Program Goal: To provide graduates with laboratory analytical testing knowledge and skills, for entry level positions, with scientific organizations.

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<th>Critical Outcomes for all Students</th>
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<td>Domain/Task/ Capability</td>
<td>Performance Criteria/ Benchmarks</td>
<td>Instrument/ Assessment of Performance</td>
<td>Develop Collect</td>
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<tr>
<td>1. General Skills and Professional Competence (Technical)</td>
<td>a. Students will understand and apply safety regulations and protocols and correctly utilize safety equipment.</td>
<td>Portfolio review. To occur at the end of Laboratory Applications VI course (0879-206).</td>
<td>a.-d. Score of at least “2” (“acceptable/meets entry level professional standards”) on all related items on the Laboratory Science Technology portfolio rating sheet.</td>
<td>Anually in the Laboratory Applications VI (0879-206) course.</td>
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<tr>
<td>2. Instrumentation (Technical)</td>
<td>a. Students will demonstrate an understanding of how to set-up, run, and maintain selected electroanalytical probes/meters.</td>
<td>Portfolio review. To occur at the end of Laboratory Applications VI course (0879-206).</td>
<td>a.-e. Score of at least “2” (“acceptable/meets entry level professional standards”) on all related items on the Laboratory Science Technology portfolio rating</td>
<td>Anually in the Laboratory Applications VI (0879-206) course.</td>
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Inasmuch as only 4 graduating students have been assessed, our first concern will be to continue to collect data over the next few years. Although students were assessed in a positive manner related to their skills in this category, the program will continue to emphasize general laboratory skills and professional competence in an effort to ensure that our graduates are technically prepared. As a result of last year’s Outcomes Assessment efforts, we made a push to increase the emphasis of the crucial topic of laboratory safety. This year’s results for that item yielded an average score of 2.3 (on a 0-3 scale). This is up slightly from last year’s average score of 2.1. It is assumed that the modest improvement is a result of the curricular changes that resulted from last year’s Outcomes Assessment. It is believed that this year’s group of evaluated students (in the seventh/final quarter of the program) were not able to take advantage of the full curriculum changes, as they had already completed a year on the “old” curriculum. It is anticipated that next year’s evaluated students will show even greater improvement. Even though both years yielded passable scores, the topic of laboratory safety is so important that we would like to see further improvement.
### Chromatography

- Students will set-up, run, and maintain selected molecular spectrophotometers.
- Students will demonstrate an understanding of how to set-up, run, and maintain atomic spectrophotometers.
- Students will demonstrate an understanding of how to set-up, run, and maintain High Performance Liquid Chromatographers.
- Students will demonstrate an understanding of how to set-up, run, and maintain Gas Chromatographers/Gas Chromatographer – Mass Spectrometers.

### Volumetric and Gravimetric Analysis (Technical)

**Eighty percent (80 %)** of all students will produce laboratory reports that demonstrate an understanding of the processes involved in volumetric and gravimetric analyses including: sample preparation, titrations, and gravimetric techniques.

- Students can perform sample preparation procedures and the corresponding calculations.
- Students can perform gravimetric procedures and the corresponding calculations.
- Students can perform acid/base titrations and the corresponding calculations.

### Biological and Microbiological Techniques (Technical)

**Eighty percent (80 %)** of all students will produce laboratory reports that identify/classify/evaluate microorganisms. Students can prepare media using sterile technique.

### Outcomes Assessment

- **AY 2004-2005**
- **AY 2006-2007**

### Evaluation Details

- **Portfolio review. To occur at the end of Laboratory Applications VI course (0879-206).**
- **Score of at least “2” (“acceptable/meets entry level professional standards”) on all related items on the Laboratory Science Technology portfolio rating sheet.
- **Anually in the Laboratory Applications VI (0879-206) course.**
- **4 graduating students were evaluated in academic year 2006-2007.**
- **100% of students performed at or above the benchmark for all Volumetric and Gravimetric Analysis sections.**

We are a relatively new and small program. Inasmuch as only 4 graduating students have been assessed, our first concern will be to continue to collect data over the next few years.

Although students were assessed in a positive manor related to their skills in this category, the program will continue to emphasize instrumentation knowledge and skills in an effort to ensure that our graduates are technically competent.

We are thrilled that students appear to be performing so well in the field of instrumental analysis; as the setting-up, running, and maintaining of analytical instrumentation is one of the primary expectations of the workplace.
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Assessment Method</th>
<th>Timeframe</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Co-op Work experience</td>
<td>Having completed a job search process, a student will complete at 10-week co-op work experience.</td>
<td>Assessment will occur prior to graduation by a Co-op supervisor.</td>
<td>AY 2004-2005</td>
<td>*For all NTID associate degree co-op students for 2004-2005: Total n=65; 94% of students met criterion. *See note below</td>
</tr>
<tr>
<td>Job Placement</td>
<td>Students will gain entry-level employment in the LST field</td>
<td>NCE Data</td>
<td>Ongoing</td>
<td>For AY 2004-2005 n=2; 100% of students seeking employment were working.</td>
</tr>
<tr>
<td>Student Satisfaction</td>
<td>Graduating students will indicate overall satisfaction with program and courses.</td>
<td>Student Satisfaction Survey</td>
<td>Annually</td>
<td>In every case where an individual is not looking for a job, the graduates of the LST program are continuing in baccalaureate programs as a result of a newly established transfer degree from the LST program. Of the remaining students, we are thrilled that 100% are finding permanent jobs. We aim to keep up our placement of students as the student enrollment in the program continues to expand.</td>
</tr>
</tbody>
</table>

80% of graduating students will indicate overall satisfaction with the program and the courses.
rating on two global items, one related to the program in general and the other related to the courses in the major.

100% responded “Agree Strongly” with question “I would recommend the Laboratory Science Technology Program to other students.”

100% indicated overall satisfaction with the courses in their major.
• 50% responded “Agree Strongly” and 50% responded “More Agree than Disagree” to the question “I was satisfied with what I learned in the Laboratory Science Technology program.”

Two years, our first concern will be to continue to collect data over the next few years. Although students indicated overall satisfaction with their courses, we examined the results from the assessment of individual courses and found the following information.

• Of the 8 categories of courses, 6 received overall ratings of average or better in the extent to which the courses improved their skills. It appears that we are doing well to satisfy student in these courses. The Instrumentation series of courses, Principles of Chemistry series of courses, Chemical/Biotechnology, and Fundamentals of Chemistry series of courses were all received overall ratings above average. While the Fundamentals of Biology series of courses and the Laboratory Applications series of courses received overall ratings of average.

• The responses for the Laboratory Mathematics and Microbiology series of courses were somewhat disappointing, receiving overall ratings below average. Of most concern, 75% of the students rated their Microbiology courses below average in improving their skills, while 25% of the students rated the same courses as average. These courses will be examined to see how they might be improved for student satisfaction.

Comments:
*The total n reflects only those co-op evaluations that were completed online. An online co-op evaluation form was implemented summer 2004. As of summer 2005 there were still additional hard-copy co-op evaluations that could not be included in this report. It is anticipated that 90% of the co-op evaluations will be completed online by summer 2006. At that time it may be possible to calculate performance of students for each program of study.

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