Interface Between the Chemistry Major and Teacher Certification Requirements

As a Chemistry major seeking teacher certification, the following demonstrates how your major program of study interfaces with teacher certification requirements:

Education Department Model

The mission of the Education Department is to empower its students with the tools needed to create learning environments that ensure belonging, mastery, independence, and generosity. Our mission is grounded in the philosophy that integrates the best of Western educational thought with the wisdom of the indigenous Native American culture of the region and emerging research on positive youth development. There are four overarching values embodied in a model of positive youth development called the Circle of Courage. The central premise of this model is that a set of shared values must undergird a community of learners including public education and teacher training institutions. Those shared values include belonging, mastery, independence, and generosity.

While the four dimensions of the Circle of Courage can be described individually, they must be viewed as one and are imbued throughout the Education curriculum and complement the Augustana Core of Liberal Studies as well as the core values of Excellence, Liberal Arts, Community, Service, and Christianity. The curriculum is structured to blend the Circle of Courage values into a model for professional behavior. A set of professional competencies that reflect the four values have been identified to guide course content and practicum experiences. Of those competencies, the following are emphasized in the course of study for a chemistry major:

<table>
<thead>
<tr>
<th>COMPETENCY</th>
<th>COURSE</th>
<th>CIRCLE OF COURAGE</th>
<th>NCATE STANDARD</th>
<th>LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge of Core</td>
<td>All required courses</td>
<td>Mastery</td>
<td>IA1, IA2, IB1, IC1, ID1</td>
<td>1&amp;2 depending on course</td>
</tr>
<tr>
<td>5. Knowledge of Resources</td>
<td>All required courses</td>
<td>Mastery</td>
<td>IC1, ID2</td>
<td>1&amp;2 depending on course</td>
</tr>
<tr>
<td>16. Communicate Clearly</td>
<td>CHEM 311W, 331, 341, 351, 381, 395, 399</td>
<td>Independence</td>
<td>ID2</td>
<td>2</td>
</tr>
<tr>
<td>19. Professionalism and Lifelong Learning</td>
<td>Two terms of CHEM 399 Independent Study</td>
<td>Independence</td>
<td>ID1</td>
<td>1&amp;2</td>
</tr>
<tr>
<td>20. Technology</td>
<td>All required Courses</td>
<td>Mastery</td>
<td>IC1, ID1, ID2</td>
<td>1&amp;2 depending on course</td>
</tr>
<tr>
<td>21. Software Integration</td>
<td>All required Courses</td>
<td></td>
<td></td>
<td>1&amp;2 depending on course</td>
</tr>
</tbody>
</table>

1. Knowledge of the Core
   - All courses that count toward the major also build the student's core knowledge of Chemistry.

5. Knowledge of Resources
   - The Department has developed a comprehensive plan for introducing students to the literature of Chemistry, including: handbooks, compendia, journals, searching the printed version of Chemical Abstracts, and on-line searching of commercial databases and the Internet. The introduction to resources begins in the first course in Chemistry, and each course has some facet.

16. Communicate Clearly
   - Advanced Analysis (CHEM 311) is a "W" component course, and the other advanced courses include a significant writing component.
   - Some advanced courses also require student oral presentations.
   - All students who take an advanced course or do an independent study at any level are required to give a departmental seminar.

19. Professionalism and Lifelong Learning
   - In the sciences new knowledge and understanding in the discipline come from laboratory research. Two semester of Independent Study Research are required for the Augustana Chemistry major where the students are introduced
to that process. Students gain experience in formulating a plan, searching the literature for background and basics, critically assessing results and reformulating the plan, writing a final report and presenting a Departmental Seminar to communicate findings to others. When appropriate, students also present results at a professional meeting or publish in a scientific journal.

20. Technology as a Tool
- Chemistry as a discipline and as a department depends heavily on technology.
- Instrumentation (computer controlled and manual) are introduced early in the curriculum and are used extensively in the more advanced courses. A series of one hour proficiency courses are offered on a rotating basis to enable students to build proficiency in the use of a computer controlled instrument, in understanding the theory behind the technique, and in interpreting the data generated by the instrument. One component of student lab assisting assignments (assistants are primarily chemistry majors) is the "care and feeding" of an instrument in the department. Students learn how to start up, operate, and shut down the instrument, and then train other assistants on that instrument.
- Computers are used extensively in courses, beginning with the Intro to Chemistry (CHEM 120) course. Early courses focus on general programs like spreadsheets and use of the Internet. More advanced courses incorporate chemistry specific software targeted toward the concepts covered in that course (e.g. SEQS for solving simultaneous equilibria equations in CHEM 242; HyperChem and Spartan for molecular modeling in CHEM 302 and 381; QuattroPro, Sigma Plot, and Minsq for statistical analysis in CHEM 242 and many advanced courses; etc.) A variety of computer-based training programs are used in conjunction with the Instrument Proficiency Courses as well. Students receive hands-on experience with several computer-controlled instruments in the department.
- On-line searching of commercial databases and Internet resources is a component of several courses as outlined in the Department's comprehensive literature plan referenced above.

21. Software Integration
- Software is a technological tool in Chemistry. For specifics, see the discussion in 20.