to gather performance and physiological data, support data-driven training decisions, and inform individualized coaching strategies. Students also reflect on practical challenges in implementation, such as accuracy, data overload, and ethical considerations.

Introductory Remarks

Wearable technology has revolutionised the way sport professionals track and assess athlete performance. These devices—whether strapped to the wrist, embedded in garments, or worn on the chest—can now provide a stream of physiological and biomechanical data in real time. Coaches and sport scientists increasingly rely on wearable tools to monitor heart rate variability, distance covered, running speed, player load, sleep patterns, and even stress levels. This digital feedback loop empowers professionals to personalize training plans, manage fatigue, detect signs of overtraining, and support injury prevention strategies.

In this week, students will explore the functional principles of different wearable tracking devices, from GPS-based location systems to movement sensors and biofeedback monitors. Case studies will highlight the use of these devices in professional sports environments such as football, athletics, and endurance training. Attention is also paid to the growing availability of wearables for recreational athletes, and how health-focused tracking is now influencing public engagement with sport and fitness.

Critical reflection is encouraged on issues such as user compliance, data privacy, reliability, and access disparities. Students will examine the value of the data collected and how it informs decision-making in practice. Through practical exercises, they will engage with sample datasets to draw performance insights and consider how wearable technology can be integrated ethically and effectively across different sport levels.

Lecture Objectives and Learning Outcomes



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Knowledge:

- Define key metrics used in athlete load and recovery monitoring.
- Judge the social and contextual factors influencing adoption.
- Explain basic wearable data to identify patterns in physical performance.

Skills:

- Arrange key performance indicators measured by wearables.
- Display wearable systems (e.g., GPS, HRM, accelerometry) by function.
- Evaluate the feasibility and cost-benefit of integrating wearables in various sport settings.

Attitudes:

- Challenge on ethical implications and responsible use of personal performance data.
- Integrate responsibility for evaluating data relevance and communicating insights effectively.
- Demonstrate openness to inclusive and ethical sport tech applications.

Keywords

Wearables, athlete monitoring, GPS tracking, heart rate monitoring, load management, sport science data, ethical data use

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Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos



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- Duration 12:09 Why Team Sports NEED Load Monitoring
<https://www.youtube.com/watch?v=HoeiGmqbJgE>
- Duration 6:24 In Focus | AIS | Athlete Management System: Innovation in Sport
<https://www.youtube.com/watch?v=eljNfPm5ds4>

Supplementary Material

- Han Z. Using adaptive wireless transmission of wearable sensor device for target heart rate monitoring of sports information. *IEEE Sensors Journal*. 2020; 21.22: 25027-25034. doi: 10.1109/JSEN.2020.3034434
<https://sci-hub.se/downloads/2021-05-16/4b/han2020.pdf>
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<https://doi.org/10.3389/fspor.2023.1284086>

Exercises / Self-Assessment Activities

- Activity 2.1: Technology Comparison Grid:
- Create a comparison chart outlining at least four wearable devices used in sport. Include details on data type, placement on the body, strengths, limitations, and sport-specific examples.
- Activity 2.2: Data Interpretation Scenario:
- Given a set of sample athlete tracking data (e.g., heart rate zones, player load, sprint counts), summarize key performance trends. Write a short 300-word report offering three practical recommendations for a coach.
- Data recording and analysis
- Research and decision-making
- Use a Likert scale (1–5), and conclude with a short paragraph setting one personal learning goal for the course.
- Activity 2.3 – Group Forum Discussion
- Do wearable technologies empower athletes or risk reducing them to numbers? Engage in a structured forum debate and respond to at least two peers.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 2	Reading	4-5



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	Digital Multimodal Educational Material	3-5
	Exercises / Self-Assessment Activities	7-10
	Supplementary material review (optional)	1- 2
Total		14-20 hours



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Week 3: Applications of Virtual and Augmented Reality in Sport Science

Summary

This week explores how Virtual Reality (VR) and Augmented Reality (AR) technologies are transforming the fields of sport training, performance enhancement, and rehabilitation. Students will gain a foundational understanding of how these immersive environments are designed, implemented, and evaluated in athletic contexts. They will explore the difference between VR and AR, identify use cases, and critically assess the value, accessibility, and effectiveness of immersive tools in different sports and populations.

Introductory Remarks

Virtual and Augmented Reality technologies are no longer futuristic concepts—they are now integrated into various aspects of athlete development and sports training. Virtual Reality (VR) typically involves the complete immersion of an athlete or participant in a simulated digital environment, allowing them to rehearse motor skills, visualise game scenarios, or re-experience specific competition moments in a controlled, repeatable setting. Augmented Reality (AR), on the other hand, overlays digital content onto the physical world, offering real-time feedback or guidance without removing the athlete from their training environment.

This week introduces students to the theoretical and practical foundations of immersive learning in sport. In VR environments, players can engage in decision-making drills, mental preparation routines, and even simulate injury scenarios to improve resilience. AR applications, such as smart glasses or motion projection systems, are increasingly used in real-time coaching to correct form, reinforce tactics, or personalise instruction.

Students will explore how VR/AR are applied in both elite athlete settings and grassroots rehabilitation contexts. For example, immersive simulations are used to support recovery from injury by encouraging precise movement patterns in a safe and gamified space. In learning environments, they enable kinaesthetic and visual students to engage more deeply with technical and tactical content.

However, not all athletes or organisations have access to these technologies, and there are growing concerns around user dependency, cost, and psychological side effects such as disorientation or simulation fatigue. Students will reflect on these limitations and propose responsible ways to integrate immersive tools based on user needs, learning outcomes, and resource availability.



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Lecture Objectives and Learning Outcomes

Knowledge:

- Define the characteristics, functions, and technical distinctions between immersive technologies.
- Identify key design and usability factors (e.g. interface, feedback, realism).
- Explain the learning and recovery principles supported by immersive media.

Skills:

- Display relevant VR/AR use cases in coaching, training, or rehabilitation.
- Critically use evidence-based studies on VR/AR use in performance or recovery.
- Sketch a simple concept or use case describing VR/AR implementation.

Attitudes:

- Follow ethical and inclusive considerations in the implementation of immersive tools.
- Demonstrate sensitivity to the needs of different users (e.g. youth, injured athletes) when recommending immersive solutions.
- Discuss cost, accessibility, and transfer of learning when designing immersive experiences.

Keywords

Virtual Reality, Augmented Reality, immersive learning, simulation, real-time feedback, motor learning, user accessibility, coaching innovation

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Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 05:08 Game Changing Tech: VR and AR in Sports Training & Rehabilitation
<https://www.youtube.com/watch?v=Cj0b-5G1dJo>
- Duration 09:41 Exclusive Talk Sessions | DreamWall | Enhancing Visibility and Reducing Cost with #AR in Sports
https://www.youtube.com/watch?v=B_eAlYIWRe4

Supplementary Material

- Vinolo Gil, M. J., Gonzalez-Medina, G., Lucena-Anton, D., Perez-Cabezas, V., Ruiz-Molinero, M. D. C., & Martín-Valero, R. (2021). Augmented Reality in Physical Therapy: Systematic Review and Meta-analysis. *JMIR serious games*, 9(4), e30985. <https://doi.org/10.2196/30985>
- The Growing Role of Augmented Reality and Virtual Reality in Sports
<https://barcainnovationhub.fcbarcelona.com/blog/the-growing-role-of-augmented-reality-and-virtual-reality-in-sports/>

Exercises / Self-Assessment Activities

- Activity 3.1: Application Scenario Design:
Create a concept for a VR or AR application in a sport of your choice. Describe the user, intended outcome (e.g., motor learning, rehab, performance enhancement), and how the experience is delivered. Keep your scenario to 300–400 words.
- Activity 3.2: Evidence Review Table:
Summarise at least two peer-reviewed articles or reports that describe the use of VR or AR in sport. Create a comparative table including aim, sport, user group, tech used, outcomes, and limitations.
- Activity 3.3: Group Forum Discussion:
Prompt: Do immersive technologies give athletes a cognitive edge—or could they interfere with natural learning? Discuss with reference to at least one case study or article. Respond to two peers with reasoned counterpoints or supporting examples.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 3	Reading	5-6



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	Digital Multimodal Educational Material	5-6
	Exercises / Self-Assessment Activities	7-10
	Supplementary material review (optional)	1-2
Total		17-22 hours



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Week 4: Foundation of Sports Performance Analysis

Summary

In this week, students are introduced to the foundational concepts of sports performance analysis. They explore how data from training and competition is collected, analysed, and used to improve individual and team performance. The week emphasises the theoretical and practical basis for analysing tactical, technical, physiological, and psychological performance indicators, setting the stage for deeper exploration in subsequent weeks.

Introductory Remarks

Sports performance analysis is a rapidly growing field that combines observation, data science, and applied sport knowledge to support coaches and athletes in optimising performance. Whether in football, athletics, swimming, or gymnastics, performance analysis provides structured insights into how an athlete moves, behaves, and reacts within training and competitive environments.

This week, students will learn about the origins and principles of performance analysis, including notational analysis, key performance indicators (KPIs), and the role of context (e.g., opponent type, match status, phase of play). These concepts help sport scientists move beyond subjective impressions toward objective, data-supported decisions.

Finally, students are encouraged to critically reflect on the human element behind the numbers. While performance data may appear objective, interpretation requires contextual sport knowledge, critical thinking, and a commitment to ethical application. This lecture forms the base for next weeks, where students will develop applied analyst competencies.

Lecture Objectives and Learning Outcomes

Knowledge:

- Identify key tools and techniques used in sport-specific analysis (manual tagging, video analysis, tracking software).
- Analyse short video clips and identify performance behaviours using basic tagging methods.
- Analyse how tactical and technical data inform feedback and planning.

Skills:

- Use and operate common performance metrics across different sport types.



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- Connect analytical findings to actionable suggestions.
- Perform notational analysis, KPIs, and observational frameworks.

Attitudes:

- Demonstrate a responsible approach to interpreting data in a way that supports athlete development.
- Challenge the limitations and biases in different analysis approaches.
- Follow evidence-based communication between analysts, coaches, and athletes.

Keywords

Performance indicators, notational analysis, tagging, observational analysis, tactical data, KPI, sports analysis tools, context-based interpretation

Bibliography

- Xu, X., Zhao, Q., Yang, T., & Liu, X. (2025). Sports information processing and physiological condition monitoring system based on multimedia computer. *Molecular & Cellular Biomechanics*, 22, 994. <https://doi.org/10.62617/mcb994>
- Exel, J., & Dabnichki, P. (2024). Precision Sports Science: What Is Next for Data Analytics for Athlete Performance and Well-Being Optimization? *Applied Sciences*, 14(8), 3361. <https://doi.org/10.3390/app14083361>
- Bai, Zhongbo, Bai, Xiaomei, Sports Big Data: Management, Analysis, Applications, and Challenges, *Complexity*, 2021, 6676297, 11 pages, 2021. <https://doi.org/10.1155/2021/6676297>
- Bhatnagar, R., & Babbar, M. (2019). *A systematic review of sports analytics*. https://www.researchgate.net/publication/332406802_A_systematic_review_of_sports_analytics

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 12:16 What is performance analysis?
<https://www.youtube.com/watch?v=-CLYLvUU4Fw>
- Duration 12:55 Sports Performance Testing Checklist | Do This BEFORE You Test Your Athletes
<https://www.youtube.com/watch?v=4gFDSa32jnk>



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Supplementary Material

- The Business Opportunities and Challenges of Implementing Analytics in Sports
<https://appinventiv.com/blog/data-analytics-in-sports-industry/>
- Sports Performance Analysis
<https://uksportsinstitute.co.uk/service/performance-analysis/>
- Leaders: How the EIS's Performance Analysis Team is supporting athletes
<https://uksportsinstitute.co.uk/resource/leaders-how-the-eiss-performance-analysis-team-is-supporting-athletes/>
- What is Performance Analysis in Elite Sports?
<https://www.catapult.com/blog/elite-sports-performance-analysis>

Exercises / Self-Assessment Activities

- Activity 4.1: Case-Based Scenario - Athlete Performance Profile (Assignment-Part A)
- Select an athlete and create his/her performance profile template using 5–6 relevant KPIs (e.g., reaction time, pass accuracy, sprint count, fatigue index). Include a rationale for each indicator and how it would inform feedback. Submit your template with a 200-300-word explanation.
- Activity 4.2: Case-Based Scenario: Analyst for a Day ((Assignment-Part B)
- You have just joined the coaching team of the athlete you selected above and you have to prepare them for a regional tournament. The head coach asks you to identify what type of performance data should be collected, how it would be analysed, and what kind of visualisations could support coaching feedback. Write a 500-word action plan outlining your approach.
- Activity 4.3: Group Forum Discussion
Topic: Is performance analysis useful at grassroots level, or is it better suited for elite sport? Defend your position with a real example or article and respond to at least two classmates.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 4	Reading	4-6
	Digital Multimodal Educational Material	4-5



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	Exercises / Self-Assessment Activities	10-13
	Supplementary material review (optional)	1-2
Total		18-24 hours



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Week 5: Athlete Profiling Using Sport Analytics Tools

Summary

This week focuses on the design and application of athlete profiles using sport analytics tools. Students explore how performance indicators across physical, physiological, technical, and psychological domains can be integrated into a single profile to inform long-term development, periodisation, and individualised coaching. Emphasis is placed on using analytics software, dashboards, and visualisation methods to monitor trends, identify strengths and weaknesses, and support evidence-based decision-making in diverse sport contexts.

Introductory Remarks

The ability to construct a comprehensive athlete profile is central to performance planning in both elite and developmental sport settings. A well-structured profile goes beyond basic statistics—it integrates multidimensional data to support a holistic understanding of the athlete's status, potential, and training needs. This includes quantitative metrics such as VO_2 max or sprint speed, as well as qualitative insights such as tactical decision-making or recovery behaviour.

This week introduces students to athlete profiling methods, with a focus on selecting relevant indicators and presenting them in a format that is interpretable by coaches, athletes, and multidisciplinary support teams. Profiles may be developed using commercial or open-access analytics platforms, or constructed manually using spreadsheet software, depending on resource availability and context.

Students will review sample profiles and visualisation dashboards used in different sports and learn how to interpret trends over time, compare athlete benchmarks to normative values, and assess athlete readiness. Case studies will be used to show how athlete profiles guide return-to-play decisions, training periodisation, and psychological interventions.

Additionally, students will explore the ethical considerations in profiling—particularly the risk of over-classification, misinterpretation, or reinforcing biases in selection and development pathways. Students will be encouraged to consider how athlete profiles can be co-created with athletes and adapted to support long-term engagement, motivation, and fairness.

Lecture Objectives and Learning Outcomes

Knowledge:

- Analyse the multidimensional nature of performance profiling and its practical applications.
- Identify patterns, trends, and deviations across training phases or competition periods.
- Define common concerns (e.g., labelling effects, privacy, data reliability).



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Skills:

- Use relevant KPIs, organise them meaningfully, and present them in a clear format.
- Design basic analytics tools (e.g., Excel dashboards, tracking templates) to create visual summaries.
- Operate alternative approaches to profiling that promote inclusion and minimise bias.

Attitudes:

- Discuss the importance of transparency, collaboration, and equity in profiling processes.
- Justify critically on the use of data in making training, feedback, or selection decisions.
- Demonstrate ethical awareness in designing and using performance profiles.

Keywords

Athlete profile, KPIs, sport analytics, performance monitoring, benchmarking, dashboards, long-term athlete development, ethical profiling

Bibliography

- Palmer, B. L., van der Ploeg, G. E., Bourdon, P. C., Butler, S. R., & Crowther, R. G. (2023). Evaluation of Athlete Monitoring Tools across 10 Weeks of Elite Youth Basketball Training: An Explorative Study. *Sports (Basel, Switzerland)*, 11(2), 26. <https://doi.org/10.3390/sports11020026>
- Exel, J., & Dabnichki, P. (2024). Precision Sports Science: What Is Next for Data Analytics for Athlete Performance and Well-Being Optimization? *Applied Sciences*, 14(8), 3361. <https://doi.org/10.3390/app14083361>
- Xu, X., Zhao, Q., Yang, T., & Liu, X. (2025). Sports information processing and physiological condition monitoring system based on multimedia computer. *Molecular & Cellular Biomechanics*, 22, 994. <https://doi.org/10.62617/mcb994>

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 26:34 Profiling & Benchmarking in Sport | Essentials of Sport Science Live Lecture <https://www.youtube.com/watch?v=g-Yolyp4G6o>
- Duration 24:51 Determining Key Performance Indicators (KPIs) for Sport | Essentials of Sport Science Live Lecture 3



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https://www.youtube.com/watch?v=vvP_pJcOZT4&t=1314s

- Duration 07:35 Creating a Power Profile | Using Individualised Testing to Optimize Athletic Performance
<https://www.youtube.com/watch?v=BkrD27u6WX0>

Supplementary Material

- Ferraz, A., Duarte-Mendes, P., Sarmento, H., Valente-Dos-Santos, J., & Travassos, B. (2023). Tracking devices and physical performance analysis in team sports: a comprehensive framework for research-trends and future directions. *Frontiers in sports and active living*, 5, 1284086.
<https://doi.org/10.3389/fspor.2023.1284086>
- Davidson, T. K., Barrett, S., Toner, J., & Towlson, C. (2024). Professional soccer practitioners' perceptions of using performance analysis technology to monitor technical and tactical player characteristics within an academy environment: A category 1 club case study. *PLOS ONE*, 19(3), e0298346.
<https://doi.org/10.1371/journal.pone.0298346>

Exercises / Self-Assessment Activities

- Activity 5.1: Interactive Template Practice
Athlete Profiling Dashboard-Build your own excel template and input a fictional dataset for an individual athlete. Use the dashboard tools (e.g., radar chart, conditional formatting) to visualise the athlete's performance across five dimensions. Upload a screenshot of your visualisation with brief notes (150–200 words) explaining what the chart shows.
- Activity 5.2: Reflection Journal:
Interpreting Athlete Data Ethically -Write a short journal entry (300 words) reflecting on how profiling data could affect the athlete's motivation, self-perception, or opportunities. How can performance analysts ensure that profiles are used constructively and not as rigid labels?
- Activity 5.3: Group Forum Discussion
Exchange your athlete profile (from Activity 5.1) with a classmate. Review their profile and leave one piece of constructive feedback on:
 - Indicator selection
 - Visual clarity
 - Relevance to the athlete's context

Recommended Time of Student Involvement



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Week	Activity Description	Hours of Student Involvement
Week 5	Reading	4-6
	Digital Multimodal Educational Material	5-6
	Exercises / Self-Assessment Activities	10-12
	Supplementary material review (optional)	1-2
Total		21-24 hours



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Week 6: Conducting Research in Performance Analysis

Summary

This week introduces students to the principles and methodologies of conducting applied research in performance analysis. Students will explore how data collection, study design, and interpretation are used to evaluate athlete performance in a systematic and evidence-based manner. Emphasis is placed on small-scale sport-specific investigations, with practical guidance on how to plan, conduct, and present analysis-based research in a way that supports athlete development and professional reflection.

Introductory Remarks

Performance analysis is not only a coaching tool. It is also a foundation for applied research in sport. Whether the goal is to evaluate the effectiveness of a training intervention, compare tactical behaviours, or monitor changes in athlete performance over time, research in performance analysis helps validate practice and inform future decisions.

This week introduces students to the research process, including how to ask meaningful questions, design data collection methods, and analyse performance outcomes. Unlike traditional laboratory studies, performance analysis research is often situated in real sport environments. It requires thoughtful adaptation of methods, ethical awareness, and the ability to manage variables in dynamic field settings.

Students will review examples of real-world performance analysis projects, from match analysis case studies to single-subject designs used in athlete monitoring. They will explore the types of data commonly collected (e.g., technical actions, physical metrics, tactical patterns), and how these are analysed using both descriptive and comparative methods.

Importantly, this week encourages students to think of themselves as practitioner-researchers. Whether working as coaches, analysts, or support staff, the ability to ask questions, gather evidence, and share findings is central to reflective practice and continuous improvement in sport settings.

Lecture Objectives and Learning Outcomes

Knowledge:

- Identify the stages of a research cycle (problem formulation, design, data collection, analysis, reporting).
- Apply common metrics and formats used in descriptive and inferential analysis.
- Recommend elements of research structure: aim, hypothesis, method, expected outcome.



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Skills:

- Adapt simple research questions and select appropriate methods for sport-specific inquiry.
- Use tools (software and devices) to structure and evaluate performance outcomes.
- Sketch a clear, concise plan for an applied performance analysis project.

Attitudes:

- Discuss ethical conduct in sport research contexts.
- Demonstrate critical thinking in interpreting data trends and considering study limitations.
- Follow autonomy in designing ethically sound and practically useful investigations.

Keywords

Applied research, performance analysis, field study, research question, data collection, ethics, reflective practice, practitioner-researcher

Bibliography

- Carson, H.J., & Collins, D. (2023). Practitioner-researcher approaches to applied sports performance analysis: Bridging theory and practice. *International Journal of Sports Science & Coaching*, 18(2), 267–279.
- Rajšp, A., & Fister, I., Jr. (2020). A Systematic Literature Review of Intelligent Data Analysis Methods for Smart Sport Training. *Applied Sciences*, 10(9), 3013. <https://doi.org/10.3390/app10093013>
- Taylor, J.B., et al. (2022). Designing and implementing small-scale athlete monitoring studies: Practical and ethical considerations. *Sports Medicine*, 52(4), 623–638.
- Wilson, M., & Nance, M. (2023). Use of technology and data analytics in evaluating tactical performance in team sports. *Journal of Performance Analysis in Sport*, 23(1), 45–59.

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 11:43 Sport Science AI: Review Research Faster
<https://www.youtube.com/watch?v=EZWkoF6eZW0>
- Duration: 12:10 From Instincts to Science: How Data Analytics are Revolutionizing sports
<https://www.youtube.com/watch?v=wC-KnGHHSWQ>
- Duration: 11:58 The math behind basketball's wildest moves (TED Talk)



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Supplementary Material

- Blake, R., & Mitchell, J. (2021). Ethical challenges in performance analysis research: Protecting athlete welfare and data integrity. *Ethics in Sport Science*, 13(1), 56–72.
- British Association of Sport and Exercise Sciences (BASES) (2023). *Guidelines for Ethical Conduct and Data Management in Applied Sport Research*.
- International Society of Performance Analysis of Sport (ISPAS) (2022). *Standards for Performance Analysis Methodology and Reporting*.
- Marquina, M., Lozano, D., García-Sánchez, C., Sánchez-López, S., & de la Rubia, A. (2023). Development and Validation of an Observational Game Analysis Tool with Artificial Intelligence for Handball: Handball.ai. *Sensors*, 23(15), 6714. <https://doi.org/10.3390/s23156714>

Exercises / Self-Assessment Activities

- Activity 6.1: Research Design Workshop
Individual Submission/ *This activity will assist in the development of individual assignment for week 8:* Develop a short research proposal (300–500 words) for a performance analysis project based on a sport-specific question (e.g., “How effective is a new passing drill in reducing turnovers?”). Include aim, participants, data collection method, ethical considerations, and expected outcome.
- Activity 6.2: Video-Based Data Extraction Practice
Watch a brief match/training video segment. Using the tagging sheet provided, extract relevant performance events (e.g., passes completed, time in possession, defensive errors). Submit your coded data with a 150-word summary of what the data might suggest.
- Activity 6.3: Forum Discussion
Topic: What makes a performance question “researchable” in sport? Post your opinion and give an example from your sport or interest area. Respond to at least two peers by refining their question or suggesting data sources.

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 6	Reading	8-10



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	Digital Multimodal Educational Material	5-6
	Exercises / Self-Assessment Activities	10-12
	Supplementary material review (optional)	1-2
Total		23-28 hours



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Week 7: Roles and Tools of the Applied Performance Analyst

Summary

This week explores the real-world responsibilities and workflows of applied performance analysts in sports organisations. Students are introduced to the tools, practices, and professional behaviours that define the role (from match preparation and live coding to post-performance reporting) and communication with coaching staff. Emphasis is placed on data storytelling, interdisciplinary collaboration, and the use of analysis tools in high-pressure, time-sensitive environments.

Introductory Remarks

Performance analysts are no longer optional members of high-performance environment. They are critical contributors to training design, tactical planning, injury prevention, and talent development. But what does their job look like on a day-to-day basis?

This lecture presents a comprehensive overview of the applied performance analyst's role, focusing on tasks performed before, during, and after training or competition. Students will learn how analysts work with coaches and support teams to deliver relevant, timely, and digestible insights. From capturing real-time data on match day to generating post-game reports, their role blends technical skill with sport-specific knowledge, communication, and adaptability.

A major focus this week is on the tools used in practice. These may include video tagging software, data visualisation platforms, and performance management systems. Students will get hands-on exposure to sample dashboards and visual tools, learning how to transform raw data into coaching insights.

The week also examines how analysts must adapt based on the setting (elite vs grassroots, team vs individual sports) and manage expectations, ethical responsibilities, and limited resources. Students will consider how applied analysts make decisions under pressure, balance technology with intuition, and collaborate to support athlete-centred practice.

Lecture Objectives and Learning Outcomes

Knowledge:

- Justify the role across sport settings and performance levels.
- Recommend key functions of software and hardware in applied analysis.
- Apply principles of visual and verbal data communication.



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Skills:

- Design common workflows (e.g. video review, report preparation, pre-match analysis).
- Adapt the most appropriate tool for a scenario and justify your choice.
- Sketch a short insight summary or visual report suitable for a coach.

Attitudes:

- Justify the professional and ethical responsibilities of the analyst.
- Demonstrate critical awareness of tool limitations and context-based decision-making.
- Discuss the importance of clarity, timing, and tone when providing feedback.

Keywords

Applied analyst, workflow, match preparation, live coding, post-match report, dashboards, communication, decision-making, coaching collaboration

Bibliography

- Martindale, R.J.J., & Collins, D. (2023). *The Applied Sports Analyst: Practical Skills for Performance Analysis in High-Performance Sport*. Routledge.
- Rajšp, A., & Fister, I., Jr. (2020). A Systematic Literature Review of Intelligent Data Analysis Methods for Smart Sport Training. *Applied Sciences*, 10(9), 3013. <https://doi.org/10.3390/app10093013>
- Silva, J. E., Clemente, F. M., Conte, D., Figueiredo, T., Pinho, J., Sampaio, J., & Bezerra, N. (2023). Tracking devices and physical performance analysis in team sports: a comprehensive framework for research—trends and future directions. *Frontiers in Sports and Active Living*, 5, 1284086. <https://doi.org/10.3389/fspor.2023.1284086>

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration: 29:10 Podcast
[Podcast: 9. Stat Attack: Performance Data - UK Sports Institute](#)
- Duration: 4:40 TED Talk
[The power of AI and data in sports | Yash Gupta | TEDxMorris Knolls HS](#)



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Supplementary Material

- Hughes, M., & Bartlett, R. (2023). Applied performance analysis: Role definition and evolving tools in elite sports environments. *International Journal of Performance Analysis in Sport*, 23(2), 218–232.
- International Society of Performance Analysis of Sport (ISPAS) (2023). *Code of Ethics and Professional Standards for Performance Analysts*.
- UK Sport (2022). *Performance Analysis Framework and Tools Overview*.
- Walker, R., & Mitchell, H. (2020). Ethical considerations in performance analysis: Balancing technology, pressure, and athlete welfare. *Ethics in Sport Science*, 14(1), 80–92.

Exercises / Self-Assessment Activities

- Activity 7.1: Workflow Mapping Task
Based on what you've learned, map out the typical workflow of a performance analyst in your chosen sport (before, during, and after a game or session). Use a timeline, flowchart, or visual format. Accompany your graphic with a 300-word narrative explaining each phase and key responsibilities.
- Activity 7.2: Scenario Simulation – Selecting a Tool
You are asked to support a coach preparing for a crucial match. Based on the team's needs, select one analysis tool and explain (in 350–400 words) why you chose it, how you would use it, and what outcome it supports. Submit your response along with a screenshot or mock-up of what your report/dashboard might include.
- Activity 7.3: Forum Discussion
Topic: Is the performance analyst a coach, a technician, or something in between?

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 7	Reading	6-8
	Digital Multimodal Educational Material	5-6
	Exercises / Self-Assessment Activities	8-12
	Supplementary material review (optional)	1-2
Total		19-24 hours



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Week 8: Training Load Management and Athlete Health Monitoring

Summary

This week examines how sport professionals use digital tools to monitor training load and athlete well-being. Students will explore the principles of internal and external load, learn how data is collected and interpreted, and understand how insights from load monitoring can support performance planning and injury prevention. Real-world case examples will be used to demonstrate how practitioners manage risk, adapt training, and track recovery using a combination of technology and informed judgement.

Introductory Remarks

In elite and developmental sport alike, training load management is a key factor in enhancing performance while minimising injury risk. When athletes train too little, they underperform. When they train too much without proper recovery, they are more likely to become fatigued, plateau, or suffer overuse injuries. Monitoring training load provides a structured way to find the balance between stress and adaptation.

This unit introduces students to the key concepts of external load (e.g. distance run, number of accelerations) and internal load (e.g. heart rate, rate of perceived exertion). These variables are monitored using wearable technology, GPS systems, heart rate monitors, and mobile survey tools. Students will learn to distinguish between acute vs chronic load, understand the importance of training monotony and strain, and explore how these metrics can be visualised to inform coaching decisions.

Students will also examine how subjective measures (like sleep quality, mood, and soreness) are increasingly used alongside objective data to provide a holistic picture of athlete well-being. Ethical questions around data ownership, privacy, and psychological burden will be discussed, with an emphasis on how to involve athletes in conversations about their own data.

By the end of the week, learners will be able to interpret training load reports, identify warning signs of maladaptation, and propose appropriate responses using the tools and frameworks introduced throughout the course.

Lecture Objectives and Learning Outcomes

Knowledge:

- Define internal and external load, and identify technologies used for their measurement.



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- Describe concepts such as acute: chronic workload ratio, monotony, and training strain.
- Judge constraints in low-resource sports settings (e.g., lack of wearable tech).

Skills:

- Arrange variables (e.g. total distance, heart rate variability) with relevant monitoring tools.
- Perform simplified datasets and identify patterns associated with elevated risk or poor recovery.
- Design a basic monitoring strategy using a mix of objective and subjective tools.

Attitudes:

- Justify the role of accurate monitoring in injury prevention and athlete welfare.
- Demonstrate ethical awareness in using load data without causing unnecessary stress or misinterpretation.
- Synthesise a flexible, athlete-centred approach to load tracking.

Keywords

Training load, internal vs external load, wellness monitoring, GPS, heart rate, sRPE, injury risk, workload ratio, athlete well-being

Bibliography

- Halson S. L. (2014). Monitoring training load to understand fatigue in athletes. *Sports medicine* (Auckland, N.Z.), 44 Suppl 2(Suppl 2), S139–S147.
<https://doi.org/10.1007/s40279-014-0253-z>
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<https://doi.org/10.3389/fpsyg.2024.1518468>

Digital Multimodal Educational Material



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- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 25:01 Longitudinal Training Load Management Using Firstbeat Sports | Firstbeat Sports Educational Series
<https://www.youtube.com/watch?v=AE0l2EjE1qo>
- Duration 41:28 Episode 19: Load Management and Injury Prevention
<https://www.youtube.com/watch?v=u7N7epo047E>

Supplementary Material

- Davidson TK, Barrett S, Toner J, Towlson C (2024) Professional soccer practitioners' perceptions of using performance analysis technology to monitor technical and tactical player characteristics within an academy environment: A category 1 club case study. *PLOS ONE* 19(3): e0298346.
<https://doi.org/10.1371/journal.pone.0298346>

Exercises / Self-Assessment Activities

- Activity 8.1: Load Monitoring Interpretation Task
Review a simplified training load report showing an athlete's weekly workload, RPE, and wellness responses. Write a 200-300-word summary identifying trends and suggesting possible coaching actions.
- Activity 8.2: Design Your Own Monitoring Plan
Based on your sport or area of interest, create a basic weekly monitoring strategy that includes both objective (e.g. GPS, heart rate) and subjective (e.g. mood, sleep) measures. Submit a 1-page plan with brief justifications for your selected variables.
- Activity 8.3: Assignment
Individual Work: Begin planning your Assignment 2 by identifying the topic focus (e.g. a case athlete, a profile + load tracking project, a performance analysis report). Prepare a 300-word outline summarising what you will analyse, what tools you will use, and what output you plan to produce. *Work from previous weeks can be included. Provide the Lecturer with you detailed summary in mid-Week 10.*
- Activity 8.4: Forum Discussion
Topic: Should athletes be given full access to their own load and wellness data?

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
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Week 8	Reading	5-6
	Digital Multimodal Educational Material	5-6
	Exercises / Self-Assessment Activities	14-19
	Supplementary material review (optional)	1-2
Total		24-31 hours



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Week 9: Tools and Environments for Applied Data Analysis in Sport

Summary

This week introduces students to practical data analysis tools and digital environments used in applied sport settings. The focus is on helping students organise, manipulate, and interpret athlete performance and health data using accessible platforms. The unit links previous learning on profiling, load monitoring, and performance indicators to structured data workflows, visualisation, and basic decision-making frameworks. It also serves as the starting point for Assignment 2.

Introductory Remarks

Data is an asset in sport, but only if it can be organised, interpreted, and communicated in a meaningful way. This week equips students with an overview of common data analysis tools used in applied sport contexts, including spreadsheet environments, dashboards, and cloud-based reporting systems. Emphasis is placed on using software and platforms that allow analysts, coaches, and support staff to evaluate performance over time and across training blocks.

This week reinforces the idea that data analysis doesn't require coding or high-end software. What matters is clarity, structure, and consistency in how information is collected and interpreted. Students will work with real-world datasets to practice data cleaning, transformation, and summary. They will also be encouraged to choose appropriate data visualisation formats (e.g. line charts, conditional formatting, traffic-light summaries) to communicate insights clearly to stakeholders.

Importantly, this week also launches Assignment 2, which requires students to draw on their knowledge and skills from Week 5 to Week 9 to produce an integrated performance analysis product. This could include athlete profiles, load monitoring strategies, ethical considerations, and visualised findings.

Lecture Objectives and Learning Outcomes

Knowledge:

- Analyse data organisation principles and performance metrics.
- Identify visual techniques appropriate to different data types (e.g. acute load vs profile KPIs).
- Apply academic integrity, clear judgement, and personal accountability.

Skills:

- Use spreadsheet functions to clean, calculate, and visualise performance data.



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- Build tables, charts, and brief reports that are coach- or athlete-friendly
- Design a coherent, well-presented analysis project with evidence-based insights.

Attitudes:

- Discuss appropriate formats and taking ownership of interpretation quality.
- Follow user's needs when designing visual communication.
- Synthesise learning from athlete profiling, monitoring, and analyst practice.

Keywords

Data analysis, spreadsheets, visualisation, performance reporting, dashboards, athlete data workflow

Bibliography

- Palmer, B. L., van der Ploeg, G. E., Bourdon, P. C., Butler, S. R., & Crowther, R. G. (2023). Evaluation of Athlete Monitoring Tools across 10 Weeks of Elite Youth Basketball Training: An Explorative Study. *Sports (Basel, Switzerland)*, 11(2), 26. <https://doi.org/10.3390/sports11020026>
- Bai, Zhongbo, Bai, Xiaomei, Sports Big Data: Management, Analysis, Applications, and Challenges, *Complexity*, 2021, 6676297, 11 pages, 2021. <https://doi.org/10.1155/2021/6676297>
- Silva, J. E., Clemente, F. M., Conte, D., Figueiredo, T., Pinho, J., Sampaio, J., & Bezerra, N. (2023). Tracking devices and physical performance analysis in team sports: a comprehensive framework for research—trends and future directions. *Frontiers in Sports and Active Living*, 5, 1284086. <https://doi.org/10.3389/fspor.2023.1284086>

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 01:06:59 Sports Data Analytics - (Power BI, Python, Tableau etc.) - Lorna Belford #42 <https://www.youtube.com/watch?v=zISqMwptpzi>
- Duration: 9:46 TED Talk: The Data Playbook: Analytics Rewriting Global Sports <https://www.youtube.com/watch?v=JL6w0VuGrWA&t=14s>

Supplementary Material



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- Kinovea is a video annotation tool designed for sport analysis. It features utilities to capture, slow down, compare, annotate and measure motion in videos. Kinovea is completely free and open source.
- <https://www.kinovea.org/>
- Hudl Academy is a state-of-the-art e-learning platform that offers product, role and sport-specific content and certification for new and existing customers who want to improve their technical skills.
- https://www.hudl.com/en_gb/solutions/professional/education/academy

Exercises / Self-Assessment Activities

- Activity 9.1: Athlete Dataset Analysis Task
Download the sample dataset and perform basic cleaning, organisation, and visualisation (e.g. average training load over 4 weeks, visual dashboard). Submit screenshots and a 200-word summary of insights.
- Activity 9.2: Assignment
Individual Work: Assignment development.
- Activity 9.3: Forum Discussion
Topic: What challenges do analysts face when presenting data to coaches or athletes?

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student ²³ Involvement
Week 9	Reading	8-10
	Digital Multimodal Educational Material	5-6
	Exercises / Self-Assessment Activities	12-15
	Supplementary material review (optional)	1-2
Total		25-31 hours



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Week 10: Machine Learning Fundamentals in Exercise and Sports Contexts

Summary

This week introduces students to the basic principles of machine learning (ML) and how these systems are beginning to impact sport science, coaching, and athlete monitoring. Students explore the logic behind ML models, types of data used, and how predictions are generated and interpreted. Emphasis is placed on understanding, not coding, machine learning, and on developing the ability to critically assess where and when such tools may be useful or problematic. This week also marks the final development and submission of Assignment 2.

Introductory Remarks

Machine learning is rapidly reshaping how sports professionals interact with data. From predicting match outcomes and identifying injury risks to personalising recovery plans or even scouting talent, ML models are increasingly used to automate insight generation. However, understanding what these models do—and what they don't—is essential for anyone working in performance environments.

This week provides a non-technical introduction to machine learning. Students will learn about how ML works (input → algorithm → output), how models are trained, and what types of data are typically used in sport contexts (e.g., time series from wearables, video tagging data, wellness logs). Through sport-specific examples, they will consider how predictions (e.g. "likelihood of injury next week") are made, and what factors influence the reliability of such insights.

The week also explores concerns related to fairness, how easy it is to understand how the technology works, and the risks of relying too heavily on systems that make decisions without clear explanations.

In parallel, students are expected to finalise and submit Assignment 2, which consolidates key competencies developed since Week 5.

Lecture Objectives and Learning Outcomes

Knowledge:

- Define how ML models are trained and used for predictions.
- Analyse supervised and unsupervised learning, model outputs vs inputs.
- Apply cross-topic learning to real sport analysis problems.



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Skills:

- Arrange suitable sport data types and propose example applications.
- Adapt use cases critically for validity, fairness, and usefulness.
- Deliver algorithmic decision-making with caution and ethical awareness.

Attitudes:

- Discuss insights through structured narrative, visuals, and evidence-based recommendations.
- Follow a reflective stance on the role of automation in human-centred environments.
- Demonstrate autonomy, academic responsibility, and clarity in independent work.

Keywords

Machine learning, supervised learning, prediction, algorithm, data input, bias, interpretability, sport applications, automation in analysis

Bibliography

- Li, M., & Wang, Y. (2021). Interpretability and explainability of machine learning models in sports analytics. *Journal of Sports Analytics*, 7(3), 145–158.
- IFSP (International Federation of Sports Performance) (2022). *Best Practices for Machine Learning Applications in Athlete Monitoring*.
- Montgomery, P. G., & Pyne, D. B. (2023). Machine learning in sports: A review of applications, challenges, and ethical considerations. *Sports Medicine*, 53(4), 673–689.
- Nalbant, K. G., & Aydin, S. (2022). Literature review on the relationship between Artificial Intelligence Technologies with Digital Sports Marketing and Sports Management. *Indonesian Journal of Sport Management*, 2(2), 135–143.
<https://doi.org/10.31949/ijsm.v2i2.2876>

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 44:37 Machine Learning in Sports
- <https://www.youtube.com/watch?v=gayeqpbKILU>
- Duration 06:13 Unlock Athletic Potential with Machine Learning
<https://www.youtube.com/watch?v=maOBAXNAv8Y&t=30s>



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Supplementary Material

- A synthetic data-driven machine learning approach for athlete performance attenuation prediction
<https://www.frontiersin.org/journals/sports-and-active-living/articles/10.3389/fspor.2025.1607600/full>

Exercises / Self-Assessment Activities

- Activity 10.1: Case Review
ML in Sports Contexts
Choose one real-world ML application in sport (e.g., injury risk modelling, scouting automation, tactical prediction). Write a 400-word case summary explaining:
 - What the system does
 - What data it uses
 - One benefit and one concern related to its use
- Activity 10.2: Assignment 2
Finalising Assignment 2. Ensure it includes all required components (e.g. profile analysis, performance metrics, monitoring strategy, visual insights). The assignment should demonstrate coherent synthesis of learning from Weeks 5 to 9.
Submission deadline: End of Week 11.
- Activity 10.3: Assignment Visual Preview (Pre-Submission / Optional)
Choose one visual element from your draft Assignment 2 (e.g. graph, chart, dashboard section) and share it with a brief note (100–150 words) in the electronic platform peer showcase area. Use this opportunity to receive informal feedback from your peers before the final submission in Week 11. Respond to at least one classmate's post to support collaborative reflection

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 10	Reading	6-8
	Digital Multimodal Educational Material	4-5
	Exercises / Self-Assessment Activities	11-15
	Supplementary material review (optional)	1-2
Total		21-28 hours



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Week 11: AI Applications in Performance Prediction and Rehabilitation

Summary

This week introduces applied uses of Artificial Intelligence (AI) in the domains of athlete performance prediction, rehabilitation planning, and decision support. Students will explore how AI tools are being integrated into coaching, medical, and performance workflows to support early intervention, workload optimisation, and personalised training. They will also reflect critically on the benefits, risks, and ethical implications of relying on automated systems in human performance settings. This is also the week of final submission for Assignment 2.

Introductory Remarks

Artificial Intelligence (AI) is increasingly embedded in the day-to-day processes of sport science. From predicting when an athlete might be at risk of injury, to automatically generating personalised training plans, AI systems are becoming tools that support (not replace) human decision-makers. Their power lies in the ability to detect patterns across large datasets that would be difficult or time-consuming for a person to analyse manually.

This week explores some of the most common AI applications in performance prediction and rehabilitation, including:

- Injury risk forecasting based on load, fatigue, and biomechanical data
- Automatic feedback systems during rehab (e.g. movement corrections)
- Decision support for return-to-play (RTP) timelines
- Adaptive training systems that update in real-time based on athlete inputs

Students will examine case examples of how these tools are used, what data they rely on, and where they can go wrong. Importantly, students are encouraged to think critically and ethically about how AI decisions are communicated, who remains accountable, and how to ensure athletes are not treated as data points alone.

This week also marks the final deadline for Assignment 2, which integrates the key skills and knowledge from Weeks 5 through 9. Students are expected to submit their assignments and reflect on the process of working with performance and athlete data.

Lecture Objectives and Learning Outcomes



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Knowledge:

- Define how AI is used to support injury prevention, workload planning, and recovery.
- Resolve issues related to accuracy, bias, and data transparency.
- Apply concepts from previous units into a cohesive output.

Skills:

- Adapt how input data is used to generate personalised outputs.
- Arrange findings using structured narrative, supporting visuals, and evidence.
- Perform a reflective, athlete-centred approach when interpreting AI-generated insights.

Attitudes:

- Justify the need for human oversight and ethical responsibility when using AI tools.
- Discuss professional judgement, and critical reflection throughout the assignment process.
- Practise the suitability of AI in different athlete scenarios.

Keywords

Artificial Intelligence, injury prediction, return-to-play, rehab support, athlete decision-making, ethical AI, personalised sport training

Bibliography

- Nalbant, K. G. & Aydin S. (2022). Literature review on the relationship between Artificial Intelligence Technologies with Digital Sports Marketing and Sports Management. *Indonesian Journal of Sport Management*, 2(2), 135-143.
- Pisaniello, A. (2024). The Game Changer: How Artificial Intelligence is Transforming Sports Performance and Strategy. *Geopolitical, Social Security and Freedom Journal*, 7, 75-84.
- The ethics of AI in sport. Taking athletes' rights and wellbeing seriously
https://www.researchgate.net/publication/375278970_The_ethics_of_AI_in_sport_Taking_a_athletes'_rights_and_wellbeing_seriously

Digital Multimodal Educational Material



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- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 11:19 | Trained AI to Predict Sports
<https://www.youtube.com/watch?v=LkJpNLIaeVvk>
- Duration: 16:29 Top 5 AI Tools for Sports Scientists in 2025
https://www.youtube.com/watch?v=yzv_hVZ795w

Supplementary Material

- European Commission (2023). *OECD Principles on Artificial Intelligence and Ethical Use in Sports*.
- How Microsoft is transforming sports with cutting-edge technology
<https://www.microsoft.com/en-us/industry/blog/media-and-entertainment/2025/03/26/how-microsoft-is-transforming-sports-with-cutting-edge-technology/#:~:text=From%20AI%2Dpowered%20analytics%20that,the%20NFL%2C%20and%20Formula%20One.>
- Marquina, M., Lozano, D., García-Sánchez, C., Sánchez-López, S., & de la Rubia, A. (2023). Development and Validation of an Observational Game Analysis Tool with Artificial Intelligence for Handball: Handball.ai. *Sensors*, 23(15), 6714. <https://doi.org/10.3390/s23156714>

Exercises / Self-Assessment Activities

- Activity 11.1: AI Use Case Review (Individual)
Select one AI tool used in sport rehab or performance prediction. Prepare a short report (400–500 words) that includes:
 - What the tool does
 - What data it requires
 - One real benefit and one concern (ethical, technical, or user-related)
- Activity 11.2: Final Assignment Submission (Individual)
- Activity 11.3: Reflection Prompt (Optional)
In 200 words, reflect on your experience working with sport data over the past five weeks. What have you learned about analysis, and how has your perspective changed on the use of tech in athlete development?
- Activity 11.4: Optional Peer Share (Post-Submission)
After submitting your assignment, share one key visual (e.g. graph, table, or dashboard) with a brief comment (100–150 words) in the forum discussion. Review 1–2 peers' submissions to gain additional ideas and perspectives.

Recommended Time of Student Involvement



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Week	Activity Description	Hours of Student Involvement
Week 11	Reading	6-8
	Digital Multimodal Educational Material	5-6
	Exercises / Self-Assessment Activities	8-11
	Supplementary material review (optional)	1-2
Total		19-25 hours



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Week 12: Interpreting and Evaluating AI Outputs in Sport Science

Summary

This week focuses on building students' ability to critically evaluate the outputs generated by AI systems in sport science contexts. Through real and simulated examples, students will learn how to interpret predictions, identify common errors or oversights, and ask appropriate questions about reliability and transparency. The unit encourages a critical and reflective stance when working with algorithm-generated feedback, especially when such outputs may influence training, rehabilitation, or selection decisions.

Introductory Remarks

AI tools offer convenience and speed, but without human oversight, even sophisticated systems can produce misleading or flawed results. In sport settings, this can have real consequences—such as withholding training from an athlete based on an inaccurate injury prediction, or promoting players based on biased talent indicators.

This week shifts attention from how AI works to how to read and evaluate its outputs. Whether it's a readiness score, return-to-play timeline, performance forecast, or wellness classification, AI-generated results must be interpreted by trained professionals, not taken at face value. Students will explore common challenges in interpreting AI outputs, including issues of:

- Data bias (e.g. models trained on limited populations)
- Overfitting (e.g. models that perform well in training on the data they were trained with but give inaccurate or unreliable results in practice)
- Poor explainability (e.g. unclear why a certain prediction was made)
- Miscommunication (e.g. dashboards that over-simplify risk or confidence levels)

The week encourages students to develop questioning habits when encountering algorithmic feedback, to validate model outputs using human judgement and contextual knowledge, and to suggest strategies that improve model transparency and usefulness.

Lecture Objectives and Learning Outcomes

Knowledge:

- Define how AI outputs are calculated and what they aim to represent.



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- Analyse outputs (e.g. risk predictions, recovery timelines) and explain them in athlete-friendly language.
- Judge model credibility using basic criteria (e.g. accuracy, relevance, interpretability).

Skills:

- Use strategies for validating AI outputs using sport-specific context.
- Fix technical limitations such as biased training data, missing variables, and overconfidence in predictions.
- Build a checklist or protocol for evaluating AI-generated insights before use.

Attitudes:

- Demonstrate care and precision when communicating predictive feedback to stakeholders.
- Resolve a critical stance and challenge AI decisions that may be misleading or unsupported.
- Follow responsible innovation that balances automation with professional judgement and athlete care.

Keywords

AI interpretation, risk prediction, algorithm bias, explainability, model reliability, human oversight, athlete communication, ethical decision-making

Bibliography

- Doshi-Velez, F., & Kim, B. (2020). Towards a rigorous science of interpretable machine learning. *arXiv preprint arXiv:1702.08608*.
- Liu, Y., & Wang, S. (2023). Explaining and understanding AI decisions in sports analytics: A systematic review. *Journal of Sports Analytics*, 9(2), 77–94.
- Holzinger, A., Biemann, C., Pattichis, C., & Kell, D. B. (2021). *Explainable AI Methods in Sports and Medicine: Challenges and Applications*. Springer.
- Nalbant, K. G. & Aydin S. (2022). Literature review on the relationship between Artificial Intelligence Technologies with Digital Sports Marketing and Sports Management. *Indonesian Journal of Sport Management*, 2(2), 135-143.
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https://www.researchgate.net/publication/375278970_The_ethics_of_AI_in_sport_Taking_a_athletes'_rights_and_wellbeing_seriously



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Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos
- Duration 34:09 How to Use AI for your Sport Science Projects
https://www.youtube.com/watch?v=CLxynM-L4_U

Supplementary Material

- Get started with Copilot in Excel
<https://support.microsoft.com/en-us/office/get-started-with-copilot-in-excel-d7110502-0334-4b4f-a175-a73abdfc118a>
- Identify insights with Copilot in Excel
<https://support.microsoft.com/en-us/office/identify-insights-with-copilot-in-excel-52d97339-86c0-431c-b46c-e7b07b2898dd>
- Rudin, C. (2022). Stop explaining black box models for high stakes decisions and use interpretable models instead. *Nature Machine Intelligence*, 4(1), 206–215.

Exercises / Self-Assessment Activities

- Activity 12.1: Interpretation Challenge – Athlete Readiness Score
You are provided with a sample AI-generated readiness report for an elite athlete, including injury risk, training load forecast, and recovery trend. Write a 400-word summary explaining:
 - What the system is predicting
 - What the results might mean
 - What you would say (and not say) to the athlete and coach
- Activity 12.2: AI Transparency Checklist Task
Create a simple checklist (8–10 items) for evaluating the quality and reliability of AI-generated outputs in sport science. Your checklist should reflect themes from readings (e.g. data quality, model explainability, risk communication).
- Activity 12.3: Forum Discussion
Topic: Should athletes be told exactly how AI systems generate their scores or decisions?

Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 12	Reading	6-8



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	Digital Multimodal Educational Material	5-6
	Exercises / Self-Assessment Activities	7-10
	Supplementary material review (optional)	1-2
Total		18-24 hours



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Week 13: Final Exam Preparation and Synthesis of Course Concepts

Summary

In this final week, students review and consolidate their learning across all 13 weeks of the course. Emphasis is placed on identifying the key themes, digital tools, and analytical methods covered throughout the course. Students will participate in guided revision, complete reflective activities, and prepare for the final examination. The week is structured to promote both individual recap and collaborative clarification of concepts.

Introductory Remarks

Over the past 12 weeks, students explored a wide range of technologies, analytical techniques, and ethical considerations involved in modern sports science. From wearable sensors and motion tracking to performance analysis, load monitoring, and AI-driven prediction, they've gradually built a toolkit of knowledge and skills relevant to both elite and grassroots sport contexts.

This final week is designed to help them synthesize what they've learned, revisit key ideas, and gain confidence before the final examination. In addition to reviewing readings, discussion highlights, and assignments, they'll have opportunities to test their knowledge using reflection prompts. They'll also examine how the various parts of the course are connected—for example, how athlete profiling relates to training load decisions, or how AI predictions require human interpretation and ethical oversight.

While the course has focused on applied digital tools, it has also aimed to build their capacity as a critical, reflective, and responsible practitioner. The final exam will assess their understanding of key concepts, their ability to analyse practical scenarios, and their readiness to apply digital tools responsibly in sport contexts. The use of this week aims to fill any gaps, reinforce what they already know, and prepare themselves for confident, well-supported answers in the exam.

Lecture Objectives and Learning Outcomes

Knowledge:

- Define key terms, concepts, and frameworks introduced during the course.
- Explain the structure and expectations of the final exam.
- Apply what has been learned and how it applies to real sport settings.

Skills:



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- Arrange and relate content from multiple weeks into meaningful connections.
- Demonstrate the ability to organise, evaluate, and construct effective responses to exam-style questions by applying analytical tools and methods discussed in Weeks 1–12.
- Calibrate and adapt your use of sport technology tools and analysis methods by engaging in self-assessment activities and constructing structured answers based on real-world performance scenarios.

Attitudes:

- Synthesise your digital competence development and characterise the professional behaviours and values required to use sport technologies responsibly, ethically, and with athlete well-being in mind.
- Reflect on, value, and justify your own learning journey by identifying personal progress, ongoing challenges, and the role of digital tools in your future practice within sport science.
- Demonstrate confidence, curiosity, and readiness for further digital learning.

Keywords

Course review, exam preparation, reflective learning, knowledge synthesis, performance analysis, digital sport tools

Digital Multimodal Educational Material

- Video lecture/narrated presentation, learning scenarios, case studies, interactive videos

Exercises / Self-Assessment Activities

- Activity 13.1: Self-Quiz Practice
Complete a set of multiple-choice, matching, and short-answer questions covering topics from Weeks 1–12. Use this quiz to identify areas where you need further review.
- Activity 13.2: Thematic Review Map
Using the review worksheet, create a visual map (mind map, timeline, or table) that connects key concepts across the course—for example, how wearable tech links to load monitoring and rehabilitation.
- Activity 13.3: Final Reflection (Individual Submission – Optional)
Write a 300–400-word reflection summarising your development during the course. What digital tools or concepts were most valuable? What challenged you? How will this course influence your approach to working in sport?



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Recommended Time of Student Involvement

Week	Activity Description	Hours of Student Involvement
Week 13	Reading	8-10
	Digital Multimodal Educational Material	2-3
	Exercises / Self-Assessment Activities	7-10
	Supplementary material review (optional)	1-2
	Instructor Q&A (optional)	1-2
Total		17-23 hours



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