

Subject Description Form

Subject Code	BME5320																																								
Subject Title	Sports Equipment and Product Design																																								
Credit Value	3																																								
Level	5																																								
Pre-requisite/ Co-requisite/ Exclusion	Nil																																								
Objectives	This subject aims to enable students to understand the principles, methodologies, and technologies involved in the design and development of sports equipment and products. The course also seeks to foster students' ability to create innovative and customized solutions that enhance athletic performance and safety.																																								
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Understand the core principles and technologies involved in sports equipment design and manufacturing. b. Apply design thinking and engineering principles to develop innovative sports products. c. Analyze the performance and safety aspects of sports equipment through testing and evaluation. 																																								
Contribution to Programme Outcomes (Refer to Part I Section 2)	<p>Program Learning Outcome (a) Acquire and apply advanced levels of knowledge and skills in the sports technology and management discipline. (Teach, Practice, Measure)</p> <p>Program Learning Outcome (b) Apply critical analysis and problem-solving skills for evidence-based practice in the sports technology and management discipline. (Practice)</p> <p>Programme Learning Outcome (c) Demonstrate a higher level of professional competence to cope with the rapid changes in practice in the sports technology and management discipline. (Teach, Practice)</p> <p>Programme Learning Outcome (d) Develop research skills that will help incorporate evidence-based practice in the delivery of sports services and industry. (Teach, Practice, Measure)</p>																																								
Subject Synopsis/ Indicative Syllabus	<p>The course begins with an introduction to the fundamental concepts of sports product design, including design thinking and user-centered design. Students will learn material science, examining the material properties, and applications of various materials used in sports equipment. The syllabus also covers the engineering aspects of product development, focusing on design processes, prototyping, and manufacturing techniques. Practical sessions will enable students to apply theoretical knowledge through hands-on projects, including the design and testing of sports products. The course also addresses performance analysis, where students will learn to evaluate the effectiveness and safety of sports equipment through rigorous testing protocols. Furthermore, the environmental and ethical considerations in sports product design will be discussed, emphasizing sustainable practices and responsible production.</p>																																								
Teaching/Learning Methodology	<p>Lectures and individual written assignments.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <th style="width: 50%;">Teaching/ learning methodology</th><th colspan="6">Intended subject learning outcomes</th></tr> <tr> <th></th><th style="width: 10%;">a</th><th style="width: 10%;">b</th><th style="width: 10%;">c</th><th style="width: 10%;"></th><th style="width: 10%;"></th><th style="width: 10%;"></th></tr> <tr> <td>1. Lectures</td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td></td><td></td><td></td><td></td></tr> <tr> <td>2. Case study</td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td></td><td></td><td></td></tr> <tr> <td>3. Practice</td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td></td><td></td><td></td></tr> </table>						Teaching/ learning methodology	Intended subject learning outcomes							a	b	c				1. Lectures	✓	✓					2. Case study	✓	✓	✓				3. Practice	✓	✓	✓			
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1. Lectures	✓	✓																																							
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3. Practice	✓	✓	✓																																						

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				
			a	b	c		
	1. Assignment	20%	✓	✓			
	2. Case study (report)	20%	✓	✓			
	3. Laboratory report	20%		✓	✓		
	4. Final quiz	40%	✓	✓	✓		
	Total	100 %					
<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>The assignment will require students to use professional software to design their own sports product. This assessment item will be used to test the ability of the students to understand the fundamental knowledge and technologies in the equipment/products design and development.</p> <p>Students will be required to review the most updated conceptions of product design, state-of-the-art manufacturing techniques, and the product evaluation process in case studies to deepen their learning.</p> <p>The laboratory session will be arranged to strengthen students' understanding of fundamental knowledge through hands-on experiences and the development of practical skills.</p> <p>Final quiz will be used to test the ability of the students to understand the knowledge of the entire subject.</p>							
Student Study Effort Expected	Class contact:						
	▪ Lectures						24 Hrs.
	▪ Workshops						6 Hrs.
	▪ Site visits						6 Hrs.
	▪ Laboratory session						3 Hrs.
	Other student study effort:						
	▪ Self-study						48 Hrs.
	▪ Assignments and reports						30 Hrs.
	Total student study effort						117 Hrs.
Reading List and References	<ol style="list-style-type: none"> 1. Ashby, M. F., Shercliff, H. R., & Cebon, D. (2013). Materials: Engineering, Science, Processing and Design (3rd ed.). Butterworth-Heinemann. 2. McGrath, M., & Bechtold, J. (2017). Design and Technology for Sports Equipment (2nd ed.). Springer. 3. Baxter, M. (2018). Product Design: Practical Methods for the Systematic Development of New Products. CRC Press. 4. Haake, S., & Goodwill, S. (Eds.). (2014). The Engineering of Sport (Vol. 6). Springer. 5. Norton, R. L. (2013). Machine Design: An Integrated Approach (5th ed.). Prentice Hall. 						
Date of Last Major Revision	29 August 2025						
Date of Last Minor Revision	29 August 2025						