MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Ordinary Differential Equations**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COS-05				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	2		**Semester of Delivery**	3	
Administering Department	**Physics Department**		**College**	Type College Code	
Module Leader	Name **Firas Mahmood Hady**		**e-mail**	E-mail/ **firas_1962@yahoo.com**	
Module Leader's Acad. Title	**Professor**		**Module Leader's Qualification**	**M.Sc.**	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**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 Objectives **أهداف المادة الدراسية**	1. **The general objective: to raise the level of the student in mathematics in particular and in the educational process in general.** 2. **Acquisition of the skill in using the problem-solving method .. Community development** 3. **Identifying the impact of mathematics on human civilization development and emphasizing its importance in community service.** 4. **Introduce the student to how to deal with imaginary numbers, and understand that complex numbers are composed of a real part and an imaginary part.** 5. **Numbers in general are abstract mathematical concepts to carry out the operations of measuring, counting, arranging, classifying, etc.. Depending on the concepts that we want to represent and the operations that we need to do, we can find a set of numbers that are simpler or more efficient to do the required work..**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **1. Know the concept of differentiation.** 2. **2. Knowing the methods of solving equations through derivation that includes the solution of the equation** 3. **3. Complete understanding of logical concepts are the concepts that logic imposes on us. As for conventional concepts, they are concepts that we assume make computations possible or easy.** 4. **4. Knowing the most important basic rules for solving equations by direct integration method**
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Part A _** **. Defining the differential equation and identifying the most important ways to solve the differential equation [2 hours]** **. Basic rules of differentiation [2 hours]** **. Basic rules in integration and identify the importance of integration in solving ordinary differential equations [2 hours]** **. Define ordinary differential equations.[2 hours]**

	.Degree and order of ordinary differential equations [2 hours] . Methods for solving ordinary differential equations [2 hours] First month exam [2 hours] Part B - . Methods for solving ordinary differential equations depending on the type of equation. [2 hours] . Ordinary differential equations of the first and second order [2 hours] . Solve all types of the ordinary differential equations using the different mathematical methods.[2 hours]. Second month exam [2 hours]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes and interactive tutorials and by looking at simple problem solving which includes some activities of interest to the students.**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**26**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**4**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**0**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**30 Hours**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and define the ordinary differential equations
Week 2	The general solution and the particular solution of the Differential Equations(DE)
Week 3	Find the DE from the general solution , particular solution
Week 4	Define the degree and the order of the ordinary differential equation
Week 5	Types of all the ordinary differential equations, solve DE by variable separable method and more mathematical solved examples.
Week 6	Solve the Linear DE of the first degree and more mathematical solved examples
Week 7	**Mid-term Exam 1**
Week 8	Solve the Exact DE and more mathematical solved examples

Week 9	Bernoulli equation and more mathematical solved examples
Week 10	Homogenous DE and more mathematical solved examples
Week 11	Solve the linear homogenous DE with the constant coefficients
Week 12	Solve the non – homogenous DE with the constant coefficient
Week 13	Solve the second degree DE by using D- operator and more mathematical solved examples
Week 14	Applications the DE(Differential Equations) in physics
Week 15	**Exam 2**
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
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	Thomas ، Calculus Early Transcendental 13 edition , by George B . Thomas , Jr. , 2014	Yes

Recommended Texts	Differential Equations Schaum , s outlines , 4th edition , 2014	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.