




UNIVERSITY OF KENTUCKY

**MEMORANDUM**

October 9, 2003

**Associate Provost for  
Undergraduate Education**  
*217 Funkhouser Building  
Lexington, KY 40506-0054  
(859) 257-3027  
Fax: (859) 323-1932  
[www.uky.edu/UGS/](http://www.uky.edu/UGS/)*

**TO:** Rebecca Scott  
Senate Council Office

**FROM:** Retha Higgs   
Undergraduate Council

**SUBJECT:** **Program Change**

The proposed changes in the Undergraduate Clinical Laboratory Sciences Program has been reviewed and approved by the Undergraduate Council.



UNIVERSITY OF KENTUCKY

**Office of the Chancellor**  
*Albert B. Chandler Medical Center*  
*A301 Kentucky Clinic*  
*Lexington, KY 40536-0284*  
*(859) 323-5126*  
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*www.uky.edu*

June 25, 2003

Philip J. Kraemer, Ph.D., Chair  
Undergraduate Council  
217 Funkhouser Bldg.  
CAMPUS 0054

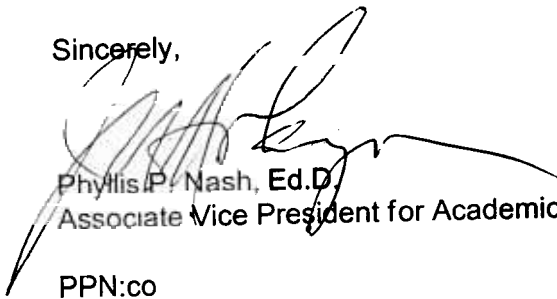
**JUL 14 2003**

Dear Dr. Kraemer:

At its meeting on June 24, 2003, the Academic Council for the Medical Center approved, and recommends approval by the Undergraduate Council, for the proposal from the College of Health Sciences to change the BHS degree program in Clinical Laboratory Sciences.

Thank you for your attention to this matter.

Sincerely,



Phyllis P. Nash, Ed.D.  
Associate Vice President for Academic and Student Affairs

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attachments

c: Thomas C. Robinson, Ph.D.  
Sharon R. Stewart, Ed.D.  
Rebecca Scott  
Jacquie Hager

## MEMORANDUM

TO: Dr. James Holsinger, Jr., Chair  
Academic Council for the Medical Center  
Deans, Department Chairs, and Members of the University Senate

FROM: Sharon R. Stewart, Ed.D., Acting Associate Dean, College of Health Sciences

TOPIC: Proposed for Changes in the Undergraduate Clinical Laboratory Sciences Program

DATE: May 19, 2003

The College of Health Sciences recommends approval of the proposed changes in the Bachelor of Health Sciences (BHS) Degree in Clinical Laboratory Sciences (CLS). The proposed changes have been reviewed by the Clinical Sciences Department Chair, the CHS Academic Affairs Committee, and the Acting Associate Dean for Academic Affairs.

The CLS division offers two tracks for completion of the BHS degree in Clinical Laboratory Sciences. Traditional students are admitted to the program without background in the clinical laboratory. Non-traditional students may be admitted to the program if they hold an associate degree in the clinical laboratory field. Non-traditional students are articulated into the CLS program with credit assigned for prior basic level education in the field of clinical laboratory science. Internet-based, distance learning courses are offered to non-traditional students across the state. The proposed changes most affect the traditional, Lexington campus-based track. The main purpose for the proposed changes is to provide clinical practice in appropriate settings that is guided and reinforced by UK CLS faculty members.

The CLS Division has devised a program that prepares students for clinical practice in the modern, automated laboratory. The program provides sequential instruction in laboratory medicine for the student who is well prepared in science and mathematics. Starting the summer before clinical practice, students complete courses in laboratory techniques and are introduced to the structure and regulatory guidelines of the clinical laboratory. Following the summer courses, students complete short, intense courses in the principles and practices of basic hematology and clinical chemistry. Students then practice in clinical chemistry and hematology laboratories while supported by faculty lectures and demonstrations in advanced topics of these disciplines. Clinical practice is structured to present increasingly complex tasks sequentially.

Following winter break, students complete short, intense courses in the principles and practices of immunohematology and clinical microbiology. After completing lectures that cover basic practice in immunohematology and clinical microbiology, students practice in microbiology and immunohematology laboratories while supported by CLS faculty lectures and demonstrations. At the completion of didactic and skills instruction, students integrate the knowledge that has been gained throughout the professional year by participating in an exploration of critical pathways and evidenced-based decision-making in the clinical laboratory.

Despite the appearance of decreased laboratory practice, students will be exposed to clinical hours of greater quality than a student laboratory may offer. As clinical laboratories become

more automated, students must be exposed to and practice in settings that can offer computerized, automated instrumentation. Such instrumentation is beyond the affordability of the student laboratory setting. Faculty will provide both didactic and practical reinforcement throughout the clinical experience.

### Summary of Proposed Revisions

#### University Studies Requirements for this program (no change)

|                                | Current                                | Proposed                               |
|--------------------------------|--|--|
| English Writing                | Choose from courses listed in bulletin | Choose from courses listed in bulletin |
| Communication                  | Choose from courses listed in bulletin | Choose from courses listed in bulletin |
| Mathematics/Inference          | Choose from courses listed in bulletin | Choose from courses listed in bulletin |
| Foreign Language               | Choose from courses listed in bulletin | Choose from courses listed in bulletin |
| Natural Science                | CHE 105, 107, 115                      | CHE 105, 107, 115                      |
| Social Science                 | Choose from courses listed in bulletin | Choose from courses listed in bulletin |
| Humanities                     | Choose from courses listed in bulletin | Choose from courses listed in bulletin |
| Elective                       | 6 credit hours                         | 6 credit hours                         |
| Non-western cultural component | Choose from course listed in bulletin  | Choose from course listed in bulletin  |

#### Premajor or Pre-professional Course Requirements

| Current  | Proposed  |
|--|---|
| 2 sem General Chemistry with laboratory                                  | 2 sem General Chemistry with laboratory                               |
| 1 sem General Microbiology with laboratory                               | 1 sem General Microbiology with laboratory                            |
| 1 sem of Statistical Methods   | 1 sem Statistical Methods   |
| 1 sem of Human Physiology (or combined course in Anatomy and Physiology) | 1 sem Human Physiology (or combined course in Anatomy and Physiology) |
|  | <i>1 sem Biochemistry</i>   |
|  | <i>1 sem Immunology</i>   |

#### Summary of University Studies and Pre-profession Credit Hours Required

|                                       | Current | Proposed |
|---------------------------------------|---------|----------|
| Required by level: 100                | 30      | 30       |
| Required by level: 200                | 32      | 32       |
| Required by level: 300, 400, 500      | NA      | NA       |
| Pre-professional                      | 20      | 26       |
| Minimum Hours of Electives (Required) | 6       | 15       |
| Total Required for Graduation         | 62      | 77       |

#### Major or Professional Course Requirements

|  | Current | Proposed for the traditional student |
|--|---------|--------------------------------------|
| CLS 822 Biochemistry for Clinical Sciences | 3       | 0 ( <i>Pre-requisite</i> )           |
| CLS 832 Basic Clinical Chemistry           | 5       | 1                                    |
| CLS 833 Basic Hematology                   | 5       | 1                                    |
| CLS 835 Clinical Immunology                | 3       | 0 ( <i>Pre-requisite</i> )           |
| CLS 836 Laboratory Organization*           | 3       | 3                                    |
| CLS 838 Basic Immunohematology             | 5       | 1                                    |

|  |           |           |
|--|-----------|-----------|
| CLS 843 Advanced Hematology*                   | 3         | 3         |
| CLS 844 Advanced Clinical Chemistry*           | 3         | 3         |
| CLS 848 Advanced Immunohematology*             | 3         | 3         |
| CLS 851 Basic Clinical Microbiology            | 5         | 1         |
| CLS 856 Advanced Clinical Microbiology*        | 3         | 3         |
| CLS 860 Blood Collection I                     | 1         | 1         |
| CLS 881 Immunohematology Clinical Practicum*   | 5         | 5         |
| CLS 882 Chemistry Clinical Practicum*          | 5         | 5         |
| CLS 883 Hematology Clinical Practicum*         | 5         | 5         |
| CLS 884 Microbiology Clinical Practicum*       | 5         | 5         |
| CLS 890 Independent Laboratory Investigations* | 3         | 1         |
| CSC 528 Lab Procedures                         | 0         | 2         |
| <b>Total</b>                                   | <b>65</b> | <b>43</b> |

\*Required for Non-Traditional Students

### **Total Hours toward graduation:**

**Current: 127**

**Proposed: 120**

### **Overview of curriculum changes:**

The number of credit hours required for the professional program has been decreased from 65 to 43 credit hours. The change includes:

- Biochemistry (3 credits) and Immunology courses (3 credits) are to be required as pre-requisites. In the current curriculum these courses are part of the professional program. Faculty of the CLS Division will continue to offer these courses to non-traditional students. Traditional students may choose to take these courses through the CLS Division or through other departments.
- Credit hours for CLS 832, CLS 833, CLS 838 and CLS 851, basic level courses in clinical chemistry, hematology, immunohematology, and clinical microbiology, have been decreased. These courses will be offered immediately before students enter their clinical rotation in these disciplines. Opportunities to practice clinical skills will be added to clinical rotations. Clinical rotations, CLS 881, CLS 882, CLS 883 and CLS 884 will each increase by one week. Faculty will provide practical reinforcement during clinical rotation, ensuring that beginning students are given individual attention and are prepared for the demands of the clinical rotation. In order to allow students to attend lecture in the afternoon after clinical rotations, the clinical rotation day will decrease from 8 hours to 7 hours. This change will allow the student greater opportunities to experience clinical work flow. For instance, in microbiology the student will have five more opportunities to participate in morning read-out of bacterial specimens. Although contact hours will increase, credit hours will not increase by university formula:
  - Current: 5 weeks x 5 days x 8 hours = 200 contact hours  
200 contact hours ÷ 40 contact hours per credit hour = 5 credit hours
  - Revised: 6 weeks x 5 days x 7 hours = 210 contact hours  
210 contact hours ÷ 40 contact hours per credit hour = 5.25 = 5 credit hours
- CSC 528, Laboratory Procedures (2 credits), will be required for the traditional student. This course will be offered immediately before students enter clinical rotations. CSC 528 introduces basic laboratory procedures. Currently, the course is offered to in-coming CLS division graduate students who do not have clinical laboratory experience.
- In order to allow students maximum practice time in a clinical setting, requirement for CLS 890, Laboratory Investigations, has been reduced from 3 to 1 credit hour(s) for traditional students. The

requirement for non-traditional students for this course will be reduced from 3 to 2 credit hours. CLS 890 may be taken for a total of 3 credit hours.

- In the current curriculum, the elective courses, CLS 871, CLS 872, CLS 873 and CLS 874, are offered to non-traditional students for review of basic level clinical laboratory knowledge. In the revised curriculum, non-traditional students who wish to review associate degree course content will be advised to register for CLS 832, CLS 833, CLS 838 and CLS 851 with traditional students. CLS 871, 872, 873 and 874 will be dropped as part of the overall revision of the program.

### **Transition**

Students who are currently completing the CLS program will be offered options to complete CLS courses in their current form or to complete revised courses with similar content.

### **Rationale for changes:**

Faculty members of the Clinical Laboratory Sciences division have six primary reasons for proposing changes to the CLS undergraduate program:

1. The proposed changes provide clinical practice in appropriate settings that is guided and reinforced by UK CLS faculty members. In doing so, the curriculum revision more closely aligns the CLS program with the new NAACLS accreditation guidelines through an integrated approach to clinical laboratory decision-making.
2. As clinical laboratories have become more automated, manual laboratory tests that are offered in student laboratories are less appropriate for practice. The cost of automation cannot be borne by academic programs; training using automated equipment is therefore more appropriately practiced in a clinical setting.
3. The program addresses the current shortage for laboratory professionals by increasing the number of students who may matriculate into the program. Admission into the current program has been restricted by the number of pre-professional courses that must be completed by the end of the 2<sup>nd</sup> year at the university. Students must make a decision to prepare to enter the program in their first year at the university. In the revised curriculum, students will have 3 years to complete pre-requisites and may make the decision to prepare for the program later in their undergraduate experience. We anticipate increased use of this major, for that reason.
4. The curricular revision allows more time for students to take electives to explore other disciplines and to prepare for the requirements of graduate programs.
5. The use of CSC 528 to teach laboratory skills to both undergraduate and in-coming graduate students more efficiently uses the resources of the division.
6. The use of CLS 832, 833, 838 and 851 as introductory classes for traditional students and review classes for non-traditional students more efficiently uses the resources of the division.

The proposed changes meet University requirements and professional accreditation guidelines. The proposed changes do not affect other departments or disciplines in the University. If approved, we plan to implement the revised program in summer of 2004.

Please contact Jean Brickell, 7-9222 ext 263 or [jmbric@uky.edu](mailto:jmbric@uky.edu), with questions or comments.

## Memorandum

Date: April 18, 2003

To: Dean Thomas Robinson

From: Doris J. Baker, PhD, Division Director, Clinical Laboratory Sciences  
Jean Brickell, EdD, Undergraduate Coordinator, Clinical Laboratory Sciences

Subject: Revision of the Undergraduate Clinical Laboratory Sciences Program

The members of the faculty of the Clinical Laboratory Sciences (CLS) Division of the Clinical Sciences Department in the College of Health Sciences submit for your review the following proposal to revise the Bachelor of Health Science (BHS) Degree in Clinical Laboratory Sciences. Attachments to the proposal contain admissions requirements, program requirements, curriculum sequence and course change and drop forms. We have also included in this proposal the rationale for the changes and compare the old program with the revised curriculum. No course that is new to the CLS division will be added.

The proposed changes meet University requirements and professional accreditation guidelines. The proposed changes do not affect other departments or disciplines in the University. If approved, we would like to implement the revised program in summer of 2004.

Please contact Jean Brickell, 7-9222 ext 263 or [jmbric@uky.edu](mailto:jmbric@uky.edu), with questions or comments

Thank you for your consideration.

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## **Revision of the Curriculum for the Clinical Laboratory Sciences Undergraduate Program**

The members of the faculty of the Clinical Laboratory Sciences (CLS) Division of the Clinical Sciences Department in the College of Health Sciences have approved and submit for your approval the following proposal to revise the Bachelor of Health Science (BHS) Degree in Clinical Laboratory Sciences. Attachments to the proposal contain admissions requirements, program requirements, curriculum sequence and course change and drop forms. CLS faculty members have also included in this proposal the rationale for the changes and compare the old program with the revised curriculum. No course that is new to the CLS division will be added; however, undergraduate students will now be required to complete a 500 level course that is currently available to incoming CLS graduate students.

The proposed changes meet University requirements and professional accreditation guidelines. The proposed changes do not affect other departments or disciplines in the University. If approved, we would like to implement the revised program in Summer 2004.

The CLS division offers two tracks for completion of the BHS degree in Clinical Laboratory Sciences. Traditional students are admitted to the program without background in the clinical laboratory. Non-traditional students may be admitted to the program if they hold an associate degree in the clinical laboratory field. Non-traditional students are articulated into the CLS program with credit assigned for prior basic level education in the field of clinical laboratory science. Internet-based, distance learning courses are offered to non-traditional students across the state. The proposed changes most affect the traditional, Lexington campus-based track. The main purpose for the proposed changes is to provide clinical practice in appropriate settings that is guided and reinforced by UK CLS faculty members.

### **Conceptual Basis of the Revised Program:**

Faculty members of the division of Clinical Laboratory Sciences wish to change the CLS program focus to best prepare the student for clinical practice in the modern, automated laboratory. The proposed program encompasses the 4<sup>th</sup> year of study at the University of Kentucky. It provides sequential instruction in laboratory medicine for the student who has been well prepared in science and mathematics during the first 3 years of study at the university.

Starting the summer before the 4<sup>th</sup> year, students are introduced to the structure and regulatory guidelines of the clinical laboratory. During the summer session, students practice basic level clinical laboratory techniques in student laboratories. Following summer courses, students complete short, intense courses in the principles and practices of basic hematology and clinical chemistry. Students then practice in clinical chemistry and hematology laboratories while supported by faculty lectures and

demonstrations in advanced topics of these disciplines. Clinical practice is structured to present increasingly complex tasks sequentially.

Following winter break, students complete short, intense courses in the principles and practices of immunohematology and clinical microbiology. After completing lectures which cover basic practice in immunohematology and clinical microbiology, students practice in microbiology and immunohematology laboratories while supported by CLS faculty lectures and demonstrations. At the completion of didactic and skills instruction, students integrate the knowledge that has been gained throughout the professional year by participating in an exploration of critical pathways and evidenced-based decision-making in the clinical laboratory.

Despite the appearance of decreased laboratory practice, students will be exposed to clinical hours of greater quality than a student laboratory may offer. As clinical laboratories become more automated, students must be exposed to and practice in settings which can offer computerized, automated instrumentation. Such instrumentation is beyond the affordability of the student laboratory setting. Faculty will provide both didactic and practical reinforcement throughout the clinical experience.

### **Transition**

Students who are currently completing the CLS program will be offered options to complete CLS courses in their current form or to complete revised courses with similar content.

### **Rationale for changes:**

Faculty members of the Clinical Laboratory Sciences division have six primary reasons for proposing changes to the CLS undergraduate program:

1. The proposed changes provide clinical practice in appropriate settings that is guided and reinforced by UK CLS faculty members. In doing so, the curriculum revision more closely aligns the CLS program with the new NAACLS accreditation guidelines through an integrated approach to clinical laboratory decision-making by integrating the clinical experiences (CLS 881, 882, 883 and 884) with didactic courses in these disciplines (CLS 843, 844, 848 and 856).
2. As clinical laboratories have become more automated, manual laboratory tests that are offered in student laboratories are less appropriate for practice. The cost of automation can not be borne by academic programs; training using automated equipment is therefore more appropriately practiced in a clinical setting.
3. The program addresses the current shortage for laboratory professionals by increasing the number of students who may matriculate into the program. Admission into the current program has been restricted by the number of pre-professional courses that must be completed by the end of the 2<sup>nd</sup> year at the university. Students must make a decision to prepare to enter the program in their first year at the university. In the revised curriculum, students will have 3 years to complete pre-requisites and may

make the decision to prepare for the program later in their undergraduate experience. We anticipate increased use of this major, for that reason.

4. The curricular revision allows more time for students to take electives to explore other disciplines and to prepare for the requirements of graduate programs.
5. The use of CSC 528 to teach laboratory skills to both undergraduate and in-coming graduate students more efficiently uses the resources of the division.
6. The use of CLS 832, 833, 838 and 851 as introductory classes for traditional students and review classes for non-traditional students more efficiently uses the resources of the division.

**UNIVERSITY OF KENTUCKY  
REQUEST FOR CHANGE IN UNDERGRADUATE PROGRAM**

Program: Clinical Laboratory Sciences (CLS)  
 Department: Clinical Sciences  
 College: Health Sciences  
 Degree title: Bachelor of Health Science  
 Bulletin PP 79  
 CIP Code: Med Technology 51.1005  
 Accrediting Agency: National Accrediting Agency for Clinical Laboratory Science (NAACLS)

**I. PROPOSED CHANGES IN PROGRAM REQUIREMENTS**

1. University Studies Requirements for this program

|                                | <b>Current</b>                         | <b>Proposed</b> |
|--------------------------------|--|-----------------|
| English Writing                | Choose from courses listed in bulletin | No change       |
| Communication                  | Choose from courses listed in bulletin | No change       |
| Mathematics/Inference          | Choose from courses listed in bulletin | No change       |
| Foreign Language               | Choose from courses listed in bulletin | No change       |
| Natural Science                | CHE 105, 107, 115                      | No change       |
| Social Science                 | Choose from courses listed in bulletin | No change       |
| Humanities                     | Choose from courses listed in bulletin | No change       |
| Elective                       | 6 credit hours                         | No change       |
| Non-western cultural component | Choose from course listed in bulletin  | No change       |

2. College Depth and Breadth of Study Requirements: Not applicable

3. Premajor or Preprofessional Course Requirements

| <b>Current</b>   | <b>Proposed</b>    |
|--|--------------------|
| 2 sem General Chemistry with laboratory                                  | No change          |
| 1 sem General Microbiology with laboratory                               | No change          |
| 1 sem of Statistical Methods   | No change          |
| 1 sem of Human Physiology (or combined course in Anatomy and Physiology) | No change          |
|  | 1 sem Biochemistry |
|  | 1 sem Immunology   |

4. Summary of University Studies and Pre-profession Credit Hours Required

|                                  | <b>Current</b> | <b>Proposed</b> |
|----------------------------------|----------------|-----------------|
| a. Total required for graduation | 62             | 77              |
| b. Required by level:            |                |                 |
| 100                              | 30             | 30              |
| 200                              | 32             | 32              |
| 300, 400, 500                    | NA             | NA              |

|   |    |    |
|---|----|----|
| c. Pre-professional   | 20 | 26 |
| d. Field of concentration                                   | NA | NA |
| e. Division hours between major subject and related field   | NA | NA |
| f. Hours needed for particular option or specialization     | NA | NA |
| g. Technical or professional support electives              | NA | NA |
| h. Minimum hours of free or supportive electives (required) | 6  | 15 |

### 5. Major or Professional Course Requirements

|  | Current   | Proposed for the traditional student |
|--|-----------|--------------------------------------|
| CLS 822 Biochemistry for Clinical Sciences     | 3         | 0 (Pre-requisite)                    |
| CLS 832 Basic Clinical Chemistry               | 5         | 1                                    |
| CLS 833 Basic Hematology                       | 5         | 1                                    |
| CLS 835 Clinical Immunology                    | 3         | 0 (Pre-requisite)                    |
| CLS 836 Laboratory Organization*               | 3         | 3                                    |
| CLS 838 Basic Immunohematology                 | 5         | 1                                    |
| CLS 843 Advanced Hematology*                   | 3         | 3                                    |
| CLS 844 Advanced Clinical Chemistry*           | 3         | 3                                    |
| CLS 848 Advanced Immunohematology*             | 3         | 3                                    |
| CLS 851 Basic Clinical Microbiology            | 5         | 1                                    |
| CLS 856 Advanced Clinical Microbiology*        | 3         | 3                                    |
| CLS 860 Blood Collection I                     | 1         | 1                                    |
| CLS 881 Immunohematology Clinical Practicum*   | 5         | 5                                    |
| CLS 882 Chemistry Clinical Practicum*          | 5         | 5                                    |
| CLS 883 Hematology Clinical Practicum*         | 5         | 5                                    |
| CLS 884 Microbiology Clinical Practicum*       | 5         | 5                                    |
| CLS 890 Independent Laboratory Investigations* | 3         | 1                                    |
| CSC 528 Lab Procedures                         | 0         | 2                                    |
| <b>Total</b>                                   | <b>65</b> | <b>43</b>                            |

\*Required for Non-Traditional Students

Total Hours toward graduation: Current: 127 Proposed: 120

6. Minor Requirements: Not applicable

7. Rationale for Change: See introduction

8. Typical Semester by Semester Program for a Major: See Appendix E

Will this program be printed in the bulletin: Yes

## Overview of Curriculum Changes

The number of credit hours required for the professional program has been decreased from 65 to 43 credit hours. The change includes:

- Biochemistry (3 credits) and Immunology courses (3 credits) are to be required as pre-requisites. In the current curriculum these courses are part of the professional program. Faculty of the CLS Division will continue to offer these courses to non-traditional students. Traditional students may choose to take these courses through the CLS Division or through other departments.
- Credit hours for CLS 832, CLS 833, CLS 838 and CLS 851, basic level courses in clinical chemistry, hematology, immunohematology, and clinical microbiology, have been decreased. These courses will be offered immediately before students enter their clinical rotation in these disciplines. Opportunities to practice clinical skills will be added to clinical rotations. Clinical rotations, CLS 881, CLS 882, CLS 883 and CLS 884 will each increase by one week. Faculty will provide practical reinforcement during clinical rotation, ensuring that beginning students are given individual attention and are prepared for the demands of the clinical rotation. In order to allow students to attend lecture in the afternoon after clinical rotations, the clinical rotation day will decrease from 8 hours to 7 hours. This change will allow the student greater opportunities to experience clinical work flow. For instance, in microbiology the student will have five more opportunities to participate in morning read-out of bacterial specimens. Although contact hours will increase, credit hours will not increase by university formula:
  - Current: 5 weeks x 5 days x 8 hours = 200 contact hours  
200 contact hours ÷ 40 contact hours per credit hour = 5 credit hours
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- CSC 528, Laboratory Procedures (2 credits), will be required for the traditional student. This course will be offered immediately before students enter clinical rotations. CSC 528 introduces basic laboratory procedures. Currently, the course is offered to in-coming CLS division graduate students who do not have clinical laboratory experience.
- In order to allow students maximum practice time in a clinical setting, requirement for CLS 890, Laboratory Investigations, has been reduced from 3 to 1 credit hour(s) for traditional students. The requirement for non-traditional students for this course will be reduced from 3 to 2 credit hours. CLS 890 may be taken for a total of 3 credit hours.
- In the current curriculum, the elective courses, CLS 871, CLS 872, CLS 873 and CLS 874, are offered to non-traditional students for review of basic level clinical laboratory knowledge. In the revised curriculum, non-traditional students who wish to review associate degree course content will be advised to register for CLS 832, CLS 833, CLS 838 and CLS 851 with traditional students. CLS 871, 872, 873 and 874 will be dropped as part of the overall revision of the program.

**Summary:**

In summary, faculty members of the CLS division believe that the advantages in the proposed program are that it:

- Provides a more integrated experience in clinical and didactic instruction
- Supports the current needs of the Commonwealth for additional trained health care professionals
- Increases options for competency-based demonstrations of skills and knowledge as alternatives to formal classes
- Makes the program more attractive to those students who are preparing for graduate study
- More effectively uses the resources of the division
- Allows a later decision/commitment to their major in the student's undergraduate academic career
- Assures the graduating student a much higher degree of professional competence with modern automated bioassays

## Attachment A

### **GOALS AND COMPETENCIES: THE UNIVERSITY OF KENTUCKY CLINICAL LABORATORY SCIENCES GRADUATE**

The goal of the CLS program is to produce graduates who

**Meet or exceed the minimum standards for knowledge and proficiency for entry-level CLS practice in typical clinical laboratory settings.**

The graduate should be able to

- Perform basic generalist technical skills and work in any clinical laboratory following new-employee training
- Follow proper procedures for specimen handling, test analysis, reporting and maintaining test results
- Establish appropriate quality control programs under supervision
- Describe and discuss the principles, uses, advantages and disadvantages of new technologies.
- Correlate test results with results from related tests, pathophysiology and clinical relevance for purposes of interpretation and quality control

**Are able to recognize technical problems, and to evaluate questions or technical problems in a systematic way so as to be able to form hypotheses, collect relevant data, analyze data and propose answers, solutions or other corrective action.**

The graduate should be able to

- Select test methodology appropriately.
- Verify test performance
- Resolve technical problems and perform corrective actions
- Utilize critical thinking and develop professional judgment to apply to the whole practice

**Have communication and management skills that meet the demands of entry level practice.**

The graduate should be able to

- Interact with co-workers and others outside of the laboratory in an effective manner including using group dynamic skills and facilitation skills to be an effective member of a health care team
- Consult with laboratory clients on quality of laboratory test results and their interpretation according to institutional policies
- Clearly communicate results of testing and/or research in both written and oral formats
- Describe major federal, state and local regulations in areas of laboratory safety (E.g., OSHA regulations)



- Be knowledgeable about the existence of federal, state, and local regulations that impact on the laboratory (e.g. CLIA '88) as well as the regulatory bodies, accrediting agencies and bodies that generate standards of performance for clinical laboratories (e.g., CAP, JCAHO, NCCLS, NAACLS); and know where to look for information about these entities
- Perform basic management activities (e.g. quality assurance)
- Participate in quality management activities (e.g. quality assurance)
- Be knowledgeable about unique problems, opportunities and multiple skill requirements related to physician office laboratories and point-of-care testing
- Utilize computers effectively
- Possess keyboard skills, use word processor, spreadsheet and presentation software effectively; and be able to search and retrieve information or data from the Internet
- Utilize computers for test data input, validation and reporting
- Diagram an information network system within a health care setting and define unique terminology related to laboratory information systems and networks

### **Adapt to different health care settings.**

The graduate should be able to

- Acquire additional skills as required by employer
- Continue learning through self-directed and collaborative activities
- Utilize CLS skills and knowledge in a creative way by exploring potential career opportunities in health care other than the clinical laboratory (e.g., physician office laboratory consulting, site surveyor, veterinarian laboratories, sales, etc.)

### **Demonstrate professional behavior/ethics.**

The graduate should be able to

- Demonstrate behaviors that are consistent with current program and university policies on professional behavior
- Participate in professional meetings and organizations
- Use the administrative system appropriately for the resolution of problems

### **Demonstrate fundamental research skills.**

The graduate should be able to

- Search professional literature for a specific topic
- Critically analyze literature
- Design simple research studies

## Attachment B

### Proposed and Current Admissions Requirements

#### Pre-Professional Course Requirements

| Current  | Proposed  |
|--|---|
| 2 sem General Chemistry with laboratory                                  | 2 sem General Chemistry with laboratory                               |
| 1 sem General Microbiology with laboratory                               | 1 sem General Microbiology with laboratory                            |
| 1 sem of Statistical Methods   | 1 sem Statistical Methods   |
| 1 sem of Human Physiology (or combined course in Anatomy and Physiology) | 1 sem Human Physiology (or combined course in Anatomy and Physiology) |
|  | 1 sem <i>Biochemistry</i>   |
|  | 1 sem <i>Immunology</i>   |

#### Admission Criteria:

Admission into the CLS program is the same for both traditional and non-traditional applicants. Admission to the CLS professional program is based on:

- Minimum cumulative grade-point average of 2.75 for all courses that are taken at institutions of higher education,
- Completion of pre-professional course requirements.
- Personal interview scores and
- Three letters of recommendations.

Interviews focus on identifying the applicant's strengths, commitment to and knowledge of the profession.

In the current curriculum structure, traditional students are admitted into the professional program in the fall of their 3<sup>rd</sup> year at the university. In the revised curriculum, traditional students will be admitted into the program in the summer following their 3<sup>rd</sup> year at the university. Non-traditional applicants are considered for admission into the professional program for either fall or spring semester.

In the current curriculum, biochemistry and immunology are part of the professional program. Faculty of CLS division will continue to offer these courses to non-traditional students. Traditional students may choose to take these courses through the CLS division or through other departments.

Pre-professional Requirements of the revised curriculum:

- o Completion of University Studies Program requirements
  - o Completion of CLS pre-requisites
    - § Two semesters general chemistry with laboratory
    - § One semester quantitative statistics
    - § One semester general microbiology with laboratory
    - § One semester human anatomy/physiology
    - § One semester biochemistry
    - § One semester immunology, that includes discussion of molecular techniques
- Organic chemistry, genetics and molecular biology are highly recommended.

## Attachment C

### Proposed and Current Program Requirements

#### Professional Course Requirements

|  | Current   | Proposed          |
|--|-----------|-------------------|
| CLS 822 Biochemistry for Clinical Sciences     | 3         | 0 (Pre-requisite) |
| CLS 832 Basic Clinical Chemistry               | 5         | 1                 |
| CLS 833 Basic Hematology                       | 5         | 1                 |
| CLS 835 Clinical Immunology                    | 3         | 0 (Pre-requisite) |
| CLS 836 Laboratory Organization                | 3         | 3                 |
| CLS 838 Basic Immunohematology                 | 5         | 1                 |
| CLS 843 Advanced Hematology*                   | 3         | 3                 |
| CLS 844 Advanced Clinical Chemistry*           | 3         | 3                 |
| CLS 848 Advanced Immunohematology*             | 3         | 3                 |
| CLS 851 Basic Clinical Microbiology            | 5         | 1                 |
| CLS 856 Advanced Clinical Microbiology*        | 3         | 3                 |
| CLS 860 Blood Collection I                     | 1         | 1                 |
| CLS 881 Immunohematology Clinical Practicum*   | 1-5       | 1-5               |
| CLS 882 Chemistry Clinical Practicum*          | 1-5       | 1-5               |
| CLS 883 Hematology Clinical Practicum*         | 1-5       | 1-5               |
| CLS 884 Microbiology Clinical Practicum*       | 1-5       | 1-5               |
| CLS 890 Independent Laboratory Investigations* | 3         | 1-2               |
| CSC 528 Lab Procedures                         | 0         | 2                 |
| <b>Total</b>                                   | <b>65</b> | <b>43</b>         |

\*Required for Non-Traditional Students

The proposed program requires a minimum of 43 credit hours of professional coursework, either through UK CLS courses or through a combination of Clinical Laboratory Technician community college courses and UK CLS courses. The program meets all requirements of the accrediting agency, National Accrediting Agency for Clinical Laboratory Science (NAACLS). Courses are offered sequentially so that students build upon cognitive, psychomotor and affective knowledge and skills.

Professional course requirements for the traditional student include:

- o Basic level CLS courses:
  - § CLS 832, Basic Clinical Chemistry and Instrumentation
  - § CLS 833, Basic Clinical Hematology and Body Fluid Analysis
  - § CLS 838, Basic Immunohematology
  - § CLS 851, Basic Clinical Microbiology
  - § CLS 860, Blood Collection
  - § CSC 528, Laboratory Techniques
- o Advanced CLS level courses
  - § CLS, 836, Laboratory Organization
  - § CLS 843, Advanced Clinical Hematology
  - § CLS 844, Advanced Clinical Chemistry
  - § CLS 856, Advanced Clinical Microbiology

- § CLS 848, Advanced Immunohematology
- § CLS 890, Laboratory Investigation (1 credit hour didactic requirement)
- § CLS 881, 882, 883, 884, Advanced Clinical Laboratory Practice in Hematology, Clinical Chemistry, Immunohematology and Clinical Microbiology

Professional course requirements for the non-traditional student include:

- o Graduation from a NAACLS accredited Associate's Degree CLT program, or equivalent
- o Advanced level courses in the UK CLS program
  - § CLS 836, Laboratory Organization
  - § CLS 843, Advanced Clinical Hematology
  - § CLS 844, Advanced Clinical Chemistry
  - § CLS 856, Advanced Clinical Microbiology
  - § CLS 848, Advanced Immunohematology
  - § CLS 890, Laboratory Investigation (2 credit hours didactic and skills practice requirement)
  - § CLS 881, 882, 883, 884, Advanced Clinical Laboratory Practice in Hematology, Clinical Chemistry, Immunohematology and Clinical Microbiology. Clinical Laboratory Technicians may be eligible for exemption from some clinical rotation objectives for CLS 881, 882, 883 and 884. One of the following requirements must be met for exemption:
    - Documentation of completion of the objectives at an school for Clinical Laboratory Technicians that is accredited by NAACLS
    - Documentation of completion of the objectives through work experience. Documentation from supervisor or employer is required. Credit for completion of objectives will be granted pending an experiential learning review by the UK CLS program.

**Attachment D**

**Proposed and Current Course Sequence: Traditional Student**

## CLS Undergraduate Program

### Semester-by-Semester Program: First and Second Pre-Professional Years

| Current                                |                                      |           | Revision                               |                              |        |
|--|--------------------------------------|-----------|--|------------------------------|--------|
| Semester                               | Course                               | Credit    | Semester                               | Course                       | Credit |
| 1 <sup>st</sup> sem 1 <sup>st</sup> Yr | Writing requirement I                | 3         | 1 <sup>st</sup> sem 1 <sup>st</sup> Yr | ENG 101                      | 3      |
|  | Humanities                           | 3         |  | Communications requirement   | 3      |
|  | Math requirement                     | 3         |  | CHE 105                      | 3      |
|  | Elective                             | 3         |  | Elective                     | 3      |
|  | Communications requirement           | 3         |  | <b>Sub-total</b>             | 12     |
|  | <b>Sub-total</b>                     | <b>15</b> |  |                              |        |
| 2 <sup>nd</sup> sem 1 <sup>st</sup> Yr | Writing requirement II               | 3         | 2 <sup>nd</sup> sem, 1stYr             | ENG 102                      | 3      |
|  | Humanities requirement               | 3         |  | CHE 107                      | 3      |
|  | Cross-cultural requirement           | 3         |  | CHE 115                      | 3      |
|  | Inference requirement                | 3         |  | Elective                     | 3      |
|  | Soc Sci requirement                  | 3         |  | <b>Sub-total</b>             | 12     |
|  | <b>Sub-total</b>                     | <b>15</b> |  |                              |        |
| 1 <sup>st</sup> sem 2 <sup>nd</sup> Yr | Anatomy/Physiology                   | 3         | 1 <sup>st</sup> sem 2 <sup>nd</sup> Yr | Foreign Language requirement | 3      |
|  | STA 291                              | 3         |  | Social Science requirement   | 3      |
|  | CHE 105                              | 3         |  | MA 109                       | 3      |
|  | Foreign Lang req or elective         | 3         |  | Elective*                    | 3      |
|  | Soc Sci requirement                  | 3         |  | Sub-total                    | 12     |
|  | <b>Sub-total</b>                     | <b>15</b> |  |                              |        |
| 2 <sup>nd</sup> sem 2 <sup>nd</sup> Yr | BIO 208 Prin of Micro                | 3         | 2 <sup>nd</sup> sem 2 <sup>nd</sup> Yr | Foreign Language requirement | 3      |
|  | BIO 209 Micro Lab                    | 2         |  | Social Science requirement   | 3      |
|  | CHE 107                              | 3         |  | Inference Requirement        | 3      |
|  | CHE 115                              | 3         |  | Cross-Cultural Requirement   | 3      |
|  | Foreign Lang requirement or elective | 3         |  | Sub-total                    | 12     |
|  | <b>Elective</b>                      | <b>3</b>  |  |                              |        |
|  | <b>Sub-total</b>                     | <b>17</b> |  |                              |        |

Current Total: 62 credit hours

Revision Total 48 credit hours

\* CHE 236 is recommended if the student intends to complete the biochemistry requirement with NFS 311.

**Semester-by-Semester Program: Third Pre-Professional Year**

| <b>Current</b>                              |                                      |                  | <b>Revision</b>                              |   |                 |
|---|--------------------------------------|------------------|--|---|-----------------|
| <b>Semester</b>                             | <b>Course</b>                        | <b>Credit</b>    | <b>Semester</b>                              | <b>Course</b>                               | <b>Credit</b>   |
| <b>1<sup>st</sup> sem 3<sup>rd</sup> Yr</b> | CLS 822, Biochemistry                | 3                | <b>1<sup>st</sup> sem, 3<sup>rd</sup> Yr</b> | BIO 208 Gen Micro                           | 3               |
|   | CLS 835, Immunology                  | 3                |  | BIO 209 Gen Micro Lab                       | 2               |
|   | CLS 832, Basic Clinical Chemistry    | 5                |  | Biochemistry (CLS 822 web-based or NFS 311) | 3               |
|   | CLS 838, Basic Immunohematology      | 5                |  | Humanities requirement                      | 3               |
|   |                                      |                  |  | Elective                                    | 3               |
|   | <b>Sub-total</b>                     | <b>16</b>        |  | <b>Sub-total</b>                            | <b>14</b>       |
| <b>2<sup>nd</sup> sem 3<sup>rd</sup> Yr</b> | CLS 833, Basic Hematology            | 5                | <b>2<sup>nd</sup> sem, 3<sup>rd</sup> Yr</b> | ANA 209 Anatomy                             | 3               |
|   | CLS 836, Lab Organization            | 3                |  | Statistics                                  | 3               |
|   | CLS 851, Basic Clinical Microbiology | 5                |  | Immunology (CLS 835 web-based or other)     | 3               |
|   | CLS 860, Phlebotomy*                 | 1                |  | Humanities requirement                      | 3               |
|   |                                      | <b>Sub-total</b> |  | <b>14</b>                                   | <b>Elective</b> |
|   |                                      |                  |  | Sub-total                                   | 15              |

Current Total: 30 credit hours

Revision Total 29 credit hours

**Semester-by-Semester Program: Fourth (Professional) Year**

| Current                                     |   |           | Revision                                     |   |           |
|---|---|-----------|--|---|-----------|
| Semester                                    | Course                                  | Credit    | Semester                                     | Course                                      | Credit    |
| <b>Summer, 3-4 Yr</b>                       |   |           |  | CLS 836, Lab Organization                   | 2         |
|   |   |           |  | CLS 860, Phlebotomy                         | 1         |
|   |   |           |  | CSC 528, Lab Procedures                     | 2         |
|   |   |           |  | Sub-total                                   | 5         |
|   |   |           |  |   |           |
| <b>1<sup>st</sup> sem 4<sup>th</sup> Yr</b> | CLS 843, Advanced Hematology            | 3         | <b>1<sup>st</sup> sem, 4<sup>th</sup> Yr</b> | CLS 832, Basic Clinical Chemistry           | 1         |
|   | CLS 856, Advanced Clinical Microbiology | 3         |  | CLS 833, Basic Hematology                   | 1         |
|   |   |           |  | CLS 836, Lab Organization                   | 1         |
|   | CLS 881,882,883 or 884                  | 10        |  | CLS 843, Advanced Hematology                | 3         |
|   | <b>Sub-total</b>                        | <b>16</b> |  | <b>CLS 844, Advanced Clinical Chemistry</b> | <b>3</b>  |
|   |   |           |  | CLS 882, Clinical Chemistry Practicum       | <b>5</b>  |
|   |   |           |  | CLS 883, Hematology Practicum               | 5         |
|   |   |           |  | <b>Sub-total</b>                            | <b>19</b> |
|   |   |           |  |   |           |
|   |   |           | <b>2<sup>nd</sup> sem 4<sup>th</sup> Yr</b>  | CLS 838, Basic Immunohematology             | 1         |
| <b>2<sup>nd</sup> sem 4<sup>th</sup> Yr</b> | CLS 844, Advanced Clinical Chemistry    | 3         |  | CLS 851, Basic Clinical Microbiology        | 1         |
|   | CLS 848, Advanced Immunohematology      | 3         |  | CLS 856, Clinical Microbiology              | 3         |
|   | CLS 881, 882, 883 or 884                | 10        |  | CLS 848, Immunohematology                   | 3         |
|   | CLS 890, Laboratory Investigations      | 3         |  | CLS 881, Immunohematology Practicum         | 5         |
|   |   |           |  | CLS 884, Clinical Microbiology Practicum    | 5         |
|   |   |           |  | <b>CLS 890, Laboratory Investigations*</b>  | <b>1</b>  |
|   |   |           |  | <b>Traditional student</b>                  |           |
|   |   |           | <b>Sub-total</b>                             | <b>19</b>                                   |           |
|   |   |           |  |   |           |
| <b>Intersession</b>                         |   |           |  | CLS 890, Laboratory Investigations*         | 2         |
|   |   |           |  | Non-traditional student                     |           |

Current Total: 35 credit hours

Revision Total 43 credit hours

Current Curriculum Total: 127 credit hours

Revised Curriculum Total: 120 credit hours

\*CLS 890, Laboratory Investigations: The requirement for traditional students is 1 credit hour didactic instruction. The requirement for the non-traditional students is 2 credit hours didactic and skills practice requirement offered as the Capstone course on the Lexington campus

\*\* The requirement for CLS professional credits for the non-traditional student is dependent upon the number of credit hours that the student must complete in clinical rotation.



| <b>Professional Year: Summer and Fall Weekly Schedule</b> |                                      |                    |  |                            |                |
|---|--------------------------------------|--------------------|--|----------------------------|----------------|
|   | Summer Session*                      | Fall Week 1        | Weeks 2 through 13   | Week 14                    | Week 15        |
| Mon   | CLS 836 (2 cr)<br>CLS 860<br>CSC 528 | CLS 832<br>CLS 833 | <p style="text-align: center;">Fall Rotation<br/>Hematology and Chemistry (7 hours/day)<br/>Meet for CLS 836 (1cr) one hour each week, CLS 843 one hour each week,<br/>CLS and 844 one hour each week<br/>Traditional and Non-traditional students complete web-based modules in CLS 836, 843 and 844 at the completion the rotation day on days that they do not meet with the instructor</p> | CLS 836<br>Project Reports | Finals<br>Week |
| Tues  |                                      |                    |  |                            |                |
| Wed   |                                      |                    |  |                            |                |
| Thurs   |                                      |                    |  |                            |                |
| Fri   |                                      |                    |  |                            |                |

| <b>Professional Year: Spring and Summer Intersession Weekly Schedule</b> |                    |  |                            |                |  |
|--|--------------------|--|----------------------------|----------------|--|
|  | Week 1             | Weeks 2-13   | Week 14                    | Week 15        | Intersession   |
| Mon  | CLS 838<br>CLS 851 | <p style="text-align: center;">Spring Rotation<br/>Microbiology and Immunohematology (7 hours/day)<br/>Meet for CLS 848 one hour each week, 856 one hour each week and CLS 890 one hour each week<br/>Traditional and Non-traditional students complete web-based modules in CLS 848, 856 and 890 at the completion the rotation day on days that they do not meet with the instructor</p> | CLS 890<br>project reports | Finals<br>Week | CLS 890<br>2 week<br>capstone for<br>non-traditional<br>students |
| Tues   |                    |  |                            |                |  |
| Wed  |                    |  |                            |                |  |
| Thurs  |                    |  |                            |                |  |
| Fri  |                    |  |                            |                |  |

\* Blocked courses in the 8 week summer session.

## Attachment E

### Proposed and Current Coursework: Non-traditional Student

The proposed curriculum change will allow the non-traditional student more flexibility in completing CLS 836 as a variable credit hour course. The proposed curriculum may increase options for competency-based demonstrations of skills and knowledge as alternatives to formal classes for individuals who have worked in clinical laboratories.

Students in the non-traditional, CLT-to-CLS track, generally complete the sequence of required courses on a part-time basis. A program of study is prepared individually for each student, based on the number of courses that they propose to complete each semester.

Such students complete a checklist of requirements for the degree, rather than follow a prescribed course of study:

|                           |  |  |                                  |  |
|---------------------------|--|--|----------------------------------|--|
| University Studies        |  | Clinical Laboratory Associate degree courses |                                  |  |
| Math                      |  |  |                                  |  |
| Inference                 |  | <b>Professional Courses</b>                  |                                  |  |
| Foreign Language          |  | CLS 836                                      | Lab Organization                 |  |
| Writing                   |  | CLS 843                                      | Advanced Hematology              |  |
| Natural Science           |  | CLS 844                                      | Advanced Clinical Chemistry      |  |
| Social Science            |  | CLS 848                                      | Advanced Immunohematology        |  |
| Humanities                |  | CLS 856                                      | Advanced Clinical Microbiology   |  |
| Electives                 |  | CLS 881                                      | Practicum: Immunohematology      |  |
| Cross Cultural            |  | CLS 882                                      | Practicum: Clinical Chemistry    |  |
| Oral Communications       |  | CLS 883                                      | Practicum: Hematology            |  |
|                           |  | CLS 884                                      | Practicum: Clinical Microbiology |  |
|                           |  | CLS 890                                      | Independent Lab Investigations   |  |
| <b>CLS Pre-requisites</b> |  |  |                                  |  |
| General Microbiology      |  |  |                                  |  |
| Anatomy + Physiology      |  |  |                                  |  |
| Statistics                |  |  |                                  |  |
| General Microbiology      |  |  |                                  |  |
| Biochemistry              |  |  |                                  |  |
| Immunology                |  |  |                                  |  |

The non-traditional associate degree graduate of a NACCLS approved Clinical Laboratory Technician program is exempt from the basic level CLS courses:

- CLS 832, Basic Clinical Chemistry and Instrumentation
- CLS 833, Basic Clinical Hematology and Body Fluid Analysis
- CLS 838, Basic Immunohematology
- CLS 851, Basic Clinical Microbiology
- CLS 860, Blood Collection
- CSC 528, Laboratory Techniques

Professional course requirements for the non-traditional student include:

- Graduation from a NAACLS accredited Associate's Degree CLT program, or equivalent
- Advanced level courses in the UK CLS program
  - CLS 836, Laboratory Organization
  - CLS 843, Advanced Clinical Hematology
  - CLS 844, Advanced Clinical Chemistry
  - CLS 848, Advanced Immunohematology
  - CLS 856, Advanced Clinical Microbiology
  - CLS 890, Laboratory Investigation (2 credit hours didactic and skills practice requirement)
  - CLS 881, 882, 883, 884, Advanced Clinical Laboratory Practice in Hematology, Clinical Chemistry, Immunohematology and Clinical Microbiology. Clinical Laboratory Technicians may be eligible for exemption from some clinical rotation objectives for CLS 881, 882, 883 and 884. One of the following requirements must be met for exemption:
    - Documentation of completion of the objectives at a school for Clinical Laboratory Technicians that is accredited by NAACLS
    - Documentation of completion of the objectives through work experience. Documentation from supervisor or employer is required. Credit for completion of objectives will be granted pending an experiential learning review by the UK CLS program.

## Attachment H

### Documentation of Need

#### The Problem

The United States is approaching a serious shortage of laboratory medical personnel with vacancy rates for key laboratory medicine positions at an all time high. The American Society of Clinical Pathologists' Board of Registry, in conjunction with MORPACE International, Inc., Detroit, conducts a biennial wage and vacancy survey of 2,500 medical laboratory managers. The survey measures the vacancy rates for 10 medical laboratory positions, and compares and contrasts these data with that from 1988, 1990, 1992, 1994, 1996, and 1998 studies. The data for 2000 was published in March 2001. Vacancy rates for clinical laboratory scientists in the United States are between 11 and 20%, depending on the job location. Rural areas are the hardest hit with 21.1% vacancy and hospitals with 100-299 beds have a rate of 17.6%.

While the supply of laboratory personnel is dwindling, the demand for these professionals is increasing - as evidenced, in part, by the rise in wages. Beginning wage increases from 1998 to 2000 were the largest experienced since comparisons from the 1990 to 1992 studies. Pay for laboratory positions increased at least 6.9% from 1998 to 2000. Median average pay rate increases from 1998 to 2000 were larger than comparisons for any other time period.<sup>1</sup>

The Bureau of Health Professions reports that the shortage is severe in Kentucky. Kentucky ranks below comparison states in its region for the number of laboratory personnel per capita population. The shortage in Kentucky is especially severe in rural areas of the Commonwealth.<sup>2</sup>

#### Medical Laboratory Programs

According to the *Health Professions Education Directory* published by the American Medical Association, the number of medical technology programs decreased from 383 in 1994 to 273 in 1999. The number of graduates in medical technology has similarly decreased from 3563 in 1994 to 2491 in 1999, a 30 percent decline in five years.<sup>3</sup>

#### Assessment

There are several reasons why the vacancy rate is increasing and the number of program enrollees is decreasing. A number of available positions are outside the traditional clinical laboratory. Some program directors have reported that graduates are gaining employment in laboratory information systems companies and corporations that manufacture or distribute diagnostic reagents, supplies or equipment. With limited resources, hospitals have merged, thus decreasing the availability of training sites for medical laboratory programs. Some programs have responded by increasing access to other laboratory training sites, such as

forensics laboratories, blood centers, physician offices, and outpatient clinics. Yet, with these shifts, the continued demand for laboratory services is real and is expected to grow.

Given the country's aging population, the number and complexity of biopsy specimens and the use of molecular techniques will likely increase during the next decade. Laboratory professionals who entered the workforce in the 1960s and 1970s will be retiring soon as the average age for a medical technologist now is 45 years old. The threat of bioterrorism calls for trained laboratory professionals to respond. The laboratory workforce will need to be able to react accordingly with appropriate numbers of trained and educated personnel.

### Current Working Solutions

There are solutions to these problems. There are grants available to help attract laboratory professionals to the field, especially individuals in rural and underserved communities. The Allied Health Project Grants program, administered by the Health Resources and Services Administration, has been successful in effectively attracting new allied health professionals into the laboratory field.

Congressman John Shimkus (R, Illinois) has introduced the Medical Laboratory Personnel Shortage Act (HR 623) in an effort to reduce the high number of openings in this highly skilled profession. "An alarming shortage of medical laboratory personnel has grown within the United States," Shimkus explained. "The vital role medical lab professionals play in health care is important to point out." Approximately 70 to 75 percent of all medical diagnoses are performed by laboratory personnel, and because these professionals work behind the scenes, their importance is often unnoticed. "I have met with numerous health care facilities and know that this need is great, both locally and nationally," Shimkus said. The legislation would expand opportunities with the Scholarship for Disadvantaged Students program for loan repayment for medical technologists and medical laboratory technicians; increase funding for the Allied Health Project Grants program, which helps attract professionals to this field.<sup>4</sup>

<sup>1</sup>Ward-Cook, K. Special Report: 2000 Wage and Vacancy Survey of Medical Laboratories. *Laboratory Medicine*. 2001; 3(32):124-38

<sup>2</sup>American Medical Association, Health Professions Career and Education Directory, 2002-2003, American Medical Association Publishers.

<sup>3</sup>Bureau of Health Professions, Kentucky State Health Workforce Profile, December, 2000, <ftp://ftp.hrsa.gov/bhpr/workforceprofiles/KY.pdf>, accessed April 8, 2003.

<sup>4</sup>House of Representatives, Feb 6, 2003, <http://www.house.gov/shimkus/prmedshortage.htm>, accessed April 8, 2003

**Attachment**  
**Letters of Support**



UNIVERSITY OF KENTUCKY

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May 13, 2003

Dr. Baker,

I am writing this letter in support of the University of Kentucky's proposed undergraduate Program in Clinical Laboratory Sciences. I see my participation in several two: (1) As the Medical Director of CLS; (2) as a core faculty member in the Microbiology curriculum.

My commitment to CLS has been evident since my assignment in 1996 as the Medical Director. During the past several years, I have had the opportunity to become more involved in shaping the direction of CLS. I anticipate continuing on in this role into the future.

My teaching commitment in CLS has grown substantially since I joined the faculty. My lectures focus on Diagnostic Microbiology. For the proposed undergraduate curriculum, I can provide lectures in Microbiology to cover virology, mycology, parasitology, and hepatitis. I also have intense interest in sexually transmitted diseases and their diagnosis and would be happy to provide those lectures also.

I am pleased to be a part of this very important proposed undergraduate program.

Sincerely,

Julie A. Ribes, M.D., Ph.D.  
Associate Professor  
Pathology and Laboratory Medicine