البرنامج الذي يقدم المقرر من خلاله (إعداد معلم الفيزياء)

- يمثل المقرر عنصرًا (رئيسيًا) بالنسبة للبرنامج
- القسم العلمي المسئول عن البرنامج (متدف)
- القسم العلمي المسئول عن تدريس المقرر (قسم الفيزياء)
- السنة الدراسية / المستوى (الفترة الرابعة عام. هيئة الفيزياء / الفصل الدراسي الأول)
- تاريخ اعتماد توصيف البرنامج

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بيانات أساسية

(1) Course Title: Plasma Physics
(2) Course Code No.: 415 ph
(3) Credit Hours: Three credit hours
  Lectures: 2 credit hours
  Tut. practice: 1 credit hour
  Total hours: 3 credit hours

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بيانات مهنية

1) General goals of the course
الأهداف العامة للمقرر
The course is designed to help student-teachers achieve the following goals:

- Developing the student's skills and creative thought needed to meet new trends in plasma, fusion research and space plasma physics.

2) Operational learning objectives of the course
الأهداف الإجرائية للمقرر
By the end of this course, student teachers are expected to achieve the following objectives:

A) Knowledge and Comprehension:
المعرفة والفهم
The students have to recognize the following:

a.1 Characteristics of plasma and plasma interaction with the magnetic field of Sun's surface, sun spot, the ionosphere, magnetic storms and the aurora belts.
a.2 Motion of charged particle in time dependant magnetic field and torodial magnetic field.
a.3 Transmission of electromagnetic waves through plasma and Alfen waves.
a.4 Transmission coefficient and plasma instabilities.
a.5 Plasma radiation and diagnosistic techniques.
B) Cognitive Skills:

b.1 Develop an understanding and appreciation for the nature of scientific inquiry
b.2 Apply mathematics, including statistics and calculus and introductory differential equations, to investigations in physics and the analysis of data.

b.3 Locate resources, design and conduct inquiry-based open-ended investigations in physics, interpret findings, communicate results, and make judgments based on evidence.

C) Practical Skills:

c.1 the appropriate use and storage of scientific equipment.
c.2 safe storage, use, and disposal of materials.

D) Enabling Skills:

d.1 Relate the concepts of physics to contemporary, historical, technological, and societal issues; in particular.
d.2 Relate concepts of physics to current controversies and other issues.
d.3 Construct new knowledge for themselves through research, reading and discussion, and reflect in an informed way on the role of physics in human affairs

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<td><strong>Topic</strong></td>
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<tr>
<td>First</td>
<td>Characteristics of plasma, the plasma interaction with a magnetic field (magnet – hydromagnetic fluids).</td>
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<td>Second</td>
<td>detailed maps of the magnetic field on the sun spots.</td>
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<td>Third</td>
<td>the ionospherem the magnetic storms, the aurora belts if energetic radiation above the earth's atmosphere.</td>
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<td>Fourth</td>
<td>the direct conversion of kinetic energy in a gas to electricity, ion jet propulsion and controlled molecular reaction.</td>
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<td>Fifth</td>
<td>Derbye radius, motion of charged particles in a uniform magnetic field, Plasma Larmony frequency and plasma magnetic moment.</td>
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<td>Sixth</td>
<td>Motion of charged particles in an non-uniform magnetic field, the magnetic mirror, drift in Toroidal magnetic field, rotating plasma, and pinch effect.</td>
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<td>Seventh</td>
<td>Plasma electron oscillation, ion oscillation and waves, Debye screening.</td>
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<td>Week</td>
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<tr>
<td>Eighth</td>
<td>transmission of electro magnetic waves / Alfven waves.</td>
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<td>Ninth</td>
<td>Lagrange interaction, relaxation time, electrical conductivity of plasma.</td>
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<td>Tenth</td>
<td>thermal conductivity and viscosity of plasma.</td>
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<td>Eleventh</td>
<td>Bersstrahlung radiation emitted by excited ions and Atoms, betatron emission from plasma Measurements of currents and voltages of moving plasma Electron density.</td>
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<td>Twelfth</td>
<td>Flux density and plasma spectrometry</td>
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<tr>
<td>Thirteenth</td>
<td>Waste production, safety. Introduction to fusion reactors, fusion reactors, self- sustaining reactions, fusion reactors and Tokamak applications.</td>
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**Activities, tasks and assignments:**

- Lectures
- Laboratory experiments.
- Demonstrations
- Report writing
- Brainstorming
- Discussions
- Problems and essay assignments.

**Assessment and Evaluation tools:**

- Semester activities including classroom interactions and Quizzes.
  - Oral exam.
  - Final exam.
- Lab performance evaluation

**Summative Evaluation table**
رؤية الكلية: انطلاقاً من رؤية جامعة الإسكندرية تسعى كلية التربية بدمهور إلى تحقيق الجودة وتحقيق الاعتماد الأكاديمي لتحل مكانة مميزة بين كليات التربية على المستوى القومي والعالمي ( مجلس الكلية ، 8 مارس 2009).

 رسالة الكلية: إعداد المعلمين والكوادر المؤهلة القادرة على تطوير التعليم

ándose المت领导小组 لكل تقييم

<table>
<thead>
<tr>
<th>Assessment</th>
<th>التقييم</th>
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<tbody>
<tr>
<td>1. Midterm exam</td>
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<tr>
<td>2. Final written exam</td>
<td>%80</td>
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<tr>
<td>3. Final oral exam</td>
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<tr>
<td>4. assignments</td>
<td>%20</td>
</tr>
<tr>
<td>Total</td>
<td>%100</td>
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</tbody>
</table>

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References:

- "Introduction to Plasma Phys, And Controlled fusion", by F.Chen, Plentum Press
- "Introduction to Plasma Theory" by D.R Nicholson, Wiley publisher.
- Waves in dusty space plasmas" by F.Verheest, Kluwer pub.

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Educational Resources

- Computer simulation programs and slides.
- Transparences.
- Manual of solved problems (answer and solutions)
- Text books.

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Course coordinator: منسق المقرر:
Head of the Department: رئيس القسم:
Date: التّاريخ: