

NEW YORK STATE EDUCATION DEPARTMENT

Office of Higher Education—Office of College and University Evaluation

89 Washington Avenue, Albany, NY 12234



Request to Change or Adapt a Registered Program	
Item	Response <i>(type in the requested information)</i>
Institution name and address	<p><b>ROCHESTER INSTITUTE OF TECHNOLOGY</b></p> <p><b>1 Lomb Memorial Drive</b></p> <p><b>Rochester, New York 14623</b></p> <p><i>Additional information:</i></p> <ul style="list-style-type: none"> <li>Specify campus where program is offered, if other than the main campus:</li> </ul>
Identify the program you wish to change	<p>Program title:</p> <p>Laboratory Science Technology (LST)</p> <p>Awards:</p> <p>A.A.S.</p> <p>Credits: Converted 105 Quarter credits to 76 Semester Credits</p> <p>HEGIS code: 5407</p> <p><a href="#">Program code</a>: 24424</p>
Contact person for this proposal	<p>Name and title: <b>Christine M. Licata, Senior Associate Provost</b></p> <p>Telephone: 585-475-2953 Fax: 585-475-4460</p> <p>E-mail: <a href="mailto:cmlnbt@rit.edu">cmlnbt@rit.edu</a></p>
CEO (or	Name and title: <b>Jeremy Haefner, Provost and Sr. Vice President for Academic Affairs</b>

<b>designee) approval</b>	Signature and date:
	<i>Signature affirms the institution's commitment to support the program as revised.</i>
	<b>If the program will be registered jointly<sup>1</sup> with another institution, provide the following information:</b>
	Partner institution's name:
	Name and title of partner institution's CEO:
	Signature of partner institution's CEO:

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## 1. RIT Program Conversion: Overview of Proposed Changes

Describe how program faculty used the calendar conversion process as an opportunity to revise and improve the program.

### Program Revisions and Improvements

The LST program has gone through extensive reviews- which include discussions with the program's Advisory Board and participation in the American Chemical Society's "Chemical Technology Voluntary Industry Skills Standards". Results of these initiatives demonstrate the need for the LST program to modify its curriculum in order to meet industrial skill standard needs. In Spring 2010, the plans for the LST conversion were presented, along with several potential semester program masks, to both the LST Advisory Board and the Department faculty. Based on extensive discussions from that meeting, during the Summer of 2010, modifications to the potential program masks were made. During Fall 2010, the program masks were modified to incorporate RIT/NTID's evolving general education requirements and logistics of the semester system (i.e- number of total program credits allowed, number of 4-credit courses allowed, etc.). In Winter 2010/2011 the updated program masks, as well as course proposals, were again shared with the Advisory Board and Department faculty- where feedback was received and incorporated into the final program conversion packet. These curricular modifications should help with student co-op experiences and job placement of graduates. As well, the revisions will help the program to include strategic /emergent areas like sustainable/green/environmental. We are confident that inherent changes in regard to program modifications required to move to a semester system have strengthened the LST program's curriculum and will result in a more robust program.

The program revisions will also allow the LST program to become better aligned with several College of Science programs (such as Environmental Science, Chemistry, and Biotechnology) to allow for more fluid transfer of NTID students to baccalaureate degrees at the other colleges of RIT and other colleges/universities. The strengthened ties between the LST program and these COS programs should also enhance collaboration between faculty from the two colleges; increasing opportunities for collaborative scholarship.

The program modifications will strengthen the program by condensing some curricular content, realigning some content, and removing more outdated content. These changes will improve the sequencing of inherent courses- ultimately streamlining the program and making it more robust. Ultimately, the program modifications will produce more competitive global graduates in the field of laboratory sciences.

Highlights of the primary modifications include:

- Improvements to our biology sequence of courses which have been a point of concern in our LST Program Outcomes Assessment Reports, as well as a point of discussion with our Advisory Board. We added a second course of introductory biology content, Fundamentals of Biology II, and the course content for microbiology has been updated, and combined with Molecular Biology, in a semester replacement program requirement course, Biotechnology II.
- The three Instrumental Analysis quarter courses were reorganized and divided into two semester courses (Quantitative Instrumental Analysis and Chemical Separations & Chromatography) with a net increase in contact hours. This is in response to a need for more depth, specifically in regard to chemical separations & Chromatography, according to the American Chemical Society's Industrial Skills Standards.
- A new semester 3-credit course, Principles of Biochemistry, was added to the second year of the

program. Discussions with the LST Advisory Board and analysis of American Chemical Society's Industrial Skills Standards indicated a need for more depth in the student learning experience in organic chemistry/ biochemistry. This course addition will help to obtain such depth, as well as help to remedy concerns with the Biology-related topics of Outcomes Assessment reports.

Additional modifications include:

- Options for students' choices of technical electives have been expanded by adding a second technical elective in the course mask.
- Several Laboratory Applications 2-credit hour quarter courses, which emphasize "soft skills" and performing on the job, have been combined, along with Job Search Process, into the semester Laboratory Applications course. Discussion of the process of finding a job in the laboratory testing field fits well with the career-focused curriculum of the Laboratory Applications course.
- The quarter-based Laboratory Applications VI and LST Senior Seminar courses were culminating/processing courses that were incorporated into the semester-based Laboratory Methods course- which will address as a LST program capstone experience.

Describe how your converted program responds to the RIT Academic Program Profile (see RIT Academic Program Profile: [https://www.rit.edu/conversion/media/documents/packet/RIT\\_Academic\\_Program\\_Profile\\_05-20-2010.pdf](https://www.rit.edu/conversion/media/documents/packet/RIT_Academic_Program_Profile_05-20-2010.pdf) . How have you aligned the appropriate Essential Program Learning Outcomes from this profile into your program? Please also include these outcomes in your Program Level Assessment Plan required in Section 3 of this form.

## Academic Program Profile

### **I. Guiding Principles: Lifelong Learning and Career Orientation**

Independence: Students in the LST program progress from dependent to independent learners by first being taught basic skills and laboratory techniques and fundamental calculations. Students are then expected to progress to understanding and performing the standard methods of the field. Ultimately students are expected to critically select appropriate methods toward problem solving and presenting solutions to results. This content is taught through a spiral curriculum- where critical information is reviewed, as students progress to applications of greater sophistication.

### **II. Critical Thinking**

The scientific/analytical process is based on critical thinking- where students are presented with a problem, contemplate different explanations/solutions, conduct experimentation, analyze results, critically determine what the results mean, and apply them back to the big picture. Likewise, when following a Standard Method, students have to align the problem to be investigated with the Standard Method, and make critical decisions about modifying the method, seek a reasonable solution, understand if the solution is reasonable and in the "ball park", and convey results.

### **III. Ethical Reasoning**

Discussion of ethics is critical in science programs, especially in regard to falsifying data, properly disposing of waste, legalities of record keeping, safety considerations, appropriate use of material safety data sheets information, and laboratory budget accountability. Of course, the program also, in detail, discusses issues of plagiarism- both in an academic and professional setting.

### **IV. Global Interconnectedness**

Students are versed in the importance of professional organizations, like the American Chemical Society (ACS). The ACS, the largest scientific society in the world, has an international reach and acceptance. The LST program currently has ACS "Chemical Technology Program Approval". Along with math,

science is often considered a universal language. The program also has a focus on environmental “green” applications. Students are shown how many environmental issues have no “boundary” and are in fact global.

#### **V. Computational or Digital Literacy**

Computer-based technology is standard in the modern academic teaching laboratory. Computers are used to generate reports, to calibrate and operate instruments, do analyses (including those from multidimensional spectra), and keep records. A backbone of the LST program is instrumentation-heavy courses- all of which are rich in computation/digital literacy.

#### **VI. Fundamental and Advanced Mathematical Literacy**

The designated general education math course required for the LST program is at advanced levels for NTID technical programs. The program also has an additional technical (Laboratory Mathematics) course within the program. As is the case with scientific majors, the majority of the LST courses involve mathematical manipulations and solutions.

#### **VII. Communication Literacy**

The LST program is rich in communication literacy. The ability to convey results, concepts, and theories is an important function of the working scientist. Students conduct written communication through memos, laboratory reports, and notebooks. Students are also often required to create formal presentations and clearly disseminate information to peers. Students also work collaboratively in teams, and are instructed on strategies to maximize the effectiveness of communication interpersonally and within group dynamics.

#### **VIII. Technical Literacy**

The LST program has gone through rigorous review and analysis of the technical skills desired of successful graduates. Through investigation of the ACS’s Industrial Skill Standards, we have aligned the technical skills taught in the program with those needed for employment. Based largely on this effort, the program has gained the ACS’s “Chemical Technology Program approval”- only the 15<sup>th</sup> program to obtain this accolade. Feedback from co-op supervisors shows that we are robust in this area.

#### **IX. Aesthetic Literacy**

Aesthetic literacy to a scientist is organization skills and efficiency in performing multiple tasks. Scientists look for a simplistic beauty through mechanistic problem solving of a complex situation. There can be aesthetic appreciation in the derivation of an equation that represents a complex scientific theory.

#### **X. Creative and Innovative Thinking**

Students in the program work on open-ended and sophisticated problems in course projects. There is a body of standard methods in the field and a plethora of problems in need of solution. And whereas there is no direct link between the two, the bridge between the two is derived from creative and innovative thinking.

**NYSED: Please check the appropriate boxes in section A-H and provide other requested information as appropriate.**

#### **A. Program Goals, Objectives, Focus and/or Design**

Have there been changes to the goals, objectives, focus and /or design of the program?

	No changes
X	Slight-moderate changes
	Substantive changes (e.g., substantial change in the focus and design of the program; change of 1/3 or more in program outcomes/objectives and accompanying content of the program).

Explain any proposed changes, the rationale for these changes, the impact of changes on the capacity of current faculty to deliver the revised program, impact, if any, on current admissions standards and the expected impact on enrollment projections. Enrollment Projection changes should be provided by EMCS, as appropriate.

The LST program has gone through extensive reviews- which include discussions with the program's Advisory Board and participation in the American Chemical Society's "Chemical Technology Voluntary Industry Skills Standards". Results of these initiatives demonstrate the need for the LST program to modify its curriculum in order to meet industrial skill standard needs. These curricular modifications should help with student co-op experiences and job placement of graduates. As well, the revisions will help the program to include strategic /emergent areas like sustainable/green/environmental. We are confident that inherent changes in regard to program modifications required to move to a semester system have strengthened the LST program's curriculum and will result in a more robust program.

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performing on the job, have been combined, along with Job Search Process, into the semester Laboratory Applications course. Discussion of the process of finding a job in the laboratory testing field fits well with the career-focused curriculum of the Laboratory Applications course.

- The quarter-based Laboratory Applications VI and LST Senior Seminar courses were culminating/processing courses that were incorporated into the semester-based Laboratory Methods course- which will address as a LST program capstone experience.

It is not anticipated that these curricular modifications will impact the capacity of current faculty to deliver the program or impact enrollment projections.

**B. Program Options or Concentrations** (i.e., a specific group of related courses that lead to greater understanding in a field or discipline).

X	No changes to options or concentrations
	Kept current option(s)/concentrations with some revisions
	Added an option(s)/concentration(s)
	Title of new option(s)/concentration(s)
	Eliminated option(s)/concentration(s)

Explain these proposed changes and the rationale for these changes:

**C. Program Title**

X	No change in program title
	New program title proposed
	New program title:
	Old program title:
	Explain the rationale for any proposed change in program title:

**D. Elimination of a requirement for completion** (e.g. requirements to be eliminated might include an internship, clinical, cooperative education or other work-based experience).

X	No change in requirements
	Change made to program completion requirements

Describe any change proposed and the rationale for the change:

**E. Change in program award** (e.g. BFA to BS, MBA to MS, etc).

X	No change in program award
	Change in program award

Describe any proposed change and the rationale for the change:

--

**F. Mode of delivery** (e.g. adding distance education format).

X	No change in mode of delivery
	Change in mode of delivery

Describe the change proposed and the rationale for the change:

--

**G. Format Change** (a change that alters the program’s financial aid eligibility;e.g. from full-time to part-time, or to an abbreviated or accelerated semester format).

X	No change in format
	Proposed change in format

Describe the proposed change in format and any change in availability of courses, faculty, resources or support services that this proposed format change requires:

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**H. Discontinuing a Program**

X	No discontinuance
	Proposed discontinuance

Indicate the date by which the program will be discontinued and reason for discontinuance action:

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**I. Dual-Degree Program**

a) Complete the following table to identify the existing programs:

	Program Title	Degree Award	Program Code
Program 1			
Program 2			

b) Proposed dual-degree program (title and award):

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c) Courses that will be counted toward both awards:

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d) Length of time for candidates to complete the proposed program:

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e) Use the Sample Program Schedule in [Table 1](#) to show the sequencing and scheduling of courses in the dual-degree program.

**J. Creating a new program** by merging or consolidating with one or more existing programs and basing the new program entirely on existing courses converted to semester calendar

a) Provide Current Program Name(s) and Program Code(s)

b) Brief description of proposed program and rationale for converting the existing coursework to a separately registered program.

c) Brief description of the expected impact on existing program(s).

d) Adjustments the institution will make to its current resource allocations to support the newly created program.

e) Statement confirming that the admissions standards, process and evaluation methods are the same as those in the existing program.

## 2. Program Course Mask and Schedule

**Directions:**

- a) Using [Table 1](#), display program course sequencing by semester. Use the table to show how a typical student may progress through the program.
  - a. Free electives which may be taken from any college should be designated in table 1 and table 2. A listing of possible elective courses is not needed.
  - b. If a program includes track, concentration, area of interest or general technical/professional electives, please indicate this in table 1 and table 2. In addition please attach a list of the courses (number, name, credit hours) that satisfy this requirement.
  - c. If a program includes electives from a broad discipline area or areas (which are not included as part of the general education requirement) please list the discipline area (eg. Mathematics). A list of specific courses is not required.
- b) Using **Table 2** (which follows below), display program courses by year level in the quarter calendar and display how program courses have been converted to the semester calendar. Please follow the course conversion designation directions on Table 2.

# AAS- Laboratory Science Technology (LST)

## Table1.doc

### Program Course Mask and Schedule

#### Audience

This document is intended for all department chairs and program directors.

#### Summary

This document is the table for the program course mask and schedule.

#### Change Log

Responsible	Date	Version	Short description
Chris Licata	6/15/2010	1	Document originator
Todd Pagano	12/25/2010	1.1	AAS Degree Laboratory Science Technology

**Table 1a: Undergraduate Program Schedule**

- Indicate academic calendar type: \_\_X\_\_ Semester \_\_\_ Quarter \_\_\_ Trimester \_\_\_ Other (describe)
- Label each term in sequence, consistent with the institution's academic calendar (e.g., Fall 1, Spring 1, Fall 2)
- Copy/expand the table as needed to show additional terms

Term: Fall 1		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
NLST-120 Laboratory Tools	3		X			
NLST-171 Fundamentals of Chemistry I	3		X			
LAS-P6 (NSCI-161 Fundamentals of Biology I)	3	X				
LAS-Elective (NMTH-212 Integrated Algebra or higher)	3	X				
First Year Seminar	3	X				
Term credit total:	15	9	6			
Term: Fall 2		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
NLST-250 Quantitative Instrumental Analysis	4		X		NLST-220, NLST-172	
NLST-240 Biotechnology I	3		X		NSCI-162	
NLST-230 Principles of Organic Chemistry	4		X		NLST-172, NSCI-162	
NLST-225 Laboratory Applications	3		X		NLST-220	
NLST-232 Laboratory Mathematics	3		X		NMTH-212	
Term credit total:	17	0	17			
Term: Summer 2		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
NLST-299: Co-op	0		X		NLST-255	
Term credit total:	0	0	0			
Term: Fall 3		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
Technical Elective	3		X			
Technical Elective	3		X			
LAS- P3	3	X				
LAS- P4	3	X				
Term credit total:	12	6	6			

  

Term: Spring 1		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
*ASL/Deaf Cultural Studies						
LAS-P1	3	X				
NLST-172 Fundamentals of Chemistry II	3		X		NLST-171	
NSCI-162 Fundamentals of Biology II	3		X	X	NSCI-161	
NLST-220 Analytical Chemistry	4		X		NLST-171, NLST-120	
First Year Writing Seminar	3	X				
Term credit total:	16	6	10			
Term: Spring 2		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
NLST-255 Chemical Separations & Chromatography	4		X		NLST-250, NLST-230	
NLST-245 Biotechnology II	3		X		NLST-240	
NLST-235 Principles of Biochemistry	3		X	X	NLST-230	
NLST-260 Laboratory Methods	3		X		NLST-225	
LAS-P2	3	X				
Term credit total:	16	3	13			
Term:		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
Term credit total:						
Term:		Check course classification (s)				
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	
Term credit total:						

  

<b>Program Totals:</b>	<b>Credits: 76</b>	<b>Liberal Arts &amp; Sciences: 24</b>	<b>Major: 52</b>	<b>Elective &amp; Other:</b>
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\* A 3-credit ASL/Deaf Cultural Studies course, to be taken at NTID or another college of RIT; will count for RIT Gen Ed credit if it is simultaneously an RIT (non-NTID) Perspective Category course.

Technical Electives are listed below:

- NLST-270 *Chemical Technology*

- **NSCI-120 or above, with Department approval**
- **NMTH-212 or above, with Department approval**
- **BIOL-121 *Introductory Biology I* or equivalent, with Department approval**
- **BIOL-101 *General Biology I* or equivalent, with Department approval**
- **CHMG-141 *General & Analytical Chemistry I* or equivalent, with Department approval**
- **STAT-145 *Introduction to Statistics I* or equivalent, with Department approval**
- **STAT-155 *Introduction to Biostatistics* or equivalent, with Department approval**
- **MATH-161 *Applied Calculus* or equivalent, with Department approval**

**Table 2**

**Program Course Conversion Table: Quarter Calendar and Semester Calendar Comparison**

Name of Program: Laboratory Science Technology Degree: AAS

**Directions:** Use the following legend to show course comparison by year in program in quarter calendar and semester formats. Use courses as listed in the current (2010-11) bulletin as basis for this table. Display all required program courses and program-specific elective courses. Display General Education course requirements with generic label (not each course) of "Liberal Arts and Sciences "= X Credits. Clarify how course sequences in the quarter calendar convert to semesters by either bracketing or using some other notation.

**Course Conversion Designations**

**Semester Equivalent (SE)** – Closely corresponds to one quarter course (e.g., a 4 quarter credit hour (qch) course which becomes a 3 semester credit hour (sch) course.) The semester course may develop material in greater depth or length. Identify the number and the title of the quarter course being converted.

**Semester Replacement (SR)** – A semester course (or courses) taking the place of previous a quarter course(s) by rearranging or combining material from a previous quarter course(s) (e.g. a two semester sequence that replaces a three quarter sequence). List the new semester course or sequence and the old quarter course or sequence it is replacing. For all SR designations, if additional space is needed to describe the distribution of content among courses, use space provided in the last column.

**New (N)** - No corresponding quarter course(s).

**Course Deleted (D)** – No corresponding semester course.

Year	QUARTER: Current Program Courses			SEMESTER: Converted Program Courses			Course Conversion Designation	
	Course #	Course Title	QCH	Course #	Course Title	SCH	Course Conversion Designation <b>SE, SR, N, D</b>	Additional comments on content distribution within semester courses
1	0879-200	Introduction to LST	2	NLST-120	Laboratory Tools	3	SR	This course contains parts of 0879-200, 201, & 202
1	0879-201	Laboratory Applications I	2					
1	0879-202	Laboratory Applications II	2					
1	0885-205	Fundamentals of Chemistry I	4	NLST-171	Fundamentals of Chemistry I	3	SE	
1	0885-206	Fundamentals of Chemistry II	4	NLST-172	Fundamentals of Chemistry II	3	SE	
1	0885-215	Fundamentals of Cellular Biology	4	NSCI-161	Fundamentals of Biology I	3	SE	
1	-----	-----	-----	NSCI-162	Fundamentals of Biology II	3	N	
1	0885-291	Principles of Analytical Chemistry	4	NLST-220	Analytical Chemistry	4	SE	
1	0884—212	Integrated Algebra	4	NMTH-212	Integrated Algebra	3	SE	
1	0884-231	Laboratory Math I	3	-----	-----	-----	SR	0884-231 and 0884-232 have been combined to make NMTH-232
1	0887-200	Freshman Seminar	2		First Year Seminar	3		
1	0502-227	Writing Seminar	4		First Year Writing Seminar	3		
1		Liberal Arts	8		LAS-P1	3		
1		Deaf Cultural Studies/ASL	3		Deaf Cultural Studies/ASL	(3)		

Year	QUARTER: Current Program Courses			SEMESTER: Converted Program Courses			Course Conversion Designation	
2	0879-203	Laboratory Applications III	2	NLST-225	Laboratory Applications	3	SR	This course contains parts of 0879-203 & 204 and 0806-101
2	0879-204	Laboratory Applications IV	2					
2	0806-101	Job Search	2					
2	0879-301	Instrumental Analysis I	3	NLST-250	Quantitative Instrumental Analysis	4	SR	This course contains parts of 0879-301 & 303
2	0879-303	Instrumental Analysis III	4					
2	0879-302	Instrumental Analysis II	3	NLST-255	Chemical Separations & Chromatography	4	SE	NLST-255 contains 0879-302 plus additional content
2	0884-232	Laboratory Math II	3	NLST-232	Laboratory Math	3	SR	0884-231 and 0884-232 have been combined to make NLST-232
2	0885-292	Principles of Organic Chemistry	4	NLST-230	Principles of Organic Chemistry	4	SE	
2	0879-218	Introduction to LST Microbiology	3	NLST-245	Biotechnology II	3	SR	0879-218 plus 0879-398 combine to make NLST-245
2	0879-398	Special Topics: Molecular Biology	4					
2	0879-314	Biotechnology	4	NLST-240	Biotechnology I	3	SE	
2	0879-313	Chemical Technology	4	(NLST-270)	(Chemical Technology)	(3)	(SE)	Was required, now a possible program elective
2	0879-205	Laboratory Applications V	2	NLST-260	Laboratory Methods	3	SR	This course contains parts of 0879-205, 206, & 250
2	-----	-----	-----	NLST-235	Principles of Biochemistry	3	N	
2	0879-299	Co-op: LST	0	NLST-299	Co-op: LST	0	SE	350 hour co-op requirement
2		Liberal Arts	4		LAS-P2	3		
3	0879-206	Laboratory Applications VI	2	-----	-----	-----	SR	0879-206 & 250 are incorporated in NLST-260.
3	0879-250	LST Senior Seminar	2	-----	-----	-----		
3		Technical Elective	4		Technical Electives	6		
3		Liberal Arts/Capstone	7		LAS-P3 & P4	6		
		<b>Total</b>	<b>105</b>		<b>Total</b>	<b>76</b>		
<b>Other</b>	0879-398	Special Topics	1-4	NLST-289	Special Topics	1-4	SE	
	0879-399	Independent Study	1-4	NLST-199	Independent Study	1-4	SE	
	0879-280	Sampling/Testing Soil & Groundwater	4				D	
	0879-311	Food Lab Science	4				D	
	0879-322	Environmental Lab Science II	4				D	

### 3. Program Level Outcomes Assessment Plan

See Program Outcomes Assessment [Overview and Directions](#) for guidance, required form, and sample plans.

<input checked="" type="checkbox"/>	a. Attach updated Program Level Outcomes Assessment Plan which should include how your program meets the RIT Essential Program Outcomes outlined in the RIT <a href="#">Academic Program Profile</a> . b. Program Assessment Plan should follow one of the formats found at: <a href="#">Program Level Outcomes Assessment Plan Blank Form Option 1</a> <a href="#">Program Level Outcomes Assessment Plan Blank Form Option 2</a> <a href="#">Program Level Outcomes Assessment Plan Blank Form Option 3</a>
<input checked="" type="checkbox"/>	c. Complete information requested in <a href="#">Table 3</a> for Middle States. (See: <a href="#">Sample Completed Form</a> for guidance and other information.)

# Table3.doc

## Version 1

### Audience

This document is intended for all department chairs and program directors.

### Summary

This document is used to collect information on the use of program-level outcomes data to make improvements and changes to programs.

### Change Log

Responsible	Date	Version	Short description
Anne Wahl	6/15/2010	1	Document originator
Todd Pagano	12/25/2010	1.1	AAS Degree Laboratory Science Technology

TABLE 3

**Use of Program Level Assessment Data to Inform Calendar Conversion**

Program Name/College Laboratory Science Technology AAS/ NTID

Program Assessment Contact Todd Pagano (Program Director) and Vince Daniele (Chair)

Describe how you used the results from your current program level outcomes assessment plan to inform proposed changes to your program made as part of the conversion to semesters.

<b>Changes to Curriculum (program focus, content, requirements, course inventory, etc.)</b>	<b>Data Source (2009-10) List data, measures, findings, etc. used to inform change(s).</b>
<p>The biology sequence of courses have been adjusted in the following ways:</p> <p>A second course of introductory biology content, Fundamentals of Biology II, has been added to the first year of the program.</p> <p>Microbiology course content has been updated, and combined with Molecular Biology, in a semester replacement course, Biotechnology II- to be taken toward the end of the LST program (and just prior to co-op).</p>	<p>The LST program stated in its 2009-2010 Outcomes Assessment report: “The institute will be facing opportunities for major curricular changes in the upcoming years, and the Biology strand of courses will be central to the program’s efforts toward improvement”.</p> <p>For the past several years program Outcomes Assessment in Biology-related categories have yielded some of the lowest relative scores related to student skill acquisition. Recently, to remedy some of these concerns, we offered a Special Topics course (Molecular Biology) as a substitute to one of the Microbiology series courses. We believe that the program has witnessed positive results of this modification. To this end, we have updated the classical microbiology content with molecular biology and placed it into a second-in-a-series course, Biotechnology II. Furthermore, the LST Advisory Board recommended that the program reorganize its classical microbiology into a more up-to-date Biotechnology and Molecular Biology context.</p> <p>Also paramount to improving student</p>

	<p>performance in this category, we added a second Fundamentals of Biology course which will work to remedy gaps in student understanding of fundamental biology content.</p>
<p>The two quarter sequence of Laboratory Mathematics have been combined into one semester course.</p>	<p>The Laboratory Mathematics courses have been fine-tuned to better correlate with computation expectations of the courses they support.</p>
<p>The quarter sequence of courses (Introduction to LST, Laboratory Applications I-VI, LST Senior Seminar, and Job Search) have been reorganized into three semester courses (Laboratory Tools, Laboratory Applications, and Laboratory Methods) that students will take in the beginning, middle, and end of the program .</p>	<p>According to the 2009-2010 LST Program Outcomes Assessment report, the Laboratory Applications series of courses received overall ratings below average for consecutive years- as to how much students perceive they learn from the courses and how well the courses prepare them for the job. The same report stated “With an opportunity for institute-wide curriculum changes on the horizon, these courses will be thoroughly investigated.” We feel that the reorganization and streamlining of content in the new semester courses will greatly enhance both student perspective of the courses and learned skills.</p>

<p>The three Instrumental Analysis quarter courses were reorganized and divided into two semester courses (Quantitative Instrumental Analysis and Chemical Separations &amp; Chromatography) with a net increase in contact hours.</p>	<p>Though LST Program Outcomes Assessment reports indicate that the students perform well in chromatography portions of Instrumental Analysis, discussions with the LST Advisory Board and analysis of American Chemical Society's Industrial Skills Standards indicated a need for more depth in the student learning experience in chemical separations and chromatography related topics. The reorganization into Chemical Separations &amp; Chromatography, and the increases contact hours, will help us to achieve this depth.</p>
<p>A one semester 3-credit course, Principles of Biochemistry, was added to the second year of the program.</p>	<p>Discussions with the LST Advisory Board and analysis of American Chemical Society's Industrial Skills Standards indicated a need for more depth in the student learning experience in organic chemistry/ biochemistry. This course addition will help to obtain such depth, as well as help to remedy concerns with the biology-related topics of Outcomes Assessment reports.</p>
<p><b>Changes to Instruction (pedagogy, strategies, etc.)</b></p>	
<p>No changes to Instruction</p>	<p>N/A</p>
<p><b>Changes to Program Assessment Plan (outcomes, data sources, instruments, etc.)</b></p>	
<p>There were no major changes to the LST Program Outcomes Assessment Plan- however, entry points for data collection were added.</p>	<p>Instead of assessing skills at the very end of the program, student progress is monitored (and remediated, if needed) several times throughout the program.</p>
<p><b>Other Programmatic Changes/Comments</b></p>	
<p>No other programmatic changes.</p>	<p>N/A</p>

**Option 1**

**Program Level Outcomes Assessment Plan**

Program Name/College: Laboratory Science Technology AAS/National Technical Institute for the Deaf

College Contact for Program Assessment: Todd Pagano (Program Director), Vince Daniele (Department Chair)

Program Goals	Student Learning Outcomes	Academic Program Profile	Data Source/Measure Curriculum Mapping	Benchmark	Timeline	Data Analysis Key Findings	Use of Results Action Items and Dissemination
Please List program-level goals	Students will be able to: (task, capability, knowledge, skills, and dispositions) Use measurable verbs.	Alignment to the five RIT essential outcomes - check all that apply <input checked="" type="checkbox"/> Double click on the check box and find the <b>Default Value</b> and click <b>Checked</b> to check the box. To uncheck, the box, double click and then click <b>Not Checked</b> .	Assessment opportunity (course/experience) method/measures, assignment/rubric)	Standard, target, or achievement level (usually a %) Statement of student Success	Identify when and how data are collected, aggregated, and analyzed	Identify who is responsible and list key findings	Identify how results are used and shared. List any recommendations or action items
1. Develop and document appropriate laboratory safety skills, quality control, technical communication, and professional readiness.	a. Apply safety regulations and protocols and correctly utilize safety equipment.	<input checked="" type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Laboratory Methods Course (NLST-260)  Review of laboratory reports and ancillary course material found in the LST Portfolio	80% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating sheet.	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.

	<p>b. Demonstrate adherence to quality control procedures.</p>	<input checked="" type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	<p>Laboratory Methods Course (NLST-260)</p> <p>Review of laboratory reports and ancillary course material found in the LST Portfolio</p>	<p>80% of all students will obtain a 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>Annually, starting Spring 2014/2015</p>	<p>Collected by LST Assessment Coordinator or Program Director</p>	<p>Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.</p>
	<p>c. Demonstrate effective technical communication of results.</p>	<input type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input checked="" type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	<p>Laboratory Methods Course (NLST-260)</p> <p>Review of laboratory reports and ancillary course material found in the LST Portfolio</p>	<p>80% of all students will obtain a 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>Annually, starting Spring 2014/2015</p>	<p>Collected by LST Assessment Coordinator or Program Director</p>	<p>Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.</p>
	<p>d. Develop a professional resume.</p>	<input type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	<p>Laboratory Methods Course (NLST-260)</p> <p>Review of resume found in the LST Portfolio</p>	<p>80% of all students will obtain a score of at least “2” (“acceptable/meets entry level professional standards”) on all related items on the Laboratory Science Technology portfolio rating</p>	<p>Annually, starting Spring 2014/2015</p>	<p>Collected by LST Assessment Coordinator or Program Director</p>	<p>Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.</p>

2. Demonstrate use of analytical instrumentation including: electroanalytical, spectroscopy, and chromatography instruments.	a. Demonstrate processes and procedures to set-up, run, and maintain selected electroanalytical probes/meters.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global <input type="checkbox"/> Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Quantitative Instrumental Analysis Course NLST-250  Review of laboratory reports and ancillary course material found in the LST Portfolio	sheet. 85% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating sheet.	Annually, starting Fall 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
	b. Demonstrate how to set-up, run, and maintain selected molecular spectrophotometers.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global <input type="checkbox"/> Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Quantitative Instrumental Analysis Course NLST-250  Review of laboratory reports and ancillary course material found in the LST Portfolio	85% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating sheet.	Annually, starting Fall 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
	c. Demonstrate how to set-up, run, and maintain selected atomic spectrophotometers.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global <input type="checkbox"/> Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Quantitative Instrumental Analysis Course NLST-250  Review of laboratory reports and ancillary course material found in the LST Portfolio -	85% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory	Annually, starting Fall 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.

				Science Technology portfolio rating sheet.			
	d. Demonstrate how to set-up, run, and maintain High Performance Liquid Chromatographs.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Laboratory Methods Course (NLST-260)  Review of laboratory reports and ancillary course material found in the LST Portfolio	85% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating sheet.	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
	e. Demonstrate how to set-up, run, and maintain Gas Chromatographs/Gas Chromatograph – Mass Spectrometers.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Laboratory Methods Course (NLST-260)  Review of laboratory reports and ancillary course material found in the LST Portfolio	85% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating sheet.	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
3. Demonstrate the processes involved in volumetric and gravimetric analyses including: sample preparation,	a. Perform sample preparation procedures and the corresponding calculations.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Analytical Chemistry Course (NLST-220)  Review of laboratory reports and ancillary course material found in the LST Portfolio	85% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.

titrations, and gravimetric techniques.				Laboratory Science Technology portfolio rating sheet.			
	b. Perform gravimetric procedures and the corresponding calculations.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	<p>Analytical Chemistry Course (NLST-220)</p> <p>Review of laboratory reports and ancillary course material found in the LST Portfolio</p>	85% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating sheet.	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
	c. Perform acid/base titrations and the corresponding calculations.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	<p>Analytical Chemistry Course (NLST-220)</p> <p>Review of laboratory reports and ancillary course material found in the LST Portfolio</p>	85% of all students obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating sheet.	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
4. Demonstrate biological and biotechnology-related techniques including: tasks involving sterile technique and the manipulation	a. Demonstrate appropriate use of sterile technique.	<input checked="" type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	<p>Laboratory Methods Course (NLST-260)</p> <p>Review of laboratory reports and ancillary course material found in the LST</p>	80% of all students obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.

of proteomic and genomic material.			Portfolio	items on the Laboratory Science Technology portfolio rating sheet.			
	b. Perform proteomic and genomic manipulation techniques.	<input checked="" type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Laboratory Methods Course NLST-260  Review of laboratory reports and ancillary course material found in the LST Portfolio	80% of all students will obtain a score of at least "2" ("acceptable/meets entry level professional standards") on all related items on the Laboratory Science Technology portfolio rating sheet.	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
5. Develop professional skills required to be effective on the job.	a. Engage productively in a collaborative team project.	<input checked="" type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Ethical Reasoning <input type="checkbox"/> Integrative Literacies <input checked="" type="checkbox"/> Global Interconnectedness <input checked="" type="checkbox"/> Creative/Innovative Thinking	Laboratory Methods Course (NLST-260)  Project	85% of students will score "3" or higher on a rubric scale of 1-5.	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
	b. Accurately and clearly present technical information to peers.	<input checked="" type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input checked="" type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Laboratory Methods Course (NLST-260)  Project	85% of students will score "3" or higher on a rubric scale of 1-5.	Annually, starting Spring 2014/2015	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
	c. Apply technical knowledge and skills on a co-operative work experience.	<input checked="" type="checkbox"/> Critical Thinking <input checked="" type="checkbox"/> Ethical Reasoning <input checked="" type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input checked="" type="checkbox"/> Creative/Innovative	Co-op Work Experience (NLST-299)  RIT Supervisor Co-op Evaluation	80% of the students will successfully complete a program-related work experience and	Annually, end of summer, starting 2014/2015	Collected by NTID Center on Employment (NCE)	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute

		Thinking		receive a score of "3" or higher (5 point scale) on Overall Co-op Performance			as requested.
	d. Gain entry level employment in the laboratory science field.	<input type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	NCE Job Placement Data	90% of graduates who are seeking employment in the laboratory science field will be employed.	Annually, Spring semester starting 2016/2017	Collected by NTID Center on Employment (NCE)	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.
	e. Assess program preparation and course satisfaction.	<input type="checkbox"/> Critical Thinking <input type="checkbox"/> Ethical Reasoning <input type="checkbox"/> Integrative Literacies <input type="checkbox"/> Global Interconnectedness <input type="checkbox"/> Creative/Innovative Thinking	Student Satisfaction Survey	80% of students will indicate they <i>Strongly Agree</i> or <i>More Agree than Disagree</i> (4-point scale) when asked to give an overall rating on two global items, one related to the program in general and the other related to the courses in the major.	Annually, Fall semester starting 2015/2016	Collected by LST Assessment Coordinator or Program Director	Shared with program faculty, annual college summary report, NTID Annual Report, and the greater Institute as requested.

#### 4. RIT Incremental Resources (faculty, space, library holdings, equipment, other)

It is not expected that significant incremental resources will be required to deliver the same program outcomes in a semester format. If you believe that incremental resources are required, please explain.

None

#### 5. RIT Course Outlines

Course outlines for all required courses offered by the program and any program-specific electives must be deposited in the course outlines-final PDF module using the proper naming conventions. Use the RIT [Course Outline Form](#). These course outlines will be reviewed by the curriculum committees.

For guidance on assignment of appropriate credit hour/contact hour designation, please refer to: [http://www.msche.org/documents/Degree-and-Credit-Guidelines-062209-FINAL\[1\]Dec09.pdf](http://www.msche.org/documents/Degree-and-Credit-Guidelines-062209-FINAL[1]Dec09.pdf)

Congratulations! You are on your way to conversion!

