Department of Chemical Engineering

Course Syllabus

Course Code & Number	CHE 463		
Course Title	Polymer Technology		
Credit & Contact Hours	3 Credits; 3 Lectures, 0 Laboratories (3-0-3)		
Instructor	Dr. Mohammad Anwar Parvez		
Office Location	Room# 2303		
Instructor's Office Phone	00966 13 720 5175		
Instructor's Email	maparvez@uhb.edu.sa	**Homepage link**	https://www.uhb.edu.sa/Pages/MemberDetails.aspx?Param=college&Ref=29&Member=440
Prerequisites	CHEM 312		
Course Description	Structure and physical properties of polymers. Homogeneous and heterogeneous polymerization processes. The chemical, mechanical, and engineering properties of polymers as well as polymer processing and rheology are emphasized in this course.		
Course Objectives	i. To introduce polymer and structure properties relationships ii. To introduce polymerization techniques iii. To introduce processing and rheology		
Required Textbook	Textbook: Ferdinand Rodriguez, Claude Cohen, Christopher K. Ober, Lynden A. Archer, Principles of Polymer Systems, 6th edition, CRC Press, 2014. ISBN13: 978-1-4822-2379-8 Reference book: J. Fried, "Polymer Science & Engineering" J. Fried, Prentice Hall, 1995, ISBN: 013685561.		
Grading Scheme			

Assessments	Assessments Task	Week due	Proportion of Final Mark (%)
1	Quizzes	fortnightly	10
2	Home-works	fortnightly	10
3	Midterm exam	5	30
4	Term Project	12	10
5	Final exam	16	40

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<tr><td>Course Learning Outcomes & Mapped So’s</td><td>

To demonstrate an understanding of polymer and their properties. (ABET SO 1)
To demonstrate an ability to distinguish different polymerization reactions and their mechanisms. (ABET SO 3)
To describe the polymer processing and rheology to relate chemical, physical and mechanical properties. (ABET SO 7)
To function professionally and behave ethically(SO 4)

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<tr><td>Attendance</td><td>
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<tr><td rowspan="2"></td><td colspan="3">Number of unexcused absences</td><td>Tot Absences (excused* + unexcused)</td></tr>
<tr><td>Warning I</td><td>Warning II</td><td>DN</td><td>DN</td></tr>
<tr><td>5 Hours / Week (45 Hours Total)</td><td>4 Hours (8%)</td><td>8 Hours (17%)</td><td>11 Hours (25%)</td><td>15 Hours (33%)</td></tr>
<tr><td>Laboratory session</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td></tr>
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<tr><td>Topics</td><td>
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<tr><th>Weeks</th><th>List of Topics</th></tr>
<tr><td rowspan="3">1</td><td>Introduction to polymer materials</td></tr>
<tr><td>Polymer structure and terminology</td></tr>
<tr><td>Natural and Synthetic Polymers</td></tr>
<tr><td rowspan="2">2-3</td><td>Polymer Microstructure</td></tr>
<tr><td>Molecular weight of polymers</td></tr>
<tr><td rowspan="3">4-5</td><td>Measurements of molecular weight</td></tr>
<tr><td>Polymerization reactions</td></tr>
<tr><td>Polymerization techniques</td></tr>
<tr><td rowspan="2">6</td><td>Crystallization and Crystalline Melting Temperature</td></tr>
<tr><td>The Glass Transition Temperature</td></tr>
<tr><td>7</td><td>Thermal Characterization of Polymer Materials</td></tr>
<tr><td>8</td><td>Mechanical Properties-Definitions</td></tr>
<tr><td>9</td><td>Stress-strain Characteristics in Polymers</td></tr>
<tr><td>10</td><td>Rubber Elasticity</td></tr>
<tr><td>11</td><td>Polymer Melt Rheology and Visco-elasticity</td></tr>
<tr><td>12</td><td>Polymer processing</td></tr>
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