Clinical Lab Sciences Program

APRC 1995-1996

Section 1 of 3

CLINICAL LABORATORY SCIENCES PROGRAM
COLLEGE OF ALLIED HEALTH SCIENCES
FERRIS STATE UNIVERSITY

PROGRAM REVIEW REPORT

MARCH 1, 1996

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Section One: Overview of the Program

Introduction

The Clinical Laboratory Science programs at Ferris State University include three separate curricula. The Medical Laboratory Technician Program serves students whose goal is to earn an Associate in Applied Science degree and work as Clinical Laboratory Technicians. The curriculum includes general education electives; basic courses in mathematics, chemistry, English, computer science, medical terminology, and biology; and a basic course in each of the clinical laboratory disciplines. In addition, an on-campus simulated clinical laboratory prepares students to benefit from their sixteen week clinical experience in affiliated clinical laboratories. Successful completion of the program leads to the Associate in Applied Science degree in Medical Laboratory Technology and eligibility for national certification.

The 2+2 Integrated Medical Technology Program serves students who are interested in career advancement within clinical laboratory science. Students complete specified courses in biology, chemistry, English and communications, mathematics and statistics, management, computer science, medical terminology, and cultural enrichment and social awareness electives in the pre-professional phase of the program. They then apply to the professional phase, where entry is determined by their successful completion of required courses with satisfactory overall grades, plus specific requirements for grades in biology and chemistry courses. The Pre-Professional phase can be completed at Ferris or at any other college. The Professional phase consists of beginning and advanced courses in the Clinical Laboratory Sciences, upper level courses in biology and English, and the completion of general education requirements. In addition, students complete a course in laboratory education and management and gain experience in an on-campus simulated clinical laboratory. They then complete a twenty-two week clinical experience at an affiliated clinical laboratory. Successful completion of required on-campus courses and the clinical experience leads to the baccalaureate degree in Medical Technology and eligibility for national certification.

The 2+2 Career Mobility Program is for certified or certification-eligible Medical Laboratory Technicians who want to earn a baccalaureate degree that builds directly on their previously acquired education and experience. These students complete additional courses in biology and chemistry, as well as advanced courses in the clinical laboratory sciences. Additional courses in management, statistics, English, and general education are also included. Because of their previous internship and employment experience, these students are not enrolled in the on-campus simulated laboratory. Additional clinical experience is individually designed for them, to produce well rounded generalist technologists. Credit for previous work experience may be granted, which would shorten the clinical experience leading to the baccalaureate degree. When the degree is earned, graduates are eligible for national certification.

Medical Technology and Medical Laboratory Technician students complete the same introductory courses in each clinical discipline, with the exception of immunology and immunohematology, which are taught separately. The Medical Technology students (both Integrated and Career Mobility) then complete additional advanced course work in clinical laboratory disciplines, building on prior knowledge to learn advanced techniques and problem solving skills. In the Medical Laboratory Technician and 2+2 Integrated Medical Technology programs, students in their final semester on campus review their knowledge and practice their skills in on-campus simulated clinical laboratories, which are taught separately. After

completing on-campus course requirements, students are then assigned to affiliated clinical laboratories to complete their education. MLT students are assigned to one of ten affiliated laboratories:

Laboratory	Location (all in MI)
Bronson Methodist Hospital	Kalamazoo
Carson City Hospital	Carson City
Huron Memorial Hospital	Bad Axe
Memorial Medical Center of West MI	Ludington
Reed City Hospital	Reed City
Scheurer Hospital	Pigeon
St. Mary's Hospital	Grand Rapids
United Memorial Hospital	Greenville
West Shore Hospital	Manistee
William Beaumont Hospital	Royal Oak

MT students are assigned to ten affiliates:

Laboratory	Location (all in MI)
Alpena General Hospital	Alpena
Bay Medical Center	Bay City
Bronson Methodist Hospital	Kalamazoo
Central MI Community Hospital	Mt. Pleasant
Gratiot Medical Center	Alma
Metropolitan Hospital	Grand Rapids
Michigan Capital Medical Center	Lansing
Muskegon General Hospital	Muskegon
North Oakland Medical Center	Pontiac
W. Michigan Clinical Laboratory	Holland

Curriculum checksheets for the three programs are included below.

Mission and Goals

The mission of the Clinical Laboratory Sciences Program at Ferris State University is to prepare graduates who are ready for career entry level employment in a variety of clinical laboratory settings: hospitals, blood banks, independent and physicians' office laboratories, clinics, health maintenance organizations, urgent care centers, and industry. All graduates should be:

- able to follow all safety policies of the workplace, and recognize and correct unsafe practices
- ready to work as a member of the health care team
- capable of professional advancement
- able to maintain technical competence under the normally stressful conditions of the clinical laboratory
- able to integrate theory and practice effectively

- able to generate data to be used in patient care, evaluate the validity of those data, and to assure reliability before reporting test results
- recognize the importance of quality control and quality assurance programs
- collect and process samples of blood and other body fluids, and evaluate the suitability of these samples for analysis
- perform routine tests and appropriate additional follow-up tests where needed
- maintain instrumentation and identify and correct malfunctioning systems
- communicate effectively with coworkers, patients, their families, and others.
- to perform as laboratory professionals by respecting the confidentiality of laboratory data; maintaining neatness in personal habits, work areas, and laboratory reports; performing to the best of their abilities; following established employment policies; and assuming responsibility for their conduct and their work.

In addition, baccalaureate graduates should be able to:

- be capable of professional advancement and study, in laboratory and health care management and educational positions
- understand, promote, and participate in Total Quality Management and Continuous Quality Improvement programs
- to manage and supervise other laboratory professionals, providing clinical instruction and continuing education where appropriate
- to develop and implement new methodologies and test systems as the need arises.
- to be aware of, comply with, and monitor external regulatory requirements, such as those of Clinical Laboratory Improvement Amendments of 1988 and OSHA
- to correlate results for all areas of the laboratory and relate these results to the clinical condition of the patient

Specific goals of the program include:

1. To define clearly what is expected of students at all levels of the program, to make these expectations clear to all students, and to help students fulfill these expectations
2. To incorporate appropriate general education and related courses into the curriculum and to education professionals aware of the needs and values of a changing world
3. To provide evaluation mechanisms which recognize individual competencies and allow for advanced placement where appropriate.
4. To provide the opportunity for worthwhile clinical experience for all qualified students.
5. To provide a mechanism that coordinates on-campus preparation with the clinical experience.
6. To provide a Career Mobility Medical Technology program for certified Medical Laboratory Technicians.
7. To offer appropriate continuing education opportunities to medical laboratory professionals and others.

Program History

The Medical Technology program at Ferris State University was begun in 1968, as a traditional 3+1 program. Students completed three years at Ferris, and then applied for a one year clinical experience at an affiliated hospital to complete degree requirements and become eligible for national certification. During the 1970s, there were 2-3 applicants for every hospital-based internship position in Michigan, and Ferris students had difficulty competing with students from other Michigan universities. As a result, Ferris (and other universities) began looking for alternative educational programs that would be more cost effective and allow more students to complete the program successfully.

In 1978, the 2+2 Medical Technology program at Ferris was begun. The general design of the program allows for completion of general education requirements combined with a shortened (less than the traditional one calendar year) hospital experience. Students are prepared for career entry level by completing clinical laboratory courses on campus, taught by faculty who are medical technologists with clinical laboratory experience. After successful completion of the on-campus courses, students are assigned to a clinical site that has formal affiliation with Ferris. To date, no qualified student in the 2+2 Medical Technology program has failed to secure the clinical experience that is required for graduation.

In 1972, the Medical Laboratory Technician Program began, as the explosive growth of clinical laboratory testing began to offer opportunities to associate degree graduates. Students who successfully complete on-campus courses are assigned to affiliated clinical laboratories, where they can complete degree requirements.

Impact of the Program on the University, the State, and the Nation

The Clinical Laboratory Science programs offer Ferris students the opportunity to complete a science based health care program with good employment potential. Students interested in careers in the health care field that do not involve extensive patient contact are drawn to this field. Many of our students come from the pre-pharmacy, pre-optometry, pre-nursing, and other curricula. Students that might otherwise leave Ferris remain and successfully complete degrees in our programs, finding employment in their field after graduation. After several years of low enrollment, extensive recruitment and retention efforts have increased the numbers of students and graduates.

The Medical Laboratory Technician program is one of five in Michigan, down from eleven programs in the late 1970s. Other programs now in operation include Baker College (which has not yet been accredited by the National Accreditation Agency for Medical Laboratory Personnel), Highland Park Community College, Kellogg Community College, and Northern Michigan University. The Ferris program prepares perhaps 25-30% of the MLTs educated in Michigan. In this era of controlling health care costs and re-engineering health care facilities, most hospitals and other laboratories are being advised to increase the numbers and proportions of MLTs in their laboratories. There should be a strong demand for MLT graduates for the next decade and beyond, as medical technologists reach retirement age and are replaced in many cases by MLTs who have been trained and educated to perform the routine tasks in the clinical laboratory. Bronson Methodist Hospital and St. Mary's Hospital are examples of institutions that have discontinued their traditional hospital based Medical Technology programs in favor of providing clinical education to MLT students from Ferris.

William Beaumont Hospital is downsizing their MT program and also beginning to train MLTs from Ferris. Others are considering similar moves, due to cost constraints and the changing job market. We are negotiating with several large hospitals in Michigan about possible future affiliation; most of these have discontinued traditional year-long medical technology programs.

In the 1970s, there were more than 30 hospital based Medical Technology programs in Michigan. That number has declined to 6-7, and most of those remaining now accept a smaller number of students. Hospital laboratories can no longer afford to dedicate medical technologists and pathologists to staffing and administering a hospital based medical technology program and to providing the theoretical background of clinical laboratory science education. Ferris now provides the state of Michigan with about 25% of the Medical Technology graduates annually. Other university based programs exist at Andrews University, Eastern Michigan University, Michigan State, Michigan Technological University, Northern Michigan and Wayne State University,

The employment demands of medical technologists are changing. As the routine work is taken over by medical laboratory technicians, medical technologists have become involved in quality assurance, quality improvement teams, consultation with physicians and other personnel, meeting regulatory requirements, implementing new procedures and instrumentation, and other management oriented job requirements. As a Ferris graduate recently remarked, "When I started, we used to DO the tests. Now the instruments do the tests, and we have to decide if the results are valid, and if they make sense." Ferris has been among national leaders in incorporating management, computer science, and communications courses into program requirements, to prepare our graduates for their expanded roles.

Ferris has become a model for university based clinical laboratory science education, and has been recognized as such by other programs and by the National Certification Agency for Medical Laboratory Personnel. Other universities that are interested in beginning a university based medical technology program, particularly those which are exploring a Career Mobility Program, are routinely referred to Ferris for consultation. Wayne State University, the Medical College of Georgia, and others have sent observers to visit our program, especially the simulated laboratory in action, in the hopes of emulating our success.

In addition to educating students enrolled in the Clinical Laboratory Science Programs at Ferris, the program faculty present educational programs at meetings of various local, state, and national professional organizations. We have presented continuing education programs at some of our affiliated laboratories, and provided consultation and advice about policies and procedures. Mrs. Ross has served as a Citizen Ambassador in a People to People tour of blood banks and clinical laboratories in three nations in Eastern Europe. Mr. deRegnier, Mr. Kellogg, and Mr. Landis have all worked extensively with students at the Mecosta-Osceola Intermediate School District Math/Science/Technology center, making classroom presentations as well as mentoring the research projects of individual students and small groups of students. Mr. Kellogg is also working with public school students through a program coordinated at Central Michigan University. (See the individual curricula vita for details).

Expectations

As the health care industry continues to change, shorter hospital stays and increased outpatient care combine to require faster diagnosis and more efficient patient monitoring.

Clinical Laboratory Science graduates will continue to be in demand, in Michigan and throughout the country. Ferris has a reputation as one of the finest, most forward looking CLS programs in the country. Students, graduates, and their employers express a high degree of satisfaction with the program, as you will see below. The remainder of this report will discuss the information gathered by the Program Review Committee, enrollment trends, program productivity costs, conclusions, and recommendations.

Plans for Improvement

Our plans for improvement include establishing articulation agreements with the state's community colleges. An arrangement is in place where Alpena Community College students can find listed in their school bulletin the exact courses they need to complete, in order to facilitate a transfer directly into the Professional Phase of the 2+2 Integrated Medical Technology program. Formal articulation agreements are being negotiated with Schoolcraft Community College, Delta College, and Grand Rapids Junior College, so that interested students can complete the first year of the MLT program while living at home, transfer to Ferris for two semesters of clinical training, and then return home for their clinical experience required to complete the degree. Such an agreement with Kalamazoo Valley Community College is already in place. These agreements should make it easier for non-traditional students to earn a degree that will qualify them for employment in health care, without having to leave their homes and employment for long periods.

The programs are also considering investigation of possible relocation within the VFS building, in order to improve student scheduling (some students now have classes from 8 A.M. through 9 P.M.) If we could meet our laboratory courses in larger laboratories, with larger numbers of students and two instructors per laboratory section, we could accommodate our greatly increased enrollment while still maintaining the faculty:student ratio recommended by our accrediting agency and avoiding student and faculty burnout.

Clinical Laboratory Science programs are expensive to begin. A university based program requires instrumentation that is beyond the budget of most schools. The Ferris program has been extensively supported by donations of equipment and supplies from our clinical affiliates and the employers of our graduates. We anticipate that this support will continue. However, our increased numbers of students will require more supply and equipment support from the university as well.

NAME_____

FERRIS STATE UNIVERSITY
COLLEGE OF ALLIED HEALTH SCIENCES
MEDICAL LABORATORY TECHNOLOGY
ASSOCIATE IN APPLIED SCIENCE DEGREE

FIRST YEAR

: Semester			
EM 114[a]	Intro. to General Chem.	4	____
or			
EM 121	General Chemistry 1	5	____
TH 115[b]	Intermediate Algebra	0	____
GL 150	English 1	3	____
:S 102	Orientation to Med. Vocab.	1	____
LS 101	Clin. Lab. Science Orient.	1	____
OL 108	Medical Microbiology	3	____
		12-13	

l Semester			
EM 124	Intro. to Organic & Biochemistry	3	____
.tural	Enrichment Elective	3	____
OL 205	Human Anat. & Physiology	5	____
?S 105	Microcomputer Applications	3	____
		14	

:al Credit Hours = 70-71

EM 114 - For students not planning to continue Medical Technology program.

HEM 121 - For students planning to continue to Medical Technology program.

TH 115 or equivalent is required prior to :aduation.

SECOND YEAR

1st Semester			
Social Foundation Elective		3	____
CLLS 228	Immunology & Immuno-hematology	4	____
CLLS 230	Hematology 1	3	____
CLLS 235	Clinical Microbiology 1	4	____
		14	

2nd Semester			
CLLS 215	Clinical Chemistry & Instrumentation	5	____
CLLS 224	Body Fluid Analysis & Hemostasis	3	____
CLLS 225	Medical Mycology, Parisitology & Virology	2	____
CLLS 256	Simulated Clin. Lab.	3	____
ENGL 250	English 2	3	____
		16	

Summer Semester			
CLLS 270	Appl. Clinical Chemistry & Instrumentation	3	____
CLLS 271	Appl. Clinical Body Fluid Analysis	1	____
CLLS 272	Appl. Clin. Microbiology	3	____
CLLS 273	Appl. Clin. Hematology	2	____
CLLS 274	Appl. Clinical Immunohematology	2	____
CLLS 275	Appl. Clin. Coagulation	1	____
CLLS 276	Appl. Clin. Serology	1	____
		13	

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NAME_____

FERRIS STATE UNIVERSITY
COLLEGE OF ALLIED HEALTH SCIENCES
MEDICAL TECHNOLOGY (INTEGRATED)
BACHELOR OF SCIENCE DEGREE

FIRST YEAR

1st Semester

BIOL 121	General Biology 1	4	____
CHEM 121	General Chemistry 1	5	____
MATH 115*	Intermediate Algebra	0	____
Cultural Enrichment Elective		3	____
CLLS 101	Clin. Lab. Science Orientation	1	____
		13	

2nd Semester

BIOL 122	General Biology 2	4	____
CHEM 122	General Chemistry 2	5	____
ENGL 150	English 1	3	____
Social Awareness Elective		3	____
MRIS 102	Orientation to Med. Vocabulary	1	____
		16	

SECOND YEAR

1st Semester

CHEM 214	Fundamentals of Organic Chem.	4	____
BIOL 205	Human Anatomy & Physiology	5	____
COMM 105	Interpersonal Communication	3	____
ISYS 105	Microcomputer Applications	3	____
Cultural Enrichment Elective		3	____
		18	

2nd Semester

CHEM 324	Fund. of Biochemistry	3	____
BIOL 286	General Microbiology	3	____
ENGL 250	English 2	3	____
STQM 260	Intro. to Statistics	3	____
MGMT 301	Applied Management	3	____
		15	

THIRD YEAR

1st Semester

CLLS 230	Hematology 1	3	____
CLLS 235	Clinical Microbiology 1	4	____
CLLS 351	Basic & Clinical Immunology	3	____
Social Awareness Elective		3	____
Cultural Enrichment Elective		3	____
		16	

2nd Semester

CLLS 215	Clinical Chemistry & Instrumentation 1	5	____
CLLS 224	Body Fluid Analysis & Hemostasis	3	____
CLLS 358	Immunohematology	4	____
CLLS 225	Medical Mycology, Parisitology & Virology	2	____
Social Awareness Elective		3	____
		17	

Summer Semester

BIOL 300	Pathophysiology	3	____
CLLS 355	Clinical Chemistry & Instrumentation 2	4	____
CLLS 435	Clinical Microbiology 2	4	____
CLLS 430	Hematology 2	3	____
		14	

FOURTH YEAR

1st Semester

ENGL 321	Advanced Composition	3	____
CLLS 463	Clin. Lab. Management Supervision & Education	3	____
CLLS 456	Clinical Lab. Practicum	3	____
CLLS 481	Clinical Chem. & Instru. Practice	4	____
CLLS 482	Clin. Body Fluid Analysis Practice	1	____
CLLS 499	Clin. Lab. Science Seminar	1	____
		15	

2nd Semester

CLLS 483	Clin. Microbiology Practice	4	____
CLLS 484	Clin. Hematology Practice	3	____
CLLS 485	Clin. Immunohematology Prac.	3	____
CLLS 486	Clin. Coagulation Practice	1	____
CLLS 487	Clin. Serology Practice	1	____
		12	

Total Credit Hours = 136

***MATH 115 or equivalent is required prior to graduation.**

Students must meet the following University requirements:

Cultural Enrichment - Three courses in two areas, with one at the 200 level or above.

Social Awareness - Three courses in two different areas, including one "Foundation" course and at least one at the 300-400 level.

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NAME_____

FERRIS STATE UNIVERSITY
COLLEGE OF ALLIED HEALTH SCIENCES
MEDICAL TECHNOLOGY (CAREER MOBILITY)
BACHELOR OF SCIENCE DEGREE
(Following Successful Completion of an Associate Degree Medical Laboratory Technology Program)

THIRD YEAR

t Semester

)L 121	General Biology 1	4	____
M 105	Interpersonal Comm.	3	____
M 214	Fund. of Organic Chem.	4	____
S 351	Basic & Clin. Immunology	3	____
QM 260	Intro. to Statistics	3	____
		17	

d Semester

)L 122	General Biology 2	4	____
)L 286	General Microbiology	3	____
cial Awareness Elective		3	____
EM 324	Fund. of Biochemistry	3	____
ltural Enrichment Elective		3	____
		16	

mmer Semester

)L 300	Pathophysiology	3	____
LS 355	Clinical Chemistry & Instrumentation 2	4	____
LS 435	Clinical Microbiology 2	4	____
LS 430	Hematology 2	3	____
		14	

FOURTH YEAR

1st Semester

ENGL 321	Advanced Composition	3	____
Cultural Enrichment Elective		3	____
Social Awareness Elective		3	____
MGMT 301	Applied Management	3	____
CLLS 463	Clinical Lab. Mgt. Supervision & Education	3	____
CLLS 459	Adv. Problem Solving in Immunohematology	1	____
CLLS 499	Clinical Lab. Science Seminar	1	____
		17	

2nd Semester

CLLS 488	Clinical Lab. Science Practice	8	____
		8	

Total Credit Hours (third and fourth years) = 72

ATH 115 or equivalent is required prior to graduation.

udents must meet the following University requirements:

Cultural Enrichment - Three courses in two areas, with one at the 200 level or above.

Social Awareness - Three courses in two different areas, including one "Foundation" course and at least one at the 300-400 level.

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Section Two: Surveys of Program Graduates

In August, 1995, when the CLS programs were informed that they had been selected for academic program review, surveys of program graduates from the classes of 1993 and 1994 were being returned. It has been the policy of the CLS programs to survey graduates at least 6-9 months after graduation, to ask them about their employment experiences, and how their education had prepared them for their current jobs. Therefore, it was decided to use the surveys being returned by program graduates in the PRP process, rather than incurring the expense of mailing a second survey to the same population of graduates so soon after the first. Thus, the surveys used asked some questions that may not reflect the interests of the APRC, but they have proved over the years to be very interesting to the program faculty, and have been of great assistance when reviewing curriculum and preparing for accreditation.

Information obtained from graduates of the MLT and MT programs, as well as the survey form used, are included on succeeding pages.

SURVEY OF GRADUATES
MEDICAL TECHNOLOGISTS

SURVEY

In August of 1995 a survey was sent to thirty-one graduates of the 1993 and 1994 graduating classes of the Medical Technology Program. Twenty-six surveys were returned for an eighty-four percent response rate. A copy of the survey and complete results are attached.

RESULTS

The graduates are working in a variety of areas within the clinical laboratory. The average salary is $12.94 per hour. Eighty-one percent responded that they did not have difficult finding a job after graduating and in fact one stated that they were abundant. Four respondents stated that if you wanted to work in either Grand Rapids or Big Rapids it was difficult to find a job.

Fifty-eight percent of the graduates felt that the part of their education that best prepared them for work was the "sim lab." The areas needing improvement were: old equipment, more phlebotomy, trouble shooting. Five graduates replied that they intend to go back to school. four stated that they were going into another medical field (nursing, physicians assistant, medical school) and one was going into a different field of work.

FERRIS STATE UNIVERSITY
MEDICAL TECHNOLOGY PROGRAM
SURVEY OF GRADUATES

Where are you currently working?

How long have you been employed here? _____

What is your present position? _____

What was your starting salary? _____

What hours do you usually work? _____

What hours would you prefer to work? _____

Do you work weekends? YES NO How frequently? _____

Do you take call? YES NO How frequently? _____

To which department(s) are you usually assigned? Check all that apply.

blood bank		histology	
chemistry		microbiology	
coagulation		serology/immunology	
cytology		urinalysis/ body fluids	
EKG		other (indicate)	
hematology			

Where else have you worked as a medical technologist?

Was it difficult to find a job when you graduated? Explain.

Which areas of your on-campus education best prepared you for your work in the clinical laboratory? Explain.

Which area(s) of your on-campus education need(s) improvement? How can they be improved?

As a regular part of your assigned duties, which of the following do you perform?

	often	sometimes	never
routine phlebotomy			
specimen processing			
using a laboratory information system			
instrument maintenance			
instrument calibration			
instrument troubleshooting/ repair			
problem solving (difficult antibody identification, unusual organisms, coagulation work-ups, etc.)			
proficiency testing			
evaluation of instruments/ procedures			
training employees			
teaching students			
supervising employees			
scheduling personnel			
ordering supplies/ maintaining inventory			
drawing donors			
preparing blood components			
drawing arterial samples			
outreach (cholesterol screening programs, etc.)			
point of care testing			
quality assurance teams/ projects			
calibration of instruments			
competency assessment (having yours assessed)			
competency assessment (assessing others)			
consultation with physicians, nurses, etc.			
outcomes assessment			
design of critical paths/ clinical paths			

At what laboratory did you acquire your clinical experience (internship)?

Which areas of your clinical experience best prepared you for your current position? Explain. Should any part of the clinical experience be changed? Explain.

Comment on the amount of venipuncture practice you acquired before your clinical experience. How could your skills in this area have been improved?

Have you continued your education since leaving Ferris? What are your plans in this area?

Please make any other comments which you believe would help us to evaluate and improve the Clinical Laboratory Science programs.

With your permission, we would like to survey your supervisor to determine his or her opinion of how well you were prepared for your present position. Any results from the employer survey (as well as the results of this questionnaire) will be kept confidential. This page, with your signature and address, will be removed before results are compiled.

I agree that the Clinical Laboratory Sciences program at Ferris State University may send a survey to my supervisor:

YES NO

Signature _____

One more item: for the purposes of our alumni data base, please tell us your current name, home address, and telephone number:

FERRIS STATE UNIVERSITY
MEDICAL TECHNOLOGIST PROGRAM
SURVEY OF GRADUATES

Where are you currently working?

-St Joseph Mercy Hospital, Pontiac
-Gratiot Community Hospital
-Community Hospital-Watervliet, MI
-Northern Michigan Hospital-Petoskey, MI
-Borgess Medical Center-Kalamazoo, MI
-American Red Cross
Great Lakes/Wolverine Region-Lansing, MI
-JFK Medical Center-West Palm Beach, FL
-Detroit Medical Center
Hutzel Hospital Stat. Lab
-Northern Michigan Hospital-Petoskey, MI
-Metpath-Auburn Hills
-Saint Mary's Health Services
-No response
-Biotech Clinical Laboratories-Southgate, MI
-Butterworth Hospital-Grand Rapids, MI
-Sturgis Hospital-Sturgis, MI
-North Oakland Medical Center
-American Red Cross
-South Haven Community Hospital-South Haven, MI
-Currently, I am a housewife. (I have a nine mo. old)
The info. I am giving you is a year and a half old.
Pontiac Osteopathic Hospital
-No response
-North Oakland Medical Centers in Pontiac
-River District Hospital-St. Clair
-Bay Medical Center-Bay City, MI
-West Michigan Clinical Laboratory
-No response
-I'm currently working at home as a <u>full</u>-time mom. Prior to that (I left the lab 3-3-95) I worked at a private clinical lab-Garcia Clinical Lab. (Jackson)

How long have you been employed here?

-1/2 years
-Since May '94

-1 year, 3 mo.
-2 years
-10-15-92
-3 years
-16 months
-1 yr. 3 months
-7 months
-12 months
-3 weeks
-2 years
-8 yrs
-3 years
-2 yrs.
-2 yrs
-15 months
-worked here for 1 1/2 yrs.
-2 years
-2 yrs
-1 yr 3 months
-2 yrs 4 mo.
-10 months
-3 years 3 months
-15 mo.

What is your present position?

-Afternoon Chemistry, Hematology
-MT
-Generalist MT
-Full time Med. Tech.
-Medical Technologist, generalist
-Reference Lab. Technologist
-Generalist Medical Technologist
-Medical Technologist
-E/N Generalist/Day Microbiologist
-Serologist
-Part time Med Tech
-Bench Tech
-Medical Technologist
-Med Tech
-Medical Tech Generalist
-MT III
-Q.L. Technologist
-Med Tech. II
-MT in Special Chemistry
-MT (Generalist)
-Med. Tech III
-MT
-Sr. Lab Tech II
-General MT
-Med. Tech
-Generalist/Microbiology Tech

What was your starting salary?

-14.79/hr
-about (rest was left blank)
-11.67 per hour
-13.03 hr
-13.39/hour
-11.99/hr
-12.44/hr + $3.50 shift differentials (now starting is $13.12)
-14.50
-$13.56 with $1.00 & $1.50 Shift differentials
-$13.30
-$11.19
-$9.00
-$12.52
-?
-$13.10/hr
-$12.60/hr
-$12.50/hr
-$12.99 (after passing registry exam)
-$14.25
-15.30 + Shift Differentials
-12.64
-13.25/hr (+ 8% Shift differential)
-$13.16 to $9.82 (Didn't pass ASCP certification and took a drastic drop)
-approximately 12
-$12.00/hr
-$12/hr

What hours do you usually work?

- 3:00-11:30 pm
- 2-10:30
- 7 am-3:30 pm
- 1-11:30 pm and 9:00 pm-7:30 am
- 8:45 pm-7:15 am
- 1530-0000
- 11 pm-7 am (actually 10:30 pm - 7 am)
- 3:00 pm - 11:30 pm
- 3-11:30 / 7-3:30
- 11 pm - 7 am
- 11-7
- Midnights
- 9 pm - 7:30 am
- 11 pm - 7:30 am
- 6 pm - 6 am
- 3:30 pm - 12:00 am
- 7:00-3:30
- right now I'm working 6 pm-6 am; I was working 2:30-11 pm
- 6:00 am-2:30 pm
- 2nd Shift 2:15-10:15

- 3:30-midnight or 11:30 pm - 7:30 am
- 11 p.m. to 7:30 a.m.
- 10:30 pm - 7:00 am (3rd)
- 2nd shift
- 7-3:30 pm
- 9 am-6 pm

What hours would you prefer to work?

-6:30-3:00
-2nd shift
-7:00am-3:30pm
-9pm-7:30am
-day shift
-1530-0000
-night shift
-3-11:30
-7-3:30
-7am-3pm
-11-7
-afternoon/midnights
-9pm-7:30am
-11pm-7:30am
-8am-4pm
-3:30pm-12am
-7am-3:30pm
-days see Mike more
-day shift
-2nd shift
-6am-2pm
-3rd shift
-1st shift
-7am-3:30pm

Do you work weekends?

-22 yes -4 no

How Frequently?

- every third weekend
- every third Saturday
- twice a month
- every other
- every third
- three out of four
- 1 in 3 approx.
- every third
- a Saturday ever 8th weekend
- often
- every other
- every 3rd

- every other
- every other
- every other
- every other
- every other
- every other
- every other
- every other
- once a month
- 1-2 per month
- 1 Sat. per month

Do you take call?

-5 yes -21 no

How Frequently?

- once a month for seven days 24hrs
- 3-4 times a month
- very rare
- 1 every 5wks
- 2-3 nights per wk

To which department(s) are you usually assigned? Check all that apply.

Blood bank	18	Histology	0
Chemistry	21	Microbiology	18
Coagulation	22	Serology/immunology	19
Cytology	0	Urinalysis/body fluids	22
EKG	1	Other (indicate)	
Hematology	22	-Phlebotomy	3
		-Special Chem.	2
		-Quality Control	1
		-ABG'S	1
		-Clerical	1
		-Industrial lab	1

Where else have you worked as a medical laboratory technician?

- Weekends, Microbiology set-ups North Oakland Medical Center
- No other place
- Visa doesn't allow me to work any place else
- This has been by only job since graduation
- I worked on call for Ingham Medical Center during internship
- Breslin Cancer Center, Blue Care Network Health Central
- at my intern, Hackley Hospital-Muskegon Mi
- N/A
- No prior experience
- Saginaw Medical Center, St. Joseph Hospital, Mt Clemens
- Metropolitan for my intern
- Citation Clinical Lab in Assessioning Dpt particularly send

- Citation Clinical Lab in Assessioning Dpt particularly send outs, client-services, phlebotomy
- Hackley Hospital
- Lansing General Hospital
- Mercy Hospital, Cadillac, Mi
- Nowhere
- Lansing General Hospital
- Nowhere
- Sheridan Community Hospital
- Sparrow Hospital, Damon-Preferred
- Nowhere
- N/A
- Muskegon General Hospital
- Intern Metro Hospital, Grand Rapids, Mi
- Alpena General Hospital, Dr's Hospital of Jackson

Was it difficult to find a job when you graduated? Explain.

- No, there were several openings, and I received phone calls for more interviews after accepting the position.

- No, I was offered a job in Muskegon and Alma about 1 month before end of intern

- No, I just had to send a lot of resumes. A lot of them wanted experience

- No, I was hired when I was doing my internship

- Yes and No, I was looking for a job in the right place at the right time. I was offered two jobs, the one I have now and one in Watervliet. There really weren't that many jobs around when I graduated.

- It didn't take too long but I feel we were misled as far as being marketable in environmental labs etc.. They laughed at me when I inquired about positions

- No, this was actually the 1st place that got back to me but I also had another interview

- No, Not really. I knew where I wanted to work and that I wanted afternoons. This job fit perfectly

- Jobs seemed to be abundant when we graduated. I was quite adamant about being in Northern Michigan, however, where the job market was slim.. Lets just say I was a mess for a while-but eventually won'em over...I've always liked a bit of a challenge.

- No, I had 9 full time offers form all over Michigan.

- Yes, because the job market in GR is saturated.

- No, 1 month later, I worked at Citation Butthen I was laid off 6 months later. It was after the lay off and not successfully passing the ASCP that the search was difficult. I still did not have work experience which decrease my credential.

- Yes, In my location no one was hiring. I got lucky w/ Metropolitan.

- No

- No, I applied to two hospitals both offered a job took Sturgis(closer to place of residence at time)

- Not really. I applied at area hospitals and was hired rather quickly. I took time off after graduation and traveled. Got many calls for part time hours available.

- No, I had a job lined up.

- Yes, in the area I wanted and full time. We want to get back up toward BR ASAP.

- Not at all. There are a lot of jobs available it just depends on what shift you want to work and how much you want to get paid.

- Not at all, I had a few job interviews lined up 2 months prior to graduation.

- Finding a job in the area you want to live, but jobs are out there if you don't mind commuting.

- No, I sent out 5 resumes (I had 50) and I got 2 job offers. I started 2 days after graduation.

- No, I started while doing internship.

- No, MGH were hiring when I was finished with my internship unfortunately I was officially part-time but worked mostly 40 hrs/week. (no health insurance).

- No they contacted me.

- Not difficult. I had interviews at 2 hospitals prior to graduating.

Which areas of your on-campus education best prepared you for your work in the clinical laboratory? Explain.

- Hematology, I learned more than enough on WBC differentials etc.. Chemistry also learned enough about QC, pipetting etc..for job.

etc.. Chemistry also learned enough about QC, pipetting etc..for job.

- Hematology, Chemistry-troubleshooting

- I got a very good education. I valued every step in my education. The part that I liked the most was simlab and phlebotomy training.

- All lab sessions greatly helped. Of course, Sim lab put it all together, but hands on involvement is so important. I think FSU prepared me very well for the clinical situation.

- The overall knowledge gained was excellent. The way it was taught helped me to retain info that I still apply at work and at home.

- Sim-Lab was crucial for organization & prioritization. Rigid training on safety & exposure to blood borne pathogens. I had done procedures at FSU that some Tech's that I work with have still never attempted.

- The simulated lab at the end plus all the labs in the med tech program. It helped me organize myself better to be more efficient in the actual work force.

- All of the clinical chemistry classes with the emphasis on troubleshooting seems the most helpful. Hematology with the abnormal diffs helps because we are a large Ob-Gyn/Oncology hospital.

- Without a doubt, Sim Lab!!

- I believe the sim lab best prepared me for the real lab setting. In the clinical lab we are responsible for a certain amount of work to do alone. Sim lab helped me be independent plus make decisions on my own.

- All of it except the nasty attitudes I would encounter most frequently. And the dog eat dog mentality I would face. And working so few hours per paid period.

- S.I.M. LAB. 3 WORDS: " ON HANDS EXPERIENCE"

- Sim Lab. It was the closest thing to working in a real lab. It prepared you for the pressures of STATS and trouble shooting.

- The combination of class work & lab work was miles ahead of other schools - actual Med. Tech curriculum as opposed to majoring in biology or chemistry

- Sim lab. It gives you practice at prioritizing and recognizing problems and abnormal results.

- Blood bank. When I reached the hospital all the new automation made all area different than school except blood bank which is basically still manual work. Micro is also similar to school setting.

- No comment.

- Sim. lab and being a work study. It showed me how things work in the "real world".

- Sim. lab. I believe you learn "on the job" more so than reading from books & studying for tests.

- Any area that applied hands on experience, such as Hematology, UA, COAG, and blood bank.

- Sim lab helped with learning to organize work load and really work with others at getting the work done.

- Simulated lab. It gave me an idea of what it would be like in an actual lab. A big plus was all the equipment we were able to use.

- Allied health classes- simulated lab was an excellent opportunity to prepare for a career in a hospital lab.

- Sim lab helped the most. But I think you can't prepare students for the real world.

- The last 2 years-med tech courses and internship.

- Sim Lab!! It was great! Techs need hands on experience and that's where we got it! Microbiology w/ Deb being a tech was a big help when I started as the microtech in both Jackson labs.

Which area(s) of your on-campus education need(s) improvement? How can they be improved?

- A little more phebo.

- Lectures need to prepare more for the certification.

- N/A

- Troubling shooting instruments

- A Phlebotomy course could be used. I think that bringing in outside experts to speak to students and to bring in new instrumentation would be a great benefit.

- Actually, I feel FSU did a great job! Lecture taught me a lot and lab time was very informative. The main area I feel weak in is trouble shooting problems. If something broke down George usually fixed it .

- We could've used more info.

- The manual methods in chem. were more frustrating than beneficial. I think the methodology behind the procedure can be taught through lecture and lab time spent on something more modern/ current and relevant.

- I could've used more phlebotomy training since I still do not do much. Computer training-many hospitals have computers these days.

- I think that with the time we have to get everything in the program does a very good job. Most things you just have to learn when you get out there.

- I know this may be a little difficult, but add more troubleshooting experience. Have a machine breakdown, let the student read the manual about the machine, try to fix it, and if all else fails let the student call the machines company, which would really be one of the teachers. Where I work, the supervisor works days and I have to fix it on my own.

- Reading/doing more differentials on newborns, and fluids for crystal eval/ID.

- Not much adequate.

- I thought the setup was decent considering the large costs involved with bringing in newer automated equipment to train on. Less concentration may need to be put on manual. Chemistry testing which I have never done except for few tests.

- I think that we need less general education and more time concentrating on our specific curriculum. I know I could have used a lot more time for clinical chemistry for example: It went to fast to learn all we need to know. Maybe 1 year general and 3 yrs. in the program.

- Chemistry. I felt chemistry was very outdated compared to what you see now.

- The medical tech. curriculum is everything I needed it to be. The professors are great and courses cover all you'll need. Great Program!

- I thought the entire program was set up well. The instructors were great and the classes educational.

- I thought the entire program was set up well. The instructors were great and the classes educational.

As a regular part of your assigned duties, which of the following do you perform?

	often	sometimes	never
routine phlebotomy	9	8	7
specimen processing	18	4	3
using a laboratory info. system	23	0	2
instrument maintenance	18	5	2
instrument calibration	12	7	5
instrument troubleshooting/repair	13	12	0
problem solving (difficult antibody identification, unusual organisms, coagulation work-ups, etc.)	10	13	2
proficiency testing	9	14	2
eval. of instruments-procedures	2	13	11
training employees	2	16	7
teaching students	0	2	23
supervising employees	1	7	17
scheduling personnel	2	3	20
ordering supplies/maintaining inventory	5	7	13
drawing donors	0	0	25
preparing blood components	5	5	15
drawing arterial samples	5	0	20
outreach (cholesterol screening programs, etc.)	0	9	16
point of care testing	0	3	22
quality assurance teams/projects	3	9	12
calibration of instruments	9	10	5
competency assessment (assessing others)	9	13	3
competency assessment (assessing others)	0	10	15
consultation with physicians, nurses, etc.	12	8	4
outcomes assessment	1	9	14
design of critical paths/ clinical paths	1	5	19

At what laboratory did you acquire your clinical experience (internship)?

- Mid Michigan Comm. Hospital-Mt. Pleasant
- Bay Medical Center
- Bad Axe Huron Memorial
- Muskegon General

- Bad Axe Huron Memorial
- Muskegon General
- Metropolitan Hospital, Grand Rapids, Mi
- Central Michigan Hospital-Mt. Pleasant
- Muskegon General Hospital- don't lose this place as a site. I couldn't have been more prepared!
- Bay Medical Center
- Central Michigan Community Hospital
- North Oakland Medical Centers
- Bay Medical Center
- North Oakland Medical Center
- Metropolitan - Grand Rapids
- Gratiot Community Hospital, Muskegon General Hospital
- NMH
- Ingham Medical Center
- Michigan Capital Medical Center-Grunlawn Campus
- Hackley Hospital in Muskegon, Mi
- Pontiac Central Hospital
- Central Michigan, Michigan Community Hospital, Mt. Pleasant
- Bay Medical, Bay City
- Metropolitan
- Hackley Hospital
- Wyandotte General Hospital
- Hackley Hospital-Associates Butterworth-4wks blood bank
- Huron Memorial, Bad Axe, Mi and Central Michigan, Mt. Pleasant

Which areas of your clinical experience best prepared you for your current position? Explain.

- Huron Memorial in the chemistry department. I was left and expected to hold my own.

- My internship turned out to be very helpful because the same computer system and many machines were the same. My rotation also gave me a good understanding of all areas.

- Working with the techs. Getting a feel for different personalities. Actually being allowed to work without supervision.

- All areas. The only thing I would change is working one shift. I would rotate to all shifts so a clear idea can be obtained about what is expected in the real world.

- I really didn't have to much experience for mu current position, but with past positions. Blood banks was taught very will by Kathy Notware. It really helped to have mystery antibodies or antibody and follow the steps to solve it. I thought Bay Med did a fine job teaching me.

- No comment

- Chemistry and Hematology were the most helpful for me strictly due to the experience to all areas from instrumentation to manual methods.

- The actual experience. I needed more trouble-shooting and maintenance on the instruments.

- Blood bank (obviously), but I feel that students that go through an internship are light years ahead of people that don't. It was the most stressful thing I've ever done and it actually.

- The theory that was taught to me. It was easier to retain info as I applied it. IMC had assignments/readings everyday, which correlated with my rotation. More practice with venipuncture- that part was rushed to me.

- I feel the clinical experience should be longer. It seemed that I was rushed through each area, and did not have time to do what I had just learned. Then when I begun to work for NMH, I was very unsure of what I was doing.

- Everyone of them was good. Maybe more phlebotomy experience.

- Chem and Hema

- Chem and Hem were both beneficial, having used instruments that are also used in my job. Procedure manuals were great in chem, hema, blood bank, micro at NOMC. Blood bank should have been one to two weeks longer. Take out manual

and workload.

- All of them. I had a wonderful internship. I do wish I could have spent more time in microbiology.

- Microbiology and Blood bank. Both theory and lab. Others worked to get out of the work-Not enough staffing. Shouldn't be expected to work as a tech. (just for output).

- Everything... I obviously, was very prepared for my first job because I stayed there. But it didn't take me very long to become familiar with WMCL.

- All areas- your internship is just like working at a job. I felt they all treated students the same.

- Chem, Hem, Serology, Body fluids-we have no microbiology or blood bank. We are affiliated with Munson Med Center who does the work there. NO.

- Doing hands on stuff prepared me the best. Yes, we should be seeing more instrument mant. and QC. I didn't really like internship.

- I work in special chemistry. Hepatitis testing, HIV testing, some Rubella's and chlamydia, all by E.I.A Methodology. We did not have a lot of preparation for this.

- I think all areas were great. We had to do a lot of phlebotomy but I was glad because my first job required that techs draw the blood. There weren't amy phlebs.

Comment on the amount of venipuncture practice you acquired before your clinical experience. How could your skills in this area have been improved?

- Not much. Personally for me, it was adequate; especially by allowing us to practice on one another. I do not do a lot of phlebotomy.

- I think my venipuncture experience was fine! The only thing that would have helped was drawing infants (0-5), but who's going to let us practice on their kids?? I am great at drawing kids of all ages now though.

- I had Jackie at metro train me for about 6 weeks. She is excellent and I can say there aren't too many patients I can't get blood from.

- I already knew how--was a phlebotomist part-time while going to college.

- The whole 6 weeks in Hemo I performed phleb. in a.m. pick-

to college.

- The whole 6 weeks in Hemo I performed phleb. in a.m. pick-ups. I am still not experienced with small children and babies.

- Very little while at school. Start earlier practicing. Be required to practice!!

- Between internship and on campus, I feel I had a lot of practice. Sometimes I think I can get blood cut of a stone. I have gotten blood out of a man with a 3 gram Hgb!!

- Hurt me hard was a great asset in learning venipuncture but while on internship no venipuncture was preformed.

- I believe I only drew 4 or 5 fellow students before internship. This served to instill to basics of phlebotomy, but it was vastly different from drawing hospital patients.

- Experience at FSU was great. I have not been asked to do much at hospital. I definitely recommend continuing phlebotomy at FSU.

- Not enough experience. More syringe, butterfly, blood culture practice.

- I needed more practice. More real venipunctures will help. Also a little patient psychology will help.

- First of all, I was scared to learn how to draw blood. Then once you learn, you need to practice a lot. It's also different to go into a patient's room, ER etc..to draw. I feel I needed a lot more practice before leaving FSU, and I am not sure how I could have received it. Maybe going to the local hospital, if possible, would help.

- Yes. I needed a lot more practice. At Borgess, we don't draw that often so my skills are already weak, I have not improved much.

- It wasn't enough. The first time I drew on my internship they had to physically take me to the bedside. Possibly drawing patients at Mecosta County or a nursing home. It took me about 20 times before I stopped shaking.

- Pretty much-NONE! If they would have made me draw as a requirement or offered me morning draws to do or something.

- Since I had worked in Reed City as a phlebotomist, they did not make me do a phlebotomy rotation, they only had me draw on days they were short of phlebotomist.

- Phlebotomy was a routine (Daily) part of our internship. At

first it was very intimidating but a definite must. I don't feel Phlebotomy is just the Phlebotomist position and take every chance I can to get out of the lab and out on the floors. Patient contact is nice, it gives me a chance to meet the patients I am pumping numbers out on. There is always a need for improvement.

- We use to draw each other a lot before out clinical, but we all had fairly decent veins, but we could have had more practice with hand draws, butterfly draws, and arterials. I am sure the students would volunteer for those.

- Venipuncture experience in clinical internships one week. Now that I am employed-not needed. Improvement only by doing. I think. MT's and MLT students should rotate thru hospital setting for phlebotomy training while in school as well on internship.

- Very little. More practice on my internship.

- I thought we got descent practice on the fake arm and on each other. My intern had me draw blood daily for the morning run. They were patient and helped me learn. I am not sure you could do better at school but have the clinicals ready to teach.

- Not a lot. Possibly drawing at area hospital.

- More experience with butterflies and syringes. Even arterial draws, some hospitals still have lab do these draws.

Have you continued your education since leaving Ferris? What are your plans in this area?

- No. I have thought about it but I am currently enjoying my present status as "mother".

- No. I am not sure what is in the future for me. More education is in consideration, but not right now.

- I am happy to have the opportunity to apply my clinical experience in the work force. Some graduates are not currently in their field, but I am soon returning to school.

- No. I would like to get my Masters degree, but I don't know what to get it in. I don't want administration, but I don't know what else there is.

- Not as much as I would have liked to. If I were back up in B.R.. I would. I might obtain another degree or just learn more. I enjoy learning.

- Yes. I am going back to school for a different field of work.

- We have continuing within WMCR. I don't have any plans to return to college.

- Not yet. plan to continue on for my masters, but not necessarily in this area.

- Yes, I am currently attending classes at Oakland University for either nursing or physicians assistant.

- Yes, I have recently completed the year long MABB lecture series in preparation for SBB. MABB spring meetings '94 and '95.

- I read MLO and other lab magazines. I am considering taking classes to specialize in an area and plan to attend seminars this year.

- No college classes yet. I do plan to in the future.

- I have studied the possibility of going to medical school. I have to study for the MCAT but medical schools in Michigan don't take foreigners. Also I had been thinking about becoming a PA-C. It would like to go into research or going in the Airforce.

- I went to the Medical Tech State meet for 2 days this last year. I hope to go next year.

- I have participated in ABBOTT diagnostics EIA seminars. I am thinking about getting a masters in Toxicology.

- We have to have continuing education credits to keep our licensure (state). Such but I haven't returned to a college or university yet. I would like to get at least a masters (in what I am not sure).

- I am currently taking classes trying to decide what program to get into. Possibly a physician asst. program that offers a masters degree.

- Physicians assistant intrigues me at the moment. Since I have rec'd the microbiology position this past month. I am pacified for a while.

- No, I am going to stay with the B.S. degree unless I climb the career ladder then I will go on to my masters degree.

- Not yet as for a medical technology, but I have in regards to pharmacy technician which I also do part-time.

- No

to pharmacy technician which I also do part-time.

- No
- I have not taken any classes. I have participated in some teleconferences and have thought about nursing for the increased money they get.
- No. Possible masters in Forensic Pathology.
- I would like to continue my education in the direction of genetics. Looking for a no weekend, no holiday job.

Please make any other comments which you believe would help us to evaluate and improve the Clinical Laboratory Science programs.

SURVEY OF GRADUATES
MEDICAL LABORATORY TECHNICIANS

SURVEY

In August of 1995 a survey was sent to the ten graduates of the 1993-94 graduating class of Medical Laboratory Technicians. Four surveys were returned for a response rate of forty per cent. A copy of the survey and complete results are attached.

Results

The graduates are working in a variety of departments in the clinical laboratory including: chemistry, coagulation, hematology, microbiology, serology, and urinalysis. The average salary is $11.71 per hour. Seventy five percent responded that they did not have difficulty finding a job. Only one graduate stated he had continued his education already to be a medical technologist. The others did not intend to do any further education at the time of the survey.

Fifty per cent of the respondents replied that the "sim lab" was the part of their education that best prepared them for their work. Areas that were thought to need improvement are: phlebotomy, instrument trouble shooting, old instruments and communication skills.

FERRIS STATE UNIVERSITY
MEDICAL LABORATORY TECHNICIAN PROGRAM
SURVEY OF GRADUATES

Where are you currently working?

How long have you been employed here? _____

What is your present position? _____

What was your starting salary? _____

What hours do you usually work? _____

What hours would you prefer to work? _____

Do you work weekends? YES NO How frequently? _____

Do you take call? YES NO How frequently? _____

To which department(s) are you usually assigned? Check all that apply.

blood bank		histology	
chemistry		microbiology	
coagulation		serology/immunology	
cytology		urinalysis/ body fluids	
EKG		other (indicate)	
hematology			

Where else have you worked as a medical laboratory technician?

Was it difficult to find a job when you graduated? Explain.

Which areas of your on-campus education best prepared you for your work in the clinical laboratory? Explain.

Which area(s) of your on-campus education need(s) improvement? How can they be improved?

As a regular part of your assigned duties, which of the following do you perform?

	often	sometimes	never
routine phlebotomy			
specimen processing			
using a laboratory information system			
instrument maintenance			
instrument calibration			
instrument troubleshooting/ repair			
problem solving (difficult antibody identification, unusual organisms, coagulation work-ups, etc.)			
proficiency testing			
evaluation of instruments/ procedures			
training employees			
teaching students			
supervising employees			
scheduling personnel			
ordering supplies/ maintaining inventory			
drawing donors			
preparing blood components			
drawing arterial samples			
outreach (cholesterol screening programs, etc.)			
point of care testing			
quality assurance teams/ projects			
calibration of instruments			
competency assessment (having yours assessed)			
competency assessment (assessing others)			
consultation with physicians, nurses, etc.			
outcomes assessment			
design of critical paths/ clinical paths			

At what laboratory did you acquire your clinical experience (internship)?

Which areas of your clinical experience best prepared you for your current position? Explain. Should any part of the clinical experience be changed? Explain.

Comment on the amount of venipuncture practice you acquired before your clinical experience. How could your skills in this area have been improved?

Have you continued your education since leaving Ferris? What are your plans in this area?

Please make any other comments which you believe would help us to evaluate and improve the Clinical Laboratory Science programs.

With your permission, we would like to survey your supervisor to determine his or her opinion of how well you were prepared for your present position. Any results from the employer survey (as well as the results of this questionnaire) will be kept confidential. This page, with your signature and address, will be removed before results are compiled.

I agree that the Clinical Laboratory Sciences program at Ferris State University may send a survey to my supervisor:

YES NO

Signature _____

One more item: for the purposes of our alumni data base, please tell us your current name, home address, and telephone number:

FERRIS STATE UNIVERSITY
MEDICAL LABORATORY TECHNICIAN PROGRAM
SURVEY OF GRADUATES

Where are you currently working?
- Mercy Memorial Hospital-Monroe, MI
- Alpena Medical Arts
- St. John Hospital-East Detroit
- Memorial Medical Center-Ludington
  West Shore Hospital-Manistee

How long have you been employed here?
- 1 year 8 months
- 5 months
- 10 months ago
- 2 years

What is your present position?
- MLT
- MLT
- MT
- MLT-part time

What was your starting salary?
- $11.93/hr
- 11.50
- 13.77/hr + 8% p.m. differential
- 9.65

What hours do you usually work?
- 40 hours a week
- 7:30 am to 6:30 pm & 8:00 am to 4:30 pm
- Afternoon shift
- Any & all

What hours would you prefer to work?
- 40 hrs/week
- Either
- Afternoon shift or midnight shift
- Anything

Do you work weekends?	How Frequently?
- Yes	- Every other
- Yes	- 1 Sat/month (4hrs)
- Yes	- Every four weekend <u>once</u>
- Yes	- Every other

Do you take call?	How Frequently?
- No	
- No	
- Yes	Rare
- No	

To which department(s) are you usually assigned? Check all that apply.

Blood bank	2	Histology	0
Chemistry	4	Microbiology	2
Coagulation	4	Serology/immunology	3
Cytology	0	Urinalysis/body fluids	4
EKG	0	Other (indicate)	-
Hematology	4		

Where else have you worked as a medical laboratory technician?

- 1st job
- I didn't work as MLT because I continued to study MT
- Central MI Community Hospital (Ready Care Clinic)
  Caro Comm. Hospital

Was it difficult to find a job when you graduated? Explain.

- Yes. Not many places were hiring at all or not MLTs.
- No. I got lucky and hired even before I graduated.
- It was easy to get job. I got full-time job 6 weeks after my graduation.
- No. I had several offers from all over MI I sent out around 100 resumes.

Which areas of your on-campus education best prepared you for your work in the clinical laboratory? Explain.

There's more to the lab worker than just running machines. They need to know about disease states & reactions-why test results come out the way they did

All-Mainly lab classes (hands on) experience

You taught me theory which is important. Your instrument were old compared to my work place, but they are helpful in training students

Sim Lab-- It's the closest to what really happens in a real lab

Which area(s) of your on-campus education need(s) improvement? How can they be improved?

Phlebotomy (needed more practice) Possibly more time spent with reading gram stains, urine micros, diffs.

Phlebotomy skills
-more time & patients to draw.

Your on campus education is excellent because you concentrate on theory

As a regular part of your assigned duties, which of the following do you perform?

	often	sometimes	never
routine phlebotomy	3	-	1
specimen processing	3	-	1
using a laboratory info. system	1	1	1
instrument maintenance	3	1	-
instrument calibration	2	2	-
instrument troubleshooting/repair	3	1	-
problem solving (difficult antibody identification, unusual organisms, coagulation work-ups, etc.)	3	1	-
proficiency testing	2	1	-
eval. of instruments-procedures	-	3	1
training employees	-	2	2
teaching students	-	1	3
supervising employees	-	1	3
scheduling personnel	-	1	3
ordering supplies/maintaining inventory	-	2	2
drawing donors	-	-	4
preparing blood components	-	1	3
drawing arterial samples	-	-	4
outreach (cholesterol screening programs, etc.)	-	-	3
point of care testing	2	-	1
quality assurance teams/projects	-	2	2
calibration of instruments	2	2	-
competency assessment (assessing others)	2	-	2
consultation with physicians, nurses, etc.	2	2	-
outcomes assessment	1	2	1
design of critical paths/ clinical paths	-	2	2

At what laboratory did you acquire your clinical experience (internship)?

Huron Memorial Hospital-Bad Axe, MI

West Shore Hospital

University of Michigan-Ann Arbor, MI

Memorial Medical Center-Ludington

Clinical Lab Sciences Program

APRC 1995-1996

section 2 of 3

Which areas of your clinical experience best prepared you for your current position? Explain.

It taught me that even though you are assigned to a department if that depart. is slow, than helping out another dept. makes for a team effort & better relations with coworkers.

I had a great clinical experience at WSH. What best prepared me was running areas by myself and learning organization skills on my own.

The instruments of U of M were the same as my work place which is helpful. Clinical experience right now is excellent for preparing students to find job.

Intern was great everyone in Ludington was so helpful!

Comment on the amount of venipuncture practice you acquired before your clinical experience. How could your skills in this area have been improved?

Needed more practice!!! Especially for hard draws/hand draws & fingersticks. And how to deal with a difficult patient!

I drew four people before going to WSH. Really need more time & practice in venipuncture.

I did 5 or 6 draws of blood on campus. During my internship in Ludington I did at least 200 draws of blood, so most of my experience I got was in Ludington hospital.

I needed more practice on hard draws back of the hand etc. But Ludington had great phlebotomist & they wouldn't let me stop until I felt comfortable.

Have you continued your education since leaving Ferris? What are your plans in this area?

No. I might go on to get bachelor's degree. Maybe specialize in Blood Bank or Chemistry.

No comment.

I got my MT degree from Eastern Michigan University. In work each year we have to earn 3 credits of continuing education which will count for our yearly evaluation.

No not yet maybe someday.

Please make any other comments which you believe would help us to evaluate and improve the Clinical Laboratory Science programs.

Students need more practice with phlebotomy esp. difficult draws & fingersticks. Maybe more time for troubleshooting/maintenance of instruments. More time spent with microscopics-urines & diffs. may be helpful before going on a clinical setting. Maybe hints on how to deal (handle) with doctors/nurses on the phone questioning results/orders.

No comment.

Your program is excellent especially concerning theory and education but your instruments are old, but during the internship the students will get training on new instruments & doing a lot of phlebotomy as I did during my internship.

No comment.

Section Three: Surveys of Employers of Graduates

Surveys were being mailed to employers of program graduates when we were informed that we had been selected for academic program review. As with the graduate surveys, the PRP decided that sending the survey suggested by the APRC would be duplicative, unnecessarily expensive, and possibly not effective, following so closely on the heels of the CLS survey.

It has been the policy of the CLS programs to ask graduates for permission to survey their employers. The employers of graduates who have not returned signed permission are excluded from CLS employer surveys. Thus the employer surveys are always mailed to a slightly smaller group of people. Nearly all graduates give permission, so the data obtained from employers of graduates are also useful for CLS curriculum development and for accreditation purposes.

The return rates for the employer surveys are similar to surveys we have mailed in past years. Some employers have hired more than one graduate, and combine their responses onto one survey. Others simply do not respond.

Information from employers of FSU CLS graduates, as well as copies of the survey forms used, are included in succeeding pages.

SURVEY OF EMPLOYERS OF GRADUATES MEDICAL TECHNOLOGISTS

SURVEY

The employers of twenty 1993 and 1994 graduates of the Medical Technologist Program were mailed surveys in February 1996. Of the twenty sent, eleven were returned for a 55% response rate. The survey that was sent is attached with the total responses per item.

RESULTS

Ninety-one percent of the employers found the students prepared to assume their duties. One stated that phlebotomy was an area of weakness. Two additional areas of concern were in the ability to troubleshoot and in quality control. Three employers (27%) found the graduates unprepared in phlebotomy and instrument maintenance.

All employers stated that they would hire another Ferris graduate. Stated areas of concern were: customer relation skills, communication and marketing, total quality management, and more independent decision making based on good theory.

Forty-five percent of the employers replied that they have had difficulty hiring capable employees in the past two years. Two employers stated that their lab would be expanding and two stated that they possibly would be expanding.

Ferris State University Medical Technology Program
Survey of Employers of Graduates

Name of employee: _____

Name of laboratory: _____

Date the above person was hired: _____

Section(s) of laboratory to which employee is assigned (check all that apply):

Blood Bank	7	Microbiology	4
Chemistry	10	Phlebotomy	8
Coagulation	8	Serology	7
EKG	0	Urinalysis	8
Hematology	8	Other (specify)	
Histology	0	Day shift	2
PM shift	6	Night shift	8

Which duties does this employee regularly perform (check all that apply):

quality control	11	scheduling of personnel	
proficiency testing	8	ordering of supplies	2
evaluating new procedures	2	drawing blood donors	
evaluating new instruments	2	blood component preparation	3
teaching of students	2	specimen collection	9
training of personnel	2	specimen processing	10
using a lab information system	8	instrument maintenance	9
troubleshooting instruments	9	complex problem solving	7
consulting with physicians and other personnel	8	quality assurance/ CQI teams	1
other (specify)		other (specify)	

Do you think that this employee was adequately prepared to assume these duties? Please explain.

1 no
10 yes — exception of phlebotomy skills

Is there any laboratory area in which the individual was NOT prepared? Please explain.

8 no — instrument maintenance

Please circle the response that best describes this employee.

Speed (rate at which assigned tasks are completed):

7 a) From time of employment has completed assigned tasks quickly and often assists others
4 b) Slow to begin with but in a short time progressed to an adequate level of speed
c) seldom finishes assigned tasks in a reasonable amount of time

Organization:

10 a) Organizes work by interrelating the preparation of specimens, assembling of equipment, completion of tests, evaluation of results, without waste of time
1 b) Performs some procedures with good organization, but has difficulty handling two or more tasks simultaneously
c) Wastes motions; neglects to think ahead; cannot perform in an organized fashion

Attitude toward change:

11 a) willingly learns new procedures
b) avoids learning new procedures, and will try to change assignments with others to avoid contact with new developments
c) reluctant to learn new procedures; thinks that only methods used at Ferris or on clinical internship are the "right" methods

Skills:

8 a) learns equipment with ease and confidence at first exposure
3 b) appears unsure at first exposure to instruments, but soon develops ease in operation
c) handles instruments with difficulty; has a high level of failure, need to rerun assays, or other problems

Orientation time:

8 a) moved ahead with initiative after initial orientation to the laboratory
3 b) needed some repetition of directions, but soon became familiar with the laboratory, with only occasional lapses
c) behaved like a stranger in the laboratory and had to be shown repeatedly what to do and how to do it.

Relationships with co-workers and professional colleagues:

11 a) sensitive and considerate of the feelings of others; seeks opportunities to help others
b) is pleasant enough to others, but rarely offers to help
c) antagonizes and irritates those with whom he/she works

Leadership qualities:

8 a can successfully give as well as follow directions; shows potential
3 b) too timid to offer suggestions even if more capable than others
c) offers suggestions often, but his/her "know it all" attitude creates resentment

Confidence:

10 a approaches assignment with assurance and reports test results with confidence
1 b) overconfident; tends to "skimp" on quality control, instrument verification, and other procedures
c) lacks confidence in his work. Checks results with others often.

Initiative (willingness and ability to function independently):

9 a) sees things to be done and acts without being specifically directed
2 b) checks with supervisor when done with work and asks for additional assignments
c) assumes responsibility for his/her own assignments but seldom assumes any for the overall function of the laboratory

Judgment:

7 a) recognizes discrepancies in work and proceeds to correct the difficulty
4 b) recognizes discrepancies in work and reports the problem to his/her supervisor
c) performs tests mechanically with no attention to quality

Problem solving skills

9 a) recognizes problems and attempts solutions in an organized and purposeful manner
1 b) recognizes problems but uses shotgun approach to solutions
1 c) fails to recognize problems

Interest in professional development

10 a) regularly participates in continuing education activities
1 b) rarely participates in continuing education and in not supportive of those who do
c) does not participate and actively discourages others from participating

Tidiness:

11 a) extremely neat; keeps everything clean and in its proper place
b) keeps work station in a sloppy condition, but cleans up at end of shift
c) keeps a sloppy work station and fails to assume responsibility for clean up, storage of reagents, and other related tasks

Adherence to safety regulations:

10 a) adheres strictly to laboratory safety policies and actively attempts to identify and correct conditions which may impair the safety of laboratory personnel
1 b) adheres to regulations when reminded; is careless about some areas of safety
c) extremely careless in the laboratory, and ridicules those who adhere to safety regulations

What are some emerging skills or tasks that you foresee for employees of your laboratory in the next five years?

customer relations
communication
marketing

Based on your experience with this employee, would you consider hiring another graduate of Ferris State University?

11 yes ____ no

What are your projected employment needs:

within 6 months: 3 within 1 year: 1 within 2 years: 2

What are your mandatory educational requirements for new testing personnel?

MT or MLT with ASCP certification

Have you experienced difficulty in the last two years in hiring capable employees?

5 yes 6 no

Has your laboratory changed its mix of MTs and MLTs? Are you considering doing so? If so, how?

ALL MTs 4 & no

Do you plan to expand your laboratory and increase your staff?

2 yes 7 no 2 possibly

What is your average annual staff turnover?

2-3 full time
< 5%

Would you be interested in graduates with multiple competencies (lab/x-ray, lab/respiratory therapy, etc.)?

1 yes 10 no

If yes, what combinations would be most useful?

Please make any other comments that would help us evaluate the Medical Laboratory Technician Program. Thank you.

SURVEY OF EMPLOYERS OF GRADUATES MEDICAL LABORATORY TECHNICIANS

SURVEY

Employers of four 1993-94 graduates of the Medical Laboratory Technician Program were mailed surveys in February 1996. Of the four sent all were returned for a 100% response rate. The survey that was sent is attached with the total responses per item.

RESULTS

All of the employers felt that the graduates were adequately prepared for the duties that they are assigned in their daily work. One stated that the graduate could use more organizational skills particularly in dealing with more than one task at a time. Fifty percent of the employers did not find the graduates unprepared in any area. The others were still in training at the time of the survey. Graduates are assigned to various areas of the lab with chemistry, coagulation, hematology and urinalysis being areas that all four graduates work in.

In response to some of the open ended questions the employers want the MLTs to have more leadership responsibilities and customer service orientation particularly in the area of communication skills. One stated that the graduates needed more leadership skills

SURVEY OF EMPLOYERS OF GRADUATES
MEDICAL LABORATORY TECHNICIANS

SURVEY

Employers of four 1993-94 graduates of the Medical Laboratory Technician Program were mailed surveys in February 1996. Of the four sent all were returned for a 100% response rate. The survey that was sent is attached with the total responses per item.

RESULTS

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In response to some of the open ended questions the employers want the MLTs to have more leadership responsibilities and customer service orientation particularly in the area of communication skills. One stated that the graduates needed more leadership skills

Ferris State University Medical Laboratory Technician Program
Survey of Employers of Graduates

Name of employee: _____

Name of laboratory: _____

Date the above person was hired: _____

Section(s) of laboratory to which employee is assigned (check all that apply):

Blood Bank	2	Microbiology	1
Chemistry	4	Phlebotomy	3
Coagulation	4	Serology	2
EKG		Urinalysis	4
Hematology	4	Other (specify)	
Histology		Day shift	2
PM shift	3	Night shift	1

Which duties does this employee regularly perform (check all that apply):

quality control	4	scheduling of personnel	
proficiency testing	2	ordering of supplies	1
evaluating new procedures		drawing blood donors	
evaluating new instruments	1	blood component preparation	1
teaching of students		specimen collection	3
training of personnel		specimen processing	3
using a lab information system	2	instrument maintenance	3
troubleshooting instruments	3	complex problem solving	1
consulting with physicians and other personnel	2	quality assurance/ CQI teams	
other (specify)		other (specify)	

Do you think that this employee was adequately prepared to assume these duties? Please explain.

3 yes

Is there any laboratory area in which the individual was NOT prepared? Please explain.

2 no

Please circle the response that best describes this employee.

Speed (rate at which assigned tasks are completed):

1 a) From time of employment has completed assigned tasks quickly and often assists others
2 b) Slow to begin with but in a short time progressed to an adequate level of speed
1 c) seldom finishes assigned tasks in a reasonable amount of time

Organization:

3 a) Organizes work by interrelating the preparation of specimens, assembling of equipment, completion of tests, evaluation of results, without waste of time
1 b) Performs some procedures with good organization, but has difficulty handling two or more tasks simultaneously
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Attitude toward change:

4 a) willingly learns new procedures
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Skills:

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Orientation time:

2 a) moved ahead with initiative after initial orientation to the laboratory
2 b) needed some repetition of directions, but soon became familiar with the laboratory, with only occasional lapses
c) behaved like a stranger in the laboratory and had to be shown repeatedly what to do and how to do it.

Relationships with co-workers and professional colleagues:

3 a) sensitive and considerate of the feelings of others; seeks opportunities to help others
1 b) is pleasant enough to others, but rarely offers to help
c) antagonizes and irritates those with whom he/she works

Leadership qualities:

2 a) can successfully give as well as follow directions; shows potential
2 b) too timid to offer suggestions even if more capable than others
c) offers suggestions often, but his/her "know it all" attitude creates resentment

Confidence:

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Initiative (willingness and ability to function independently):

3 a) sees things to be done and acts without being specifically directed
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Judgment:

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Problem solving skills

2 a) recognizes problems and attempts solutions in an organized and purposeful manner
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Interest in professional development

2 a) regularly participates in continuing education activities
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Tidiness:

3 a) extremely neat; keeps everything clean and in its proper place
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Adherence to safety regulations:

3 a) adheres strictly to laboratory safety policies and actively attempts to identify and correct conditions which may impair the safety of laboratory personnel
1 b) adheres to regulations when reminded; is careless about some areas of safety
c) extremely careless in the laboratory, and ridicules those who adhere to safety regulations

What are some emerging skills or tasks that you foresee for employees of your laboratory in the next five years?

Based on your experience with this employee, would you consider hiring another graduate of Ferris State University?

3 yes 1 no questionable

What are your projected employment needs:

within 6 months: 0 - 2 within 1 year: 1-2 4 within 2 years: 2-4

What are your mandatory educational requirements for new testing personnel?

3 - Associate Degree
1 - B.S.

Have you experienced difficulty in the last two years in hiring capable employees?

2 yes 2 no

Has your laboratory changed its mix of MTs and MLTs? Are you considering doing so? If so, how?

3 no
1 yes - more MLT's

Do you plan to expand your laboratory and increase your staff?

1 yes 3 no

What is your average annual staff turnover?

0-2 per year

Would you be interested in graduates with multiple competencies (lab/x-ray, lab/respiratory therapy, etc.)?

1 yes 3 no

If yes, what combinations would be most useful?

Please make any other comments that would help us evaluate the Medical Laboratory Technician Program. Thank you.

Section Four: Student Satisfaction Surveys of the CLS Programs

Survey

The attached survey was distributed to all second year MLT and third year MT students in on-campus courses at the end of the Winter Semester 1996. The forms were sent to the fourth year MT students at their clinical experience sites and mailed back to campus. 27 of 27 (100%) of the on-campus students returned the survey, but only 8 of 18 (44%) senior MT students returned the survey.

The survey form was designed to evaluate the student's satisfaction with their education at FSU as they perceive it to date. The form requested responses for the many areas of concern including: advising, quality of CLS instruction, quality of College of Allied Health staff and administrators, course policies, computer support, quality of general education courses and the perception of the effects of general education courses on their preparing them for the future.

Results

The mean value and standard deviation for all responses were calculated. The attached reports show a breakdown of the responses as a composite of all 35 students. Results by program and year of graduation are included in the appendix.

The items concerning CLS program resources, instruction and support show most responses near an average of Good (range of 3.7 - 4.5). Exceptions include the quality of library holdings (#7), internship experiences (#12) and preparation for employment (#16). In all three there were significant responses of "Not applicable or Unknown". The senior MT students (currently in the clinical experience) rated #16 with an average of 4.3.

Responses concerning preparation for life experiences by general education courses showed a range of scores between 3.2 and 3.9. Responses about the required science and math courses also were mostly between 3 and 4, which indicated that these courses helped "Some" to "Quite a bit".

Summary of Student Comments about the CLS Programs

Please write any constructive comments below about your CLS program that might be helpful for revising and improving the program.

Second Year MLTs

- Some of the teachers in the pre-CLS courses [General Education] don't really care if you understand what they are teaching even when you ask for help. That makes it harder over here.

- I may seem negative about my answers, but it is my own fault I have taken on new roles in my life and found myself fighting to stay above the water. As an overall I

think this program is great. The faculty have been helpful. Expectations are very high. Most of the students have done wonderful. At times I felt that I did not have a place here, but on the up note I am pulling myself up and trying to get through this semester, and next semester I am not letting myself fail as I have this semester.

- Chemistry department in general education really is poor. The equipment is nice but I've had 3 of 4 chemistry teachers here and they need to learn a better technique to teaching students, take a more humanistic approach to teaching so students aren't deathly afraid of going to chemistry or afraid to ask questions.

Third Year MTs

- Faculty is excellent and involved with students. Much better than in Arts and Sciences.

- A lab book for Immunology

- It is possible that some students do not pursue the MLT or MT profession due to lack of good chemistry teachers.

- I feel there should be an interview setting before someone is allowed into the program.

- Please provide longer lecture hours and (assign group) cooperative learning in every course of CLS program. Provide more lab practical hours and availability of open lab beyond the main lab hours in every course of the program. Besides these everything is good for now. More quizzes (either group or individual) and more often that would keep students more motivated.

- The level and quality of the general chemistry instructors at FSU is very poor in my opinion. To help improve the scede (??), and knowledge, different instructors are needed.

- I think the CLS courses are great. The teachers are very helpful.

Fourth Year MTs

- I believe that the faculty is doing much better at keeping in touch with the 1st/2nd year students, keep it up. For non-traditional students without recent (if any) study habits I would strongly suggest a "study skills" class. I had one at NCMC in Petoskey and it was a great help. An overall evaluation of Ferris CLS program is very good. When I began my internship, I found I had a sound background education and the rest is up to me. I'm not sure how to go about this, but each instructor has their own style of writing test questions which seems to be too simplified.

- The CLS program is very good, however, the general requirements need vast improvement. I am very proud to be a CLS graduate from FSU. The CLS staff is wonderful and always willing to help students. The staff arranges for special meeting times, both individually as well as groups. I feel that the general requirements need improvement with new teachers and more flexibility to be effective. The general classes really did nothing for preparing me for the CLS program except Microbiology and Biochemistry.

- The CLS program is very good. The equipment for the most part is good also. However the microscopes are not the greatest. I don't believe general maintenance will be enough to improve them. The major problem is, they don't stay in focus and some don't really focus at all. More promotion and advertising of the program needs to be done to reach those students who don't know about the program.

- My experience so far on internship makes me think that the grading is very subjective, too much so. It can't be helped in the psychomotor area, but the cognitive can. As good as essay questions are, the instructor can be very subjective. You only get one test worth 2/3 of your grade **[This is incorrect. The department exam is 20% of the rotation grade]** and it is up to the instructor. Some are better than others. I feel quite prepared for internship as far as knowledge of background is concerned. The program is good at that. The availability of computers at the Allied Health building is limited. As for general education requirements, I think the organic background is weak. The general microbiology is somewhat weak too. The important concepts should be stressed more and the lab aspect is not very helpful. Of course the infamous ENGL 321 issue will be dealt with I assume. I think it would be best taken over the 14 weeks of the summer. Keep two session for CLS classes but spread English out.

Student Perceptions of the CLS Programs (UNIV 290 and FSUS 100)

Survey

End of semester survey data obtained from freshman CLS students enrolled in UNIV 290 (Fall 94, Winter 95) and FSUS 100 (Fall 95) was used to identify freshman students who did not intend to return to Ferris State University the following semester. The status of these students was determined in December of 1995 using the FSU SIS+ database. Those students who were no longer in CLS programs were contacted by phone and asked the following questions:

a) why did you transfer from CLS programs?
b) what could we (CLS program) have done differently to make the program more attractive?
c) what are your current plans for your college education?

Results

Twenty eight students completed surveys in the UNIV 290 and FSUS 100 courses taught by CLS faculty. Seven of these students stated that they did not intend to return to Ferris State University the following semester.

Four students had transferred to other programs (EEIT, PNUR, SBM and PTSC) at Ferris State University. One of the students (SBM) is considering a transfer back into CLS programs. Three of the four students stated that their major reason for transferring was to avoid taking (or reduce number of) chemistry courses. All stated that the courses in biology and chemistry made them realize that CLS programs may not suit their career desires.

One student was academically dismissed and is retaking courses at a community college. This student plans to return to Ferris and the CLS program. One student transferred to another university and was unavailable for this survey. One student did not transfer from the program as they thought they might.

Student Satisfaction Survey
Clinical Laboratory Science Programs
Ferris State University

Please complete the following survey as part of the Academic Program Review process at FSU. The results of this survey will be used to better understand student perceptions of the CLS programs and hopefully to improve any areas identified as problems. Use a number 2 pencil and fill in the attached Scantron form for each of the following statements.

		Not Applicable or Unknown	Poor	Fair	Good	Excellent	
1.	Availability of my program advisor	1	2	3	4	5	4.1
2.	Willingness of my program advisor to help me.	1	2	3	4	5	4.5
3.	Quality of career advising in the program	1	2	3	4	5	4.2
4.	Quality of curricular advising in the program	1	2	3	4	5	4.2
5.	Quality of instruction in my program courses	1	2	3	4	5	4.5
6.	Opportunities for interaction with faculty in my program	1	2	3	4	5	4.6
7.	Quality of library holdings in my major area	1	2	3	4	5	2.9
8.	Availability of professional activities or clubs in my program	1	2	3	4	5	3.9
9.	Helpfulness of the College of Allied Health Sciences office staff	1	2	3	4	5	3.8
10.	Quality of courses for providing a good general education	1	2	3	4	5	4.1
11.	Course sequencing in the program	1	2	3	4	5	4.2
12.	Practicum or internship experiences in the program	1	2	3	4	5	2.8
13.	Laboratory facilities related to the program	1	2	3	4	5	4.1
14.	Quality of the students in the program	1	2	3	4	5	4.1
15.	Classroom facilities related to the program	1	2	3	4	5	4.2
16.	Quality of courses in preparing me for employment	1	2	3	4	5	3.5
17.	Fairness of grading in my courses	1	2	3	4	5	4.1
18.	Clarity of the degree requirements	1	2	3	4	5	4.5
19.	Opportunities for formal student evaluation of instruction in the program	1	2	3	4	5	3.7
20.	Professional competence of the program faculty	1	2	3	4	5	4.5

	Not Applicable or Unknown	Poor	Fair	Good	Excellen
21. Quality of my initial contacts with the program	1	2	3	4	5
22. Attitude of the departmental chairperson towards students	1	2	3	4	5
23. Quality of computer support for student work in my program	1	2	3	4	5
24. Quality of computer facilities	1	2	3	4	5
25. Availability of computer facilities	1	2	3	4	5
26. Overall quality of my CLS program	1	2	3	4	5

How helpful has your general education coursework (MATH, ENGL, SOCY, PSYC, HUMN ty courses) been in preparing you in the following areas?

	Not a Goal of mime	Very little	Some	Quite a bit	Ve mu
27. Communicating my ideas clearly and simply in correct English	1	2	3	4	5
28. Reading and interpreting what I read	1	2	3	4	5
29. Writing and speaking clearly and effectively	1	2	3	4	5
30. Identifying values and responding ethically	1	2	3	4	5
31. Meeting the responsibilities of citizenship	1	2	3	4	5
32. Respecting the uniqueness and worth of each individual	1	2	3	4	5
33. Calculating and interpreting data	1	2	3	4	5
34. Understanding myself - abilities, interests and personality	1	2	3	4	5
35. Improving my ability to think analytically and logically	1	2	3	4	5
36. Gaining a broad general education about different fields of knowledge	1	2	3	4	5
37. Ability to learn on my own, pursue ideas and find information I need	1	2	3	4	5
38. Accepting the responsibility of preparing for the future	1	2	3	4	5

How helpful have each of the following courses been in helping you to understand the principles and concepts of each of the following subject areas:

	Not a Goal of mime or not appliicable	Very little	Some	Quite a bit	Very much	
39. general chemistry	1	2	3	4	5	3.1
40. organic and biochemistry	1	2	3	4	5	3.4
41. general biology	1	2	3	4	5	3.5
42. general microbiology	1	2	3	4	5	3.5
43. anatomy and physiology	1	2	3	4	5	4.3
44. math 115	1	2	3	4	5	3.2

Please write any constructive comments below about your CLS program that might be helpful for revising and improving the program.

Section Five: Faculty Perceptions of the CLS Programs

Survey

The survey form for determining faculty perceptions was provided by the APRC. The four faculty members of the CLS programs completed the survey and the composite results are attached.

Results

The faculty rated most items as "Good" or "Excellent". Notable exceptions were #11 (Relevance of supportive courses), #19 (Provision for career planning) ,#22 (Placement effectiveness), #25 (Provision for Leadership and Coordination, #31 (Use of Clerical Support Staff), #34 (Adequacy of instructional facilities), #38 (Use of advisory committees), #40 (Provisions in capital outlay budget for equipment). In most of the areas where the rating was not "Good" or "Excellent", the faculty still rated the items as acceptable, or there was not consensus that the area was a concern. The lowest rating concerned the equipment budget and placement office services.

Comments from Faculty:

Question 2

- We seldom meet to compare our program to its goals.

Question 3

- Students use these.

Question 5

- We could do better at check-offs.
- Need more competency assessments.

Question 6

- As we can get the data.
- Need to look at other possible labor markets and needs.
- We need to emphasize alternate careers more.

Question 9

- Haven't seen the 1994-95 data yet.
- Need more systematic info from "leavers"

Question 10

- We try.
- A strong point of the program.

Question 11

- ENGL 321 needs major revisions to make it more relevant. Chemistry courses need major revisions to our needs
- Support courses appropriate by name only in some cases. Actual content often irrelevant or not complete.
- Biology/Chemistry faculty refuse to adapt to student needs

Question 13

- Need to consider work experience earlier in curriculum rather than just at the end.

Question 14

- A strong point of the program

Question 19

- Potential employers don't use placement office that we are aware of, so students don't either.
- More emphasis on this earlier in the curriculum

Question 22

- Placement office of little or no help with health care grads
- Individual faculty assist various students but no college program exists.

Question 24

- We could do better.

Question 25

- No accountability- we plan but there is no follow through. Problems remain unsolved.

Question 27

- Large numbers of students and requisite class hours have decreased key one-on-one time.
- But we are pushed to the limit. Little or no administrative support for the proposed solutions.

- Heavy contact hours leave little time for course and instructional development or assessment. If a faculty member wants to be involved in university committees or governance or professional activities, there is too little time.

Question 28

- We are very good.

Question 29

- But it is very hard for us to get away.
- We get the same $500 we we've gotten for 23 years. It doesn't buy much any more.

Question 30

- We couldn't manage without our tech.
- We use professionals and without him we might as well close the program.

Question 31

- Need clerical help who can use computers to make graphics and presentation quality material. Staff who can take my handwritten diagrams and create a computer graphic I can use in programs like Powerpoint or import into a document.
- Not much available.

Question 34

- Physical size of our labs frequently requires 3 sections
- Probably strongest point of the program.
- Classrooms are too hot, overhead projectors are poorly maintained.

Question 35

- Current scheduling creates long days for students and faculty resulting in burnout.
- We certainly maximize use. Students end up with long days

Question 38

- We really do not have an advisory committee that isn't directly related to the program.
- Need advisory committee members from non-affiliated hospitals and industry
- Emphasis on clinical instructors - inbred advice

Question 39

- But we must rely on donations or we wouldn't have enough supplies.

Question 40

- Without donations and occasional Voc. Ed. funds we would fold.
- Program relies heavily on donations. If these decrease the program is in big trouble.
- We rely heavily on donations.

Question 41

- Need program meeting minutes
- Need to meet deadlines
- Compare program to plans and goals
- Communication from program director, assistant dean and dean is poor.
- Administration plans but doesn't evaluate anything (zero based budget as an example)
- Deadlines are frequently missed.
- Meetings are frequently canceled without adequate notice.
- Meetings are called with no agenda or one supplied without enough notice for others to plan.
- Many functions of the CLS program director usually delegated to CLS faculty.

PROE

Michigan Community Colleges

FACULTY PERCEPTIONS OF OCCUPATIONAL EDUCATION PROGRAMS

		Keypunch Instructions	Poor 1	Below Expectations 2	Acceptable 3	Good 4	Excellent 5	Don't Know	COMMENTS (Please note explanatory remarks or needs for improvement)
GOALS AND OBJECTIVES									
1. Participation in Development of College Occupational Education Program Plan *Excellent*—Administrators and/or other supervisory personnel involved in developing and revising the college plan for this occupational program seek and respond to faculty, student and community input. *Poor*—Development of the plan for this program is basically the work of one or two persons in the college.	1					2	2		
2. Program Goals *Excellent*—Written goals for this program state realistic outcomes (such as planned enrollments, completions, placements) and are used as one measure of program effectiveness. *Poor*—No written goals exist for this program.	2					3	1		
3. Course Objectives *Excellent*—Written measurable objectives have been developed for all occupational courses in this program and are used to plan and organize instruction. *Poor*—No written objectives have been developed for courses in this program.	3					1	3		
4. Competency Based Performance Objectives *Excellent*—Competency based performance objectives are on file in writing, consistent with employment standards, and tell students what to expect and help faculty pace instruction. *Poor*—Competency based performance objectives have not been developed for courses in this program.	4					1	3		
5. Use of Competency Based Performance Objectives *Excellent*—Competency based performance objectives are distributed to students and used to assess student progress. *Poor*—Competency based performance objectives are not used with students for progress evaluation nor are students aware that they exist.	5				1	1	2		
6. Use of Information on Labor Market Needs *Excellent*—Current data on labor market needs and emerging trends in job openings are systematically used in developing and evaluating this program. *Poor*—Labor market data is not used in planning or evaluation.	6					4			
7. Use of Information on Job Performance Requirements *Excellent*—Current data on job performance requirements and trends are systematically used in developing and evaluating this program and content of its courses. *Poor*—Job performance requirements information has not been collected for use in planning and evaluating.	7					3	1		

PROE

Michigan Community Colleges

FACULTY PERCEPTIONS OF OCCUPATIONAL EDUCATION PROGRAMS

Keypunch Instructions	Poor 1	Below Expectations 2	Acceptable 3	Good 4	Excellent 5	Don't Know	COMMENTS (Please note explanatory remarks or needs for improvement)
GOALS AND OBJECTIVES (Continued)							
8. Use of Profession/Industry Standards — *Excellent*—Profession/industry standards (such as licensing, certification, accreditation) are consistently used in planning and evaluating this program and content of its courses. *Poor*—Little or no recognition is given to specific profession/industry standards in planning and evaluating this program.	8				4		
9. Use of Student Follow-Up Information — *Excellent*—Current follow-up data on completers and leavers (students with marketable skills) are consistently and systematically used in evaluating this program. *Poor*—Student follow-up information has not been collected for use in evaluating this program.	9			1 2 1			
PROCESSES							
10. Adaptation of Instruction — *Excellent*—Instruction in all courses required for this program recognizes and responds to individual student interests, learning styles, skills, and abilities through a variety of instructional methods (such as small group or individualized instruction, laboratory or "hands on" experiences, open entry/open exit, credit by examination). *Poor*—Instructional approaches in this program do not consider individual student differences.	10			1	3		
11. Relevance of Supportive Courses — *Excellent*—Applicable supportive courses (such as anatomy and physiology, technical communications, technical mathematics) are closely coordinated with this program and are kept relevant to program goals and current to the needs of students. *Poor*—Supportive course content reflects no planned approach to meeting needs of students in this program.	11		3		1		
12. Coordination with Other Community Agencies and Educational Programs. — *Excellent*—Effective liaison is maintained with other programs and educational agencies and institutions (such as high schools, other community colleges, four year colleges, area vocational schools, proprietary schools, CETA) to assure a coordinated approach and to avoid duplication in meeting occupational needs of the area or community. *Poor*—College activities reflect a disinterest in coordination with other programs and agencies having impact on this program.	12		1	2	1		
13. Provision for Work Experience, Cooperative Education or Clinical Experience. — *Excellent*—Ample opportunities are provided for related work experience, cooperative education, or clinical experience for students in this program. Student participation is well coordinated with classroom instruction and employer supervision. *Poor*—Few opportunities are provided in this program for related work experience, cooperative education, or clinical experience where such participation is feasible.	13			1	3		

PROE

Michigan Community Colleges

FACULTY PERCEPTIONS OF OCCUPATIONAL EDUCATION PROGRAMS

1

Keypunch Instructions	Poor 1	Below Expectations 2	Acceptable 3	Good 4	Excellent 5	Don't Know	COMMENTS (Please note explanatory remarks or needs for improvement)

PROCESSES (Continued)

14. Program Availability and Accessibility

14

Excellent—Students and potential students desiring enrollment in this program are identified through recruitment activities, treated equally in enrollment selection, and not discouraged by unrealistic prerequisites. The program is readily available and accessible at convenient times and locations.

Poor—This program is not available or accessible to most students seeking enrollment. Discriminatory selection procedures are practiced.

			1	2	1		

15. Provision for the Disadvantaged

15

Excellent—Support services are provided for disadvantaged (such as socioeconomic, cultural, linguistic, academic) students enrolled in this program. Services are coordinated with occupational instruction and results are assessed continuously.

Poor—No support services are provided for disadvantaged students enrolled in this program.

				2	2		

16. Provision for the Handicapped.

16

Excellent—Support services are provided for handicapped (physical, mental, emotional, and other health impairing handicaps) students enrolled in this program. Facilities and equipment adaptations are made as needed. Services and facilities modifications are coordinated with occupational instruction and results are assessed continuously.

Poor—No support services or facilities and equipment modifications are available for handicapped students enrolled in this program.

				1	3		

17. Efforts to Achieve Sex Equity

17

Excellent—Emphasis is given to eliminating sex bias and sex stereotyping in this program: staffing, student recruitment, program advisement, and career counseling; access to and acceptance in programs; selection of curricular materials; instruction; job development and placement.

Poor—Almost no attention is directed toward achieving sex equity in this program.

				1	2	1	

18. Provision for Program Advisement

18

Excellent—Instructors or other qualified personnel advise students (day, evening, weekend) on program and course selection. Registration procedures facilitate course selection and sequencing.

Poor—Instructors make no provision for advising students on course and program selection.

					4		

19. Provision for Career Planning and Guidance

19

Excellent—Day, evening, and weekend students in this program have ready access to career planning and guidance services.

Poor—Little or no provision is made for career planning and guidance services for students enrolled in this program.

		1	1	1	1		

PROF

Michigan Community Colleges

FACULTY PERCEPTIONS OF OCCUPATIONAL EDUCATION PROGRAMS

		Keypunch Instructions	Poor 1	Below Expectations 2	Acceptable 3	Good 4	Excellent 5	Don't Know	COMMENTS (Please note explanatory remarks or needs for improvement)
RESOURCES (Continued)									
33. Maintenance and Safety of Instructional Equipment *Excellent*—Equipment used for this program is operational, safe, and well maintained. *Poor*—Equipment used for this program is often not operable and is unsafe.	33					2	2		
34. Adequacy of Instructional Facilities *Excellent*—Instructional facilities (excluding equipment) meet the program objectives and student needs, are functional and provide maximum flexibility and safe working conditions. *Poor*—Facilities for this program generally are restrictive, disfunctional, or overcrowded.	34				2	1	1		
35. Scheduling of Instructional Facilities *Excellent*—Scheduling of facilities and equipment for this program is planned to maximize use and be consistent with quality instruction. *Poor*—Facilities and equipment for this program are significantly under- or over-scheduled.	35			1		2	1		
36. Adequacy and Availability of Instructional Materials and Supplies *Excellent*—Instructional materials and supplies are readily available and in sufficient quantity to support quality instruction. *Poor*—Materials and supplies in this program are limited in amount, generally outdated, and lack relevance to program and student needs.	36				1	2	1		
37. Adequacy and Availability of Learning Resources *Excellent*—Learning resources for this program are available and accessible to students, current and relevant to the occupation, and selected to avoid sex bias and stereotyping. *Poor*—Learning resources for this program are outdated, limited in quantity, and lack relevance to the occupation.	37					3	1		
38. Use of Advisory Committees *Excellent*—The advisory committee for this program is active and representative of the occupation. *Poor*—The advisory committee for this program is not representative of the occupation and rarely meets.	38			1	1	1	1		
39. Provisions in Current Operating Budget *Excellent*—Adequate funds are allocated in the college operating budget to support achievement of approved program objectives. Allocations are planned to consider instructor budget input. *Poor*—Funds provided are seriously inadequate in relation to approved objectives for this program.	39			1		3			
40. Provisions in Capital Outlay Budget for Equipment *Excellent*—Funds are allocated in a planned effort to provide for needed new equipment and for equipment replacement and repair, consistent with the objectives for this program and based on instructor input. *Poor*—Equipment needs in this program are almost totally unmet in the capital outlay budget.	40			2	2				

PROE

Michigan Community Colleges

FACULTY PERCEPTIONS OF OCCUPATIONAL EDUCATION PROGRAMS

		Keypunch Instructions	Poor 1	Below Expectations 2	Acceptable 3	Good 4	Excellent 5	Don't Know	COMMENTS (Please note explanatory remarks or needs for improvement)
ADDITIONAL STANDARDS IDENTIFIED BY COLLEGE									
41. Qualifications of Administrators and Supervisors: **Excellent** - All persons resposible for directing and coordinating this program demonstrate a high level of administrative ability **Poor** - Persons responsible for directing and coordinating this program have little administrative training and experience or demonstrate little administrative ability	41			1	1	2			
42.	42								
43.	43								
44.	44								
45.	45								

Section Six: Advisory Committees' Surveys

Survey

The Clinical Laboratory Sciences Programs have utilized the clinical adjunct instructors from our clinical affiliates as our advisory committees. Five copies of the attached survey were sent to each clinical affiliate. Of the 45 surveys sent to the Medical Technology (MT) affiliate, 28 (62%) were returned. Forty surveys were sent to Medical Laboratory Technology (MLT) affiliates and 16 (40%) were returned. The overall return rate was 52%.

The purpose of the survey was to obtain the advisory committees' overall perspectives of the programs and, more specifically, the instructional program content, equipment, facilities and job opportunities for graduates.

The mean and standard deviation were calculated for the multiple choice responses. Composites of the responses for the MT and MLT programs are attached.

Results

The questions regarding instructional program content for the MT programs had responses with the means above 4.00 (4.08-4.18) between Good and Excellent. For the MLT program, the responses to the questions had means ranging from 3.55-3.75 which is between Acceptable and Good.

The MT and MLT programs use the same laboratory equipment and facilities. For both programs, the responses had a mean of 3.85 (Acceptable to Good). The means of responses to this item ranged from 3.85 (MT) to 3.87 (MLT). The means for responses to the instructional facilities item ranged from 3.75 (MLT) to 4.15 (MT) or near 4.00 (Good).

The means for the responses addressing job opportunities was 3.61 for the MT program and 3.13 for the MLT program (better than Acceptable).

MT ADVISORY COMMITTEE SURVEY
RESULTS

Items were rated using the following guide:

5 = EXCELLENT means nearly ideal, top 5 to 10%
4 = GOOD is a strong rating, top one-third
3 = ACCEPTABLE is average, the middle-third
2 = BELOW EXPECTATIONS is only fair, bottom one-third
1 = POOR is seriously inadequate, bottom 5 to 10%

1. Instructional program content is:

- **Based on performance objectives that represent job skills and knowledge required for successful entry level employment.**

5 = 8	2 = 0	$\bar{x}$ = 4.18
4 = 16	1 = 0	
3 = 3	Don't know = 0	

- **Designed to provide students with practical job application experience.**

5 = 9	2 = 0	$\bar{x}$ = 4.67
4 = 18	1 = 0	
3 = 0	Don't know = 1	

- **Periodically reviewed and revised to keep current with changing job practices and technology.**

5 = 6	2 = 0	$\bar{x}$ = 4.08
4 = 14	1 = 0	
3 = 4	Don't know = 4	

Comments:

The program content is often better than the student retention and knowledge.

Dan keeps abreast of what is occurring in microbiology and presents current information.

Appears to be reviewed and revised because content is current.

Hard to simulate working lab due to quantity of specimens needed - work flow different in "real" lab. Good to expose students to management issues and financial issues!

Micro area always checking for new test procedures at affiliates and how to improve if necessary.

2. Instructional equipment is:

- **Current and representative of that used on the job.**

5 = 4	2 = 0	$\bar{x}$ = 3.85
4 = 15	1 = 0	
3 = 8	Don't know = 1	

Comments:

Could be upgraded.

The fact that equipment is used in sim-lab seems very valuable. However (as one might expect), it is somewhat outdated.

Very appropriate.

A lot of antiquated instruments, although the principles of these old instruments are incorporated into multi-channel analyzers.

For HEM/UA area - good microscopes (rate 4-5); automated inst. on campus give intro. to automation, but rely on internship for current technology.

3. Instructional facilities:

- **Allocate sufficient space to support quality instruction.**

5 = 5	2 = 0	$\bar{x}$ = 4.15
4 = 13	1 = 0	
3 = 2	Don't know = 7	

Comments:

Appears to have ample room for labs.

Seems quite good.

Dan is excited about the subject/material and passes his enthusiasm to the class.

Having not seen the facilities, I could only compare size to a known area. The labs seem small for the number of students.

4. Placement:

- **Job opportunities exist for students completing the program or leaving with marketable skills.**

5 = 4	2 = 0	$\bar{x}$ = 3.61
4 = 12	1 = 2	
3 = 8	Don't know = 1	

Comments:

Jobs are out there; maybe not here, but other places. If students are willing to relocate, jobs are plentiful.

Jobs opportunities rise and fall.

Current opportunities here are limited.

Have no idea about job placement opportunities provided through campus programs.

Hospital jobs are available, but rarely on a day shift. Non-hospital opportunities are increasing.

Med techs are few and far between due to downsizing - MT will become more specialized and, therefore, need troubleshooting skills and management skills to work with less educated technicians. MT will be doing more specialized testing and need to be trained in those areas as well.

1. **From your perspective, what are the major strengths of the Medical Technology program?**

Good support from college for MT program; excellent instructors who are committed to the students; good basic skills taught to student.

Sim-lab and practical experiences appear to give the students a level of confidence.

The students seem to have a good basic knowledge of subject matter. The Blood Bank exam seems very practical and fair - a good sampling of basic knowledge necessary to work in a blood bank. (I'm a little surprised the students' scores aren't higher on the exam.)

Sim-lab provides an excellent prepatory course.

Good educational background and practical skills for entry level positions in a variety of settings.

The major strength is that Ferris organizes the clinical internship for the student. Many students from other universities have difficulty obtaining internships on their own. The time spent in sim-lab is another wonderful opportunity for the students. It prepares them pretty well for their clinical internships. However, technology is changing so fast, it's difficult to keep up in instrumentation, etc.

Conscientious, concerned instructors.

On-site lab practicum; excellent staff.

A good foundation in the clinical sciences.

Provides basic skills and knowledge. Student lab is good for some practical lab experience, but has its limitations.

Students are well prepared in chemistry, although practical math experience still seems to be lacking.

Instrumentation oriented; up with current technology and advancement; students able to make transition fairly easy from academic front into real clinical laboratory setting.

The students we have had are well prepared for their clinical rotation.

Exposure to "lab" situations as well as theory is a big plus. Seem to cover not only regular testing, but expose student to QC management and financial skills.

Students have a thorough, well-rounded education that allows them to become workable technologists with minimal orientation, i.e., become immediate asset to working environment.

Students leaving FSU have a good command of basics in the medical technology field. They are able to step in to our job site training program.

Students have had excellent instruction in the theory behind clinical laboratory tests.

Most students (80%) come well-prepared for internship.

Good instrumentation; well organized program.

Students are well prepared. With minimal teaching, they are able to assume many of the job duties in the clinical lab. Emphasis on overall knowledge and assistance for passing certification exams.

Good theory, good instructional equipment.

Keeping updated on current theory.

The practical "hands-on" approach to the last 1½ - 2 years of the Med. Tech. program. The staff which teaches basics as well as the new and innovative trends in the clincal lab sciences. The integration of management, QC, QA education, etc., into the science program which produces a well rounded med. tech. who can do clinical work, as well as participate in these other areas.

Top notch instructors!

The students are well versed in lab procedures and so are comfortable when they start their rotations. The theory is in place already, so we can teach how to put it into daily use at the bench. Knowledge of area is very strong!

Small class size provides lots of individual attention for mastering lab skills.

2. **From your perspective, what are the major needs for improvement in the Medical Technology program?**

The need to stress the importance of the internship to students. They need to know that this is the time in which they should be making the transition from students to trained professionals.

Theoretical background in immunology appears weak.

Some of the students don't seem to be very motivated to make the most of their clinical instruction. They need to be constantly prodded to stay busy and take on "extra" tasks which would benefit them. (This may be an individual need for improvement rather than a program flaw.)

Need to strengthen academic preparation for immunology; stress to students the need for commitment to this endeavor. Every supervisor is looking at these people as potential employees. The students need to work at showing interest.

Keep acquiring as much instrumentation as possible for students to become familiar with.

Continue to emphasize everything that's being taught on campus in the medical technology curriculum will be needed when the students do their internship.

Recruitment to the field!

Have the instructors spend some time in the clinical lab to update their skills and provide them a chance to reacquaint themselves with lab work flow.

I'd like to see a major review of all aspects of lab. Some areas are covered early in the curriculum and skills/knowledge have eroded by the time the student arrives in the clinical setting.

Since the focus in the industry appears to be more MLT's and less MT's, it may be appropriate to direct the MT program in other directions, e.g., management skills or computerization.

More emphasis should be put into developing trouble-shooting skills. More time should be spent performing anaerobic culture set up and identification techniques.

Stress to the students that the clinical rotation is just that in this program, not class time.

If we hire students, we seem to still spend a lot of time training them. Is 6 months of "internship" really adequate for the students? Students need to get more "hands-on" time in the lab. They need more correlation of results to be able to interpret results to disease states. There is a lot of "knowledge" given to them, but "nothing?" practical. Timing - depending on student, takes an extremely motivated individual to accomplish tasks in allotted time and be able to work in lab without more training.

Coordination with changes in "Health Care Environment", i.e., managed care, downsizing, robotics, etc. (For someone 18-22 years old, hard to encourage this field as future is unclear.)

I see the need for med tech being reduced and replaced with medical technicians.

Students need more contact with real patients and public presentation.

Need more time for problem-solving and trouble-shooting, both instruments and events.

Possibly get students more actual lab exposure before SIM LAB so they "know what they are getting into".

More DNA probe technology (kits, etc.).

MLT ADVISORY COMMITTEE SURVEY
RESULTS

Items were rated using the following guide:

5 = EXCELLENT means nearly ideal, top 5 to 10%
4 = GOOD is a strong rating, top one-third
3 = ACCEPTABLE is average, the middle-third
2 = BELOW EXPECTATIONS is only fair, bottom one-third
1 = POOR is seriously inadequate, bottom 5 to 10%

1. Instructional program content is:

- **Based on performance objectives that represent job skills and knowledge required for successful entry level employment.**

5 = 1	2 = 0	$\bar{x}$ = 3.75
4 = 10	1 = 0	
3 = 5	Don't know = 0	

- **Designed to provide students with practical job application experience.**

5 = 2	2 = 1	$\bar{x}$ = 3.75
4 = 9	1 = 0	
3 = 4	Don't know = 0	

- **Periodically reviewed and revised to keep current with changing job practices and technology.**

5 = 0	2 = 1	$\bar{x}$ = 3.55
4 = 7	1 = 0	
3 = 3	Don't know = 5	

Comments:

None

2. Instructional equipment is:

- **Current and representative of that used on the job.**

5 = 4	2 = 0	$\bar{x}$ = 3.87
4 = 5	1 = 0	
3 = 6	Don't know = 1	

2. **Comments:**

Sounds good for a school of Ferris's size; most labs these students train in will have these instruments, but I have no basis to compare with other programs.

With past students observations, they like to do hands-on running instruments. Are weak on understanding how instruments operate and basic math skills to troubleshooting instrument functions.

3. Instructional facilities:

- **Allocate sufficient space to support quality instruction.**

5 = 0	2 = 0	$\bar{x}$ = 3.75
4 = 9	1 = 0	
3 = 3	Don't know = 4	

Comments:

I have never personally seen their facilities, but the description sounds adequate.

Sounds OK - have never seen them.

Sounds OK on what you have described you have.

4. Placement:

- **Job opportunities exist for students completing the program or leaving with marketable skills.**

5 = 0	2 = 1	$\bar{x}$ = 3.13
4 = 5	1 = 1	
3 = 8	Don't know = 1	

Comments:

The job market for MLT's seems good right now. We have trouble finding them.

MLT's are very marketable right now.

1. **From your perspective, what are the major strengths of the Medical Laboratory Technician program?**

Your students seem well trained in most areas before coming into their clinical rotation here. They seem to adjust quickly to working in the lab, however, I feel they need more time here. We have to push them through too quickly.

School is in an area where students should be able to find jobs; has labs for internship that are representative of the area.

The MLT students have good background. They seem to know their stuff. Good updated material and equipment.

Interns seem well prepared and eager to learn.

They come with a solid theoretical background ready for clinical training.

Good technical training.

Ferris has a lot of good, useable equipment. I think your stuff is very good.

"Sim Lab" gives students an idea of what it's like to work in a laboratory.

The students seem well informed on most subjects.

The theory given is excellent, but sometimes the practical side of the program does not reflect the real work experience.

The "mock" laboratory and all the equipment there gives students the opportunity to really know what they're going to be doing in this type of career.

Dedicated, well informed instructors. Good program for entry level work force.

Practical training in a real-to-life health care setting prepares students for immediate job skills necessary for placement.

2. **From your perspective, what are the major needs for improvement in the Medical Laboratory Technician program?**

More time is needed for training in the laboratory.

They need more practice with actual patient specimens. The students I have had here had virtually no experience reading gram stains (direct specimen*). Also, although you list a Vitek Jr as part of your equipment, our students hadn't worked with one. Is this new? *There are computer programs and Kodachrome study sets available dealing with gram stains from patient specimens.

The best thing these students can see is real samples from real patients with real diseases so they can correlate results.

Most MLT's I've seen just need a little more common sense, which only comes from experience.

The MLT internship is too short now. It really needs to be back to the old way. There is too much to learn during this time and the students are missing out.

Students need to realize that while in training (clinical), they must study. Studying does not end when they leave FSU.

Because of the two year degree, I think it's difficult to give your students an adequate knowledge in the medical tech field - "more hours of training are needed". Because of the importance in computers, the future students should be better trained in computer programming, etc.

Blood drawing skills improving, but still needs work. Although there is exposure to a work place situation in the sim-lab before the students reach the internship site, I feel in addition, students must be groomed for interacting with the other people at the work site. Ex. - phone skills.

Need more blood drawing experience.

More blood drawing skills are needed. More phone skills needed.

Blood drawing skills, though I think that is improving. Organizational skills, i.e., doing more than one thing at a time.

Program is pretty good. Students rather young when finishing the course - are too concerned with themselves and how they relate to others rather than what skills they have to contribute to the medical environment.

More emphasis on instrumentation and computerization - less emphasis on manual methods.

Section 7: Labor Market Analysis

Recently, Laboratory Medicine and Medical Laboratory Observer (MLO), conducted surveys of laboratory personnel vacancy and pay rates. In the Laboratory Medicine (February, 1995) survey of medical laboratory managers (table 1), the vacancy rate was computed by dividing the number of vacant positions by the budgeted numbers of full-time equivalent employees. Medical Laboratory Observer, May 1995. reported the results of a survey of their 1,647-member professional advisory panel consisting of MLO readers (table 2). The results of both surveys are summarized in the tables below.

Table 1: Average Vacancy Rates for Laboratory Personnel by Region

	Region					
% FTE Vacancy Rate	Northeast	**East North Central**	South Central Atlantic	West South Central	West North Central	Far West
MT (staff)	4.5	**13.1**	12.1	11.8	5.5	7.1
MT (supervisor)	7.5	**11.5**	10.0	14.8	7.9	10.8
MT (manager)	7.7	**15.4**	14.3	16.7	8.3	23.1
MLT (staff)	11.5	**12.7**	18.3	21.2	5.6	10.3

Reference: Castleberry, Barbara et al, 1994 Wage and Vacancy Survey of Medical Laboratories. *Laboratory Medicine.* February, 1995; 26(2): 106-112.

Table 2: What Personnel Shortage?

	Year			
	1995*	1993	1991	1989
% Reporting a Significant Shortage of Personnel	13	42	66	67
% Reporting a Significant Surplus of Personnel	21	5	2	2
% Reporting neither too many or too few	57	47	28	31
Unsure	8	6	4	N/A

N/A. not asked
* Total does not equal 100% due to rounding
Reference: Jahn, M. Salary Survey, Part 1. *MLO*, May 1995: 22-26

The survey reported in MLO shows a significant decrease in the shortage of laboratory personnel since 1989. Examining the decrease in vacancy rates by region, the data in the Laboratory Medicine survey show that Michigan's region has demonstrated a more gradual decline in vacancy rates than some other regions.

Although the profession may be near the end of a shortage of lab personnel, it has been shown by these same surveys that the pay rates continue to climb. The following table was taken from the February, 1995, issue of Laboratory Medicine. It shows the average median hourly pay rates for a variety of lab workers and is broken down by region. Michigan is in the East North Central region.

Table 3: Average Median Hourly Pay Rates for Laboratory Personnel by Region

	Region					
Average Hourly Rate	Northeast	**East North Central**	South Central Atlantic	West South Central	West North Central	Far W
MT (staff)	$16.00	**$14.63**	$14.45	$14.00	$13.61	$17.0
MT (supervisor)	20.00	**18.65**	17.00	15.50	16.91	20.0
MT (manager)	23.10	**20.70**	20.90	20.00	18.20	24.0
MLT (staff)	13.00	**12.33**	11.65	10.50	11.00	11.9

Reference: Castleberry, Barbara et al, 1994 Wage and Vacancy Survey of Medical Laboratories. *Laboratory Medicine*. February, 1995; 26(2): 106-112.

To compare the above hourly wages to annual the annual salaries, multiply the hourly wage by 2080, which is the number of hours worked in a year (assuming a standard 40-hour work week).

The next two tables illustrate the average *annual* salaries from the respondents to the MLO survey. The survey compares salaries by regions and with respect to whether the lab is in an urban, suburban, or rural setting.

Table 4: Lab Salaries Around the Nation

	Region				
Average Annual Salary	National Average	East	South	**Midwest**	West
MT (technologist)	$26,100	$27,200	$24,600	**$24,600**	$29,400
MT (section supervisor)	32,500	34,200	29,900	**30,700**	37,200
MT (lab manager)	44,700	47,400	41,700	**42,800**	49,000
MLT (Technician)	20,100	22,200	19,000	**19,600**	20,700

Reference: Jahn, M. Salary Survey, Part 1. *MLO*, May 1995: 22-26

Table 5: Lab Salaries Around the Nation

	Region			
Average Annual Salary	National Average	Urban	Suburban	Rural
MT (technologist)	$26,100	26,600	27,100	24,400
MT (section supervisor)	32,500	33,700	33,100	29,000
MT (lab manager)	44,700	48,000	45,600	38,300
MLT (Technician)	20,100	20,300	20,700	19,400

Reference: Jahn, M. Salary Survey, Part 1. *MLO*, May 1995: 22-26

The Ferris Career Planning and Placement Services provides a summary of placement and salaries gathered from graduates during the first five months after graduation. The tables below summarizes the results of surveys collected following the 1990-1991, 1991-1992, 1992-1993, 1993-1994 academic years for both the MT and MLT programs.

Table 6: Salary Data from FSU Career Planning and Placement Services (MT)

Medical Technology	Year			
	1990-1991	1991-1992	1992-1993	1993-1994
# of Degrees Granted	13	20	17	15
% Placed †	75*	100	94	93
Beginning Salary ǂ	N/A**	24,702	27,407	28,502

* three were not seeking employment
** not available
† number of graduates placed in jobs or further education on full-time basis
ǂ Average annual beginning salary

Table 7: Salary Data from FSU Career Planning and Placement Services (MLT)

Medical Laboratory Technician	Year			
	1990-1991	1991-1992	1992-1993	1993-1994
# of Degrees Granted	6	14	6	6
% Placed †	100	91	66	83
Beginning Salary ǂ	N/A*	N/A	N/A	N/A

** not available
† number of graduates placed in jobs or further education on full-time basis
ǂ Average annual beginning salary

If you compare the salaries reported in the MLO survey with those of the most recent Ferris survey, it is clear that graduates from our MT program are paid above the regional and national average.

Section Eight: Evaluation of Facilities and Equipment

The laboratory facilities of the Clinical Laboratory Science programs at Ferris State University are located on the first floor of the Victor F. Spathelf Center for Allied Health Sciences (VFS). Two laboratories, VFS 103 and VFS 104, are separated by a central preparation area, VFS 104A. A third laboratory, VFS 102, is located close to VFS 103. An additional laboratory, VFS 421, has occasionally been used for instruction in clinical microbiology and for group instruction in laboratory management and education.

VFS 102 occupies 700 square feet, and can accommodate twelve students comfortably. It is used for instruction in hematology, coagulation, and body fluid analysis.

VFS 103 and 104, with VFS 104A, occupy 2100 square feet. Movable partitions can close off each room when quiet is needed. When open, the rooms can be used as one large, integrated laboratory. VFS 104 is used for instruction in clinical chemistry, and can accommodate fifteen students comfortably. VFS 103 is used for instruction in clinical microbiology and immunology, and can accommodate thirteen students comfortably. (Immunohematology instruction occurs in whichever laboratory is available).

VFS 104A provides space for preparation of specimens and reagents, as well as a dishwasher, pipette washer, and limited storage space. Additional storage space is available in the laboratories, in a storage area on the first floor of the building, and in a walk-in refrigerator on the fourth floor.

VFS 421 occupies about 1500 square feet, and has a capacity of 32 students. When laboratory instruction occurs in this room, equipment and supplies are moved upstairs as needed. The room is already equipped with incubators and a walk-in refrigerator, and has access to an autoclave.

Classroom instruction takes place mainly in the VFS building, with occasional class meetings in adjacent campus buildings. A computer laboratory is located within the VFS building, available for student use approximately 56 hours per week. It can be scheduled for instructional use as needed.

The office of the Head of the Department of Environmental and Clinical Sciences is located on the fourth floor of the VFS building. It occupies 200 square feet. Some student and program records are stored in this office. The offices of program faculty occupy 100 square feet each, and are located on the third and fourth floors of the VFS building. Each office is self contained, and provides space for small meetings and for confidential student advising.

Within the laboratories of the Clinical Laboratory Science Programs is found much of the instrumentation needed to introduce students to the common procedures used in clinical laboratories today. Each student can use his/her own microscope in microbiology, hematology, and body fluid laboratories. In addition, a two-headed microscope outfitted for phase contrast microscopy, a four-headed microscope for group instruction, two fluorescent microscopes, and a system for projection of microscopic images on a video monitor are available. In microbiology, enough bacti-cinerators and incubator space are available for students to work up cultures individually, although counter space is often at a premium. In immunohematology, each student has an individual work station, with centrifuge, illumination

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viewer, and the other materials necessary to perform testing. In the coagulation course, multiple fibrometers are available, so that many students can work on coagulation procedures simultaneously.

When students are introduced to larger instruments, such as the Coulter JT, the ASTRA, the blood gas analyzers, and others, work is assigned in small groups on a rotation basis. Several groups of students work independently at different assignments, which maximizes opportunities to learn to operate each instrument. When one or a small group of students are the only ones assigned to work on a given instrument for a given laboratory period, they have more opportunity to progress at their own pace. They can learn routine maintenance as well as direct operation without pressure from other students who are waiting for them to finish. Eventually, everyone gets an unhurried change to learn each instrument.

Within the Clinical Laboratory Sciences laboratories, students have access to the following computer hardware:

- 7 Gateway 80486sx-25 with 6 VGA color monitors, 3.5" floppy drives, 85 MB hard drives, network cards (connected to CAHS Novell network and through this network to the Internet). Two of these have multimedia packages consisting of CD ROM drive, 8 meg RAM(?), a sound card, and speakers.
- 2 Zenith 80286 with color monitor, one floppy disk drive, 20 MB hard drive
- 1 Zenith 8088 with monochrome monitor, one floppy drive and 20 MB hard drive
- 1 Compuadd 80386 with two floppy drives, 80 MB hard drive
- 1 Epson LX-810 dot matrix printer
- 1 Epson LQ-500 dot matrix printer
- 1 Epson Fx-86e dot matrix printer
- 5 Hewlett-Packard deskjet 500 Inkjet printers

These computers are available for student use in word processing, statistical calculations, and other classroom assignments. In addition, tutorials and quizzes are assigned in clinical chemistry, clinical microbiology, and other courses. Each student has an e-mail address, which facilitates student-faculty communication. Some faculty assign quizzes and readings via e-mail, to help students practice with this communication system. The hematology and body fluids courses are greatly enhanced by use of extensive collections of CD-ROM images of normal and abnormal blood cells, bone marrow, and cells found in other body fluids. Mr. Landis has developed software that provides students with tutorials, short review sessions, and quizzes on these topics.

Several faculty have spent many years trying to design an in-house laboratory information system, for use specifically in simulated clinical laboratories. Our goal was to provide students with experience in entering and retrieving information, assessing test results from on-line instrumentation before reporting the results, and other skills that are required in even the smallest clinical laboratories today. Hundreds of hours of work have failed to produce a system that in any way simulates a truly adequate laboratory information system. Attempts to persuade vendors to donate a small system, led by faculty and alumni of the program, have been unsuccessful. The Clinical Laboratory Sciences programs would be greatly enhanced if our students were required to apply the skills and knowledge from their computer-related course work to a simulated laboratory situation.

A list of major items of equipment available at Ferris for student use is found below.

Each clinical affiliate is a full service clinical laboratory with a full range of instrumentation. Student learning experiences are integrated with the service work of each laboratory. As students become proficient, most laboratories allow them to participate in the service work of the laboratory, under close supervision. Although no two laboratories use the same instrumentation, each has a wide variety, all of which are used for student instruction during the clinical experience.

MAJOR EQUIPMENT AND INSTRUCTIONS
CLINICAL LABORATORY SCIENCES PROGRAM

Equipment	Brand	Model #
General Chemistry		
Blood Gas Analyzer	IL	BGE 1400
Blood Gas Analyzer	Corning	168
Nephelometer	Kallestad	QM 300
Chemistry Analyzer	DuPont	ACA IV
Chemistry Analyzer	Kodak Ektachem	DT 60
Chemistry Analyzer	Abbott	TDX
Chemistry Analyzer	Beckman/Astra	A-8
Chemistry Analyzer	Beckman/Synchron	AS-8
Spectrophotometer (4)	Turner	250
Spectrophotometer (3)	Gilford	III
Spectrophotometer (3)	Coleman	Jr.
Chart Recorder	Searle	4-2500-0
Osmometer	Advance	3D2
Electrophoresis		
Densitometer	Gelman	ADC 2020
Power Supply (2)	Gelman	
Power Supply (3)	Beckman	
Pheresing Chamber (2)	Gelman	
Pheresing Chamber (6)	Beckman	
Immunohematology		
Immufuge (15)	Dade	II
Cell Washer (5)	Sorvall	CW-1
Cell Washer	IEC	Centra W
Cell Washer	Sorvall	CW-2
Incubator (5)	Marsters	
Incubator	Thermolyne	
Agglutination Viewer (15)	Clay Adams	
Coagulation		
Fibrometer (8)	BBL	
Coagumate, Dual Channel (2)	General Diagnostics	
Coagumate, Single Channel	General Diagnostics	330
Platelet Aggregometer	Chronolog Linear	702
Chart Recorder	Instruments Corp.	650
Clot Detector	MLA	

Hematology		
Coulter Counter	Coulter Electronics	S-Plus Jr.
Coulter Counter	Coulter Electronics	ZM
Coulter Counter	Coulter Electronics	ZF
Computer MCV	Coulter Electronics	MHR
Cell Counter	Cell Dyn	610
Differential Counter (200)	Clay Adams	
Digital Counter	American Dade	Tally III
Hematocrit Centrifuge (2)	Damon/IEC	MB
Hematocrit Reader (2)	Damon/IEC	7950
Hemoglobinometer (2)	Coulter Electronics	HGBR
Microbiology		
Bacterial ID System	Vitek	JR
Blood Culture Detector	Bactec	NR-730
Bacti-cinerators (10)	Scientific Products	B9750, B9753
Disc Dispensers (10)	Difco, BBL	
Disc Dispensers (10)	Contamination Control Inc.	740
Biological Safety Cabinet	Napco	330,332
Incubators (2)	National	
Incubator	Labline Instruments	442
Bunsen Burners (33)	BBL	
Gas Pak Jars (17)		
Serology		
Heating Blocks (2)	Roche Diagnostic	
Rotators (2)	Clay Adams	J2624
Rotator	HWD	40
Urinalysis		
Refractometers (3)	A/O	
Urinometers (13)	Adams/Squibb	
General Equipment		
Centrifuge	Sorvall	GLC-2B
Centrifuges (5)	IEC	CL4
Centrifuge	Clay Adams	Dynac
Balance, Analytical (2)	Mettler	P-120
Balance, Top Loader (2)	Mettler	H31AR
RPM Tachometer	Power Instruments	B-891
OHM/Voltmeters (5)	Simpson, Miconta	
Digital Thermometer	Markson Scientific	5650
Electronic Project Kits (10)	IRS	
Freezer	Whirpool	
Glass Drying Oven	Labline Instruments	
Plastics Drying Oven	Chicago Surgical	

General Equipment Cont.

Refrigerators (6)	Sears	
	Kelvinator	
	General Electric (2)	
	Hot Point (2)	
Water Baths (6)	Crystalab	CL5
Demineralizers (5)	Wm. Boekel and Co.	
Pipette Washer	Heinicke	HN-1
Hot Plate w/ Stirrer (3)	Corning	PC-351
Utility Carts (5)		
Automatic Dispenser	Oxford	
Phlebotomy Arm (2)	Nasco	

Microscopes

Binocular Microscopes	A/O (14)	150
	Reichert-Jung (6)	150
	Olympus (6)	CH2
Phase Microscope	Olympus	BH2
Phase Microscope, 2 Head	A/O	
Teaching Microscope w/ 2 Head Attach.	A/O	
Fluorescent Microscopes (2)	A/O	2071

Safety Equipment

Fumehood	Vectaire
Eye Wash Fountains (2)	
Eye Wash Station	
Fire Blankets (3)	
Fire Extinguishers (4)	
Safety Showers (3)	
First Aid Kits (3)	

Section Nine: Curriculum Evaluation

Evaluation of the CLS curricula was accomplished not by survey, but by a guided discussion. Members of the PRP were asked to review data from surveys of students, program "leavers," graduates, employers, advisory committees. With these data and the program faculty's own experience, we discussed the following topics:

- required courses in biology, mathematics, chemistry
- required courses in computer science, medical terminology, English, statistics, and management (the latter two are required of four year students only)
- elective courses to meet general education requirements in cultural enrichment and social foundations/development
- clinical laboratory science courses

Biology Courses

Members of the committee expressed overall satisfaction with the required courses in the Biology Department. CLS students enroll in their clinical courses with good preparation to succeed. BIOL 205 (Human Anatomy and Physiology) is used as a predictor course as part of the CLS program's Progression Review Policy. Students who earn less than a grade of C in BIOL 205 are required to repeat the course before they can enroll in courses with the CLLS prefix other than CLLS 101 (Clinical Laboratory Science Orientation). Difficulty in achieving a grade of C or better in BIOL 205 has proved to be the best available tool for identification of students who will have difficulty in the clinical laboratory science courses.

A concern was expressed that, with the developing technology that is bringing techniques such as DNA probes and PCR (polymerase chain reaction) testing into the clinical laboratory, are students getting adequate preparation in genetics? Review of course descriptions indicated that they are. Graduates and their employers have not mentioned any deficiency in this area. Program faculty indicate that students have enough understanding of both Mendelian and molecular genetics to complete course objectives in the program.

A second concern was with the Career Mobility program biology requirements. A student who completes the MLT program at Ferris now completes BIOL 108 (Medical Microbiology), CLLS 235 (Basic and Clinical Microbiology 1) while on campus, and CLLS 272 (Applied Clinical Microbiology) during the clinical experience. If they return to Ferris, their checksheet indicates that they need BIOL 286 (General Microbiology) in order to complete the baccalaureate degree. This course requirement arose from the last major revision of the MLT program, where BIOL 108 was dropped from program requirements. This course has been reinstated as a necessary prerequisite for clinical microbiology, without changing the additional requirement for the Career Mobility students. It was the conclusion of the Program Review Panel that students with the FSU sequence of microbiology courses (or their equivalent from another MLT program), do not require an additional introductory microbiology course in their junior year, and a minor curriculum revision should be proposed to this effect.

It was agreed that BIOL 286 is an excellent preparatory course for the majority of Medical Technology students, who have not had an introduction to microbiology.

Mathematics

Students in each program are required to complete MATH 115 (Intermediate Algebra). This seems to provide adequate preparation for the mathematics that students need in clinical laboratory science. The program faculty agree that students need a basic understanding of logarithms, graphing, scientific notation, setting up equations, and solving problems using computations. CLS students often still display difficulty in reading "word problems" and solving them mathematically, and often display serious math anxiety. However, with all the complaints students express, they are able to complete MATH 115 successfully, and continue in the program.

Chemistry and Physics

The CLS faculty believe strongly that all program students would benefit from an introductory course in physics. PHYS 130 (Concepts in Physics) seems from its catalog description to include the topics that would benefit our students: mechanics, electricity, and light, among others. We have been unable to require high school physics for admission, because many of our students come from high schools where physics is not offered. However, as clinical laboratories become more and more automated, students will need some expertise with robotics, electronics, and automation.

Requiring physics would add credit hours to already overcrowded curricula. The program faculty would like to propose that all of our students take one semester of physics and one semester of general chemistry in their first year, followed by one semester of organic/biochemistry in the second year. This would adequately prepare students for CLLS 215 (Clinical Chemistry and Instrumentation 1). Students in the four year programs would add an additional course in biochemistry, CHEM 324 (Fundamentals of Biochemistry).

We have proposed this sequence several times in the past, only to be met with a complete lack of cooperation by the chemistry department faculty, who insist that they are better aware of the chemistry courses required for our students than we are. Several surveys of CLS programs nationwide (by FSU faculty and other researchers) have agreed that the sequence we have proposed would be adequate. We remain locked into enrolling our students in the courses that the chemistry department faculty believe are appropriate.

We realize that we cannot demand Chemistry for CLS, just as other CAHS programs cannot demand Chemistry for Nurses, Chemistry for Nuclear Medicine, and others. However, CAHS faculty, through the CAHS Planning Committee, are beginning to recognize that none of us is completely satisfied with chemistry course offerings, and that together we have sufficient student numbers to justify consideration of our opinions. So for the time being, CLS faculty are going to postpone trying to deal with the concerns expressed by students and graduates about chemistry courses required, in the hope that a concerted approach by all CAHS faculty may bring more consideration of our requirements.

Computer Science

All students are required to complete ISYS 105 (Microcomputer Applications). Our understanding of the course description was that this was the course that would provide our students with an introduction to elementary operations, such as file management, word

processing, data bases, and spreadsheets. However, the CLS faculty are concerned that these topics are not always dealt with in the course. Some senior MT students seem to lack basic understanding about opening and moving files and performing other basic operations. Currently enrolled students report that they are not given more than a few hours of computer experience. Other students report that they are learning about Internet functions in some sections, but haven't covered word processing or other procedures.

As our students come to Ferris with better computer skills, we are considering some competency-based assessment of our students' computer skills, which may remove the need for many of our students to enroll in this course at all.

Students with interest in computers and with time available are encouraged to enroll in additional ISYS and CISM courses.

Medical Terminology

All CLS students are required to complete MRIS 102 (Orientation to Medical Vocabulary), a one credit course which teaches the basic terminology relate to health sciences. The course has helped all of our students with the complex terminology of medicine. Students display greatly increased ability to divide words into their component parts and work out a definition. The course has the additional benefit of providing practice in speaking and writing such terms for our students for whom English is not their first language. We are very pleased to have this course as part of the curriculum.

English and Communications

Students in the two year program complete ENGL 150 (English 1) and ENGL 250 (English 2). Students working on a four year degree add ENGL 321 (Advanced Composition) to these courses. Discussion indicates that ENGL 211 (Industrial and Career Writing) may be more appropriate and more interesting for students than ENGL 250. The original rationale for ENGL 250 was to hone students' library research skills, and provide them with a chance to write a reasonably long research paper. However, writing memoranda, policies, and procedures should seem more relevant to them.

ENGL 321 has not been as successful as we had hoped. However, with a very few exceptions (transfer students), the students enrolled in it thus far were transition students who had already completed their graduation requirements in English. They have been reluctant to meet the expectations of the instructor, which include attendance at 8 AM their last few weeks on campus, writing and revising several drafts of papers, and using correct grammar and spelling.

Beginning in Fall 1996, students in the baccalaureate programs will need to complete ENGL 321 as a graduation requirement. This alone may cause them to approach the course with a different attitude. We are considering their suggestion that the course be moved to an earlier semester, so that they are not left with extensive writing assignments in their last ten weeks on campus. However, moving this course to the previous summer requires moving something from the summer to the fall. We will discuss this suggestion, but we have not yet come up with a resolution.

Students in the four year program also complete COMM 105 (Interpersonal Communication). We are considering recommending additional communication courses, such as COMM 221 (Small Group Decision Making) and COMM 370 (Communication and Conflict) to students with time to complete additional course work.

Statistics

Students in the four year programs complete STQM 260 (Introduction to Statistics). Both faculty and students have expressed overall satisfaction with this course. However, faculty in other areas of the CAHS have indicated to us that the course content has changed since the course number was changed from STQM 321 to STQM 260. HOW it has changed is not clear to us, so we need to discuss the course content with the faculty that teach this course.

All Clinical Laboratory Science students need an understanding of descriptive statistics (which is accomplished for the two year students through a brief introduction in a CLS course). Practicing medical technologists need additional experience with linear regression, correlation coefficients, and other statistics that are needed to estimate analytical error in laboratory procedures. Students in CLLS 463 (Clinical Laboratory Management, Supervision, and Education) complete a long assignment concerning the calculations performed when changing methods or instrumentation in the clinical laboratory. The assignment involves using specific statistics to estimate three kinds of analytical error, combining those errors in an estimate of total analytical error, and then using the information to make decisions about whether the new analytical system is clinically acceptable. To date, STQM 260 has prepared the students for this assignment.

Management

Students in the four year program complete MGMT 301 (Applied Management) as a prerequisite to CLLS 463 and their management assignments in CLLS 456 (Clinical Laboratory Practicum). Although it is unusual for graduates to enter clinical laboratory management directly, many do become supervisors or managers after a few years of experience. As the health care field changes and graduates find employment in physicians' offices, health maintenance organizations and other nontraditional settings, they may find their management skills in greater demand. This course prepares them for the laboratory-specific assignments students are required to complete in CLLS 463.

General Education Electives

Dr. Hanson was very helpful in leading our discussion of the various courses that will allow students to complete their requirements for graduation. He was able to point the faculty to several courses, particularly in social foundations, that will serve as prerequisites for upper level courses. It was agreed that the faculty should prepare a list of directed electives, and to print them at the bottom of the program checksheets, to guide students to courses that they may find interesting, rewarding, and which will help prepare them for their roles as citizens of a diverse society.

There was general agreement that a course in Biomedical Ethics would be an excellent choice for all students in the program. Although currently NOT required, faculty strongly suggest that students choose such a course.

Clinical Laboratory Science Courses

The strong point of our program is that we have faculty specializing in each of the major disciplines of clinical laboratory science: clinical chemistry (Mr. Kellogg); hematology, coagulation, and body fluid analysis (Mr. Landis); clinical microbiology (Mr. deRegnier), and immunohematology and laboratory management (Mrs. Ross). Having revised the curriculum during the semester conversion process, we are satisfied that we have included the content needed by entry level practitioners in clinical laboratory science.

However, two issues emerged from the discussion of courses bearing the CLLS designation. First, with the increase in enrollment, we are facing serious difficulties in scheduling three or four sections of each course in the space we have available. In the Fall Semester of 1995, classes ran in VFS 102, 103, and 104 from 8 AM to 8 PM Monday and Wednesday, from 8 AM to 9 PM Tuesday and Thursday, and from 8 AM through 3 PM Friday. In the Winter Semester of 1996, classes meet from 8 AM through 5 PM Monday, 8 AM through 9 PM Tuesday, Wednesday, and Thursday, and from 8 AM through noon on Friday. Adding an additional section of each course to accommodate our increased enrollment next year is going to be nearly impossible.

Further, it is difficult for faculty to schedule office hours; if we are free to sit in our offices and meet with students, they cannot come, because they are in class with one of the rest of us. It is difficult for us to participate in university governance, special projects, or research. Simply meeting enough to finish the Program Review Process, streamlined as it is, was difficult. No one can ever sit back and look at the big picture; we are too busy dealing with the hectic pace and minutia of daily teaching.

Secondly, we are facing up to the fact that, even if we had only ONE section of each course (making scheduling easier), we are asking students to spend more than 30 hours each week in class. Given that many of our students have jobs, families, and fairly long commutes, this is unrealistic. Students who leave home at 6:30 AM and return at 10 PM are NOT going to sit down to study for a couple of hours after they get home. So we need to look seriously at revising our curriculum, before it burns out both students and faculty. We anticipate beginning this process with a review of the competencies required by our graduates at both the associate and baccalaureate degree levels. When these are agreed upon, we can begin the curriculum revision process.

Section Ten: Enrollment Trends over the Past Five Years

Enrollment in the CLS programs reached a low point in the years 1992-1994. Intense recruitment and retention efforts have increased both enrollment and graduation rates in recent years, and program faculty expect the increased enrollment to continue. Consequently, there are more students enrolled in the CLS programs now than at any point in its history. Nearly 130 students list MT, MLT, pre-MT, or pre-MLT as their selected major. Fall term enrollment can be summarized by these data (1990-95 data collected from the Ferris State University Fact Book, 1994-5; current year from the SIS+):

	1990-91	1991-92	1992-93	1993-94	1994-5	1995-6
Medical Technology (BS)	49	54	51	52	73	81
MLT (AAS)	29	17	12	14	25	34
pre-MT	0	7	12	9	9	5
pre-MLT	0	6	7	12	12	3
total enrollment	78	84	82	87	119	123

In addition to increasing enrollment in the programs, faculty have worked hard to improve program retention. We have implemented a Progression Review Policy, to inform students of the academic performance expected of them, and to provide more frequent advising and academic remediation for students having difficulties completing the program. With the use of academic progression review for all CLS students, we are sending better-prepared students to their clinical experience, and producing more, and better prepared graduates.

Another retention tool used by the CLS faculty is the Freshman Experience Seminar, called UNIV 290 in the 1994-95 academic year, and FSUS 100/101 in the 1995-6 academic year. All first time freshman students in CLS programs are enrolled in this course. The seminar meets once a week to discuss issues of concern to all college freshmen (time management, dealing with diversity, drugs and alcohol, financial aid, stress reduction, among others). The CLS students have also developed group awareness by challenging the UNIV 290 students from other curricula to games of Wally Ball, by going rock climbing, touring clinical laboratories, and having the occasional pizza party. To maintain interest in a curriculum where science courses can seriously discourage students in the first year, occasional class sessions discussing simple case studies in medical ethics are scheduled. Several sessions introduce students to the Internet. Offering this course has provided first year students with an introduction and the opportunity to develop friendship with two of the program faculty, and a chance to interact with other students in the same program.

In recent years, the programs have produced the following numbers of graduates:

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96 (projected)
MLT (2 year)	14	5	6	4	10	14
MT (4 year)	14	19	16	15	20	20

We expect a decline in MT graduates in 1997 (to approximately 13), and an increase in the number of MLT graduates to about 20. In addition, there may be 20+ MT graduates in 1998. More non-traditional students are enrolling in the program, which means that more students are completing the professional phase part-time, so it is not always possible to project graduation figures precisely.

We anticipate that employers may be more interested in hiring graduates of the MLT program for the next several years, as re-engineering impacts the clinical laboratory field. The faculty are emphasizing the value of an AAS degree in Medical Laboratory Technology to future students.

We are also working actively to be sure that we will have enough clinical internship sites to accommodate our increased enrollment.

Section Eleven: Program Productivity/Costs

Unfortunately, the most recent available data on productivity and costs do not reflect the increased enrollment in the CLS programs. However, data provided by the Office of Institutional Studies are included below.

In 1992-1993, when program enrollment was at its ebb, the costs per student credit hour for the Medical Laboratory Technology program (AAS) were $137.15. In 1993-4, these had decreased to $116.12.

In the 1992-1993 academic year, the cost per student credit hour for the Medical Technology (Baccalaureate degree) was $72.10. For the 1993-4 academic year, costs per credit hour were $124.71 for the 2+2 Integrated Medical Technology program and $123.75 for the Career Mobility Medical Technology Program. Why the costs increased per credit hour in a period when supply and expense money actually decreased (from $43,604 in FY93 to $42,303 in FY94) and student enrollment increased is beyond our understanding. Average salary for faculty increased by $1095, but this can hardly have caused a near doubling of program costs in one year.

The Office of Institutional Studies explains that the data from 1992-1993 were based on academic quarters, while data from 1993-1994 were based on semesters, and only includes fall and winter semesters. The summer of 1993 was NOT included in the cost analysis. Therefore, data from 1992-3 and 1993-4 are not directly comparable.

Why the conversion from academic quarters to semesters caused costs in one program to drop, while costs in the other program increased remains unexplained. The PRP asks the reader to bear in mind that more current enrollment data should produce a decrease in program costs per SCH.

It is our belief that costs per credit hour will show a decline when more current data reflect the greatly increased enrollment in courses with the CLLS prefix.

Perhaps more informative is information on student credit hours and credit hours per Full Time Equated Faculty:

Student Credit Hours

Year	Summer	Fall	Winter	F + W
1993-4	0	525	635	1160
1994-5	291	639	665	1304

Student Credit Hours/FTEF

Year	Summer	Fall	Winter	F + W
1993-4	---	262.5	317.5	290.0
1994-5	403.27	327.99	341.49	334.74

To improve productivity, when semester conversion took place, the curriculum was rearranged so that the introductory courses in most major subject areas were taught in the same semester. Thus, second year MLT and third year MT students could meet

together in the classroom, and be combined in laboratory sections. Under the quarter system, MLT students took MLT 106: Hematology in the Spring Quarter of their first year, and MLT 202: Clinical Chemistry and Instrumentation in the Winter Quarter of their second year. Meanwhile, third year MT students took MT 330: Hematology 1 in the Fall Quarter of their third year, and MT 334: Clinical Chemistry and Instrumentation 1 in the Winter Quarter of the third year. The two hematology courses were very similar in content, course objectives, and student outcomes, yet they were taught at opposite ends of the academic year, which was not efficient. The two chemistry courses were also similar, and were actually taught during the same quarter each academic year, without combining the student populations, which made scheduling difficult, placed a heavy burden on one instructor, and required extra laboratory sections that may not be at capacity, all in the interests of keeping the students separated. Now, second year MLT and third year MT students complete CLLS 230: Hematology in the Fall Semester, and CLLS 215: Clinical Chemistry 1 in the Winter Semester. This made it possible to combine 14 second year MLT and 17 third year MT students into three sections in VFS 102 this fall. Under the old system, since VFS 102 can only accommodate twelve students in a laboratory, we would have needed two sections for the 14 MLT students and two additional sections for the MT students.

Section Twelve: Conclusions

Analysis of the results of surveys of the CLS program's students, faculty, advisory committee, graduates, and employers of graduates has provided valuable information that can be used in program planning. The data lead to the following conclusions:

Students

- After serious effort, program enrollment has greatly increased. Recruitment efforts, combined with retention mechanisms such as FSUS 100/101 have filled our classrooms and laboratories, leading to waiting lists for entry to the programs.

- The establishment and enforcement of a program specific Progression Review Policy has resulted in students who take their education more seriously. They come to their clinical courses better prepared to succeed. Not only have numbers increased, but student performance has been enhanced.

- A few adjunct instructors are concerned that some students are not as well prepared for the rigors and stress of clinical experience as they might be. While they are academically and technically competent, a few students do not take full advantage of their opportunities while in the clinical laboratory.

Curriculum

- The curricula are current and relevant to the needs of program graduates. Successful completion of course objectives prepares graduates for entry level employment in the clinical laboratory.

- The simulated laboratories that are taught during students' last semester on campus provide a valuable review of material from previous courses. In addition, the simulated laboratory provides practice in time management, organizational skills, analysis of laboratory data, quality control, and communication. Because of the simulated clinical laboratory, most students arrive at their clinical site ready to benefit from that experience.

- The venipuncture skills of students are improving (says the advisory committee, who are also our clinical instructors). Faculty efforts of the last two years have led to increased student venipuncture experience on campus. Students are happy to have performed forty or more venipunctures before their clinical experience. We anticipate that future surveys of graduates and their employers will reflect their satisfaction with graduates' venipuncture skills.

- The curriculum may need revising to reflect the changing skills needed by graduates in this field. Specifically, four year graduates need better communication, management, quality assurance practice built into existing course work. All graduates need good computer skills. Four year graduates will spend less time performing routine testing and more time in analysis, problem solving, and communication of laboratory data.

- The curriculum also needs examination to see how the burden of excessive class hours for students can be relieved.

- The program faculty, students, and graduates continue to express concern about the relevance and perceived difficulty of prerequisite courses, particularly in chemistry. Students leaving the programs all cite their reluctance to enroll in further chemistry courses as a reason for leaving.

Facilities, Equipment, and Program Costs

- Facilities and equipment are scheduled heavily, due to increased program enrollment. Thanks to serious effort of program faculty and administration, classes are full, and additional sections of courses need to be scheduled. This leads to greatly increased use of the facilities, but often at the expense of inconvenient schedules for students and faculty.

- Equipment used in the program, while often not equivalent to instruments in current clinical laboratory practice, is adequate to teach current students on campus and to prepare them for the instrumentation they will encounter during their clinical experience and subsequent employment. Much of this equipment has been donated by the clinical affiliates themselves. However, the lack of a consistent and adequate budget for maintaining, replacing and updating equipment is a constant concern for program faculty. While our clinical affiliates and other laboratories have been very generous in their donations of analyzers and supplies for them, other items in constant use, such as microscopes and automated pipettes, wear out before they can be replaced.

- The advisory committee has been impressed with the size and furnishing of our laboratory space. However, they have not seen the rooms full of students that our current enrollment provides. The faculty and students believe that alternatives must be explored. If larger laboratories cannot be utilized, we will be driving away students because of the large numbers of night laboratory sessions made necessary because of multiple sections of required classes.

- Increased numbers of students require larger amounts of laboratory supplies. Some of these are donated by our clinical affiliates, but this is not a reliable source of the materials we need to provide adequate instruction. Our budget support has been excellent, but this needs to continue, and to keep pace with student enrollment.

- Faculty are concerned about the lack of budgetary support for maintenance and support of computer hardware and software. The computers on in our student laboratories and on faculty desks are old and slow, and technical support for problems can be significantly delayed.

- Currently available data about cost per student credit hour and cost to educate program graduates are skewed by the conversion from academic quarters to semester, and by the fact that the currently available figures are based on the low program enrollment of 2-3 years ago. More up-to-date information should reflect a decrease in program costs per student credit hour.

Program Faculty

- Students, graduates, the advisory committee, and the faculty agree that the program faculty are knowledgeable and competent. They provide excellent instruction, good student advising, and caring supervision of program students. Their cooperative efforts help our students succeed.

- Faculty and the advisory committee agree that the faculty should have a mechanism for periodic updating of their clinical skills.

- Faculty have very positive feelings and beliefs about the quality of the program and its students and graduates.

- Faculty have expressed some concerns about details of program administration. While planning does occur, there is often little follow-up. Meetings can waste time dealing with trivia, while larger issues remain unaddressed.

Other Conclusions

- Ferris graduates in the Clinical Laboratory Sciences curricula find employment in their field with little difficulty.

- Four year graduates are generally paid more than the national starting salary for career entry medical technologists.

- The employment outlook for the near term (next five years) may provide more opportunities for MLT graduates.

- Changes in the delivery of health care in the United States will lead to changes in the jobs of medical laboratory technicians and medical technologists. Medical technologists will spend less time performing laboratory tests, and more time supervising, planning, and performing other quality-related tasks. The Ferris curriculum has been a national leader in requiring such course work as management, computer classes, statistics, and communications. We need to continue to revise our curricula to respond to changing demands on program graduates.

- The use of adjunct clinical instructors as the program advisory committee has enhanced communication and cooperation between on-campus and off-campus instructors. However, given the volatile nature of the health care industry, an independent advisory committee, comprised of laboratory managers, vice presidents of ancillary services, and other health care professionals may provide timely and relevant advice.

Section Thirteen: Recommendations

After discussion, the Clinical Laboratory Science Program Review Panel would like to propose the following recommendations:

1. Our first recommendation involves the Academic Program Review Process itself. The CLS programs were originally scheduled for academic program review in 1994, when the process was suspended due to fiscal restructuring. In 1994, CLS also underwent re-accreditation by the National Accrediting Agency for Clinical Laboratory Sciences, which would have been conveniently coordinated with the APRC process, as we undergo similar processes of data gathering and analysis for each. We are tentatively scheduled to undergo another re-accreditation cycle that will involve writing our self study in 1999 and having an accreditation site visit in 2000. We would like our APRC review to coincide with the external re-accreditation process. This would relieve the burden on faculty and administrators of duplicating efforts. So, given our NAACLS schedule, we would like to volunteer for repeated academic program review in academic year 1999-2000.

2. The programs need to continue to monitor enrollment and retention, in order to maintain our increased enrollment and higher productivity.

3. The CLS programs need to continue to use and monitor each students' academic progress, using the programs' Progression Review Policy.

4. The CLS programs need to put greater effort into preparation of all students for the processes of interviewing, choosing, and succeeding at our clinical internship sites. Our goals are to streamline the process of assigning students to clinical sites and to prepare them better for the stressful world of the clinical laboratory when they enter it.

5. The CLS programs need to assess their scheduling of courses and sections to relieve the burden on students and faculty. This needs to be addressed, if possible, before the next academic year. A move to larger laboratories would enable us to hold fewer but larger laboratory sections. We could then offer all courses within the standard forty hour week, with additional time available for student advising, university service, and other activities.

6. The programs should continue the use of the on-campus simulated laboratory, to prepare the students for their clinical experience via application and review of previously learned theory and techniques, as well as opportunities for time management, planning, and other valuable skills.

7. The CLS faculty need to continue to require more venipuncture practice on campus, so that students are better prepared for using this skill during their clinical experience.

8. The curriculum, especially of the four year students, may need revision to reflect the changing role of the medical technologist. The faculty recommend an in-depth examination of the existing curriculum, with a proposal for revision no later than academic year 1997-98.

9. The curriculum review should also include an in-depth examination of pre-professional course requirements, to reflect existing and future professional practice, rather than the

historical practice of requiring the classical pre-med curriculum of pre medical technology students.

10. Ferris State University needs a consistent source of funding for updating of instruments and equipment. When the last vocational-educational program funds were available, CLS did not receive any, due to our low enrollment in the two year program at the time. Low enrollment is no longer a problem, but adequate funding still is.

11. The CLS programs have traditionally been well funded for supplies and other expenses. This support should continue, reflecting our increased enrollment.

12. The university should also address the funding required for purchase, upgrading, maintenance, and support of computer hardware and software.

13. The CLS faculty need support to upgrade their laboratory practice and skills on a timely basis. This will require financial and scheduling support.

14. The CLS faculty should continue to monitor employment trends in the clinical laboratory industry. If larger numbers of MLTs are actually demanded (as the literature predicts), we should consider maintaining or increasing enrollment in the associate degree program, while limiting enrollment in the baccalaureate degree program. One possibility is to require all students to complete the two year program and become certified medical laboratory technicians (either at Ferris or at some other accredited program). Selected students could then be admitted to a Career Mobility program that emphasizes supervisory, management, computer, communication, and other skills, as well as a limited exposure to advanced laboratory techniques.

15. The CLS programs should establish and meet with an advisory committee that is independent of their adjunct clinical instructors. This committee may be able to provide a more broadly based outlook and advice about the changes in health care that will impact the programs in the future.

Appendix G

PROGRAM REVIEW PANEL EVALUATION FORM

Program _____

Instructions: Circle the number which most closely describes the program you are evaluating.

1. Student Perception of Instruction

Average Score 4.2

4 4 4 4 4 5 (4.5)

5 (4) 3 2 1

Currently enrolled students rate instructional effectiveness as extremely high

Currently enrolled students rate the instructional effectiveness as below average

2. Student Satisfaction with Program

Average Score 4.1

4.5/4/4/4/4/4/4.5

5 (4) 3 2 1

Currently enrolled students are very satisfied with the program faculty, equipment, facilities, and curriculum

Currently enrolled students are not satisfied with program faculty, equipment, facilities, or curriculum

3. Advisory Committee Perceptions of Program

Average Score 4

4/4/4/4/4/4/4

5 (4) 3 2 1

Advisory committee members perceive the program curriculum, facilities, and equipment to be of the highest quality

Advisory committee members perceive the program curriculum, facilities, and equipment needs improvement

4. Demand for Graduates

Average Score 3.8

3.5/4/4/4/4

4/3.5

5 (4) 3 2 1

Graduates easily find employment in field

Graduates are sometimes forced forced to find positions of their field

5. Use of Information on Labor Market

Average Score 3.1

5/3/3/4/5/3/

5	4	3	2	1

The faculty and administrators use current data on labor market needs and emerging trends in job openings to systematically develop and evaluate the program

The faculty and administrators do not use labor market data in planning or evaluating the program

6. Use of Profession/Industry Standards

Average Score 4.1

5/3/3/5/5/4/

5	4	3	2	1

Profession/industry standards (such as licensing, certification, accreditation) are consistently used in planning and evaluating this program and content of its courses

Little or no recognition is given to specific profession/industry standards in planning and evaluating this program

7. Use of Student Follow-up Information

Average Score 3.8

4.5/3/4/3/5/3/4.5

5	4	3	2	1

Current follow-up data on completers and leavers are consistently and systematically used in evaluating this program

Student follow-up information has not been collected for use in evaluating this program

8. Relevance of Supportive Courses

Average Score 3.6

3/3/4/4/3.5/3.5/4

5	4	3	2	1

Applicable supportive courses are closely coordinated with this program and are kept relevant to program goals and current to the needs of students

Supportive course content reflects no planned approach to meeting needs of students in this program

9. Qualifications of Administrators and Supervisors

Average Score 3.9

5	4	3	2	1
All persons responsible for directing and coordinating this program demonstrate a high level of administrative ability				Persons responsible for directing and coordinating this program have little administrative training and experience

4/4/4/3/5/3.5
4

10. Instructional Staffing

Average Score 3.5

5	4	3	2	1
Instructional staffing for this program is sufficient to permit optimum program effectiveness				Staffing is inadequate to meet the needs of this program effectively

4/2/3/4/4/4
3.5

11. Facilities

Average Score 3.3

5	4	3	2	1
Present facilities are sufficient to support a high quality program				Present facilities are a major problem for program quality

3.5/2/3/4/3.5
3/4

12. Scheduling of Instructional Facilities

Average Score 3.2

5	4	3	2	1
Scheduling of facilities and equipment for this program is planned to maximize use and be consistent with quality instruction				Facilities and equipment for this program are significantly under-or-over-scheduled

4/3/3/3/3.5
2.5/3.5

13. Equipment

Average Score 3.8

5	4	3	2	1
Present equipment is sufficient to support a high quality program				Present equipment is not adequate and represents a threat to program quality

4.5/3/4/4/4
3/4.5

14. Adaption of Instruction

Average Score 4.6

5	4	3	2	1

5/4/4/4/4
5/4.5

Instruction in all courses required for this program recognizes and responds to individ- student interests, learning styles, skills, and abilities through a variety of instructional methods (such as, small group or individualized instruction, laboratory or "hands on" experiences, credit by examination)

Instructional approaches in this program do not consider individual student differences

15. Adequate and Availability of Instructional Materials and Supplies

Average Score 4.1

5	4	3	2	1

5/3/4/4/4
4/4.5

Faculty rate that the instructional materials and supplies as being readily available and in sufficient quantity to support quality instruction

Faculty rate that the instructional materials are limited in amount, generally outdated, and lack relevance to program and student needs

CURRICULUM VITAE

JANICE MARIE WEBSTER

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Big Rapids, Michigan 49307

PHONE: Home: 616-796-0266
Work: 616-592-2314

EDUCATION:

Ph.D. Microbiology	West Virginia University Morgantown, West Virginia
M.S. Biology	Villanova University Villanova, Pennsylvania
A.B. Biology	Lycoming College Williamsport, Pennsylvania

CERTIFICATION:

American Society of Clinical Pathologists, M.T. (ASCP) 106636

EXPERIENCE:

1979-Present Department of Environmental and Clinical Sciences
College of Allied Health Sciences
Ferris State University
Big Rapids, Michigan
Department Head and Professor

1977-1979 Division of Medical Technology
Department of Medical Allied Health Professions
School of Medicine
University of North Carolina
Chapel Hill, North Carolina
Associate Professor

1975-1977 Department of Clinical Laboratory Sciences
School of Community and Allied Health
University of Alabama in Birmingham
Birmingham, Alabama
Assistant Professor

Graduate School Faculty
University of Alabama in Birmingham
Birmingham, Alabama

1974-1975 Department of Medical Technology
School of Allied Health Professions
Medical College of Virginia
Virginia Commonwealth University
Richmond, Virginia
Assistant Professor

Department of Pathology
School of Medicine
Assistant Professor

Graduate School Faculty

COLLEGE/UNIVERSITY COMMITTEES:

Search Committee for Department Head of Criminal Justice — Chair
Ferris State University, 1995-1996

Financial Aid Advisory Committee
Ferris State University, 1991-Present

Planning Committee — Chair
College of Allied Health Sciences
Ferris State University, 1985-1987

Search Committee for Associate Dean
College of Business
Ferris Stage University, 1986

North Central Accreditation Institutional Dynamics Committee
Ferris State University, 1985-86

Search Committee for Department Head of Nursing
College of Allied Health Sciences
Ferris State University, 1985-86

Medical Records Program Director Search Committee
College of Allied Health Sciences
Ferris State University, 1985-86

Curriculum Committee
College of Allied Health Sciences
Ferris State University, 1985, 1989-Present

Recruitment and Retention Committee
College of Allied Health Sciences
Ferris State University, 1984-1987

Search Committee for Dean
College of Allied Health Sciences
Ferris State University, 1983-1984

Faculty Research Committee
Ferris State University, 1983-1985

Journalism Program Review Committee
Ferris State University, 1982-1983

Promotions Committee
College of Allied Health Sciences
Ferris State University, 1982-1984

Campuswide Master Plan Committee
Ferris State University, 1981-1984

Nursing Faculty Workload Committee
College of Allied Health Sciences
Ferris State University, 1981-1982

Restructuring Committee
College of Allied Health Sciences
Ferris State University, 1980-1981

Dental Hygiene Faculty Workload Committee
College of Allied Health Sciences
Ferris State University
Chair, 1980-1981

NATIONAL ACCREDITING AGENCY FOR CLINICAL LABORATORY SCIENCES (NAACLS)

1992 Member — Accreditation Site Visit Team
Medical Technology Program
University of Wisconsin - Milwaukee
Milwaukee, Wisconsin

1989 Chair — Accreditation Site Visit Team
Medical Laboratory Technician Program
Alexandria Technical College
Alexandria, Minnesota

1988 Chair — Accreditation Site Visit Team
Medical Technology Program
National College of Education
Evanston, Illinois

1985 Chair — Accreditation Site Visit Team
Medical Technology Program
Bowling Green State University
Bowling Green, Ohio

1983 Member — Accreditation Site Visit Team
Medical Technology Program
State University of New York at Syracuse
Syracuse, New York

1981 Chair — Accreditation Site Visit Team
Medical Technology Program
Utica College of Syracuse University
Utica, New York

1981 Chair — Accreditation Site Visit Team
Medical Laboratory Technician Program
Eastern Kentucky University
Richmond, Kentucky

1981	Self-Study Critique Medical Technology and Medical Laboratory Technician Programs University of Vermont Burlington, Vermont
1980	Chair — Accreditation Site Visit Team Medical Technology Program University of Tennessee Memphis, Tennessee
1979	Self-Study Critique Curriculum in Medical Laboratory Sciences University of Illinois at the Medical Center Chicago, Illinois
1978	Chair — Accreditation Site Visit Team Medical Technology Program University of Kentucky Lexington, Kentucky
1977	Chair — Accreditation Site Visit Team Medical Technology Program Howard University Washington, D.C.

PROFESSIONAL SOCIETIES:

American Society for Medical Technology
Central Michigan Association for Medical Technologists
Michigan Association of Laboratory Science Educators
Michigan Environmental Health Association
Michigan Society for Medical Technology
National Environmental Health Association

PROFESSIONAL SOCIETY COMMITTEES

Michigan Society for Medical Technology
Past President 1992-1993
President 1991-1992
President Elect 1990-1991
Board of Directors 1982-1984; 1987-Present
Awards Committee Chair, 1982-1983
Education Scientific Assembly Chair, 1982-1984

Michigan Association of Laboratory Science Educators
Chair, 1987-1989

Medical Technology Internship Matching Program of Michigan
Board of Directors, 1985-1987

American Society for Medical Technology
Region IV, Microbiology Scientific Assembly Chair, 1985
Microbiology Scientific Assembly Nominations Committee, 1981
Education Scientific Assembly Nominations Committee, 1979

North Carolina Society for Medical Technology
Education Scientific Assembly Chair, 1979

PROFESSIONAL ACTIVITIES:

American Society for Medical Technology
National Meeting
Information Exchange and Open Discussion for Educators
Orlando, Florida
Moderator 1985

American Society for Medical Technology
Region III Meeting
Nashville, Tennessee
Systemic Mycoses in the Southeast
Moderator 1978

Student Bowl - Microbiology Judge
New Jersey Society for Medical Technology, 1979
North Carolina Society for Medical Technology, 1979
American Society for Medical Technology - Region II, 1978
American Society for Medical Technology, 1977-1980
Alabama State Society for Medical Technology, 1976

North Carolina Society for Medical Technology
Student Forum
Health Careers Day
Graduate Education in Medical Technology
Spring 1979

American Society for Medical Technology
Education and Research Fund, Inc.
Education Media Committee - Reviewer 1979

National Certification Agency for Medical Laboratory
Personnel (NCAMLP)
Evaluator of Microbiology and Immunology Questions 1978

American Society for Medical Technology
National Meeting
Representative to the House of Delegates 1976, 1980, 1985, 1990,
1991, 1992

PROFESSIONAL MEETINGS ATTENDED:

Michigan Allied Health Administrators 1988-1989

National Association of Women Deans, Administrators, and
Counselors 1988

Michigan Health Occupation Educators 1985, 1988

American Society for Medical Technology
National Meetings 1974, 1976-1980, 1982-1985, 1990-1992

Michigan Occupational Educators Association 1984

Michigan Society for Medical Technology 1980-1986, 1988-1993

American Society of Allied Health Professions
National Meeting 1979-1980, 1983

North Carolina Society for Medical Technology 1977-1979

Alabama Society for Medical Technology 1976

Virginia Society for Medical Technology 1974-1975

American Society for Medical Technology, Region III 1978

PRESENTATIONS:

1991	Central Michigan Association for Medical Technologists Mt. Pleasant, Michigan Perspectives on Medical Technology Education
1986	Phi Delta Kappa Big Rapids, Michigan AIDS: Current Information and Implications for Schools
1981	Vocational Technical Education Conference Ferris State University Big Rapids, Michigan Identifying and Eliminating Dental Clinic Health Hazards
1979	New Jersey Society for Medical Technology Spring Meeting Cherry Hill, New Jersey Rocky Mountain Spotted Fever - Do You Know How To Spot It? Anaerobic Bacteriology — How To Begin
1979	Northwest Area Health Education Center Winston Salem, North Carolina Legionnaires' Disease
1979	Eastern Area Health Education Center Elizabeth City, North Carolina Legionnaires' Disease
1979	Eastern Area Health Education Center Goldsboro, North Carolina Legionnaires' Disease
1979	Eastern Area Health Education Center New Bern, North Carolina Legionnaires' Disease
1978	Greensboro Area Health Education Center Greensboro, North Carolina Legionnaires' Disease

1978 North Carolina Society for Medical Technology
Fall Seminar
Durham, North Carolina
Legionnaires' Disease

1978 Central Jersey Chapter of the New Jersey Society for Medical Technology
Annual Winter Seminar
Cherry Hill, New Jersey
How to Select a Professional Society and What It Should Offer
An Internal Quality Control Program for Microbiology

1978 Charlotte Area Health Education Center
Charlotte, North Carolina
Workshop - Anaerobic Bacteriology

1977 American Society for Medical Technology
National Meeting, Atlanta, Georgia
Symposium - Educational Methodologies in Clinical Microbiology
Practicum Instruction in Clinical Microbiology

1976 Alabama State Society for Medical Technology
State Meeting, Birmingham, Alabama
Workshop - Comparative Analysis of Rapid Methods of Identification of Enteric Organisms

1976 Veterans Administration Southeastern Regional Medical Education Center
Birmingham, Alabama
Workshop — Comparative Analysis of Rapid Methods of Identification of Enteric Organisms

1974 American Society for Microbiology National Meeting
Chicago, Illinois
Quantitation of Lymphocytic Choriomeningitis Virus and Serum-Neutralizing Antibodies by Immuno-fluorescent Cell Counting

1973 American Society for Microbiology, Allegheny Branch
Regional Meeting
Morgantown, West Virginia
Assay of Lymphocytic Choriomeningitis Virus by Immunofluorescent Cell Counting

CONTINUING EDUCATION — PARTICIPANT

1991 National Clinical Laboratory Educators' Conference
Grand Rapids, Michigan

1989 Connections
Joint Conference of the American Association of Women in Community Colleges and the Michigan Association of Women Deans, Administrators, and Counselors
Battle Creek, Michigan

1988 AIDS and Its Ramifications
Central Michigan Association for Medical Technologists
Mt. Pleasant, Michigan

Trends in Occupational Studies
Michigan Community College Educators
Traverse City, Michigan

1987 Management Development Retreat
Ferris State University

Grant-Winning Techniques, David G. Bauer
Oakland University
Rochester, Michigan

The Accreditation Process Using the 1986 Essentials — Workshop
National Accrediting Agency for Clinical Laboratory Sciences
Framingham, Massachusetts

Clinical Laboratory Educators' Forum
Indianapolis, Indiana

1986 Power Communication Skills for Women
Grand Rapids, Michigan

Political Action Workshop
Michigan Society for Medical Technology
Lansing, Michigan

Management Development Retreat
Ferris State University

Clinical Laboratory Educators' Forum
Birmingham, Alabama

1985 Management Development Retreat
Ferris State University

Be Prepared: Staffing the Clinical Laboratory Today and Tomorrow
American Hospital Association
Chicago, Illinois

Conflict Management Workshop
Ferris State University

The Future of Clinical Laboratory Science — A Crisis in Education
Minneapolis, Minnesota

Who Develops the Study Habits?
Group Instruction as Effective as Tutoring
Medical Technology Educators' Meeting — Lansing

1984 DRGs — Your Interest Areas — Workshop
Ferris State University

Legal Implication of Clinical Instruction — Workshop
Department of Health Careers
Lansing Community College

Program Evaluation: A Survival Tool Workshop
American Society for Medical Technology Region IV Meeting

Improving Teaching Skills Workshop
U.S. Department of Health and Human Services
Public Health Service, Centers for Disease Control
Grand Rapids, Michigan

1983 Strategic Planning for Allied Health Managers
Legal Concerns for Allied Health Educational Institutions:
Student Admissions, Faculty Liability and Risk Management
American Society of Allied Health Professions, National Meeting

1982 Coagulation — Update and Review
Central Michigan Association of Medical Technologists
Mt. Pleasant, Michigan

1981 Effective Bench Instruction — Workshop
Michigan Society for Medical Technology Spring Meeting

Life, Death, and Transition
Elizabeth Kubler-Ross, M.D.
Ferris State University
Big Rapids, Michigan

The Medical Laboratory Worker and the Law
Blodgett Memorial Medical Center
Grand Rapids, Michigan

1980 Role of the Microbiology Laboratory in Bacterial Identification
Saint Mary's Hospital
Grand Rapids, Michigan

Rapid Methods in Microbiology
Saint Mary's Hospital
Grand Rapids, Michigan

1979 Laboratory Procedures in Parasitology
School of Health Sciences
Grand Valley State University
Allendale, Michigan

1978 Developmental Management Advancement Program — Course
Department of Medical Allied Health Professions
University of North Carolina at Chapel Hill

Clinical Instruction — Workshop
Durham, North Carolina

1977 Small Group Instruction — Workshop
Office of Medical Studies, School of Medicine
University of North Carolina at Chapel Hill

Site Visit Surveyor Training Workshop
National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)
Atlanta, Georgia

AWARDS:

Omicron Sigma Service Award
American Society for Medical Technology 1983, 1984, 1990-1992

Tanner Distinguished Teaching Award
University of North Carolina at Chapel Hill
Finalist 1979

PUBLICATIONS:

Webster, Janice M., and B. E. Kirk. 1974
Immunofluorescent cell-counting assay for lymphocytic choriomeningitis virus. *Infec. Immunity.* 28: 17-21.

Webster, Janice M., and B. E. Kirk. 1974
Neutralizing antibody response of guinea pigs to lymphocytic choriomeningitis virus. *Infec. Immunity.* 10: 516-519.

Webster, Janice M., and B. E. Kirk. 1974
Quantitation of lymphocytic choriomeningitisvirus and serum-neutralizing antibodies by immunofluorescent cell counting. *Bacteriological Abstracts.* American Society for Microbiology.

GRANT:

For Industrial and Environmental Health Faculty to Develop Health and Safety Training Course for UAW-Chrysler Employees $211,225

Daniel P. deRegnier, M.S., MT(ASCP)

18865 Winding Brook Pl.
Big Rapids, MI 49307

Home (616) 592 - 0358
Office (616) 592 - 2327
email: dderegni@alh01.ferris.edu

CAREER OBJECTIVE

Seeking a position in research or clinical microbiology to utilize my teaching, research, and clinical laboratory experience.

EDUCATION

UNIVERSITY OF MINNESOTA, Minneapolis, MN 55455. Master of Science, Clinical Laboratory Science. September, 1988 (GPA = 3.65, A=4.00)

UNIVERSITY OF NORTHERN IOWA, Cedar Falls, IA 50614. Bachelor of Arts Degree in General Science, with honors, September, 1983. (GPA = 3.29, A=4.00)

ALLEN MEMORIAL HOSPITAL SCHOOL OF MEDICAL TECHNOLOGY, Waterloo, IA 50701. MT(ASCP), August, 1983

CERTIFICATION

American Society of Clinical Pathologists (ASCP) 1983; MT - 152652

EMPLOYMENT EXPERIENCE

Assistant Professor, Microbiology — September 1992 - Present
Clinical Laboratory Sciences
FERRIS STATE UNIVERSITY
Big Rapids, MI 49307

Prepare and deliver lectures and plan the laboratory sessions for the microbiology portion of the MT and MLT curriculum, including Basic and Clinical Microbiology I, Clinical Microbiology II, Medical Mycology, Parasitology, and Virology, and Basic and Clinical Immunology. Responsible for designing the microbiology and serology portion of the Simulated Laboratory Practicum. Faculty advisor to MT and MLT students. Assist in monitoring students' progress while on internships by means of weekly phone contact and occasional site visits.

Medical Technologist — December 1991 - August 1991
IOWA LUTHERAN HOSPITAL
Des Moines, IA 50311

Work on a part-time basis in a busy medium-sized clinical laboratory. Scheduled rotations through chemistry, hematology, immunohematology, coagulation, and urinalysis. Responsible for operating and maintaining all state-of-the-art laboratory equipment in each department. Extensive use of Cerner Laboratory Information System for ordering and reporting patient test results.

Assistant Professor, Microbiology — September 1988 - July 1991
Department of Medical and Research Technology
UNIVERSITY OF MARYLAND AT BALTIMORE
Baltimore, MD 21201

Planning of microbiology/immunology curriculum for junior and senior medical technology students. Responsible for presenting sections of the lecture material, including: bacteriology, parasitology, and mycology, and in charge of set-up, instruction, and supervision of all laboratory sessions. Also responsible for contacting and inviting non-university laboratory personnel to supplement in-house lecture programs.

Medical Technologist — January 1989 - July 1991
ASSOCIATES IN PATHOLOGY, P.A.
Baltimore, MD 21201

Work on a part-time basis in a private laboratory utilizing state-of-the-art equipment, procedures, and techniques for a variety of specimen analyses.

Medical Technologist — September 1983 - August 1985
ALLEN MEMORIAL HOSPITAL
Waterloo, IA 50701

Sole third-shift technologist with responsibilities that included phlebotomies and clinical assays (routine and STAT) from all departments including the intensive care unit and emergency room. Responsible for operating and maintaining laboratory equipment from each section, including: microbiology, hematology, chemistry, urinalysis, and blood bank.

Adjunct Instructor — January 1985 - May 1985
UNIVERSITY OF NORTHERN IOWA
Cedar Falls, IA 50614

Developed curriculum for the undergraduate course "Bacteriology and Immunology." Planned and delivered all lectures covering basic microbiology and immunology. Organized and supervised all phases of the laboratory exercises including media preparation and performance.

PROFESSIONAL ORGANIZATIONS

1983 - present American Society for Clinical Laboratory Science
1987 - present American Society for Microbiology
1992 - present Michigan Society for Clinical Laboratory Science
1992 - present Central Michigan Association for Medical Technology
1993 - present Michigan Branch American Society for Microbiology

ACADEMIC HONORS

American Scientific Products Graduate Scholarship, 1987
Graduate School Academic Scholarship, University of Minnesota 1987-1988

PRESENTATIONS

American Society for Microbiology, Annual meeting, Miami Beach, FL "*Giardia* Cysts in the Environment: Effect of Lake, River, and Tap Water." May, 1988

Metropolitan Hospital, Grand Rapids, MI "Clinical Parasitology Update." April, 1994

American Society for Microbiology, Annual meeting, New Orleans, LA "The Simulated Laboratory: A Hands-on Strategy for Educating Clinical Laboratory Science Students." May, 1996

Michigan Society for Clinical Laboratory Sciences, Annual Meeting, Kalamazoo, MI "Don't Drink the Water: A Review of Waterborne Pathogens." April, 1996

PUBLICATIONS

"Viability of *Giardia* Cysts Suspended in Lake, River, and Tap Water" D.P. deRegnier, L. Cole, D.G. Schupp, and S.L. Erlandsen, Applied and Environmental Microbiology, May 1989, Vol. 55 NO. 5, pp. 1223-1229

PROFESSIONAL ACTIVITIES

1992 - present	Faculty Advisor - Association of Clinical Laboratory Sciences, Student Organization, Ferris State University
1993 - present	Board of Directors, Michigan Society for Clinical Laboratory Science
1993 - 1995	Scientific Assembly Chair-Microbiology, Michigan Society for Clinical Laboratory Science
1993 - 1995	Program Committee, Michigan Society for Clinical Laboratory Science State
1993 - present	Legislative Steering Committee, Michigan Society for Clinical Laboratory Science
1993 - 1994	College of Allied Health Sciences 25th Anniversary Committee Ferris State University
1993 - present	Mentor, Mecosta/Osceola Math/Science/Technology Center
1995 - present	Co-chair, Library/Historical/Archival Committee, Ferris State University
1995 - present	Safety Committee, College of Allied Health Sciences
1995 - 1996	Recipient of Timme Center Instructional Assistance Grant, $2,700

Mark David Kellogg, MT(ASCP)

WORK ADDRESS
College of Allied Health
200 Ferris Drive
Big Rapids, MI 49307-2740
Telephone: (616) 592-2324

HOME ADDRESS
329 South Lake Dr.
Cadillac, MI 49601

Internet: mkellogg@ALH01.FERRIS.EDU

EDUCATION:

Ph.D. Candidate in Biological Sciences. (August 1987 to present)
University of Notre Dame, Notre Dame Indiana

Certificate of Clinical Practicuum. (August, 1984 to August 1985)
Munson Medical Center Laboratories, Traverse City, Michigan

Bachelor of Science Degree in Medical Technology with High Honors. (1980 to 1984)
Options in Microbiology and Research
Michigan Technological University, Houghton, Michigan

TEACHING EXPERIENCE:

Clinical Laboratory Sciences Seminar (Capstone Course)
(CLLS499, 1 credit, 1+0 format)
Ferris State University, Big Rapids, Michigan
Fall Semester 1993, 1994, 1995

Clinical Chemistry and Instrumentation I
(CLLS215, formerly MDT334; 5 credits, 3+6 format)
Ferris State University, Big Rapids, Michigan
Winter Quarter 1992-3, Fall Semester 1993,
Winter Semester 1995

Clinical Chemistry and Instrumentation II
(CLLS355, formerly MDT454, 4 credits, 2+4 format)
Ferris State University, Big Rapids, Michigan
Summer Quarter 1993, 1994, 1995

Basic and Clinical Immunology
(CLLS351, 3 credits, 2+3 format)
Ferris State University, Big Rapids, Michigan
Fall Semester 1994, 1995

Medical Mycology, Parasitology and Virology
(CLLS235, 2 credits, 1.5+4.5 format)
Ferris State University, Big Rapids, Michigan
Winter Semester 1994 (15 students)

Environmental Health Laboratory
(IEHM311, 3 credits, 2+3 format)
Ferris State University, Big Rapids, Michigan
Fall Semester 1995

Introduction to Toxicology
(IEH375, 3 credits, 3+0 format)
Ferris State University, Big Rapids, Michigan
Winter Quarter 1992-3

Human Anatomy Laboratory
(A210, 2 credits, 0+3 format)
Indiana University South Bend
Fall Semesters 1991, 1992 (2 sections)

Medical Physiology Lab Teaching Assistant
(SBCM504L, 0+3 format)
Indiana University School of Medicine, South Bend Center
Spring Semesters 1989-1992

Human Physiology Lab Graduate Teaching Assistant
(BIOS344L, 2 credits, 0+3 format)
University of Notre Dame, Notre Dame Indiana
Fall Semesters 1987-1989, Spring Semester 1988

WORK EXPERIENCE:

Medical Technologist. (August 1985 to August 1987)
Munson Medical Center, Traverse City, Michigan
Rotated in all sections of the laboratory with emphasis in chemistry and blood bank. Worked day, afternoon and midnight shifts. Trained Medical Technology students and new employees. Developed computer software for analysis of lipid profile data.

Medical Platoon Leader/Field Medical Assistant (April 1988 to October 1993)
Rank: 1st Lieutenant. Indiana Army National Guard, 2-151st Infantry Battalion. Planned, directed and coordinated administrative activities in the medical platoon. Advised the Battalion Commander on matters pertaining to health care of the battalion. Directed training of the medical platoon personnel, and reviewed effectiveness and efficiency of platoon. Assisted the commander in attaining and maintaining 105% of authorized strength through recruiting and retention programs.

Patient Administration Officer (April 1994 to December 1995)
Rank: 1st Lieutenant. United States Army Reserve, 395th Combat Support Hospital. Responsible for administrative support of all hospital operations. Direct patient admissions and dispositions. Coordinate evacuation from hospital. Responsible for daily reports of hospital bed status, patient census and patient billing. Supervise twenty enlisted personnel. Develop and coordinate continuing education programs for hospital personnel and section personnel regarding paperwork procedures. Responsible for the review of all medical records generated by the hospital and maintenance of those records.

Hospital Company (Detachment) Commander (December 1995 to present)
Rank: Captain. United States Army Reserves, 4201st U.S. Army Hospital
Responsible for administration and training of the two hundred and thirty enlisted members of the 4201st U.S. Army Hospital. Activities include administration of the Uniform Code of Military Justice, promotions, awards, requests for military schools, preparation of unit training plans, and approval of all subordinate section training schedules. Additionally responsible for coordination of supply, maintenance, utilities and other essential functions for operation of the hospital. Conduct evaluations of company first sergeant and four full time staff members.

ROFESSIONAL CTIVITIES

Vice President; Central Michigan Assoc. for Medical Technology, 1995-96
Program moderator for Michigan Society for Clinical Laboratory Sciences Spring Meeting 1995
NCCLS Self Study Paper Reviewer and Site Visitor (once each)
District Representative for Michigan Society for Clinical Laboratory Sciences 1994-95, 1995-96.
Invited Speaker for National Laboratory Training Network Meeting, June 16, 1996 (Compressed video applications in laboratory training)
Invited Speaker for Michigan Society for Clinical Laboratory Science 1996 Annual Meeting: Topic: Clinical Chemistry Review (April 1996)
Invited Speaker for Inservice education at Carson City Hospital, 24Jan96 (Quality Control of Laboratory Testing)
Workshop Instructor: FSU College of Optometry TPA workshop, Summer 1995 Topic: Glucose testing in the optometry clinic/office
Invited Speaker for Inservice education series at Reed City Hospital, 12&19Jul93 (Acid-Base balance, Blood gas analysis and interpretation)
Invited Speaker for the Northwest Michigan Health Information Management Association Fall Meeting (1993)(Laboratory Role in Diagnosis of Myocardial Infarction)
Invited Speaker for Michigan State Society of Medical Technology 1994 State Meeting "Cooperative Learning: A Guide to Successful Implementation."
Poster Competition Judge for the Michigan Society for Medical Technology Spring Meeting 1993, 1994, 1995
Mentor for Mecosta Osceola Intermediate School District Math/Science/Technology Center students.
Mentor for Central Michigan University "Mentoring through Cross Age Teams" project. (Winter semester 1996)

OMMITTEES

Ferris State University Faculty Research Committee (Jan96 to present)
Ferris State University, Radiation Safety Committee (Jan96 to present)
Ferris State University, College of Allied Health, TechPrep Task Force (Sept94-present)
Ferris State University, College of Allied Health, Recruitment&Retention Committee (Sept95-present)

Newaygo Intermediate School District Gifted/Talented Program
Physiology curriculum design, fall and winter semesters 1994, 1995

PUBLICATIONS:

1) Olson, K.R., Duff, D.W., Farrel, A.P., Keen, J., Kellogg, M.D., Kullman, D., Villa, J. (1991) Cardiovascular Effects of Endothelin in Trout. Am.J.Physiol.Heart Circ.Physiol. 260:H1214-H1223

2) Kellogg, M.D. Olson, K.R., Duff, D.W. Blood Volume and Extracellular Fluid Spaces in Freshwater and Seawater adapted Rainbow Trout. In preparation.

3) Kellogg, M.D., Olson, K.R. Determination of Mean Circulatory Filling Pressure and Whole Body Vascular Compliance in Euryhaline Fish. In preparation.

4) Olson, K.R., Kellogg, M.D., Duff, D.W. Effects of Chemical Sympathectomy and Angiotensin Converting Enzyme Inhibition on Fluid Balance in Trout. In preparation.

ABSTRACTS:

1) Kellogg, M.D. Olson, K.R. (1990) Inactivation of Angiotensin II Induced Pressor Response in Trout. FASEB Journal 4:A704 .

2) Kellogg, M.D., Duff, D.W., Kullman, D.E., and Olson K.R. (1990) Simultaneous Determination of Blood Volume and Extracellular Spaces in Fish with Two Gamma-emitting Nuclides. The Physiologist 33(4):A112.

3) Olson, K.R., Kellogg, M.D., Villa, J.F. (1990) Vascular Effects of Endothelin in Trout. The Physiologist 33(4):A112.

4) Kullman, D.E., Xu., H., Kellogg, M.D., Olson, K.R. (1990) Effects of Sympathetic Denervation and Converting Enzyme Inhibition on Trout Plasma Catecholamines. The Physiologist 33(4):A131.

)NTINUING EDUCATION

Fall 1993	Case Studies in Clinical Laboratory Mycology	CACMLE Self Study	1.5 PACE CEU
25Mar94	Site Visitor Training Workshop	NCCLS Chicago Workshop	0.6 PACE CEU 6 ASCP CEU
27Apr94	Apolipoproteins	MSMT State Meeting	0.1 PACE CEU
27Apr94	Future Technologies	MSMT State Meeting	0.2 PACE CEU
28Apr94	Chemical Hygiene Plan	MSMT State Meeting	0.1 PACE CEU
28Apr94	Becoming What We Deserve	MSMT State Meeting	0.1 PACE CEU
28Apr94	Developing Leadership	MSMT State Meeting	0.1 PACE CEU
29Apr94	DNA and PCR	MSMT State Meeting	0.1 PACE CEU
29Apr94	Establishing and Setting up a DNA/PCR lab	MSMT State Meeting	0.1 PACE CEU
29Apr94	Latex Allergies	MSMT State Meeting	0.1 PACE CEU
29Apr94	Problem Based Learning	MSMT State Meeting	0.2 PACE CEU
10Sep94	Clinical Laboratory Quality Assurance and Proficiency Testing Under CLIA '88 by: Great Lakes Regional Quality Assurance Assoc.		
26Apr95	Planning Successful Quality Control Procedures	MSCLS Meeting	2.0 PACE CEU
26Apr95	Practical Aspects of Quality Control	MSCLS Meeting	2.5 PACE CEU
27Apr95	Update/Case Studies in Clin. Chem.	MSCLS Meeting	2.5 PACE CEU
27Apr95	Measurement of Cytokines	MSCLS Meeting	1.5 PACE CEU
27Apr95	Cytokines: An Intricate Network	MSCLS Meeting	1.0 PACE CEU
28Apr95	Methods for Blood Lead Measurements	MSCLS Meeting	1.0 PACE CEU
28Apr95	Troponin T	MSCLS Meeting	1.5 PACE CEU
28Apr95	The New Cardiac Markers	MSCLS Meeting	1.5 PACE CEU
28Apr95	Glycolsylated Hemoglobin	MSCLS Meeting	1.0 PACE CEU
29Aug95	Coaching and Teambuilding Skills for Managers and Supervisors	Skillpath Seminar	
30Sep95-2Oct95	Frontiers in Clinical Lab. Practice	CDC Institute	15 CME
22Feb96	Computer Update (Medical Informatics)	Michigan AACC	4 ACCENT credits

Curriculum Vitae

John H. Landis

Address:	Telephone:	Date of Birth:	Place of Birth:
18768 13 Mile Road Big Rapids, MI 49307	Home: (616) 796-0851 Work: (616) 592-2283	3/26/47	Flint, Michigan

Marital Status:	Children:
Married, Sheila C.	Eric 19 and Kristin 17

Education:

Institution	Field of Study	Degree	Year
Albion College	Biology/Med. Tech.	A.B.	1970
Pontiac General Hospital School of Medical Technology	Medical Technology	Certificate	1970
Wayne State University College of Education	Instructional Technology	25 Graduate Credits	1972-73
Michigan State University	Pathology - Clinical Laboratory Sciences	M.S.	1985

Experience:

Consultant for Abbott Diagnostics, Hematology Division, 1995 to Present
Ferris State University, Professor, 1993 to Present
Ferris State University, Associate Professor, 1986 to present
Ferris State University, Software Consultant, Dept. of Academic Computing, 1989-90
Ferris State College, MLT Program Coordinator and Assistant Professor, 1981-1986
Ferris State College, MLT Program Coordinator and Technical Instructor, 1973-1981
Oakland Community College, part-time Instructor, MLT Program, 1971-73 (20 hrs./week)
Pontiac General Hospital, Staff Medical Technologist, 1970-72 (Full-time)
Albion Community Hospital, Laboratory Technician, 1968-70 (Part-time - 10 hrs./week, full-time - 6 months)
Hurley Hospital, Research Assistant, 1967
Albion College, Biology Laboratory Assistant, 1966 (part-time - 10 hrs./week)

Certification:

MT(ASCP) #072020 (1970)

Current Teaching Schedule:

CLLS 230 - Hematology 1 - Fall
CLLS 456 - MT Simulated Clinical Lab - Fall
CLLS 224 - Urinalysis and Coagulation - Winter
CLLS 430 - Hematology 2 - Winter/Summer
CLLS 256 - MLT Simulated Clinical Lab
Assigned Clinical Experience Courses - Winter/Summer

Past Teaching Schedule:

MDT 101 - Orientation to Medical Technology Program
MLT 101 - Orientation to Medical Laboratory Technician Program
MDT 334 & MLT 202 Clinical Chemistry and Instrumentation
MLT 105 & MDT 305 Basic Clinical Lab Techniques
MDT 454 - Clinical Chemistry and Instrumentation 2
MDT 450 - Hematology and Coagulation 2
MDT 456 - Clinical Laboratory Practicum
MLT 205-211 - Clinical Experience
MA 229 - Laboratory Techniques for Medical Assistants

Administrative Duties:

Order and maintain supplies and equipment for assigned courses
Assist in grant development
Assist in curriculum and course evaluation and development for MLT and MT Programs
Advise and counsel students
Assist in writing the MLT/MT self studies for accreditation by NAACLS
Part Time Coordinator - Timme Center for Instructional Technology, 1990 to Present
Middle and High School Recruiting Visits - 1987 to Present

Professional Activities and Awards:

Michigan Society for Medical Technology - Membership Chairman - 1975; Elected Secretary - 1976; Education Committee - 1976-78; District 8 Representative 1985-86; Hematology Scientific Assembly Chair - 1986-87; Elected Nominations Committee 1988-89, 1989-90; Appointed Education Scientific Assembly Chair 1989-90.
American Society for Medical Technology - Member 1973 to present
American Society of Clinical Pathologists - Affiliate Member - 1975 to present
Evaluation of NCAMLP MLT Examination Questions - 1979
Central Michigan Association of Medical Technologists - President Elect - 1982-83; President - 1983-84; Past President - 1984-85; Member 1975 to present
Site Survey Team Member for NAACLS Accreditation of MLT programs - 1982, 1984, 1989, 1990, 1991, 1993
Site Survey Team Captain for NAACLS Accreditation of MT and MLT programs - 1985, 1995 (2), 1996 (2)
Clinical Chemistry Judge - Annual Michigan Medical Technology Student Bowl - 1982 and 1986
Granted Sabbatical leave to update clinical skills - March-May 1985
William Beaumont Hospital - Royal Oak, Michigan; Thomas Dutcher, MD
Central Michigan Community Hospital Mt. Pleasant, Michigan; Ronald Moss, M.D., Ph.D.
Hematology/Coagulation Judge - Annual Michigan Medical Technology Student Bowl - 1987, 1988, 1989, 1990

Professional Activities and Awards: (continued)

Awarded FSU Faculty development grant to establish a local area network/laboratory information system for CLS programs - Spring, 1988
Awarded FSU Timme Foundation Advanced Instructional Technology Grant, 1989
Awarded FSU Timme Foundation Instructional Assistance Grant ($1500.00), 1990-91
Awarded FSU Timme Foundation Instructional Assistance Grant ($2100.00), 1991-92
Appointed Adjunct Assistant Professor, University of North Dakota School of Medicine, 1991 to Present
Awarded Distinguished Teacher of the Year, FSU, 1991-92.
Appointed as a consultant and faculty member in College of Medicine, King Abdulazziz University, Jeddah, Saudi Arabia. Program sponsored by the University of Alabama at Birmingham and the US-Saudi Joint Economic Corporation, Spring 1992, Winter 1993.
Awarded FSU Timme Foundation Instructional Assistance Grant ($3000.00), 1994-95

Ferris State University Committee Assignments:

School and Departmental

Allied Health Sabbatical Leave Committee - 1978-79
Hospital Related Programs Clinical Adjunct Faculty Committee - 1978-79
Allied Health Dean's Search Committee - 1983-84
Allied Health Centennial Committee - 1982-84
Allied Health Parent's Day Committee - 1984
Allied Health Computer Planning Committee - 1982 to Present, Chair, 1987-1994
Allied Health Recruitment/Retention Committee, 1990-91
Program Review Panel - Respiratory Therapy Program, Chair 1989-90
Program Review Panel - Computer Information Systems, 1990-91
Program Review Panel - Recreation Leadership and Management, 1992-93
Tenure Committees for Dan deRegnier and Mark Kellogg
Promotions Committee, 1995 to Present

All University Committees

Katke Golf Course Advisory Committee - 1975-77
Athletic Advisory Committee - 1979-83
Elected Allied Health Representative to Representative Faculty
Advisory Council - 1982-84
Student Activities Budget Advisory Committee - 1985-1987
College Professional Orientation Committee - 1986 to present
Computer Steering Committee - 1989, 1990, 1991
TIMME Center for Teaching Excellence Committee, Member, 1990-92; Chair, 1992 to Present
FSU MAGB Teacher Selection Committee, 1994, 1995
FSU Distinguished Teacher Selection Committee, 1994 to Present
Search Committee for Director of Center for Teaching, Learning and Faculty Development, 1996
Faculty Summer Institute Committee, 1996

Workshops Coordinated:

"UFO's The Greatest Challenge Since Copernicus" - GECCLGAP program - 1975
"Evaluation of Clinical Performance" - FSC - 1976
CMAMT Seminar Series (7) - CMAMT - 1983-4

Seminars Presented:

"Clinical Enzymolgy" - West Michigan - American Chemical Society - 1976
"Instructional Objectives in Clinical Chemistry" - FSC MT Educators Meeting - 1978
"The Role of the MLT in the Clinical Laboratory" - FSC MLT Coordinators Meeting - 1979
"Hormones of the Adrenal Cortex" - Michigan State University (MSU) - 1980
"Biochemical Pathology of the Thyroid" - MSU - 1980
"Clinical Laboratory Evaluation of the Thyroid" - Central Michigan Association of Medical Technologists (CMAMT) - 1981
"Coagulation - Review and Update" - CMAMT and MSU - 1982
"Applications of Chemistry in the Clinical Laboratory" - FSC - Super Saturday - (7th and 8th graders) 1982
"Coagulation Review" - Michigan Association of AMT State Meeting - 1982
"Computer Assisted Instruction in Clinical Laboratory Sciences" - MSU - 1985
"Computer Assisted Instruction in Clinical Laboratory Sciences" - Mercy College of Detroit - 1986
"Hemostasis and Thrombosis Review" - Michigan Society for Medical Technology Annual Meeting - 1987
"Diagnostic Laboratory Tests" - Michigan Optometric Association Annual Meeting - 1987
"Diagnostic Laboratory Tests" - Ferris State University College of Optometry Senior Seminar 1987 to Present
"Use of Interactive Videodiscs in Hematology Instruction", 6th Annual Clinical Laboratory Computer Symposium, University of Michigan Medical School, 1988
"Optometric Management of Diabetes Mellitus Patients," North Central States Optometric Conference, 1989.
"Diagnostic Laboratory Tests" - FSU College of Optometry Post Graduate Course, OPT 767, 1989, 1990.
"Using Guide for CAI in Hematology Instruction," FSU - Faculty Orientation, 1990, 1991
"Using CAI in Radiography Education", Michigan Society of Radiologic Technologists, Spring 1990
"Using Guide for CAI in Hematology Instruction," Michigan State University - CLS Faculty, Fall 1991
"Using Guide and Iconauthor as authoring tools for CAI," FSU, Fall 90, 91 for EDU 489, Special Topics in Education.
Pathology 511, "Leukocytes in Health and Disease", Graduate Course, University of North Dakota School of Medicine, 1991.
"Videodisc Technology at FSU", Applied Technology Center, Grand Rapids Community College/FSU, 1992
"Hematology and Clinical Chemistry," MOISD Monday Night Technology (100 middle school students), Winter 1992 and Fall 1992
"Teaching Practices - Classroom and Clinical," New Faculty Orientation Program, Fall 1992.
"Clinical Laboratory Assays Explained," Northwest Michigan Health Information Management Association, Fall meeting, November 1992.
"Urinalysis and Body Fluids Update," Michigan Society of Medical Technology, April, 1993.

Publications:

Electronic Transparencies for the Teacher's Edition of Introduction to Computers and Information systems, Symanski, Symanski, Morris and Pulschen, 2nd Edition, MacMillan, 1991. 255 graphic images produced using Storyboard (IBM).

Continuing Education Granting CEUs:

American Society for Medical Technology (ASMT) National Meetings - 1974-1977, 1987
Michigan Society for Medical Technology (MSMT) State Meetings - 1973 to Present
"Blood Smear Observations" - ASMT Workshop - 1974
"Problem Solving in the Blood Bank" - ASMT Workshop - 1975
"ABO and Rh Grouping Problems" - ASMT Workshop - 1975
"Acid-Base, Fluid and Electrolytes" - ASMT Workshop - 1975
"RBC Enzymes - Lab Investigation" - ASMT Workshop - 1976
"Isoenzyme Electrophoresis" - ASMT Workshop - 1976
"Electronics & Instrumentation" - ASMT Workshop - 1977
"Thyrodynamics" - ASMT Workshop - 1977
"Techniques of Instrument Maintenance in Clinical Chemistry Lab" - ASMT Workshop - 1977
"Quality Control in Chemistry" - ASMT Workshop - 1977
"Chromatograph: Theory and Applications in the Clinical Laboratory" - ASCP Workshop - 1977
"Coagulation Workshop" - MSMT, 1977
"Electrophoresis Workshop" - Helena Lab, Inc., 1978
"CPK Isoenzymes" MSMT Workshop - 1979
"Recognition and Management of Problems in Pretransfusion Testing" - MDPH Workshop - 1979
"Controversy in Clinical Chemistry" - Seminar - Mayo Clinic - 1979
"Clinical Chemistry Seminar" - University of Michigan, Towsley Center - 1979
American Society of Clinical Pathologists (ASCP) National Meeting - 1980
"Electrolyte Balance and Osmolality" - ASCP - 1980
"Modern Concepts in Hemostasis and Thrombosis" - ASCP - 1980
"Solution of Endocrinologic Problems" - ASCP - 1980
"Clinical Chemistry Symposium" - ASCP - 1980
American Association of Clinical Chemistry (AACC) National Meetings - 1981
"Decision Making Using Clinical Chemistry Results" - AACC - 1981
"Ion-Selective Electrodes in Clinical Chemistry" - AACC - 1981
"Personal Computers in the Clinical Lab" - AACC - 1981
"Diagnosis of Myocardial Infarction" - AACC - 1981
"ToxiLab System Users Workshop" - Analytical Systems, Inc. - 1981
"Parasitology/Mycology Review" - CMAMT and MSU - 1982
"Blood Coagulation - Clinical and Laboratory Aspects" - MSU - 1982
"Evaluation and Implementation of Clinical Chemistry Methods" - CMAMT and MSU - 1983
"Microcomputer Operation and Application in the Laboratory" - CMAMT Workshop - 1983
Scientific Sessions - Copper Harbor Hematology Conference (CHHC) - 1984
"Introduction to Flow Cytometry" - CHHC - 1984
"Current Studies in Hemoglobinopathies and Thalassemic Syndromes" - CHHC - 1984
"Correlation of Cytomorphology of Abnormal RBC, WBC and Platelets with Population Histograms" - CHHC - 1984
"Hemoglobin Electophoresis Wet Workshop" - CHHC - 1984
"Morphology for Students and Teachers" - Beaumont Hospital Seminar - 1984
"Hematology Case Studies" - MSMT - 1984
Ninth Symposium on Computer Applications in Medical Care SCAMC - 1985
"Evaluation of Computer Assisted Instruction Software" - SCAMC - 1985
"Microcomputer Seminar Series" - Office of Academic Computing FSC - 1985 to Present
"Understanding Your Communication Profile" - ASCP - 1987

Continuing Education Granting CEUs: (continued)

"Automation and Quality Control in Hematology" - ASCP - 1987
"White Blood Cell Morphology" - ASCP - 1987
"Red Blood Cell Poikilocytes as Diagnostic Clues" - ASCP - 1987
"A Hematological Potrourri of a Large Lab" - ASCP - 1987
"R:Base 5000 Workshop" - GILL/FSU - 1987
"Microcomputers in Clinical Laboratories: Administrative and Technical Applications" - University of Michigan Medical School, 1988
"R:Base - Application Development," Microrim, May 1989
"Higher Taxonomy Levels in CLS Education," MSMT, 1989
"Pedagogy in Computer Assisted Learning," SALT, 1990
"Microscopic Urinalysis," MSMT, 1990
"Learning to Remember Why Students Forget," MSMT, 1991
"Bone Marrow Morphology," ASCP, 1991
"Hypermedia 1991 - Scientific Sessions," Ball State University, 1991
"Clinical Laboratory Educators Scientific Sessions," CLEC, 1992
"Critical Thinking Workshop," FSU, 1992
"The New Morphology in Hematology," MSMT, 1992
"Teaching Thinking and Decision Making," FSU, 1992
"Institute for Academic Technology" workshops, 1992, 1993
"Microscopy of CSF and Body Fluids," ASCP, 1993
"Automated Hematology Update," ASCP, 1993
"Problem Cases in Pediatric hematology," ASCP, 1993
MSCLS Annual Meetings, 1993 to Present
Clinical Laboratory Educators Conference, 1994, 1995, 1996

Community Involvement:

United Way Solicitor - 1984, 1987, 1988, 1989, 1990
Big Rapids Little League - Head Coach - 1982-85
Meceola Golf and Country Club - Elected Board of Governors - 1983-85 and 1986-88, Elected President of the Board 1985, 1986, 1987 and 1988
Ferris State University Hockey Alumni Golf Tournament - Co-Chair - 1988, 1989
Big Rapids Area Junior Hockey Association - Board Member - 1985-86 Season, Elected President - 1989-90 Season
Big Rapids High School Hockey Boosters - Board Member - 1990 to Present
Big Rapids High School Sports Boosters - Board Member - 1992 to Present
Solid Ice Community Fund - Board Member - 1995 to Present

CURRICULUM VITAE
BARBARA ROSS

	Home:	Business:
Address:	16809 125th Avenue Rodney, MI 49342	Ferris State University 200 Ferris Drive Big Rapids, MI 49307
Telephone:	(616) 867-3631	(616) 592-2317
E-Mail		BROSS@ALH01.FERRIS.EDU

Education:

Institution	Field of Study	Degree	Year
Albion College Albion, MI	Biology	A.B. (honors)	1970
Kent State University Kent, OH	Chemistry	-----	1970
Akron City Hospital Akron, OH	Medical Technology	MT(ASCP)	1971
Central Michigan University Mt. Pleasant, MI	Biology/biochemistry Health Services Adm.	----- -----	1977-80 1985-90

Certification: Medical Technologist, American Society of Clinical Pathologists
MT # 079289

Experience:

Ferris State University: Education Coordinator and Assistant Professor, 1981- present
Education Coordinator and Instructor, 1978-81
Acting Program Director, 1979
Teaching Assistant, 1976-78

Robinson Memorial Hospital, Ravenna, OH: Staff Technologist, 1975-6

St. Vincent's Medical Center, Jacksonville, FL: Section Supervisor, Special Chemistry, 1974-5
Staff Technologist, 1973-4

South County Hospital, Wakefield, RI: Staff Technologist and Section Supervisor, Hematology, 1972-3

Robinson Memorial Hospital, Ravenna, OH: Staff Technologist, 1971-2

Current Teaching Schedule:

CLLS 228: Immunology and Immunohematology
CLLS 256: Simulated Clinical Laboratory
CLLS 358: Immunohematology
CLLS 456: Clinical Laboratory Practicum
CLLS 459: Advanced Problem Solving in Immunohematology
CLLS 463: Clinical Laboratory Management, Supervision, and Education
FSUS 100: Freshman Year Experience

Previous Courses Taught:

MLT 101: Orientation to Medical Laboratory Technician Program
MLT 105: Introduction to Clinical Laboratory Techniques
MLT 202: Clinical Chemistry and Instrumentation
MLT 228: Immunology and Immunohematology
MDT 101: Orientation to Medical Technology
MDT 334: Clinical Chemistry and Instrumentation 1
MDT 338: Immunohematology 1
MDT 454: Clinical Chemistry and Instrumentation 2
MDT 456: Clinical Laboratory Practicum
MDT 458: Immunohematology 2
MDT 460: Procedural Evaluation
MDT 461: Clinical Laboratory Education
MA 229: Laboratory Techniques for Medical Assistants
UNIV 290/291: Freshman Year Experience

Administrative Duties:

- Coordinate clinical experience for MLT and MT students, including placement at clinical sites, coordination of evaluation, supervising and maintaining telephone communication with clinical faculty and students, visiting affiliates, problem solving
- Provide information and applications for national certification exams
- Coordinate development, administration, evaluation, and updating of "mock" certification exams
- Advise and counsel students
- Order and maintain supplies and equipment for courses taught
- Assist in development and updating of on campus and clinical course objectives
- Assist program director in locating and establishing clinical sites, graduate placement and follow-up; preparation of self study documents; evaluation of students for entry into professional phase of MT program; planning and holding Clinical Adjunct Instructor meetings; maintaining quality of CLS programs
- Assist in curriculum and course development
- Assist in grant development

College and University Committees:

Ferris State College Educational Planning Committee, 1980-84
Ferris State College Ophthalmic Dispensing Program Review Committee, 1983
Ferris State College Health Services Management Program Review Committee, 1984
School of Allied Health Dean's Search Committee, 1985
College of Allied Health Sciences Curriculum Committee, 1987-90, 1995- (chair, 1995-6)
College of Allied Health Sciences Task Force on Clerical Staff Reorganization, 1991
College of Allied Health Sciences Task Force on Administrative Restructuring, 1992
College of Allied Health Sciences Tenure Committee, 1990-3; Chair, 1992-3
College of Allied Health Sciences Faculty Development Committee, 1991-4
College of Allied Health Sciences Planning Committee, 1995-
Ferris State University Sabbatical Leave Committee, 1994
Ferris State University Student Health Advisory Committee, 1990-3
College of Allied Health Sciences Recruitment- Retention Committee, 1992- 1995
Ferris State University Human Subjects Review Committee, 1992- 1995
Chair, Candidate's Tenure Committee, Ms. Lori Seiler, 1993- present
Chair, Candidate's Tenure Committee, Mr. Mark Kellogg, 1993- present
Candidate's Tenure Committee, Mr. Dan deRegnier, 1995-

Professional Society Memberships:

American Society for Medical Technology, 1979-1985; American Society for Clinical Laboratory Science, 1995- present
American Association of Blood Banks, 1979- present
Ferris Professional Women, 1981- present; Treasurer, 1985-6
Clinical Laboratory Management Association, 1985- present
American Society of Clinical Pathologists, Associate Member, 1994- present
Michigan Association of Blood Banks, 1979- present
CLMA, Michigan Chapter, 1988- present
Central Michigan Association of Medical Technologists, 1978-9; 1993- present

Professional Society Committees:

CLMA Education Committee, 1985-88

Other Professional Activities:

Evaluation of NCAMLP MLT Examination Questions, 1979
Michigan Joint Council for Continuing Education for Medical Laboratory Personnel, 1979-81
NAACLS site surveyor, 1988
Consultant in Blood Banking, Reed City Hospital, Reed City, MI, 1993
Ferris State University Faculty Mentor for three faculty
Volunteer Assistant for MSMT Student Bowl and Student Competitions, 1981, 1983-5, 1994-5
Participant, People to People Citizen Ambassador Program, Tour of Blood Banks in St. Petersburg, Russia; Warsaw, Poland; and Budapest, Hungary, 1994

Continuing Education Programs Attended:

Hyland Coagulation Workshop, 1973
Behring Diagnostics Immunology Workshop, 1977
Helena Electrophoresis Workshop, 1978
Michigan Association of Blood Banks Workshops, 1978 and 1979
Michigan Association of Blood Banks Annual Meeting, 1978-82, 1985
Current Topics in Immunohematology, 1979
AABB Workshop: Competency Evaluation of Blood Bank Personnel, 1980
AABB Annual Meetings, 1980-81
AABB Workshop: Pretransfusion Testing for the '80s, 1980
AABB Workshop: Therapeutic Hemapheresis, 1981
AABB Workshop: Women in Management, 1981
MSMT Workshop: Cost Analysis in Clinical Education, 1983
AACC Annual Meeting, 1983
AACC Workshop: Case Studies in Clinical Chemistry, 1983
AACC Workshop: Procedural Evaluation, 1983
Ferris State College: Computers in Education, 1984
Clinical Laboratory Management Association Regional Meeting, 1985
ASCP Workshop: Using Statistics in the Clinical Laboratory, 1985
ASCP Workshop: Common and Uncommon Problems in Hematology, 1985
Clinical Laboratory Management Association Annual Meetings, 1985, 1988
CLMA Workshop: Laboratory Management in Transition, 1985
CLMA seminar: Growth, Quality, Communication in Today's laboratory, 1990
CLMA Regional Meeting, 1992
AABB Teleconference: Changes in the AABB Standards, 1993
Ann Arbor Seminars: Current Topics in Blood Banking, 1979, 1984, 1986, 1988-90, 1992-3
Michigan Society of Medical Technology Annual Meetings, 1980-1, 1983-5, 1993-5
Central Michigan Association of Medical Technologists Meetings, 1993-4
ASCP Workshop: Statistics, Quality Control, and CLIA 88, 1994
ASCP Workshop: Competency Testing, 1994
ASCP Workshop: Total Quality Management Program for the Lab, 1994
NAACLS Workshop: Site Visitor Training Workshop, 1994
Conflict Management Skills for Women, 1995
Coaching and Teambuilding Skills, 1995
JCAHO Accreditation Standards for Laboratories, 1995

Continuing Education Presentations:

Workshop: Recognition and Management of Problems in Pre transfusion Testing:

- Ferris State College, 1979
- Muskegon Community College, 1980
- Michigan Department of Public Health, 1981

"Applications of Chemistry in the Clinical Laboratory": Super Saturday for 8th graders, 1982

Rotary Club of Big Rapids: "Current Developments in Medical Technology," 1988

Workshop: Transfusion Reactions, Ferris State University, 1989

Poster Session: "The Key to Student Retention: Early Intervention," Association of Schools of Allied Health Professions, 1993

Case Study: "Just Another Night in the Blood Bank," FSU/ Michigan State University Distance Learning Program, 1994

Workshop: Coaching and Team Building Skills, 1995 (coordinator)

ADMINISTRATIVE PROGRAM REVIEW

rogram/Department: Medical Laboratory Technology/Clinical Lab Sciences

ate Submitted: December 4, 1995 **Dean:** Isabel J. Barnes

lease provide the following information:

nrollment/Personnel

	Fall 1991	Fall 1992	Fall 1993	Fall 1994	Fall 1995
enure Track FTE (a)	4	4	3	3	4
verload/Supplemental FTEF (a)	2.5	2.8	1.0	0.90	N/A
djunct/Clinical FTEF (unpaid) (a)	100	100	100	100	100
nrollment on-campus total*	17	12	14	25	28
Freshman			2	6	7
Sophomore			6	7	9
Junior			3	7	7
Senior			3	5	5
Pre-MLT			12	12	9
Doctorial					
Enrollment off-campus*	0	0	0	0	0

Use official count (7-day count for semesters, 5-day count for quarters).
a) Same personnel teach in Medical Technology Program. No separate faculty for MLT.

inancial

xpenditures* (b)	FY91	FY92	FY93	FY94	FY95
Supply & Expense		$41,032	$43,604	$42,303	$40,405
Equipment		158			
Gifts & Grants		33,444	589	54,291	146,408

Use end of fiscal year expenditures.
b) Budget shared with Medical Technology. No separate budget for MLT.

)ther

	AY 90-91	AY 91-92	AY 92-93	AY93-94	AY 94-95
Number of Graduates * - Total	6	14	6	5	7
- On campus	6	14	6	5	7
- Off campus	0	0	0	0	0
lacement of Graduates	100%	92%	66%	83%	N/A
verage Salary	$18,000	$19,500	$21,000	$22,500	N/A
roductivity - Academic Year Average	367	171	211	290	334
- Summer	95	396	76	0	403
ummer Enrollment	18	4	7	N/A	N/A

Use total for academic year (F,W, S)

1. a. Areas of strengths:

- Good placement.
- Retention activities.
- Faculty.
- Superior on-campus laboratory experience including Sim-lab (simulated clinical lab) and lab computer network.
- Externally accredited.
- Strong clinical affiliates.
- Advisory committee.
- Use of internet by students.
- Enrollment is increasing.
- Semester conversion has led to an increase in productivity.
- Good financial management.
- Appropriate equipment provided by Voc-Ed funds and donations.
- Provides an opportunity to ladder from 2-year degree to 4-year degree.

1. b. Areas of concern:

- Lack of on-going funding for equipment updating.
- Rapidly increasing costs for medical supplies needed to teach.

2. Future goals (please give time frame):

- Implement cooperative MLT degree by FY97.
- Increase number and ethnic diversity of graduates by 15% by the year 2000.
- 90% of graduates will pass certifying examinations.
- 90% of graduates will find employment in their field or enroll for further education.

3. Recommendations:

- Continue recruiting activities to maintain enrollment at the current level.
- Explore the need for multi-skilled/multi-competent practitioners.

ADMINISTRATIVE PROGRAM REVIEW

rogram/Department: Medical Technology/Clinical Lab Sciences

ate Submitted: December 4, 1995 **Dean:** Isabel J. Barnes

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nrollment/Personnel

	Fall 1991	Fall 1992	Fall 1993	Fall 1994	Fall 1995
:nure Track FTE (a)	4	4	3	3	3
verload/Supplemental FTEF (a)	1.5	1.8	1	0.90	N/A
djunct/Clinical FTEF (unpaid) (a)	100	100	100	100	100
nrollment on-campus total*	54	51	52	73	70
Freshman			7	22	13
Sophomore			8	5	14
Junior			15	13	7
Senior			22	33	36
Pre-MT			9	9	10
Doctorial					
nrollment off-campus*	0	0	0	0	0

Jse official count (7-day count for semesters, 5-day count for quarters).
) Same personnel teach in Medical Laboratory Technology program. No separate faculty for MT.

inancial

xpenditures* (b)	FY91	FY92	FY93	FY94	FY95
Supply & Expense		$41,032	$43,604	$42,303	$40,405
Equipment		158			
ifts & Grants		33,444	589	54,291	146,4088

*Use end of fiscal year expenditures.
) Budget shared with Medical Laboratory Technology. No separate budget for MT.

)ther

	AY 90-91	AY 91-92	AY 92-93	AY93-94	AY 94-95
umber of Graduates * - Total	13	20	16	15	20
- On campus	~~13~~ 14	20	16	15	20
- Off campus	0	0	0	0	0
lacement of Graduates	76%	100%	94%	93%	N/A
verage Salary	$23,000	$24,702	$27,407	$28,502	N/A
roductivity - Academic Year Average	408	416	490	290	334
- Summer	147	230	152	0	403
ummer Enrollment	31	22	29	N/A	N/A

Use total for academic year (F,W, S)

1. a. Areas of strengths:

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- Retention activities.
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- Externally accredited.
- Strong clinical affiliates.
- Advisory committee
- Use of internet by students.
- Enrollment is increasing.
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1. b. Areas of concern:

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3. Recommendations:

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