Instructor: H.K. Khalil; Room 2308F EB; Tel. 355-6689; E-mail khalil@msu.edu
Lab Instructor: H.K. Khalil
Lecture Schedule: Tu Th 1:50 – 2:40, Room 1235 Anthony Hall
Lab Room: 3230A EB
Office Hours: Tu & Th 10:00 – 11:00, F 11:00 – 12:00 (If you have conflict with the scheduled office hours, send e-mail to H. Khalil to arrange for other times)
ANGEL: The following material will be posted on ANGEL. All sections are synchronized with ECE-416-002.
- Homework assignments (one week before the due date)
- Homework solutions (after the due date)
- Selected lecture notes
- Lab manuals (one week before the lab). Read before the lab

Grading
Grading is assigned using the straight scale shown below, with 2/3 of the score for the lecture and 1/3 for the lab.

<table>
<thead>
<tr>
<th>Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100%</td>
<td>4.0</td>
</tr>
<tr>
<td>82-89%</td>
<td>3.5</td>
</tr>
<tr>
<td>75-81%</td>
<td>3.0</td>
</tr>
<tr>
<td>68-74%</td>
<td>2.5</td>
</tr>
<tr>
<td>60-67%</td>
<td>2.0</td>
</tr>
<tr>
<td>52-59%</td>
<td>1.5</td>
</tr>
<tr>
<td>45-51%</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Points for the lecture portion are distributed as follows:

<table>
<thead>
<tr>
<th>Homework</th>
<th>Exam 1</th>
<th>Exam 2</th>
<th>Exam 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Points for the lab portion are distributed as follows:

<table>
<thead>
<tr>
<th>Lab Performance</th>
<th>Reports</th>
<th>Quizzes</th>
<th>Exam</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>30%</td>
<td>10%</td>
<td>20%</td>
<td>100%</td>
</tr>
</tbody>
</table>

- The lowest grade in each of the homework assignments, lab experiments (performance & report), and lab quizzes will be dropped.
- All exams are closed book (formulas are provided).
- Homework is due in class.
- Pre-lab assignments (handwritten or typed) should be shown to the lab instructor at the beginning of the lab. They need to be typed when included in the lab report.
- Lab reports should be done individually. Of course, you will have the same numbers and figures as your partner, but the rest of the work should be your own.
- Everything in the lab report should be typed, including the pre-lab assignment. However, if it is not convenient for you to type mathematical equations, they can be hand written.
- An electronic copy of the lab report (as pdf file) should be uploaded to a Drop Box in ANGEL by 8 A.M. on the Tuesday following the lab. For the week preceding the spring break the report is due on the first Tuesday after the break.
Lab quizzes will be given randomly at the beginning of the lab and will cover previous experiments. There is no makeup for students who arrive late or those who are absent.

If you miss more than three labs without acceptable excuse, you will receive zero in the lab portion. Make-up labs may be arranged at the discretion of the lab instructor, but they are not guaranteed. If you are seriously ill you must contact your lab instructor before you miss the lab. You cannot submit a report for a missed lab.

**Exam Schedule**

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date and Time</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>Tuesday, February 12, 1:50 – 2:40</td>
<td>Lectures 1 – 9</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Tuesday, March 26, 1:50 – 2:40</td>
<td>Lecture 12 – 18</td>
</tr>
<tr>
<td>Exam 3</td>
<td>Monday, April 29, 3:00 – 3:50</td>
<td>Lectures 19 – 27</td>
</tr>
<tr>
<td>Lab Exam</td>
<td>Monday, April 29, 4:00 – 4:30</td>
<td></td>
</tr>
</tbody>
</table>

**Lab Exam:**

<table>
<thead>
<tr>
<th>Lecture Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture #</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>18</td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>21</td>
</tr>
<tr>
<td>22</td>
</tr>
<tr>
<td>23</td>
</tr>
<tr>
<td>24</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>26</td>
</tr>
<tr>
<td>27</td>
</tr>
<tr>
<td>28</td>
</tr>
<tr>
<td>29</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>M 4/29</td>
</tr>
</tbody>
</table>

DB=Dorf&Bishop; ROTPEN=Rotary Pendulum; all chapters are from the textbook; DTS = Discrete Time Systems; DC = Digital Controllers
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/8 – 1/10</td>
<td>Before you start</td>
</tr>
<tr>
<td>2</td>
<td>1/15 – 1/17</td>
<td>Lab 1: DC Motor I</td>
</tr>
<tr>
<td>3</td>
<td>1/22 – 1/24</td>
<td>Lab 2: DC Motor II</td>
</tr>
<tr>
<td>4</td>
<td>1/29 – 1/31</td>
<td>Lab 3: VHAC I</td>
</tr>
<tr>
<td>5</td>
<td>2/5 – 2/7</td>
<td>Lab 4: VHAC II</td>
</tr>
<tr>
<td>6</td>
<td>2/12 – 2/14</td>
<td>Lab 5: Labview I</td>
</tr>
<tr>
<td>7</td>
<td>2/19 – 2/22</td>
<td>Lab 6: Labview II</td>
</tr>
<tr>
<td>8</td>
<td>2/26 – 2/28</td>
<td>Lab 7: VTOL I</td>
</tr>
<tr>
<td>9</td>
<td>3/12 – 3/14</td>
<td>Lab 8: VTOL II</td>
</tr>
<tr>
<td>10</td>
<td>3/19 – 3/21</td>
<td>Lab 9: ROTPEN I</td>
</tr>
<tr>
<td>11</td>
<td>3/26 – 3/28</td>
<td>Lab 10: ROTPEN II</td>
</tr>
<tr>
<td>12</td>
<td>4/2 – 4/4</td>
<td>Lab 11: Digital Control I</td>
</tr>
<tr>
<td>13</td>
<td>4/9 – 4/11</td>
<td>Lab 12: Digital Control II</td>
</tr>
<tr>
<td>14</td>
<td>4/16 – 4/18</td>
<td>Lab 13: Digital Control III</td>
</tr>
<tr>
<td>15</td>
<td>4/23 – 4/25</td>
<td>Makeup Week</td>
</tr>
<tr>
<td></td>
<td>4/29</td>
<td>Lab Exam</td>
</tr>
</tbody>
</table>