

**SPORT SCIENCE & MANAGEMENT
SS2320 FUNDAMENTALS OF SPORTS INJURIES**

Academic Year	2025-26	Semester	1
Course Coordinator			
Course Code	SS2320		
Course Title	Fundamentals of Sports Injuries		
Pre-requisites	-		
No of AUs	3		
Contact Hours	39		

Course Aims

This course is designed to introduce the types, causes and mechanisms of common sports injuries. The course will be anchored on knowledge of functional anatomy and its application in the context of sports, exercise, and fitness training. You will develop fundamental knowledge to determine the underlying risk factors and skills to identify common injuries in sports. This course will provide a strong foundation on injury risk factors, mechanisms, and principles of the management and prevention of common sports injuries. You will learn the applied translation of knowledge in various sports-specific contexts to enhance participation safety and injury risk mitigation during training and competitions, high-performance training, strength and conditioning for fitness and health, exercise prescription, coaching and athlete development, first-aid and rehabilitation of injuries, and development of injury prevention programmes.

Intended Learning Outcomes (ILO)

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

1. explain the functional anatomy of the injured body part and list the structures involved.
2. list the risk factors, identify and describe the mechanisms of common sports injuries, and categorise sports injuries according to type, nature, tissue, and body part.
3. identify the type of sports injury, recognise and list the signs and symptoms, and enumerate the principles and steps of its management.
4. classify and articulate general and specific principles of sports injury management and rehabilitation.
5. list the general and specific principles for injury prevention and explain the rationale for developing preventive programmes to reduce the risk and occurrence of sports injuries.

Course Content

The following topics will be covered:

1. Functional anatomy and terminology related to sports injuries
2. General aspects of sports injuries
3. Mechanisms and characteristics of sports trauma
4. Common injuries to the shoulder in sport
5. Common injuries to the elbow, wrist and hand in the sport
6. Common injuries to the neck and back in sport
7. Common injuries on the hip and thigh in sport
8. Common injuries to the knee in sport
9. Common injuries on the lower leg in sport
10. Common injuries to the foot and ankle in sport
11. Sports-related concussion and injuries to the face in sport

NTU Competencies & Graduate Attributes

NTU Competencies

Character	√
Competence	√
Cognitive agility	√

NTU Graduate Attributes

Graduate Attributes	Level (i.e., basic, intermediate, advanced)
1. Curiosity	Advanced
2. Creative thinking	Intermediate
3. Decision making	Intermediate
4. Care for Society	Intermediate
5. Learning agility	Advanced

Assessment (includes both continuous and summative assessment)

Component	ILO Tested	Weighting	Team/ Individual	Assessment Rubrics
1. Poster Presentation	1-5	20%	Individual	Appendix 1
2. Group Report (Assignment)	1-5	30%	Team	Appendix 2
3. Final Examination	1-5	50%	Individual	
Total		100%		

Formative Feedback

The lectures will involve 'Blended learning' and 'Team-based Learning' approach. You will receive prompt feedback on learning based on the performance in the knowledge and application readiness exercises and classroom discussions. The feedback will facilitate content learning and retention, its utility and application in practice, and positively impact competencies like collaboration, teamwork, cognitive agility, and knowledge construction.

During the applied learning sessions, the feedback on learning and skill development will be verbally provided, facilitating the development of knowledge transfer skills into different sports and training contexts and developing problem-solving and decision-making competencies of applying yourselves to solve the problems related to the injury 'risk-mechanism-incident-outcome' continuum during different contexts in sport.

Following the poster presentation, you will be individually provided with verbal feedback pertaining to your assessed performance based on the rubric. There will also be some feedback on the group's performance. Generic verbal feedback will be provided on the written assignment. Lastly, generic written feedback will be provided to the class on the examination performance.

Throughout the course, you will have the opportunity to use various interactive smartscreen technologies, software, videos and apps to promote immersive learning of the content. This will include 3D apps and software on human anatomy, functional anatomy apps with self-paced learning and quizzes, and sports injury-related apps to facilitate out-of-class learning and application. You will also be experiencing real-time injury case presentations to develop real-world connections and the skills to apply the learning into practice. Throughout the course, you will receive frequent verbal feedback on your progress, gaps in learning and conceptual understanding, and suggestions will be provided to improve applied skills.

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lectures	All classroom-based lectures will adopt a blended learning and team-based learning approach. All content will be pre-uploaded as both slides and video lectures. The lesson time will be essentially used to discuss the key aspects of the topic and develop applied knowledge and skills. This will promote content learning and retention, skills to critique and collaborate, facilitate decision-making and problem-solving skills, and develop the attributes of self-discipline and accountability. Furthermore, the team-based learning exercises will enable the lecturer to provide immediate feedback, monitor progress of students at both individual level and as a group, fill up the gaps in content knowledge and theory-practice transfer skills, and consolidate the key learning concepts and theories.
Online Learning	The course will adopt a blended learning approach. Time will be given for learning from pre-recorded lectures, reading materials and online resources as a part of the flipped teaching approach. These materials will support key concepts covered in lectures and practical sessions.

Reading and References

NIE Research and Publications

1. Lau, R., Mukherjee, S. (2023). Effectiveness of overuse injury prevention programs on upper extremity performance in overhead youth athletes: A systematic review. *Sports Medicine and Health Science*, 5, 91-100.
2. Lau, R., & Mukherjee, S. (2022). Prevalence rates of shoulder and elbow overuse injuries among competitive overhead youth athletes in Singapore population.

Orthopaedic Journal of Sports Medicine. doi:
<https://doi.org/10.1177/23259671231156199>.

3. Sim, A., & Mukherjee, S. (2021). Potential Low Energy Availability (LEA) Risk Amongst Amateur and Recreational Athletes in Singapore. *Physical Activity and Health*. 5(1), 166-177. DOI: <https://doi.org/10.5334/paah.120>
4. Mukherjee, S., Lye, C.T.J, Leong, H.F. (2017). Fundamental motor skill proficiency of 6-to 9-year-old Singaporean children. *Perceptual and Motor Skills*. 124 (3), 584-600. DOI: 10.1177/0031512517703005
5. Mukherjee, S., Chand, V., Wong, X.X., Choong, P.P., Lau, V. S. M., Wang, S.C.L., Tou, N.X., & Ng, K.W. (2016). Perceptions, awareness and knowledge of the female athlete triad amongst coaches- are we meeting the expectations for athlete safety? *International Journal of Sports Science and Coaching*. 11 (4), 545-551. DOI: 10.1177/1747954116654781
6. Mukherjee, S. (2015). Retrospective designs in sports injury surveillance studies: all is not lost. *Sports and Exercise Medicine- Open Journal*. 1 (5), 164-166.
7. Mukherjee, S. (2015). Little League elbow in a pre-pubertal cricket player. *Current Sports Medicine Reports*. 15 (6), 455-458.
8. Mukherjee, S. (2015). Sports injuries in university physical education teacher education students: a prospective epidemiological investigation. *Jacobs Journal of Sports Medicine*. 2 (1), 1-8.
9. Mukherjee, S., Leong, H.F., Chen, S., Foo, Y. X.W., Pek, H.K. (2014). Injuries in competitive Dragon Boating. *Orthopaedic Journal of Sports Medicine*. 2 (11), doi:10.1177/2325967114554550. eCollection 2014.
10. Mukherjee, S. (2013). Traumatic upper limb injuries during the field hockey Junior World Cup 2009. *Research in Sports Medicine*. 21, 318-329.
11. Mukherjee, S. (2012). Head and face injuries during the men's field hockey Junior World Cup 2009. *The American Journal of Sports Medicine*. 40 (3), 686-690.

Other Readings and References

12. Peterson, L., & Renstrom, P. (2016). Sports Injuries- Prevention and Treatment (4th Edition). CRC Press. Taylor and Francis Group. Core text.
13. Sports Injuries Guidebook (2020). Robert Gotlin, 2nd Edn, Human Kinetics.
14. Flegel, M. J. (2014). Sport First Aid: A coach's guide to the care and prevention of athletic injuries (5th Ed.). Human Kinetics.
15. McCrory, P., Meeuwisse, W., Dvorak, J. et al. (2018). Consensus statement on concussion in sport—the 5th international conference on concussion in sport held in Berlin, October 2016. *British Journal of Sports Medicine*. 51, 838-847.

Course Policies and Student Responsibilities

(1) General

You are expected to complete all assigned pre-class readings and activities, attend all classes – lecture and laboratory – punctually, submit all scheduled assignments and take tests by due dates. You are not allowed to swap laboratory groups without express permission from the course coordinator. You are expected to take responsibility to follow up with course notes, assignments and course-related announcements for sessions they have missed. You are expected to participate in all discussions and class activities unless there is a valid medical reason not to do so.

(2) Absenteeism

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

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

(3) Absence Due to Medical or Other Reasons

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

(4) Attire and safety

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

Academic Integrity

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

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

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

Course Instructors

Instructor	Office Location	Phone	Email

Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	• Course Overview • Basic anatomy and Terminology	1	Course outline; Ref 1: Ch 1; pp 1-10; Web links provided
2	Tissue types and injuries	1, 2	Ref 1: Ch 2, pp 14-31; Ch 3, pp33-37; Ch 8, pp 128-189; Ref 11
3	Mechanisms and Characteristics of Sports Trauma	2, 3	Ref 1: Ch 8, pp 129-189
4	Shoulder – functional anatomy, biomechanics, essential inspection/examination, common injuries and their management and prevention	2, 3, 4, 5	Ref 1: Ch 10, pp 212-255; Ref 5, 12
5	Elbow, wrist & hand – functional anatomy, biomechanical relationships, basic inspection/examination, common injuries and their management and prevention	2, 3, 4, 5	Ref 1: Ch 11, pp 264-286; Ch 12, pp 284-308; Ref 5, 10, 13
6	Neck and trunk – functional anatomy, basic inspection/examination, common injuries and their management and prevention	2, 3, 4, 5	Ref 1: Ch 16, pp 327-337
7	Spine- Osseous, muscular and ligamentous anatomy, basic inspection/examination, common injuries and their management and prevention	2, 3, 4, 5	Ref 1: Ch 16, pp 338-353
Recess Week			
8	Hips and pelvis – functional anatomy, basic inspection/examination, common causes of groin pain in sports, common hip and pelvic injuries in sports and their management and prevention	2, 3, 4, 5	Ref 1: Ch 17, pp 356-383
9	Thigh and knee – Functional and Musculoskeletal anatomy, basic	2, 3, 4, 5	Ref 1: Ch 18, pp 385-396; Ch 19, pp 397-470

	inspection/examination, common injuries of thigh and knee, and their management and prevention		
10	Lower leg – functional anatomy, common causes of shin and calf pain in sports, common sports-related injuries and their management and prevention	2, 3, 4, 5	Ref 1: Ch 20, pp 473-497
11	Foot and ankle – functional anatomy, basic inspection/examination, common sports-related injuries and their management and prevention	2, 3, 4, 5	Ref 1: Ch 21, pp 499-535; Ch 22, pp 537-561
12	<ul style="list-style-type: none"> •Sports-related concussion •Common injuries to the eyes, ear, nose and mouth 	2, 3, 4, 5	Ref 1: Ch 14, pp 310-320; Ref 4, 14
13	Poster presentation	1, 2, 3, 4, 5	

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

	A+, A, A-	B+, B	B-, C+, C	D+, D	F
Quality of presentation (max 25)	Information provided clearly answers the question set out. Presentation is clear and the flow is coherent and logical. Pace is appropriate.	Information mostly answers the question set. Presentation is mostly clear and the flow generally coherent and logical.	There are weaknesses or absences in the information provided, and the flow of presentation is unclear at times.	Much of the information provided does not answer the question, and the flow is difficult to understand.	Little relevant information and unclear flow.
Demonstration of material (max 40)	Able to clearly demonstrate and thoroughly explain skeletal muscle movements associated with sport and exercise. Able to answer questions in a poised and articulate manner with a high level of confidence.	Good demonstration and explanation of skeletal muscle movements associated with sport and exercise. Able to answer most of the questions clearly and with confidence.	Clear but basic demonstration and explanation of skeletal muscle movements associated with sport and exercise. Able to answer some of the questions clearly but lacks confidence at times.	Poor demonstration and weak explanation of skeletal muscle movements associated with sport and exercise. Has difficulty answering questions and lacks confidence.	Unable to demonstrate or explain skeletal muscle movements associated with sport and exercise. Unable to answer questions.
Use of technology (max 10)	Uses relevant technology (incl. AI/GAI tools) very well to supplement and enhance the quality of presentation.	Good use of technology (incl. AI/GAI tools) to improve the presentation.	Some use of technology (incl. AI/GAI tools) to help improve the presentation.	Little use of relevant technology (incl. AI/GAI tools) in the presentation.	No clear use of technology (incl. AI/GAI tools) in the presentation.
Communication and audience engagement (max 25)	Communication is very clear and easy to understand.	Communication is clear and easy to understand most of the	Communication is unclear at times. There is minimal effort	Communication is unclear and there and difficult to	Communication is unclear and not possible to understand.

	Engages and interacts with the audience in a proactive and persuasive manner.	time. Demonstrates some effort to engage and interact with the audience	to engage and interact with the audience.	understand. There is no notable effort to engage and interact with the audience.	There is no effort to engage and interact with the audience.

Appendix 2: Assessment Criteria for Group Work/Report (30% Final Grade – marked out of 100)

	A+, A, A-	B+, B	B-, C+, C	D+, D	F
Team: Groupwork and data collection* (max 10)	Clear teamwork, planning and group cohesion with appropriate division of work by each member of the group contributing to the successful collection of data.	Good teamwork and cohesion, but improvement is needed in the planning of roles by group members for data collection.	Obvious improvements are needed in teamwork and cooperation of members to improve data collection.	Team members working in small cliques with infrequent whole group cooperation.	Poor teamwork with little or no cooperation among group members during data collection processes.
Introduction (max 20)	Information provided clearly presents the significance of the topic and is supported by statistics. The premise and the focus are clear. The organisation and presentation of the argument is completely and clearly outlined and implemented.	Information provided is mostly clear, and significance of the topic is highlighted. The focus is clearly presented. The organisation and presentation of the argument is generally well outlined and implemented.	Information provided lacks adequate clarity and significance of the topic vaguely presented. The focus is not adequately clear. The organisation and presentation of the argument is vague & not well implemented.	Much of the information provided lacks clarity, and the significance of the topic is not well-established. The focus lacks clarity, and there is a lack of clarity with respect to the organisation and presentation of the argument.	There is little relevant information and unclear flow. The premise is unclear, and there is no clarity on the focus of the paper. There is a total lack of clarity with respect to the organisation and presentation of the argument.
Research (max 40)	Research selected credible, highly relevant to the argument, and presented accurately and completely. The method, results, and implications	Research selected is largely credible, relevant to the argument and presented clearly. The methods, results and implications are clearly presented.	Some of the research selected is not from credible sources and, at times, irrelevant to the argument. Methods lack adequate clarity, and findings and implications	Most research selected is not credible and has minimal relevance to the argument. Methods lack clarity, and findings and implications are vaguely presented. Relationship	Almost all research is from non-credible sources. No relevance to the argument. Methods are not clear, and findings and implications are vague

	are all presented accurately. Relationship between research and theory is clearly and accurately articulated.	Relationship between research and theory is clearly articulated.	are sometimes vaguely presented. Articulation of the relationship between research and theory at times lacks clarity.	between research and theory is unclear.	and irrelevant. Either inaccurate or no attempt has been made to establish the relationship between research and theory.
Conclusion (max 15)	Conclusion is clearly stated, and connections to the research and position are clear and relevant. The underlying logic is explicit.	Conclusion is clearly stated with some connections to the research and position. The underlying logic is largely clear.	Conclusion is stated with some connections to the research and position. The underlying logic is barely clear.	Conclusion is stated with minimal connections to the research and position. The underlying logic is not very clear.	Conclusion is stated with no connections to the research and position. The underlying logic is vague.
Writing (max 15)	Paper is coherently organised, and the logic is easy to follow. There are no spelling or grammatical errors, and terminology is fully and clearly defined. Writing is clear, concise and persuasive.	Paper is largely well-organised, and most of the argument is easy to follow. There are only a few minor spelling or grammatical errors. Some of the terms are not clearly defined. Writing is mostly clear but, at times, lacks conciseness.	Paper is generally well-organised, but the argument is sometimes difficult to follow. There are several minor spelling or grammatical errors. Many terms are not clearly defined. Writing is, at times, unclear and lacks conciseness.	Paper is not well organised, and the argument is difficult to understand. Parts are poorly connected. There are many minor spelling or grammatical errors, and most terms are not clearly defined. Writing mostly lacks clarity and conciseness.	Paper is poorly organised and difficult to read and understand. Parts are disconnected . There are several spelling and/or grammatical errors; Most terms are not clearly or correctly defined. Writing lacks clarity and conciseness.