

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
Total	65	43

*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 2nd 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, 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, with questions or comments

Thank you for your consideration.

Table of Contents

Revision of the Curriculum for the CLS Undergraduate Program

Form: Request for Change in an Undergraduate Program

Overview of Curriculum Changes

Attachment A, Goals and Competencies: The CLS Graduate

Attachment B, Proposed and Current Admission Requirements

Attachment C, Proposed and Current Program Requirements

Attachment D, Proposed and Current Course Sequence: Traditional Student

Attachment E, Proposed and Current Course Sequence: Non-traditional Student

Attachment F, Course Change Forms

Attachment G, Course Drop Forms

Attachment H, Documentation of Need

Attachment I, Letters of Support

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 4th 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 4th 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 2nd 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

	Current	Proposed
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

Current	Proposed
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

	Current	Proposed
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
Total	65	43

*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
 - 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.

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)
	<i>1 sem Biochemistry</i>
	<i>1 sem 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 3rd year at the university. In the revised curriculum, traditional students will be admitted into the program in the summer following their 3rd 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
Total	65	43

*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 st sem 1 st Yr	Writing requirement I	3	1 st sem 1 st Yr	ENG 101	3
	Humanities	3		Communications requirement	3
	Math requirement	3		CHE 105	3
	Elective	3		Elective	3
	Communications requirement	3		Sub-total	12
	Sub-total	15			
2 nd sem 1 st Yr	Writing requirement II	3	2 nd 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		Sub-total	12
	Sub-total	15			
1 st sem 2 nd Yr	Anatomy/Physiology	3	1 st sem 2 nd 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
	Sub-total	15			
2 nd sem 2 nd Yr	BIO 208 Prin of Micro	3	2 nd sem 2 nd 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
	Elective	3			
	Sub-total	17			

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

Current			Revision		
Semester	Course	Credit	Semester	Course	Credit
1st sem 3rd Yr	CLS 822, Biochemistry	3	1st sem, 3rd Yr	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
	Sub-total	16		Sub-total	14
2nd sem 3rd Yr	CLS 833, Basic Hematology	5	2nd sem, 3rd Yr	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
		Sub-total		14	Elective
				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
Summer, 3-4 Yr				CLS 836, Lab Organization	2
				CLS 860, Phlebotomy	1
				CSC 528, Lab Procedures	2
				Sub-total	5
1st sem 4th Yr	CLS 843, Advanced Hematology	3	1st sem, 4th Yr	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
	Sub-total	16		CLS 844, Advanced Clinical Chemistry	3
				CLS 882, Clinical Chemistry Practicum	5
				CLS 883, Hematology Practicum	5
				Sub-total	19
			2nd sem 4th Yr	CLS 838, Basic Immunohematology	1
2nd sem 4th Yr	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
				CLS 890, Laboratory Investigations*	1
				Traditional student	
	Sub-total	19		Sub-total	19
Intersession				CLS 890, Laboratory Investigations* Non-traditional student	2

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.

Professional Year: Summer and Fall Weekly Schedule					
	Summer Session*	Fall Week 1	Weeks 2 through 13	Week 14	Week 15
Mon	CLS 836 (2 cr) CLS 860 CSC 528	CLS 832 CLS 833	<p style="text-align: center;">Fall Rotation Hematology and Chemistry (7 hours/day) Meet for CLS 836 (1cr) one hour each week, CLS 843 one hour each week, CLS and 844 one hour each week 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 Project Reports	Finals Week
Tues					
Wed					
Thurs					
Fri					

Professional Year: Spring and Summer Intersession Weekly Schedule					
	Week 1	Weeks 2-13	Week 14	Week 15	Intersession
Mon	CLS 838 CLS 851	<p style="text-align: center;">Spring Rotation Microbiology and Immunohematology (7 hours/day) Meet for CLS 848 one hour each week, 856 one hour each week and CLS 890 one hour each week 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 project reports	Finals Week	CLS 890 2 week capstone for non-traditional 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		Professional Courses		
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	
CLS Pre-requisites				
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 F

Course Change Forms

CLS 832

CLS 833

CLS 836

CLS 838

CLS 851

CLS 890

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR AND MINOR PAGE 2 OF 2

11. Is this a minor change? Yes X-No

(NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

12. Within the Department, who should be consulted for further information on the proposed course change?

Name: Jean Brickell Phone Extension: 7-9222 ext 263

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 11/98

OBJECTIVES FOR CLS 832: BASIC CLINICAL CHEMISTRY

Following completion of this course, the student will be able:

Cognitive objectives:

1. For each of the following analytical categories (i-vi),
 - a. Describe the function, metabolic or kinetic process, and clinical significance in the body
 - b. Describe the collection and handling of specimens to be tested
 - c. Describe procedures that are used for laboratory determination
 - i. Carbohydrates
 - ii. Proteins and enzymes
 - iii. Lipids
 - iv. Electrolytes and minerals
 - v. Non-protein nitrogen compounds
 - vi. Bilirubin
2. For each of the following laboratory procedures (i-iv),
 - a. State the principle(s)
 - b. Identify components of testing equipment
 - c. List the mode(s) of operation of the testing equipment
 - d. Describe clinical applications
 - e. Discuss common trouble-shooting protocols
 - i. Spectrophotometry, to include light, atomic absorption, turbidimetry, nephelometry, and fluorometry spectrophotometry
 - ii. Electrochemical testing, to include ion selective electrodes
 - iii. Osmometry
 - iv. Automation
3. Discuss the use of glassware and pipettes in the clinical chemistry laboratory
4. Apply mathematic formulas to practice in the clinical chemistry laboratory.
5. Apply and interpret statistical calculation for quality assurance in the clinical chemistry laboratory
6. Discuss common trouble-shooting protocols for quality assurance problems

Affective objective:

1. Demonstrate professionalism in clinical chemistry by communicating in positive, constructive and polite verbal and written form; participating in group endeavors; and adhering to the policies of the program

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by College of: Health Sciences Date: April 30, 2003
Department/Division offering course: Clinical Sciences/Clinical Laboratory Sciences
2. Changes proposed:
 - (a) Present prefix & number: CLS 833 Proposed prefix & number: same
 - (b) Present Title: Basic Clinical Hematology and Body Fluid Analysis
New Title: Basic Hematology
 - (c) If course title is changed and exceeds 24 characters (Including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts: Hematology
 - (d) Present credits: 5 Proposed credits: 1
 - (e) Current lecture: laboratory ratio: 2:3 Proposed: 1:0
 - (f) Effective Date of Change: (Semester & Year): Fall, 2004
3. To be Cross-listed as: NA
Prefix and Number Signature: Department Chair
4. Proposed change in Bulletin description:
Present description (including prerequisite(s):
 - (a) The theory and practice of clinical hematology laboratory testing, including the performance of manual and automated procedures, instrumentation principles, quality assurance, and problem-solving. Hematopoiesis, hemostasis, blood cell function and body fluid physiology are discussed as they relate to clinical laboratory practice. Special emphasis is placed on the relationship of clinical hematology and body fluids analysis testing to pathophysiology and on the acquisition of valid test results.
Prerequisite(s): Admission into the Clinical Laboratory Sciences Program or consent of the instructor
 - (b) New description: The theory and practice of clinical hematology laboratory testing, including manual and automated procedures, instrumentation principles, quality assurance, and problem-solving. Hematopoiesis, hemostasis and blood cell function are discussed as they relate to clinical laboratory practice. Special emphasis is placed on the relationship of clinical hematology testing to pathophysiology and on the acquisition of valid test results
 - (c) Prerequisite(s) for course as changed: Admission into the Clinical Laboratory Sciences program or consent of instructor
5. What has prompted this proposal?
This course change is part of an overall program change (a) to improve clinical practice that is guided and reinforced by UK CLS faculty members and (b) to increase program flexibility with regard to students and faculty
6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:
Psychomotor objectives of this course will be completed in CSC 528 and clinical rotation
7. What other departments could be affected by the proposed change? None
8. Will changing this course change the degree requirements in one or more programs?* X-Yes
No
If yes, please attach an explanation of the change.*
See Request for Change in Undergraduate Program
9. Is this course currently included in the University Studies Program? Yes X-No
If yes, please attach correspondence indicating concurrence of the University Studies Committee.
10. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.

*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR AND MINOR PAGE 2 OF 2

11. Is this a minor change? Yes X-No

(NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

12. Within the Department, who should be consulted for further information on the proposed course change?

Name: Jean Brickell Phone Extension: 7-9222 ext 263

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 11/98

OBJECTIVES FOR CLS 833: BASIC CLINICAL HEMATOLOGY

Following completion of this course, the student should be able to:

- Discuss hemoglobin synthesis.
- Discuss the presently accepted theories of blood cell formation (hemopoiesis)
- List the normal circulating leukocytes
- Explain the mechanisms of normal hemostasis
- For each of the procedures a-o, explain or provide the following information. For procedures a-f. provide the following information for both Coulter and Bayer Multichannel Instruments.
 - Specimen collection, handling, storage and preparation requirements
 - Principle of method
 - Technical, instrument, physiologic causes of problems or unexpected test results
 - Quality control procedures
 - Reference ranges
 - a. Automated red blood cell (RBC) counts
 - b. Automated white blood cell (WBC) counts
 - c. Automated hemoglobin
 - d. Automated hematocrit
 - e. Automated platelet counts
 - f. Automated WBC differentials
 - g. Manual hematocrit
 - h. Manual platelet counts
 - i. Red Cell Indices (manual and automated)
 - j. Manual WBC differentials
 - k. Reticulocyte count including corrected reticulocyte count and reticulocyte production index
 - l. Westergren erythrocyte sedimentation rate (ESR)
 - m. Activated partial thromboplastin time (APTT)
 - n. Prothrombin time (PT)
 - o. Modified template bleeding time (IBT)

Performance criteria for cognitive objectives: Achievement of a minimum 70%-score for Hematology Examination I and II

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR AND MINOR PAGE 2 OF 2

11. Is this a minor change? Yes X-No

(NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

12. Within the Department, who should be consulted for further information on the proposed course change?

Name: Jean Brickell Phone Extension: 7-9222 ext 263

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 11/98

OBJECTIVES FOR CLS 836: LABORATORY ORGANIZATION AND MANAGEMENT

Following completion of this course, the student will be able:

Cognitive Objectives

1. Diagram the work flow of the clinical laboratory in a hospital setting.
2. Describe the principles and practices of quality assurance/quality improvement as applied to the preanalytical, analytical, and post-analytical components of laboratory services.
3. Apply safety and governmental regulations and standards to scenarios which describe clinical laboratory practice.
4. Describe the use of a laboratory information system (LIS) in the clinical laboratory to include:
 - Explain the process involved in each step in the selection of an LIS
 - List the steps involved in the acquisition of an LIS
 - Explain the process involved in each step in the acquisition of an LIS
 - Evaluate a LIS to determine if it meets the needs of a particular clinical laboratory
5. Discuss the management process as it applies to the clinical laboratory to include:
 - Describe management techniques used to facilitate problem solving and decision-making.
6. Apply principles of the following to clinical laboratory scenarios:
 - Personnel motivation
 - Communication
 - Negotiation
 - Delegation
7. Apply basic principles of financial management to the preparation of a budget.
8. Describe the characteristics of effective leaders and identify leadership styles.
9. Discuss personnel issues including:
 - Preparing a job description
 - Marketing
 - Screening potential applicants
 - Interviewing
 - Disciplinary action
 - Conflict resolution
 - Employee performance reviews
10. Demonstrate the principles of interpersonal and interdisciplinary communication and team-building skills by participating as a member of a committee to solve complex problems associated with clinical laboratory practice.
11. Demonstrate the use of education techniques and terminology sufficient to train/educate users and providers of laboratory services to include
 - Describe different learning styles and identify preferred learning style.
 - Demonstrate comprehension of learning domains by writing instructional objectives for each domain.

- Write instructional objectives for three levels of difficulty: Level I, recall; Level II, understanding and application; and Level III, problem solving.
- Discuss the differences between formative, summative, norm-referenced and criterion-referenced evaluation.
- Write test questions for each learning domain and level of difficulty.
- Develop an education presentation including selection of a topic and title, written objectives, presentation handout with references and test questions.
- Give an oral education presentation.
- Develop a plan of action for effective supervision of clinical instruction.

Affective Objectives

12. Describe the principles of ethics and professionalism in the clinical laboratory

13. Demonstrate ethics and professionalism in the clinical laboratory by communicating in positive, constructive and polite verbal and written form; participating in group endeavors; and adhering to the policies of the program

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by College of: Health Sciences Date: April 30, 2003
Department/Division offering course: Clinical Sciences/Clinical Laboratory Sciences
2. Changes proposed:
 - (a) Present prefix & number: CLS 838 Proposed prefix & number: same
 - (b) Present Title: Basic Immunohematology
New Title: same
 - (c) If course title is changed and exceeds 24 characters (Including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts: Basic Immunohematology
 - (d) Present credits: 5 Proposed credits: 1
 - (e) Current lecture: laboratory ratio: 2:3 Proposed: 1:0
 - (f) Effective Date of Change: (Semester & Year): Fall, 2004
3. To be Cross-listed as: NA
Prefix and Number Signature: Department Chair
4. Proposed change in Bulletin description:
 - (a) Present description (including prerequisite(s)): Introduction to the principles and practice of blood banking including blood group systems, routine serologic testing, blood collection and processing and component therapy. Prerequisite(s): Admission to the Clinical Laboratory Sciences Program and CLS 835 or equivalent
 - (b) New description: same
 - (c) Prerequisite(s) for course as changed: same
5. What has prompted this proposal?
This course change is part of an overall program change (a) to improve clinical practice that is guided and reinforced by UK CLS faculty members and (b) to increase program flexibility with regard to students and faculty
6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:
Psychomotor objectives will be completed in CSC 528 and conical rotation
7. What other departments could be affected by the proposed change? None
8. Will changing this course change the degree requirements in one or more programs?* X-Yes
No
If yes, please attach an explanation of the change.*
See Request for Change in Undergraduate Program
9. Is this course currently included in the University Studies Program? Yes X-No
If yes, please attach correspondence indicating concurrence of the University Studies Committee.
10. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.

*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR AND MINOR PAGE 2 OF 2

11. Is this a minor change? Yes X-No

(NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

12. Within the Department, who should be consulted for further information on the proposed course change?

Name: Jean Brickell Phone Extension: 7-9222 ext 263

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 11/98

OBJECTIVES FOR CLS 838: BASIC IMMUNOHEMATOLOGY

Following completion of this course, the student will be able:

1. Discuss antigen/antibody reactions as applied to blood banking, including antibody structure and function, immune response and molecular structure.
2. Discuss the major antigens and clinical significance of the major blood group systems.
3. Describe the principles, techniques, reagents and interpretation of results of routine blood bank procedures.
4. Describe the guidelines for determining acceptable blood donors and deferral period for donors who are disqualified from donation.
5. Discuss the collection, preparation, storage and selection of commonly used blood components.
6. Interpret routine serologic testing including:
 - a. ABO and Rh grouping
 - b. Antibody screening and identification
 - c. Compatibility testing
 - d. Direct antiglobulin testing
7. Interpret basic serological testing on newborns.
8. Discuss the indications for Rh Immune Globulin.
9. Interpret Rh Immune Globulin work-up, including screen for fetal-maternal hemorrhage.
10. Discuss and perform quality control procedures required in immunohematology.
11. Discuss and perform titers on serum containing antibody.
12. Discuss common adverse effects of transfusion.
13. Discuss the clinical conditions that warrant component therapy and the component of choice for each.
14. Describe hazards associated with component therapy and safeguards used to minimize hazards.

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by College of: Health Sciences Date: April 30, 2003
Department/Division offering course: Clinical Sciences/Clinical Laboratory Sciences
2. Changes proposed:
 - (a) Present prefix & number: CLS 851 Proposed prefix & number: same
 - (b) Present Title: Basic Clinical Microbiology
New Title: same
 - (c) If course title is changed and exceeds 24 characters (Including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts: Basic Clin Micro
 - (d) Present credits: 5 Proposed credits: 1
 - (e) Current lecture: laboratory ratio: 2:3 Proposed: 1:0
 - (f) Effective Date of Change: (Semester & Year): Fall, 2004
3. To be Cross-listed as: NA
Prefix and Number Signature: Department Chair
4. Proposed change in Bulletin description:
 - (a) Present description (including prerequisite(s):
The study of medically significant microbiology, including commensal flora, normal flora and pathogens. Lectures also cover microbial physiology, interactions between host and pathogenic microorganisms, and the clinical and epidemiological consequences of these interactions. The laboratory will cover microscopic, cultural and immunological techniques used for the recovery, isolation and identification of clinically significant microorganisms. Prerequisite(s): Admission to the Clinical Laboratory Sciences Program
 - (b) New description:
The study of medically significant microbiology, including commensal flora, normal flora and pathogens. Lectures also cover microbial physiology, interactions between host and pathogenic microorganisms, and the clinical and epidemiological consequences of these interactions.
 - (c) Prerequisite(s) for course as changed: same
5. What has prompted this proposal?
This course change is part of an overall program change (a) to improve clinical practice that is guided and reinforced by UK CLS faculty members and (b) to increase program flexibility with regard to students and faculty
6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:
Psychomotor objectives will be completed in CSC 528 and clinical rotations
7. What other departments could be affected by the proposed change? None
8. Will changing this course change the degree requirements in one or more programs?* X-Yes
No
If yes, please attach an explanation of the change.*
See Request for Change in Undergraduate Program
9. Is this course currently included in the University Studies Program? Yes X-No
If yes, please attach correspondence indicating concurrence of the University Studies Committee.
10. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.
*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR AND MINOR PAGE 2 OF 2

11. Is this a minor change? Yes X-No

(NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

12. Within the Department, who should be consulted for further information on the proposed course change?

Name: Jean Brickell Phone Extension: 7-9222 ext 263

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 11/98

OBJECTIVES FOR CLS 851: BASIC CLINICAL MICROBIOLOGY

Following completion of this course, the student will be able:

1. Identify the disease caused by each agent discussed.
2. Describe the epidemiology for each agent, listing the mode of transmission, reservoir, host range and port of entry.
3. List the virulence factors for each agent discussed and predict their mechanism of action on the host.
4. Discuss the major considerations in collection and handling of clinical specimens for processing and identification.
5. Develop a flow chart for the initial identification of various groups of microorganisms.
6. Describe means of identification for each agent; correlate microbiological assays with immunology assays and clinical findings.
7. List treatments and preventions of diseases of microbiological origin, and note if a vaccine is available for each agent discussed.
8. Compare and contrast the various methods for testing antimicrobial effectiveness.
9. Describe the classes of antimicrobial agents used to treat systemic infections. Correlate mode of action of each class of antimicrobial agent with organism susceptibility.
10. Interpret case studies to identify disease and causative agent.
11. Given a demonstration (actual or photograph) of a pure culture and knowledge of body site source, identify the microorganism, determine the significance of the organism and suggest tests for antimicrobial susceptibility when indicated.

Affective objective:

Demonstrate professionalism in clinical microbiology by communicating in positive, constructive and polite verbal and written form; participating in group endeavors; and adhering to the policies of the program

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by College of: Health Sciences Date: April 30, 2003
Department/Division offering course: Clinical Sciences/Clinical Laboratory Sciences
 2. Changes proposed:
 - (a) Present prefix & number: CLS 890 Proposed prefix & number: same
 - (b) Present Title: Independent Laboratory Investigations
New Title: Laboratory Investigation
 - (c) If course title is changed and exceeds 24 characters (Including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts: Lab Investigation
 - (d) Present credits: 1-5 Proposed credits: 1-3
 - (e) Current lecture: laboratory ratio: 1:0 Proposed: 1:0 (for 1 credit hour) 1:1 (for 2 credit hour)
 - (f) Effective Date of Change: (Semester & Year): Fall, 2004
 3. To be Cross-listed as: NA

	Prefix and Number	Signature: Department
Chair		
 4. Proposed change in Bulletin description:
 - (a) Present description (including prerequisite(s):
Students will demonstrate knowledge and expertise in CLS through interpretation and integration of CLS issues. Student will analyze laboratory data through patient-focused scenarios and integrate information from multiple laboratory reports for the patient care management. Students will apply the principles of research technique to analyze problems arising from technical methods, disease correlation, or other pertinent problem areas in laboratory sciences and will use library sources, computer skills, and presentation skills in the pursuit of solutions to identified problems. Requirements of the CLS program for CLS 890: total of 3 credit hours.
Pre-requisite: admission into the clinical laboratory sciences program and STA 291 or equivalent
 - (b) New description:
Students will demonstrate knowledge and expertise in CLS through interpretation and integration of CLS issues. Student will analyze laboratory data through patient-focused scenarios and integrate information from multiple laboratory reports for the patient care management. Students will apply the principles of research technique to analyze problems arising from technical methods, disease correlation, or other pertinent problem areas in laboratory sciences and will use library sources, computer skills, and presentation skills in the pursuit of solutions to identified problems.
 - (c) Prerequisite(s) for course as changed: completion of all requirements for the CLS program; may be concurrent
 5. What has prompted this proposal?
This course change is part of an overall program change (a) to improve clinical practice that is guided and reinforced by UK CLS faculty members and (b) to increase program flexibility with regard to students and faculty
 6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:
Non-traditional students are required to participate in demonstrations of laboratory testing
 7. What other departments could be affected by the proposed change? None
 8. Will changing this course change the degree requirements in one or more programs?* X-Yes
No
- If yes, please attach an explanation of the change.***
See Request for Change in Undergraduate Program
9. Is this course currently included in the University Studies Program? Yes X-No
If yes, please attach correspondence indicating concurrence of the University Studies Committee.

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR AND MINOR PAGE 2 OF 2

10. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted. *NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.

11. Is this a minor change? Yes X-No

(NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

12. Within the Department, who should be consulted for further information on the proposed course change?

Name: Jean Brickell

Phone Extension: 7-9222 ext 263

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 11/98

OBJECTIVES FOR CLS 890: LABORATORY INVESTIGATION

Following completion of this course, the student will be able:

1. Discuss the development, establishment, oversight, and performance of the pre-analytical, analytical, and post-analytical phases of testing on body fluids, cells and other specimens.
2. Demonstrate statistical analysis of data for use in laboratory epidemiology, examining the relationships of tests to treatment decisions, and to health care outcomes.
3. Establish and use quality assurance and performance measurements to develop solutions to problems and to assure the validity and accuracy of information concerning laboratory data, generated both within and external to the laboratory.
4. Assess laboratory results
 - a. Discuss utilization of the results of laboratory diagnostic procedures and employ algorithms to achieve optimal, full value patient outcomes.(objective for one credit hour course; requirement for traditional students)
 - b. Given demonstrations of laboratory testing (actual or photographic) demonstrate utilization of the results of laboratory diagnostic procedures and employ algorithms to achieve optimal, full value patient outcomes (objective for 2 credit hour course; requirement for non-traditional students)
5. Use library sources, computer skills, and other research techniques in the pursuit of solutions to identified problems in CLS issues.
6. Communicate findings of CLS integrative analysis by oral and written presentation for problems arising from technical methods, disease correlation, or other pertinent problem areas in laboratory sciences.

Attachment G

Course Drop Forms

CLS 871

CLS 872

CLS 873

CLS 874

APPLICATION TO DROP A COURSE

1. Submitted by College of: Health Sciences Date: April 30, 2003
Department/Division offering course: Clinical Sciences/Clinical Laboratory Sciences
2. Prefix and Number: CLS 872 Title: Clinical Chemistry Survey Credits: 1
3. Effective Date (semester & year): Fall, 2003
4. Why is the course to be dropped?
This course change is part of an overall program change to eliminate overlap of course content and use faculty resources of the division more effectively.
5. Will dropping this course change the degree requirements in one or more programs?* Yes
X-No
6. Has the course been taken by a significant number of students in other departments/colleges?
Yes X-No
 - c. If yes, list the college(s) or department(s) from which student enrollment in this course has come, if known.
 - d. What provision has been made for meeting the needs of these students?
7. Is this course in current use in any of the Community Colleges? Yes X-No
If so, please submit evidence (e.g., correspondence) that the Community College System has been consulted.
8. Is this course currently included in the University Studies Program? Yes X-No
9. Within the Department, who should be contacted for further information about this proposal?
Name: Jean Brickell Phone Extension: 7-9222 ext 263

*NOTE: Approval to drop the course will constitute approval of the program change unless additional modifications are proposed.

APPLICATION TO DROP A COURSE

1. Submitted by College of: Health Sciences Date: April 30, 2003
Department/Division offering course: Clinical Sciences/Clinical Laboratory Sciences
2. Prefix and Number: CLS 873 Title: Clinical Microbiology Survey Credits: 2
3. Effective Date (semester & year): Fall, 2003
4. Why is the course to be dropped?
This course change is part of an overall program change to eliminate overlap of course content and use faculty resources of the division more effectively.
5. Will dropping this course change the degree requirements in one or more programs?* Yes
X-No
6. Has the course been taken by a significant number of students in other departments/colleges?
Yes X-No
 - e. If yes, list the college(s) or department(s) from which student enrollment in this course has come, if known.
 - f. What provision has been made for meeting the needs of these students?
7. Is this course in current use in any of the Community Colleges? Yes X-No
If so, please submit evidence (e.g., correspondence) that the Community College System has been consulted.
8. Is this course currently included in the University Studies Program? Yes X-No
9. Within the Department, who should be contacted for further information about this proposal?
Name: Jean Brickell Phone Extension: 7-9222 ext 263

*NOTE: Approval to drop the course will constitute approval of the program change unless additional modifications are proposed.

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.¹

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.²

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.³

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.⁴

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

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

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

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

Attachment I
Letters of Support