The University of Jordan  
School of Engineering  
Industrial Engineering Department  
Spring 2018/2019

<table>
<thead>
<tr>
<th>Course name:</th>
<th>Plastic Engineering</th>
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<tbody>
<tr>
<td>Course code:</td>
<td>0906573</td>
</tr>
<tr>
<td>Credits hours:</td>
<td>3</td>
</tr>
<tr>
<td>Contact hours/room:</td>
<td>9:00 – 10:00 Sun Tue Thu (Sec2) &amp; 9:30 – 11:00 Mon Wed (Sec1)</td>
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</table>
| Course instructor’s name, E-mail, and phone: | Walid Khraisat, Ph.D.  
[<w.khraisat@ju.edu.jo>](mailto:w.khraisat@ju.edu.jo)  
22872 |
| Course Coordinator:| Walid Khraisat, Ph.D. |
| Text book:         | Materials Science of Polymers for Engineers, Author: Osswald, Tim A.  
and Menges, Georg Edition: 3rd Edition Year: 2012 |
| Other reference(s):| Handouts and notes that will be provided by the instructor |

### Course Description:
This course is designed to educate students the fundamentals of polymer structure, mechanical properties, rheological behavior and the major processing methods of polymers. It also introduces in details the major manufacturing processes of polymers. Students will carry out a mini research project where they will gather information about a certain polymeric product. They have to be able to identify the polymer used in the product and how the product is manufactured. Then they have to present their project orally in the classroom.

### Providing Department:
Industrial Engineering

### Prerequisite Course:
0906273 Properties of Eng. Materials

### Course type
Elective

<table>
<thead>
<tr>
<th>Assessment Methods:</th>
<th>Method</th>
<th>Weight %</th>
<th>Date</th>
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<tbody>
<tr>
<td>Mid-term Exam</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project work</td>
<td>20</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Quizes</td>
<td>10</td>
<td></td>
<td></td>
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<tr>
<td>Final Exam</td>
<td>40</td>
<td>TBD</td>
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### Assessment Methods:
- **After successful completion of this course, the student will be able to**

  - **CLO1**
    - Understand the relation between polymer structure and mechanical and rheological properties (a,c)
  - **CLO2**
    - Apply the theory of engineering Polymers to engineering problems (a,e)
  - **CLO3**
    - Understand general polymer structure and mechanical properties and be able to characterize them (IE4)
  - **CLO4**
    - Polymer main Manufacturing processes
  - **CLO5**
    - Understand the impact of polymeric material on the
envirnoment

**CLO6**
- Enhance their presentation and information seeking skills

<table>
<thead>
<tr>
<th>Brief list of topics</th>
<th># of Weeks</th>
<th>Reading Material</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Ch1 – text</td>
<td>Introduction</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Ch3 - text</td>
<td>Structure of polymers</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Ch8-text</td>
<td>Solidification of Polymers</td>
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<tr>
<td></td>
<td>2</td>
<td>Ch9 - text</td>
<td>Mechanical Behavior of Polymer</td>
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<tr>
<td></td>
<td>2</td>
<td>Ch5 – text</td>
<td>Rheology of Polymer Melts</td>
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<tr>
<td></td>
<td>3</td>
<td>Ch6 - text</td>
<td>Introduction to processing</td>
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<tr>
<td></td>
<td>2</td>
<td>Handouts</td>
<td>- Transfer molding</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Rotational molding</td>
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<td></td>
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<td>- Thermoforming</td>
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**Important Notes:**
- Class-notes, in-class drills and any handout you receive from the instructor are required as part of the course.
- Passing grade must earn in all the components (Lectures and Project) of this class.
- Prompt, regular attendance is necessary for the lecture, and the exams. There is no makeup for the Midterm exam, missing them will give you zero grade.
- Any students needing assistance because of any disabilities must notify the instructor, and follow established university procedures.

**Cheating and Honor Code**
- Any student caught cheating, or helping someone cheat, will be reported to the Dean Council.
- Plagiarism on the mini project constitutes cheating in this course.

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**The B.Sc. in industrial Engineering program enables students to achieve, by the time of graduation the following program learning outcome (SOs)**

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<tbody>
<tr>
<td>a</td>
<td>An ability to apply knowledge of mathematics, science and engineering.</td>
<td>g</td>
<td>An ability to communicate effectively.</td>
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<tr>
<td>b</td>
<td>An ability to design and conduct experiments, as well as to analyze and interpret data.</td>
<td>h</td>
<td>An ability to understand the impact of engineering solutions in a global, economic, environmental and societal context.</td>
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<tr>
<td>c</td>
<td>An ability to design a system, component, or process to meet desired needs within realistic constraints.</td>
<td>i</td>
<td>An ability to engage in life-long learning.</td>
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<tr>
<td>d</td>
<td>An ability to function productively as part of multidisciplinary teams and show leadership qualities.</td>
<td>j</td>
<td>An ability to acknowledge contemporary issues related to the discipline.</td>
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<tr>
<td>e</td>
<td>An ability to identify, formulate and solve engineering problems.</td>
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<tr>
<td>f</td>
<td>An ability to understand professional and ethical responsibilities.</td>
<td>k</td>
<td>An ability to use techniques, skills and modern engineering tools necessary for engineering practice.</td>
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