1. Course Details
   Instructor: Professor Caroline Taylor
   email: cmtaylor@mtu.edu
   Phone: 7-1645
   Office: ChemSci 701C
   Office Hours: Monday, Wednesday 1pm – 2pm, or by appointment
   Lecture: ChemSci 101
   Monday, Wednesday 4:05pm – 4:55pm
   Required Text: Physical Chemistry 4th Ed.,
   Robt. Silbey, Robt. Alberty, Moungi Bawendi
   John Wiley and Sons, Inc.
   A copy of the text is on reserve in the library.
   Supplemental Texts: K. Denbigh, Principles of Chemical Equilibrium, 2nd Ed.
   R. S. Berry, S. A. Rice, and J. Ross, Physical Chemistry, 2nd Ed.
   H. Callen, Thermodynamics
   These texts are also on reserve in the library. They are not required, but may prove helpful
   in understanding the material.

   Webpage: http://www.chemistry.mtu.edu/pages/courses/class.php?class=CH3500&sem=20051
   Prerequisites: Introductory-level chemistry and calculus (multi-variable).

2. Lecture
   The central component of this course is the lecture. It will meet twice a week (MW) for 50 minutes, and will
   run the entire allotted course time. While attendance will not be taken, participation can affect the final grade.

3. Assignments & Grading
   Problem Sets: During the course of the semester there will be six graded problem sets. These will be dis-
   tributed in class and posted on the web site, and will count toward the overall course grade.
   Exams: There will be two mid-term examinations during the semester, covering material from lecture,
   the textbook, and problem sets. These will be held in class on Wednesday, 19 October*
   and Wednesday, 30 November. (*NB: the October exam may shift a week or two)
   Research Paper: There will be no final examination in the course. In place of a final examination, a research-
   based paper of about 10 double-spaced pages (in 12pt) will be required, to be handed in during
   finals week. General topic areas for this paper will be distributed separately; all topics must
   be approved in advance.
   Late work will not be accepted, and there are no make-up exams.
   Grade: The course grade will be determined from the two mid-term exams, cumulative problem set
   scores, the final research paper, and participation in lecture. The anticipated (tentative)
   breakdown is:
   5% participation
   20% problem sets
   25% exam I
   25% exam II
   25% research paper

4. Academic Integrity
   Collaboration is both expected and encouraged. However, every student must submit their own
   work. This extends to the final research paper, where scholarly standards must be met. Please
   review the University’s policy on Academic Integrity, available at
   http://www.studentaffairs.mtu.edu/dean/judicial/policies/academic_integrity.html.
   Any violations will be subject to the full range of penalties, from a zero score on the assignment or
   exam to failure of the course and an indication on the permanent record.
   If you are at all uncertain, please speak to me.
5. **Tentative Schedule**

<table>
<thead>
<tr>
<th>Week(s) of</th>
<th>General Topics (<em>abridged</em>)</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/29</td>
<td>Thermodynamics definitions, the 0th Law, temperature, Equations of State and state variables</td>
<td>1</td>
</tr>
<tr>
<td>9/5, 9/12</td>
<td>Changes of state, work and heat, internal energy and enthalpy, the 1st Law, thermochemistry</td>
<td>2</td>
</tr>
<tr>
<td>9/19, 9/26</td>
<td>Entropy, the 2nd Law, reversibility and irreversibility</td>
<td>3</td>
</tr>
<tr>
<td>10/3</td>
<td>Absolute zero and entropy, the 3rd Law</td>
<td>3</td>
</tr>
<tr>
<td>10/3, 10/10, 10/17</td>
<td>Thermodynamic postulates, fundamental relations, Gibbs equations, thermodynamic transformations</td>
<td>4</td>
</tr>
<tr>
<td>10/24, 10/31</td>
<td>Phase equilibria, Gibbs-Duhem relations</td>
<td>6</td>
</tr>
<tr>
<td>11/7, 11/14</td>
<td>Chemical equilibria</td>
<td>5</td>
</tr>
<tr>
<td>11/28</td>
<td>Biochemical thermodynamics</td>
<td>8</td>
</tr>
<tr>
<td>12/5</td>
<td>Kinetics, rates, liquid state kinetics</td>
<td>18, 20</td>
</tr>
</tbody>
</table>