IE 449 Safety Engineering 3(3,1,0)

<table>
<tr><td>Catalog Data</td><td colspan="4">Introduction to regulations and standards, industrial hazard avoidance concepts and techniques, plant safety applications, management and its safety responsibilities, analytical trees and fault tree analysis, risk assessment, emergency planning.</td></tr>
<tr><td>Prerequisite</td><td colspan="4">None</td></tr>
<tr><td>Co-requisites</td><td colspan="4">None</td></tr>
<tr><td>Level</td><td colspan="4">10</td></tr>
<tr><td>Textbook</td><td colspan="4">1. Industrial Safety and Health Management; Asfahl, C. Ray, Pearson Prentice Hall, ISBN-13- 142392-4
2. Occupational Safety Management and Engineering; Hammer, W, Prentice Hall, ISBN-13-629379-4</td></tr>
<tr><td>Reference</td><td colspan="4">3. 1- Enhancing Safety: A Workplace Guide (3rd edition) by Taylor, Easter and Hegney, 2001
4. 2- System Safety 2000 by J. Stephenson, 1991</td></tr>
<tr><td>Learning Objectives</td><td colspan="4">To provide students with understanding of the principles of hazards, occupational risk assessment and safety improvement in the workplace</td></tr>
<tr><td rowspan="15">Topics (classes)</td><td></td><td>Topic</td><td>Week</td><td>Contact, hr</td></tr>
<tr><td>1.</td><td>Introduction to Industrial Safety</td><td>(1)</td><td>[4]</td></tr>
<tr><td>2.</td><td>Risk Management and Analysis</td><td>(1)</td><td>[4]</td></tr>
<tr><td>3.</td><td>Failure Mode and Effect Analysis, Fault Tree Analysis, Event Tree</td><td>(2)</td><td>[8]</td></tr>
<tr><td>4.</td><td>Job Safety Analysis and Preliminary Hazard Analysis</td><td>(1)</td><td>[4]</td></tr>
<tr><td>5.</td><td>Ergonomics</td><td>(1)</td><td>[4]</td></tr>
<tr><td>6.</td><td>Development of Safety and Health Function</td><td>(1)</td><td>[4]</td></tr>
<tr><td>7.</td><td>Information Systems and Process Safety</td><td>(1)</td><td>[4]</td></tr>
<tr><td>8.</td><td>Buildings and Facilities</td><td>(1)</td><td>[4]</td></tr>
<tr><td>9.</td><td>Hazardous Substances Management</td><td>(1)</td><td>[4]</td></tr>
<tr><td>10.</td><td>Mechanical and Electrical Hazards</td><td>(1)</td><td>[4]</td></tr>
<tr><td>11.</td><td>Material Handling and Storage</td><td>(1)</td><td>[4]</td></tr>
<tr><td>12.</td><td>Personal Protection and First Aid</td><td>(1)</td><td>[4]</td></tr>
<tr><td>13.</td><td>Fire Protection- Traffic Safety</td><td>(1)</td><td>[4]</td></tr>
<tr><td>Laboratory Topics</td><td></td><td colspan="3">Personal Protection Equipment and Fire Safety</td></tr>
<tr><td>Project work</td><td colspan="4">Independent group projects for design of a new safety system or evaluate and improve safety at a workplace.</td></tr>
<tr><td>Computer Usage</td><td colspan="4">None</td></tr>
<tr><td>Learning outcomes</td><td colspan="4">1) Understand the sources of hazards in the workplace [a,e,j,k]
2) Assess the risk to humans due to existing hazards in the workplace [a,b,c,e,k]
3) Ability to Develop methods and ways to minimize occupational risk [a,c,e,h,k]
4) Ability to Develop training modules that would enhance safety in the workplace [a,e,j]
5) Understand sources of fire and improve fire safety conditions in the workplace [a,c,e,h,k]
6) Learn types of personal protection equipment and their applications [a,c,e,h,k]
7) Understand aspects related to and ways to improve traffic safety [a,b,c,h,k]</td></tr>
<tr><td>Estimated Category Content</td><td colspan="4">Engineering Design: 1 credit hour or 33%
Engineering Science: 2 credit hour or 67%</td></tr>
<tr><td>Prepared by</td><td colspan="4">Dr. Waleed Mahmoud Elnahas</td></tr>
<tr><td>Preparation Date</td><td colspan="4">March 2008 – revision December 2009-12-15- revision 12 may 2012</td></tr>
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