البرنامج الذي يقدم المقرر من خلاله ( برنامج إعداد معلم الفيزياء )

- يمثل المقرر عنصرًا (رئيسياً ) بالنسبة للبرنامج
- القسم العلمي المسئول عن البرنامج (متعدد)
- القسم العلمي المسئول عن تدريس المقرر (قسم الرياضيات )
- السنة الدراسية / المستوى (الفرقة الثانية / عام فيزياء / الفصل الدراسي الثاني )
- تاريخ اعتماد ووصفي البرنامج ( )

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بيانات أساسية

(1) العنوان : معادلات تفاضلية
(2) الكود : MS 226
(3) عدد الساعات :

- المحاضرة : 2
- الدروس العملية : 1
- المجموع : 3 ساعات

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بيانات مهنية

1 - الأهداف العامة للمقرر :

- Familiar with the fundamental concepts and properties of group theory .
- Know and understand the properties of special types of groups and subgroups .
- Know the concepts and properties of homoeomorphism and isomorphism.
- Be familiar with the fundamental concepts of solid geometry , and present these facts to others.
- Know different coordinate systems and the classification of the second order equations in the space .
- Solve applications of surfaces.
- Expanding the Understanding of the concepts of differentiation and integration introduced in calculus 1 .
- students will Know and understand various techniques for differentiating , integrating different functions .
- Be able to apply the concepts on different topics .
• Understand the concepts of differential equation and able to convey the meaning of these concepts to others.
• Know and understand the difference between kinds of differential equation.
• Know the techniques for building and solving many famous models.

2. - النتائج التعليمية المستهدفة للمقرر:
أ - المعرفة والفهم:
1. Understand fundamental concepts and properties of group theory.
2. Understand groups and subgroups.
3. Understand co-sets and Lagrange’s theorem.
4. Understand the concepts and properties of homoeomorphism and isomorphism.
5. Understand and know the fundamental concepts of vector operations.
6. Understand and know the fundamental concepts of the plane, the straight line surfaces in 3-D.
7. Know the different coordinate systems in space.
8. Know the canonical forms of the plane and the surfaces.
9. Know and understand the fundamental concepts and properties of differentiation and integration.
10. Knowledge and understanding of ordinary differential equation of first order and (n) order.

ب - المهارات الذهنية و المهنية والعملية:
1. Show logical thinking.
2. Able to convey the meaning of the above concepts to others.
3. Distinguishing between different types of special kinds of groups and subgroups.
4. Classifications of general forms of second order equations in space.
5. Show mathematical thinking.
6. Illustrate applications of the methods.
7. Distinguish between various methods to solve ODES.
8. Show logical thinking in problem solving.
1. apply the fundamental concepts and properties of the group theory on many of problems
2. apply geometric methods in calculus analysis.
3. write rigorous proofs .
4. apply the fundamental concepts and properties of differentiation and integration in many problems
5. convey the meaning of these concepts to others.
6. apply the fundamental properties of the differential equation in many problems .

1. solve and study problems in small terms .
2. be self independent in problem solving.

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المحتويات:

<table>
<thead>
<tr>
<th>عدد الساعات</th>
<th>محاضرة</th>
<th>عمل</th>
<th>شفوي</th>
<th>الموضوع</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>2</td>
<td>4</td>
<td></td>
<td>Basic concepts ,definitions of order , degree , solution of the differential equation – formation of the equation</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>6</td>
<td></td>
<td>Equations of first order and first degree ( separation of variable method , homogeneous and reducible to homogeneous equation , exact equation , integrating factor , Bernoulli equation .)</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>4</td>
<td></td>
<td>Equations of first order but not of the first degree ( equation solvable – for ( x,y,z ) ,Lagrange – Clairaut equation)</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>4</td>
<td></td>
<td>Linear equations with constant coefficients ( definition – auxiliary equation , complementary function , determination of particular equations. )</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>4</td>
<td></td>
<td>System of differential equations .</td>
</tr>
</tbody>
</table>

الأسابيع:

الأول الثاني
الثالث الرابع
الخامس
السادس السابع
الثامن التاسع
الحادي عشر
Applications and modeling (population model – chemical reaction – orthogonal trajectories – economics – infected disease.)

- discussion
- projects
- team work
- interaction

Asessment and Teaching

- discussion
- projects
- team work
- interaction

Asessment

1. Writing tests; Evaluating the student's achievement and writing skills.
2. Research and writing; Evaluating research and writing skills of students.

Evaluation Table

<table>
<thead>
<tr>
<th>Week of the academic year</th>
<th>Evaluation of the first half of the academic year</th>
<th>Evaluation of the first half of the academic year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>2nd</td>
<td>12th</td>
</tr>
</tbody>
</table>

Percentage of each evaluation

- Mid-term exam
- Final exam
- Oral exam
- Yearly activities
- Total

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Courses notes prepared by staff members of math.dept.


Courses notes prepared by staff members of math.dept.

P.M.Cohn. Solid geometry, New York, Reitledge.

L.Lines, Solid geometry, New York, Dover.


Courses notes prepared by staff members of math.dept.


- Selected material by instructor


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(1) توفير مراجع متخصصة.


(3) أماكن كافية لتقسيم الطلاب إلى مجموعات.

(4) أجهزة كمبيوتر.

(5) برامج تعليمية كمبيوترية (Software).

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• منسق المقرر: د/ محمد درويش

• رئيس القسم: د/ محمد درويش

التاريخ: