MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Projectile Physics**		**Module Delivery**
Module Type	**Core**		• ☒ Theory • ☒ Lecture • ☐ Lab • ☐ Tutorial • ☐ Practical • ☐ Seminar
Module Code			
ECTS Credits	**2**		
SWL (hr/sem)	**60**		
Module Level	3	**Semester of Delivery**	2
Administering Department	FOR	**College**	College of Science
Module Leader	Dr. Sadeem Abbas Fadhil	**e-mail**	sadeemfadhil@yahoo.com
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	E-mail
Scientific Committee Approval Date	10/4/2025	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims **أهداف المادة الدراسية**	1. To understand the fundamental principles of projectile motion and dynamics. 2. To apply these principles to forensic scenarios such as bullet trajectory reconstruction, wound ballistics, and crime scene analysis. 3. To introduce experimental and computational methods for projectile motion analysis. 4. To build interdisciplinary knowledge linking physics with forensic science, criminal investigation, and law enforcement.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	1. **Explain projectile motion under ideal and real-world conditions (air resistance, wind, spin).** 2. **Reconstruct trajectories of bullets, arrows, and other projectiles in forensic cases.** 3. **Use mathematical and computational models to analyze projectile behavior.** 4. **Perform case studies related to projectile physics and interpret data for forensic applications.** 5. **Critically evaluate forensic reports involving projectile trajectories.**
Indicative Contents **المحتويات الإرشادية**	**1 — Introduction & Course Foundations** **2 — Kinematics of Projectile Motion (Idealized)** **3 — Dynamics & Aerodynamic Forces** **4 — Internal Ballistics (Forensic Perspective)** **5 — External Ballistics & Ballistic Coefficients** **6 — Terminal Ballistics & Impact Phenomena (Interpretation)**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**1. Lectures (Conceptual and Analytical Foundations)** **2. Tutorials and Problem-Solving Workshops**

	3. Laboratory and Simulation Sessions (Safe and Ethical Focus) **4. Case Studies and Forensic Applications**
	5. Use of Digital and Multimedia Resources **6. Interactive and Inquiry-Based Learning** **7. Project-Based Learning (Team Mini-Project)** **8. Independent Learning and Directed Reading**

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	30	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	2
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	30	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	2
Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	60		

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, 3and 6
	Assignments	1	10% (10)	2, 12	LO # 3, 4, 5 and 6
	Projects / Lab.		10% (10)	Continuous	
	Report	1	10% (10)		LO # 4, 5 and 6
Summative assessment	**Midterm Exam**	1hr	10% (10)	10	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction & Basics of Motion**
Week 2	**Ideal Projectile Motion**
Week 3	**Real-World Effects: Drag and Resistance**
Week 4	**Fundamentals of Ballistics**
Week 5	**External Ballistics in Detail**
Week 6	**Terminal Ballistics**
Week 7	**Midterm Exam**
Week 8	**Trajectory Reconstruction: Basics**
Week 9	**Wound Ballistics & Crime Scene Correlation**
Week 10	**Non-Firearm Projectiles**
Week 11	**Midterm Exam1**
Week 12	Seminars discussion
Week 13	Mid-term exam2
Week 14	Case studies discussions
Week 15	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. **Fundamental of Physics, by Halliday and Resnick** **2. Handbook of Firearms and Ballistics Examining and Interpreting Forensic Evidence, Second Edition**	No
Recommended Texts	**BALLISTICS Theory and Design of Guns and Ammunition, Third Edition by Donald E. Carlucci Sidney S. Jacobson**	No
Websites		

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	**راسب (قيد المعالجة)**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required

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.