جامعة المجمعة
Majmaah University

Course Specifications

Institution:	**College of Education in Zulfi**
Academic Department :	**Physics Department**
Programme :	Bachelor of Education in Physics(B. Ed in Physics)
Course :	Computational Physics2
Course Coordinator :	Dr. Fatema Alzahraa M.
Programme Coordinator :	Dr. Fatema Alzahraa M.
Course Specification Approved Date :	1/ 1 / 1438 H

A. Course Identification and General Information

1 - Course title : computational physics2	Course Code: PHYS421
2. Credit hours : (3 C.H.)	
3 - Program(s) in which the course is offered:	B. Ed in Physics
4 – Course Language : Arabic Language.	
5 - Name of faculty member studying the course:	Dr. Fatema Alzahraa M. Nabieh
6 - Level/year at which this course is offered :	8th level.
7 - Pre-requisites for this course (if any) : • **PHYS411**	
8 - Co-requisites for this course (if any) : -	
9 - Location if not on main campus : (-)	

10 - Mode of Instruction (mark all that apply)

A - Traditional classroom	√	What percentage?	**80 %**
B - Blended (traditional and online)	-	What percentage?	**--- %**
D - e-learning	√	What percentage?	**20 %**
E - Correspondence	-	What percentage?	**--- %**
F - Other	-	What percentage?	**--- %**

Comments :
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B Objectives

What is the main purpose for this course?

1. Understand the basic concepts of simulations and modeling and using Mathematica 7 for student program.
2. Acquire the necessary skills (e.g. computational and numerical skills) to solve systems problems and gain deeper understanding of the concepts of physics.
3. Using Mathematica 7 for student program in solving problems in physics applications in different branches.
4. Using Mathematica 7 for student online.
5. Using simulations in practicum.

Briefly describe any plans for developing and improving the course that are being implemented :
discussion with staff members, using E-Learning.

C. Course Description
1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Quickly revision on computational physics 1 and its joining with computational physics 2.	1	2
Installation of Mathematica7 program.	1	2
Introduction to Mathematica7 and its interface.	1	2
Using Mathematica7 program in mathematical calculations.	2	4
Instruction of mathematical functions by Mathematica7 and plots.	2	4
Midterm exam and its discussion	1	2
Application in physics.	2	4
Introduction to simulation and modeling systems.	1	2
Simulation system experiments by Phet website.	3	6
Revision and Responding to inquiries.	1	2
Computer Laboratory		
Installation of Mathematica program.	1	2
Make small programs using Mathematica.	4	8
Using Mathematica in physics and mathematical applications.	4	8
introduction to simulation and simulation application	4	8
revision	1	2

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	**30**	-	-	**28**	-	58
Credit	**30**	-	-	**14**	-	44

3. Additional private study/learning hours expected for students per week.

A round 3 : 5 training hours in the home to solving problems and on the training on the program.

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the basics of Mathematica program	Lectures – tutorials – discussion- brain stormy.	• Homework. • Group Discussion • Mid-term exam • Practical Exam • Final Exam
1.2	Recognize the basics of modelling and simulation.		
1.3	Rename the most using of computer program in physics.		
2.0	**Cognitive Skills**		
2.1	Setup of Mathematica program in PC.	lectures – training on computers- discussion-	• Homework. • Group Discussion • Mid-term exam
2.2	Using mathematical operations in Mathematica program.		
2.3	Compared between programming language, between matlab and Mathematica program..		

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.4	Develop lines of argument and appropriate judgments in accordance with handling computational physics	brain stormy.	• Practical Exam • Final Exam
2.5	Using simulations in physics.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Engage in teamwork and manage time effectively.	• Encourage students to help each other • Group presentation • Group assignment.	• Showing students activities in class. • Work in a team.
3.2	Respect community ethics traditions and moral values		
3.3	Identify his/her rights and responsibilities as a member of a research / teaching team and as a member of the scientific community at large.		
4.0	**Communication, Information Technology, Numerical**		
4.1	Use information, communication technology and numerical technology effectively.	Encourage students to use program softwear and internet.	• Showing students activities in class. practical exam.
4.2	Engage work in a teamwork and effective communications. using computer professionally in programming language.		
5.0	**Psychomotor**		
Not applicable			

5. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment task	Week Due	Proportion of Total Assessment
1	Attendance	within the semester	5 %
2	Homework, Quizzes, Discussions, cooperation, Teamwork.		15 %
3	Mid-term Exam	8	20 %
4	Final Theoretical and Practical Exam	16	60 %

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Two office hour per week

E. Learning Resources

1. List Required Textbooks :
- Lecture notes prepared by academic staff member .
- Mathematica documentation center./ getting started

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4. List Recommended Textbooks and Reference Material :

-

4. List Electronic Materials : -

5. Other learning material
Web sites and electronic materials are available with the lecturer
- **https://www.wolfram.com/mathematica/**
- **https://www.wolfram.com/mathematica/trial/**
- https://phet.colorado.edu/ar_SA/

F. Facilities Required

1. Accommodation
- Lecture room, a smart board to write on and computer

2. Computing resources
- Computer Lab. and internet lab if available

3. Other resources
- Library of college or department , internet connection

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:
Student evaluation manually organized by the quality center of University

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor : --

3 Processes for Improvement of Teaching :
1. Course report.
2. Program report.

4. Processes for Verifying Standards of Student Achievement
- **Internal revision by staff members.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :
1- Course Report
2- Exam report
3- Improvement plan
4- comparison between Program ILO's with course ILO's
5- Discussion with staff members.

<table>
<tr><th>Course's Coordinator</th><th>Department Head</th></tr>
<tr><td>*Name :*   Dr.Fatema Alzahraa</td><td>*Name :*   Dr.Fatema Alzahraa</td></tr>
<tr><td>*Signature :* ....</td><td>*Signature* ....</td></tr>
<tr><td>*Date :*   3/ 12 / 1437 *H*</td><td>*Date :*   3/ 12 / 1437 *H*</td></tr>
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Course Specification Approved
Department Official Meeting No (2) Date 1 / 1 / 1438 *H*