

**NTID**  
**Laboratory Science Technology Program Outcomes Assessment**  
**Plan and Report for AY 2006-2007**

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

Critical Outcomes for all Students		Assessment of Outcomes		Timeline		Results	
Domain/Task/Capability	Performance Criteria/Benchmarks	Instrument/Opportunity	Assessment of Performance	Develop	Collect	Summarization of Results	Use of Results
1. General Skills and Professional Competence (Technical) <b>[Eighty percent (80 %)]</b> of all students will understand, use, and document appropriate laboratory skills related to safety, quality control, technical communication, and professional readiness.	a. Students will understand and apply safety regulations and protocols and correctly utilize safety equipment.  b. Students will appropriately follow quality control procedures.  c. Students will demonstrate effective technical communication of results.  d. Students will develop a resume that is accurate, complete, and professional.	Portfolio review. To occur at the end of Laboratory Applications VI course (0879-206).	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.	AY 2004-2005	Annually 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 General Skills and Professional Competence 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 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.
2. Instrumentation (Technical) <b>[Eighty percent (80 %)]</b> of all students will produce laboratory reports that demonstrate an understanding of the use of analytical instrumentation including: electroanalytical, spectroscopy, and	a. Students will demonstrate an understanding of how to set-up, run, and maintain selected electroanalytical probes/meters.  b. Students will demonstrate an understanding of how to	Portfolio review. To occur at the end of Laboratory Applications VI course (0879-206).	a.-e. Score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating	AY 2004-2005	Annually 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 Instrumentation sections. In fact, all students showed a rating of 3 (on a 0-3 scale).	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

<p>chromatography instruments.</p>	<p>set-up, run, and maintain selected molecular spectrophotometers.</p> <p>c. Students will demonstrate an understanding of how to set-up, run, and maintain selected atomic spectrophotometers.</p> <p>d. Students will demonstrate an understanding of how to set-up, run, and maintain High Performance Liquid Chromatographers.</p> <p>e. Students will demonstrate an understanding of how to set-up, run, and maintain Gas Chromatographers/Gas Chromatographer – Mass Spectrometers.</p>		<p>sheet.</p>				<p>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.</p>
<p>3. Volumetric and Gravimetric Analysis (Technical) <b>[Eighty percent (80 %)]</b> 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.</p>	<p>a. Students can perform sample preparation procedures and the corresponding calculations.</p> <p>b. Students can perform gravimetric procedures and the corresponding calculations.</p> <p>c. Students can perform acid/base titrations and the corresponding calculations.</p>	<p>Portfolio review. To occur at the end of Laboratory Applications VI course (0879-206).</p>	<p>a.-c. Score of at least “2” (“acceptable/meets entry level professional standards”) on all related items on the Laboratory Science Technology portfolio rating sheet.</p>	<p>AY 2004-2005</p>	<p>Annually in the Laboratory Applications VI (0879-206) course.</p>	<p>4 graduating students were evaluated in academic year 2006-2007.</p> <p>100% of students performed at or above the benchmark for all Volumetric and Gravimetric Analysis sections.</p>	<p>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.</p> <p>Although students were assessed in a positive manor related to their skills in this category, the program will continue to emphasize volumetric and gravimetric knowledge and skills in an effort to ensure that our graduates are technically competent. The competency receiving the lowest score, sample preparation, yielded an average rating of 2.25 (on a 0-3 scale). This is a good score, but we believe that the students’ skills in sample preparation are even better than the statistics show. Therefore we believe that our Outcomes Assessment metric is adequate (but not ideal) for evaluating this skill, as sample preparation is involved in most of their laboratory techniques. Students are using this skill often (and appropriately) in most of their experiments, but reporting on this skill is not the focus of their efforts.</p>
<p>4. Biological and Microbiological Techniques (Technical) <b>[Eighty percent (80 %)]</b> of all students will produce laboratory reports that</p>	<p>a. Students can identify/classify/evaluate microorganisms.</p> <p>b. Students can prepare media using sterile technique.</p>	<p>Portfolio review. To occur at the end of Laboratory Applications</p>	<p>a.-b. Score of at least “2” (“acceptable/meets entry level professional standards”) on all</p>	<p>AY 2004-2005</p>	<p>Annually in the Laboratory Applications VI (0879-206) course.</p>	<p>4 graduating students were evaluated in academic year 2006-2007.</p> <p>75% of students performed at or above the benchmark</p>	<p>We are a relatively new and small program. Inasmuch as only 4 graduating students have been assessed, our first concern will be to</p>

demonstrate an understanding of biological and microbiological techniques including: tasks involving sterile technique and the identification/classification/evaluation of microorganisms.		VI course (0879-206).	related items on the Laboratory Science Technology portfolio rating sheet.			for all Biological/Microbiological Techniques sections.	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 biological and microbiological knowledge and skills in an effort to ensure that our graduates are technically competent. For the second consecutive year, this category yielded some of the lowest average scores. We plan to continue to investigate the individual items in this category in order to develop a plan for the improvement of biological techniques, including the potential substitution of one of the Microbiology courses in the program mask with a Molecular Biology course. This program change would not only help the program to remain current with the field but should also help to address some of the identified student weaknesses that have surfaced as a result of our Outcomes Assessment initiatives.
Co-op Work experience	Having completed a job search process, a student will complete at 10-week co-op work experience.	Assessment will occur prior to graduation by a Co-op supervisor.	80% of the students will successfully complete a 10-week program-related work experience and receive a score of 3 or above (5 point scale) on overall Co-op performance.	AY 2004-2005	TBD	*For all NTID associate degree co-op students for 20061 to 20063: Total n=20; Students whose supervisors completed online evaluations: N=8; 100% of those students met criterion.	*See note below
Job Placement	Students will gain entry-level employment in the LST field	NCE Data	90% of graduates will be employed in the field.	Ongoing	Annually	For AY 2004-2005 n=2; 100% of students seeking employment were working.	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.
80 % of graduating students will indicate overall satisfaction with the program and the courses.	Graduating students will indicate overall satisfaction with program and courses.	Student Satisfaction Survey	Students will indicate they <i>Strongly Agree</i> or <i>More Agree than Disagree</i> (4-point scale) when asked to give an overall	AY 2004-2005	Annually	4 graduating students were surveyed in academic year 2006-2007.  100% indicated overall satisfaction with the program.	We are a relatively new and small program. Inasmuch as only 4 graduating students have been surveyed this past year (a total of 12 students over the past

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:**

\*While there were problems getting online evaluations for 12 of the 20 students on co-op from 20061-20063, it is anticipated that 90% of the co-op evaluations will be completed online during summer 20064. At that time it may be possible to calculate performance of students for each program of study.

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