	Ministry of Higher Education and Scientific Research - Iraq Al-Mustaqbal University College of Engineering Department of Prosthetics and Orthotics Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	الأطراف الصناعيةII			**Module Delivery**	
Module Type	CORE			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	UOMU0103051				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3UGx11		**Semester of Delivery**	5	
Administering Department	UOMU0103		**College**	UOMU01	
Module Leader	Muntadher Saleh Mahdi		**e-mail**	Muntadher.saleh.mahdi@uomus.edu.iq	
Module Leader's Acad. Title	Asst. Lect.		**Module Leader's Qualification**	MSc.	
Module Tutor					
Peer Reviewer Name			**e-mail**		
Review Committee Approval	01/09/2025		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Biomechanics and rehabilitation	**Semester**	4, 5, and 6
Co-requisites module		**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. Define the functional objectives (reasons) that an ankle foot orthosis (AFO), knee ankle foot orthosis would be prescribed for persons with mobility dysfunction. 2. Explain the evaluative process used to determine appropriate prescription for individuals requiring a lower extremity orthosis. 3. Describe the biomechanical control systems for foot, ankle, knee, and/or hip designed into an AFO. 4. Describe how each type of lower extremity orthosis is designed to enhance achievement of stance phase stability, swing limb clearance, limb prepositioning, adequate step length, and efficiency of gait. 5. Describe how each of the most commonly prescribed AFO, designs affect transition through the rockers of stance and swing phase of gait. 6. Compare and contrast the indications and limitations of prefabricated, custom fit, and custom molded lower extremity orthoses. 7. Apply knowledge of normal and pathological gait, assessment of impairment, and functional potential in the selection of an appropriate lower extremity orthosis for patients with neuromuscular impairments. 8. Identify effective strategies for donning/doffing the orthosis, gait and mobility training, and orthotic maintenance for children and adults using lower extremity orthoses. 9. Select appropriate outcome measures to evaluate effectiveness of orthotic intervention and gait training for persons using lower extremity orthoses. 10. Describe the indications for, functional characteristics of, and advantages and limitations of the most commonly used transfemoral components and suspension strategies. 11. Compare and contrast the design, fit, and function of the four most popular transfemoral socket designs: quadrilateral, ischial containment, Marlo Anatomical Socket (MAS), and subischial. 12. Describe the interaction among alignment stability, mechanical stability, and muscular stability on the control and function of the prosthetic knee in standing, during gait, and on uneven surfaces. 13. Describe the key influences that bench, static, and dynamic alignment have on fit and function of a transfemoral prosthesis. 14. Identify the nine items that will cause variations in socket fit and the quality of transfemoral gait 15. Recognize and describe the intraindividual and extraindividual causes of the most common transfemoral gait deviations, and suggest appropriate corrective action.		
Module Learning Outcomes	1. Understand the principles and components of transfemoral prostheses and orthoses for knee dysfunction. 2. Demonstrate knowledge of prosthetic management techniques after knee disarticulation or transfemoral amputation.		

مخرجات التعلم للمادة الدراسية	3. Analyze the functional capabilities and limitations of functional knee orthoses for knee dysfunction. 4. Evaluate the energy expenditure and biomechanical performance of prophylactic knee orthoses. 5. Assess the evidence of efficacy for prophylactic knee orthoses in preventing knee dysfunction. 6. Compare different transfemoral socket designs, including quadrilateral socket and hinge design. 7. Explain the biomechanical performance of functional knee orthoses for anterior cruciate ligament insufficiency. 8. Analyze the evidence of efficacy for functional knee orthoses in treating anterior cruciate ligament insufficiency. 9. Discuss the evolution of ischial containment sockets and their influence on femur position. 10. Evaluate the impact of socket configuration on the functionality of Marlo anatomical socket. 11. Compare and contrast the use of elevated vacuum sockets and suction suspension systems. 12. Analyze the application of orthoses for osteoarthritis and patellofemoral dysfunction. 13. Describe the different types of transfemoral suspension systems, including traditional pull in suction suspension. 14. Evaluate the use of roll-on suspension liners, shuttle lock systems, lanyard system, cushion liner with air expulsion valve, and elevated vacuum in prosthetic management. 15. Discuss the application of orthoses for spinal dysfunction, focusing on the three-column concept. 16. Compare the fit and function of spinal orthoses, including regional orthoses and cervical orthoses. 17. Consider the specific considerations and challenges related to knee disarticulation. 18. Analyze the prosthetic systems available for transfemoral prostheses, including single-axis knee units, polycentric knee units, and weight-activated stance control knee units. 19. Compare and contrast different knee unit types, such as manual locking, hydraulic, pneumatic, and microprocessor technology. 20. Explore additional components used in prosthetic systems. 21. Evaluate the prevalence and natural history of scoliosis and its implications for orthotic management. 22. Assess the biomechanics and evaluation methods relevant to choosing a prosthetic foot and evaluating socket fit and alignment. 23. Understand the gait characteristics in transfemoral prosthetics and the importance of knee and pelvic stability. .24Apply the principles of biomechanics in the evaluation and selection of prosthetic systems
Indicative Contents المحتويات الإرشادية	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	By providing a supportive and interactive learning environment, students

	will have the opportunity to apply theoretical concepts to real-world scenarios, enhancing their comprehension and practical skills. The module will encourage students to analyze and evaluate information, participate in discussions, and collaborate with peers to deepen their understanding of prosthetics and orthotics. The teaching methods employed will include lectures, group discussions, case studies, and practical demonstrations. Additionally, technological tools and resources may be utilized to enhance the learning experience, such as multimedia presentations, virtual simulations, and online resources. Formative assessments and feedback will be integral components of the module, allowing students to continuously monitor their progress and identify areas for improvement. This approach will empower students to take an active role in their learning, fostering a sense of ownership and motivation.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	13	LO # 5, 8 and 10
	Report	1	10% (10)	7	LO # 1-7
Summative assessment	**Midterm Exam**	2	10% (10)	16	All
	Final Exam	3	50% (50)		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Transfemoral Prostheses
Week 2	Prosthetic management after knee disarticulation or transfemoral amputation
Week 3	Energy expenditure
Week 4	Transfemoral socket designs, quadrilateral socket
Week 5	Evolution of Ischial Containment Sockets, Socket Configuration Influence on Femur Position, Marlo Anatomical Socket
Week 6	Elevated Vacuum Sockets.
Week 7	Transfemoral suspension systems, Traditional Pull-in Suction Suspension.
Week 8	Roll-on Suspension Liners, Shuttle Lock Systems, Lanyard System, Cushion Liner with Air Expulsion Valve, Elevated Vacuum
Week 9	Silesian Belt Suspension, Total Elastic Suspension Belt, Pelvic Belt and Hip Joint
Week 10	Knee Disarticulation Considerations,
Week 11	Prosthetic systems, Single-Axis Knee Units, Polycentric Knee Units, weight-activated stance control knee units
Week 12	Manual Locking Knee Units, Hydraulic Knee Units, Pneumatic Knee Units, Microprocessor Technology,
Week 13	Additional Components
Week 14	Choosing a prosthetic foot, gait characteristics in transfemoral prosthetics, Knee Stability, Pelvic Stability, evaluation of socket fit and alignment
Week 15	Prosthetic alignment

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	

Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. ORTHOTICS & PROSTHETICS IN REHABILITATION, THIRD EDITION 978-1-4377-1936-9 Copyright © 2013, 2007, 2000 by Saunders, an imprint of Elsevier . 2. Short Textbook of Prosthetics and Orthotics, R hinnathurai, 2010	No
Recommended Texts	1. essentials of Prosthetics and Orthotics with MCQs and Disability Assessment Guidelines	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C –Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي