

مواصفات مقرر النظرية النسبية

- البرنامج الذي يقدم المقرر من خلاله (إعداد معلم الفيزياء)
- يمثل المقرر عنصرا (رئيسيا) بالنسبة للبرنامج
- القسم العلمي المسئول عن البرنامج (متعدد)
- القسم العلمي المسئول عن تدريس المقرر (قسم الفيزياء)
- السنة الدراسية / المستوى (الفرقة الثالثة عام. شعبة الطبيعة / الفصل الدراسي الأول)
- تاريخ اعتماد توصيف البرنامج ()

Basic Data

بيانات أساسية

- (1) العنوان : النظرية النسبية
- (2) الكود : 314 ph
- (3) الساعات المعتمدة Three credit hours
- المحاضرة : 2 h lect. /w
 - الدروس العملية : 1h lab / w.
 - المجموع : 3 credit hours

Professional Data

بيانات مهنية

1) General goals of the course

(1) الأهداف العامة للمقرر

The course is designed to help student-teachers achieve the following goals:

- Building a solid foundation for electro dynamics and advanced courses in atomic and nuclear physics.

2) Operational learning objectives of the course

(2) الأهداف الإجرائية للمقرر

By the end of this course, student teachers are expected to achieve the following objectives:

A) Knowledge and Comprehension:

أ- المعرفة والفهم:

The students have to recognize the following :

- a.1 the difference between Galilean and Lorentz transformations.
- a.2 Length contraction time dilation and the transformation of velocities and accelerations.
- a.3 Relativistic mass and mass energy equivalent.

B) Cognitive Skills:**ب- المهارات العقلية:**

- b.1 Apply mathematics, including calculus and statistics, to investigations in physics and the analysis of data.
- b.2 Relate the concepts of physics to contemporary, historical, technological, and societal issues; in particular, relate concepts of physics to current controversies, such as those around energy uses and medical research, as well as other issues.

C) Practical Skills:**ج- المهارات العملية:**

- c.1 Locate resources, design and conduct inquiry-based open-ended investigations in physics, interpret findings, communicate results, and make judgments based on evidence
- c.2 Construct new knowledge for themselves through research, reading and discussion, and reflect in an informed way on the role of science in human affairs.
- c.3 Understand and promote the maintenance of a safe science classroom, including the appropriate use and storage of scientific equipment, and the safe storage, use, and disposal of chemicals.

D) Enabling Skills:**د- المهارات العامة والمنقولة:**

- d.1 Demonstrate competence in the practice of teaching as defined within the Entry-Level Standards .
- d.2 Create and maintain an educational environment in which conceptual understanding will occur for all science students.
- d.3 Demonstrate competence in the practice of teaching through investigative experiences and by demonstrating the application of the scientific process and assessing student learning through multiple processes.
- d.4 Develop an understanding and appreciation for the nature of scientific inquiry.

Contents

المحتويات

Week	Topic	Assigned hours		
		Lectures	Rec	Total
First	• Frame of references	2	1	3
Second	• Galilean transformations	2	1	3
Third	• Michelson & Morley Exp.	2	1	3
Fourth	• Lorentz Tran.	2	1	3
Fifth	• Length contraction and time dilation.	2	1	3
Sixth	• Transformation of velocity and acceleration.	2	1	3
Seventh	• Relativistic mass.	2	1	3
Eighth	• Equivalence of mass and energy.	4	2	6
Ninth				
Tenth	• Total energy and potential energy in relativistic forms.	4	2	6
Eleventh				
Twelfth	• Applications of relativistic dynamics.	4	2	6
Thirteenth				

Activities, tasks and assignments:

أساليب التعليم والتعلم

Lectures.

Problems essay and assignments.

Assessment and Evaluation tools:

أساليب التقييم

- Semester activities including classroom interactions and Quizzes.
- Final exam.

Summative Evaluation table

جدول التقييم

Assessment	Final exam	Fifteenth Week	الأسبوع الخامس عشر	نهاية الفصل الدراسي	التقييم
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النسبة المئوية لكل تقييم

Assessment	Score ّ وزن الدرجة Weight	التقييم
1. Midterm exam	-	1. امتحان نصف الفصل الدراسي
2. Final written exam	%80	2. امتحان نهاية الفصل الدراسي
3. Practical exam	-	3. الامتحان العملي
4. assignments	%20	4. أعمال السنة
Total	%100	المجموع

References:

قائمة المراجع

- Text books.

- 1- Relativity and Early Quantum theory by Robert Resnik.

الإمكانات المطلوبة للتعليم والتعلم

Educational sources:

- Computer simulation programs and slides.
- Transparencies.
- Manual of solved problems (answer and solutions)

Course coordinator:

• منسق المقرر:

Head of the Department:

رئيس القسم:

Date:

التاريخ: