	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	مبادئ الأطراف والمساند الصناعية			**Module Delivery**	
Module Type	CORE			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	UOMU013031				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	2		**Semester of Delivery**	3	
Administering Department	UOMU013		**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	01/06/2023		**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. . Define the Medicare functional levels. 11. Explain key factors analyzed when prescribing a prosthetic foot. 12. Define the fundamental characteristics of the different types of prosthetic feet. 13. Formulate a prescription recommendation for a prosthetic foot based on the patient's needs. 14. Differentiate among the various disarticulation and transaction surgeries used when amputation of the forefoot, midfoot, or rearfoot is necessary. 15. Describe usual gait performance and limitations of individuals with a partial foot and with the Syme amputation. 16. Compare the advantages and disadvantages of prosthetic options for individuals with partial foot amputation. 17. Compare the advantages and disadvantages of the various prosthetic designs for persons with the Syme amputation, including donning and pressure tolerance. 18. Compare how the various nonarticulating and dynamic response Syme prosthetic feet mimic the three rockers of gait.		

	19. Describe typical static and dynamic alignment variables or issues affecting gait for patients with a Syme or partial foot prosthesis. Use knowledge of prosthetic options to suggest prosthetic prescriptions and plans of care for patients with partial foot and Syme amputation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the principles and factors involved in selecting a prosthetic foot, considering functional level, patient's weight, amputation level, and residual limb characteristics. 2. Identify the determinants of functional gait and their significance in prosthetic foot selection. 3. Recognize the performance features and appearance of different types of prosthetic feet, particularly focusing on the characteristics of K1, K2, K3, and K4 feet. 4. Evaluate appropriate footwear options for different prosthetic feet and understand the importance of proper footwear in prosthetic management. 5. Analyze the biomechanical principles involved in the use of ankle-foot orthoses (AFOs) in conjunction with prosthetic feet for K4-level activities. 6. Understand the postsurgical management of partial foot amputations, including the use of static ankle-foot orthoses (SAFOs) and solid ankle-foot orthoses (SAFO) control systems. 7. Identify gait characteristics after partial foot amputation and determine the indications for using anterior floor reaction ankle-foot orthoses (AFOs). 8. Evaluate different prosthetic management strategies, including the use of toe fillers, modified shoes, custom shoe inserts, cosmetic slipper designs, and prosthetic boots. 9. Understand the application of different orthotic devices, such as dynamic ankle-foot orthoses (DAFOs), UCBL orthoses, posterior leaf spring AFOs, and carbon fiber spring orthoses. 10. Identify the postoperative care options for Syme amputations, including walking casts, Canadian Syme prostheses, medial opening Syme prostheses, and sleeve suspension Syme prostheses. 11. Evaluate additional orthotic options for dorsiflexion assist, including functional neuromuscular electrical stimulation and commercially available dorsiflexion-assist designs. 12. Determine the prosthetic clearance value and understand the use of nonarticulating Syme feet, hinged thermoplastic ankle-foot orthoses (AFOs), and dynamic response Syme feet. 13. Recognize alignment issues and their impact on prosthetic management, including the use of conventional dorsiflexion-assist AFOs, different AFO designs, and their effects on tone and postural control.
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	123	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

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	2hr.	10% (10)	7	LO # 1-7
Summative assessment	**Midterm Exam**	3hr	60% (60)	16	All
	Final Exam	2	10% (10)	5, 10	LO #1, 2, 10 and 11
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري		
	Material Covered	
Week 1	Understanding Prosthetic Feet	Introduction lower extremity orthoses
Week 2	Factors in selecting a prosthetic foot, functional level	What type of orthosis is best?
Week 3	Activities of Daily Living and Work Requirements, Patient's Weight, Amputation Level and Residual Limb Characteristics	Determinants of functional gait
Week 4	Performance features and appearance of available prosthetic feet: a compact guide k1 feet	Appropriate footwear
Week 5	K2 feet, k-3 feet	The Rockers of Stance Phase, Prefab, Custom Fit, Or Custom Molded?
Week 6	K-4 feet: high activity	Appropriate footwear, ankle-foot orthoses, Biomechanical Principles
Week 7	Postsurgical Management of Partial Foot and the Syme Amputation, PARTIAL FOOT AMPUTATIONS	Static ankle-foot orthoses, Solid Ankle-Foot Orthoses, SAFO Control Systems
Week 8	Gait characteristics after partial foot amputation	Progression Through Stance Phase, Indications for SAFO, The Anterior Floor Reaction Ankle-Foot Orthosis
Week 9	Prosthetic Management, Toe Fillers and Modified Shoes, Custom Shoe Inserts and Toe Fillers	Weight-Relieving Ankle-Foot Orthoses
Week 10	Cosmetic slipper designs, prosthetic boots	Dynamic ankle foot orthoses, The UCBL Orthosis
Week 11	Syme amputation	Dynamic Ankle Foot Orthosis, Posterior Leaf Spring Ankle-Foot Orthosis
Week 12	Postoperative care: walking casts, prosthetic management, Canadian Syme prostheses, medial opening Syme prostheses	Additional Dorsiflexion Assist Options, Carbon Fiber Spring Orthoses
Week 13	Sleeve suspension Syme prostheses, expandable wall prostheses, tucker-Winnipeg Syme prostheses	Functional Neuromuscular Electrical Stimulation, Commercially Available Dorsiflexion-Assist Designs
Week 14	Determining the Prosthetic Clearance Value, Nonarticulating Syme Feet,	Hinged Thermoplastic Ankle-Foot Orthosis
Week 15	Dynamic Response Syme Feet, Alignment Issues	Conventional Dorsiflexion-Assist Ankle Foot Orthosis, AFO Designs, Tone, and Postural Control

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 . Short Textbook of Prosthetics and Orthotics, R hinnathurai, 2010	No
Recommended Texts	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