MustansiriyahUniversity
College: **Science**
Department : **Physics**

(Course Syllabus)

CourseTitle	*Credit Hours*	*Year (semester)*	*Study Level*
Mathematical Physics	**3**	***2022-2023 (1)***	***Master***

Lecturer	*E -mail*
Ass. Prof. Dr. hassan Abd Salman	hassanaldujaly@uomustansiriyah.edu.iq

Course Objectives:

1- To provide the fundamental analytical and underpinning knowledge and techniques needed to successfully complete scientific and physics principles modules.
2- To help students learning about mathematical methods that are important in physics, as well as serve as a guide throughout and beyond their study and research.
3- To enable students to use techniques learned for the analysis, modelling and solution of realistic physics problems.

Course Description:

Course Introduction:

1- This course covers essential mathematical material suitable for students studying Degree in physics disciplines.
2- In this course, students will gain real understanding through seeing problems solved and then through solving similar problems themselves.

Course Contents :

Week	Topic Details	(chapter)
1	Review for fundamental concepts in Calculus	1
2	Ordinary Differential equatuions (1^{st} order): solving methods and examples.	2
3	Ordinary Differential equatuions (2^{nd} order): solving methods and examples.	
4	Laplace Transform: definition , concept, examples	3
5	Inverse Laplace Transform and solving Ordinary Differential equatuions	
6	Fourier series (Real) : definition , concept, examples	4
9	Fourier series (Complex) : definition , concept, examples	
10	Fourier Transform : definition , concept, examples, properties	
11	Power series sloution of differential equations : Frobenius method	5
12	Bessel's equation and Bessel's functions	
13	Legendre's equation and Legendre's polynomials	
14	Partial Differential equatuions: definition, solving methods and examples	6
15	Special methods for solving Partial Differential equatuions	
16	**Final Exame**	

Grade Distribution :

Assessment	Grade	Date
- Exam	%20	6-11-2022
- Assignments (Reports /Quizzes/ Programming Project ….)	%10	
- Final Examination	%70	

* Make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.

Reading List:

Text Book	1- Mathematical Methods for Physicists (8th Ed)
Other References	2- Schaum's outline of theory and problems of advanced mathematics for engineers and scientists 3- Higher Engineering Mathematics (Sixth Edition)