_____UNIVERSITY OF KENTUCKY_____

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28 February 2002

TO: Members, University Senate

FROM: University Senate Council

RE: Course/Program Actions: Effective Date: Fall Semester, 2002, UNLESS OTHERWISE NOTED.

The Senate Council circulates for your approval the following curricular actions. Objections will be accepted from University Senators and faculty members and must be received within ten days of receipt of this notice. All other requirements for the courses or programs as approved below must be met.

SENATE COUNCIL

COLLEGE OF ALLIED HEALTH PROFESSIONS

Division of Clinical Laboratory Sciences:

Proposal for Curriculum Change For the Bachelor of Health Science Degree In the Clinical Laboratory Sciences

Overview

The Division of Clinical Laboratory Sciences (CLS) proposes to modify the present Baccalaureate Degree Program in the Clinical Laboratory Sciences. The modification will clearly define basic level and advanced level content in the clinical laboratory sciences. Basic level courses will be defined in the third year of the program. Advanced level courses, offered in the fourth year, will build on this base. Advanced level courses will offer instruction toward supervisory and management positions in health care settings, which will represent a unique niche for the University of Kentucky (UK) CLS program. The baccalaureate degree in Clinical Laboratory Sciences is the entry-level degree for laboratory management. The fourth year will emphasize integration of didactic and clinical knowledge. During the fourth year, clinical practicum experiences will be supplemented and monitored by faculty through web-based, asynchronous exercises.

The present CLS program consists of two options or tracks: a traditional 2 year professional program that is offered to third and fourth year students on the Lexington campus of the University of Kentucky and a non-traditional, distance learning program that is offered to graduates of associate degree, clinical laboratory technician programs at community colleges.

The traditional CLS program emphasizes lecture and student laboratory practice in hematology, clinical chemistry, clinical microbiology, immunology and immunohematology. The traditional option is now in suspension and is offered as needed, based on assessment of health care needs of the Commonwealth. This issue is further elaborated in the Needs Assessment section of this document.

The present non-traditional program offers courses to distance-learning students through synchronous format via interactive video and other technological instruction. The non-traditional program builds on basic level technical courses of associate degree clinical laboratory technician program. Students of the non-traditional program complete advanced level courses while practicing in a clinical setting. Students also complete advanced science and math courses and complete other requirements of undergraduate study at the University of Kentucky. Nontraditional students are required to complete 44 credit hours in professional courses to earn the bachelor degree.

The non-traditional, articulated CLS program serves health care needs across Kentucky. The program provides a unique opportunity in distance education for rural and/or place-committed students through an associate-to-baccalaureate degree program. Success of the non-traditional program can be measured by outcome. Ninety-five percent of graduates of the current distance learning program practice in rural, medically under-served counties throughout Kentucky. Most graduates have remained in their home counties and continue to contribute to their local health care delivery systems.

Graduates have attained higher job positions and contribute to improving health care. Nine percent of graduates move into management or director positions at clinical laboratories within a year of graduation. Seven percent of graduates matriculate into medically related graduate programs within one year of graduation. Sixty-seven percent of graduates report increased bench-level supervisory responsibility, in clinical laboratory medicine within one year of graduation.

The modification, proposed in this application, reorganizes the content of the program to place basic level, student laboratory instruction into the third year of the program and concentrate advanced level content into the fourth year. The reorganization ensures relevancy for the nontraditional, articulation program, which is based on advanced level content. For all students, the modification strengthens fourth year clinical practicum experiences by increasing instructor supervision during web-based, problem-solving exercises. Advanced level courses will be available to students during clinical practicum by

Internet and other asynchronous technology, such as computed-assisted exercises and videotape presentations.

Background: Description of the Profession

The National Accrediting Agency for Clinical Laboratory Science describes the profession best:

"The clinical laboratory scientist/medical technologist is an allied health professional who is qualified by academic and practical training to provide service in clinical laboratory science. The clinical laboratory scientist/medical technologist must also be responsible for his/her own actions, as defined by the profession. The ability to relate to people, a capacity for calm and reasoned judgment and a demonstration of commitment to the patient are qualities essential for a clinical laboratory scientist/medical technologist. They must demonstrate ethical and moral attitudes and principles which are essential for gaining and maintaining the trust of professional associates, the support of the community, and the confidence of the patient and family. An attitude of respect for the patient and confidentiality of the patient's record and/or diagnoses must be maintained. Clinical laboratory scientists/medical technologists are competent in:

a. developing and establishing procedures for collecting, processing, and analyzing biological specimens and other substances;
b. performing analytical tests of body fluids, cells, and other substances;
c. integrating and relating data generated by the various clinical laboratory departments while making decisions regarding possible discrepancies;
d. confirming abnormal results, verifying quality control procedures, executing quality control procedures, and developing solutions to problems concerning the generation of laboratory data;
e. making decisions concerning the results of quality control and quality assurance measures, and instituting proper procedures to maintain accuracy and precision;
f. establishing and performing preventive and corrective maintenance of equipment and instruments as well as identifying appropriate sources for repairs;
g. developing, evaluating, and selecting new techniques, instruments and methods in terms of their usefulness and practicality within the context of a given laboratory's personnel, equipment, space, and budgetary resources;
h. demonstrating professional conduct and interpersonal skills with patients, laboratory personnel, other health care professionals, and the public;
i. establishing and maintaining continuing education as a function of growth and maintenance of professional competence;
j. providing leadership in educating other health personnel and the community; exercising principles of management, safety, and supervision;
k. applying principles of educational methodology, and
l. applying principles of current information systems.

Upon graduation and initial employment, the clinical laboratory scientist/medical technologist should be able to demonstrate entry-level competencies in the

above areas of professional practice. " (NAACLS Essentials)

The Transition from Technician to Scientist

Entry into the profession is gained through a variety of educational options. Graduates of associate degree programs as CLTs receive technical training with minimal management instruction. CLT graduates may expect to fill technical positions in clinical laboratories in hospitals, medical centers, clinics and other health care facilities. Instruction to the baccalaureate level includes technical training at the basic level. In addition, the baccalaureate curriculum includes education and practice in specialized procedures, advanced problem-solving in the clinical laboratory, statistical analysis of health care outcomes related to the laboratory, and correlation of laboratory data and disease management.

This profession is served by an educational "ladder" approach. Students and practitioners of associate degree CLT programs may seek further education in the laboratory sciences for career advancement to the supervisory and management level in the clinical setting. Graduates of the baccalaureate program use the education and degree as a rung in the ladder toward graduate education in primary care, clinical research and public health epidemiology.

At the University of Kentucky, the Clinical Laboratory Sciences Program leads to a Bachelor of Health Sciences Degree in the College of Allied Health Professions. The CLS program provides academic and technical instruction that prepares graduates for work in clinical settings as Clinical Laboratory Scientists. The program is accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS), 8410 West Bryn Mawr Avenue, Chicago, Illinois 60631; 773.714.8880. Graduates are qualified to take national certification examinations and licensure examinations.

The goal of the UK CLS Program is to produce graduates who:

1. Meet or exceed the minimum standards for knowledge and proficiency for entry-level CLS practice in typical clinical laboratory settings.
2. Are able to recognize and evaluate technical problems in a systematic way, so as to be able to form hypotheses, collect relevant data, analyze data and propose answers, solutions and other corrective action.
3. Possess communication and management skills that meet the demands of entry-level practice.
4. Adapt to different health care settings.
5. Demonstrate professional behavior/ethics.
6. Demonstrate fundamental research skills.

Assessment of Need

The 2000 Wage and Vacancy Survey of Medical Laboratories: A National Survey

According to the results of the most recent survey conducted by the American Society of Clinical Pathologists, vacancies for positions as clinical laboratory personnel are increasing. (2) In addition, salary levels for clinical laboratory personnel continue to increase. The

following information is part of the results of a biennial wage and vacancy survey of medical laboratory managers. The survey was sent to 2500 randomly selected laboratory managers. Responses were received between August 4, 2000 and October 10, 2000, and fully represent clinical laboratories by type and size of facility and geographic region of the country.

Vacancy Survey Results
Mean Percent (%) Vacancy Rate in 1996, 1998 and 2000

	1996	1998	2000
Medical Technologist Staff	8.2	10.2	11.1
Medical Technologist Supervisor	8.6	9.3	12.5
Medical Technologist Manager	7.7	15.4	13.3
Cytotechnologist Staff	7.1	10.5	20.6
Cytotechnologist Supervisor	12.5	10.0	10.0
Histologic Technician	13.0	12.9	16.1
Histotechnologist	5.3	10.3	22.3
Histologic Supervisor	10.0	20.0	20.0
Medical Laboratory Technician	9.4	11.1	14.3
Phlebotomist	12.5	12.3	18.1

As vacancies in clinical laboratories continue to increase in health care facilities, educational programs to train new personnel decrease. The American Society of Clinical Pathologists reports that a recent survey of educational programs for CLS revealed a reduction in baccalaureate degree programs. In the latest journal of Clinical Laboratory Science the accrediting body for CLS education programs reports that, over a ten-year period (1988-1998), the number of CLS programs went from 464 to 288 in the nation. (3)

Health Professions Needs Assessment in Kentucky

An assessment of the personnel needs for health professions in Kentucky was conducted by the UK Center for Rural Health in 1999. Based on the Kentucky Workforce Occupational Outlook to 2005, the assessment found that Kentucky would have an estimated need for 2,910 laboratory workers with bachelor degree education by the year 2005 and an estimated need for 2,133 laboratory workers with associate degree education by the year 2005. To meet the projected need, Kentucky will need 80 new laboratory workers with bachelor degree education per year and 58 new laboratory workers with associate degree education per year. The Commonwealth will gain new laboratory workers through out-of-state hire and through education of its residents. State-supported CLS programs at UK, Eastern Kentucky University and University of Louisville now graduate approximately 40 bachelor degree laboratory workers annually. Based on the results of the assessment, the workforce analysis task force recommended that the Commonwealth of Kentucky support two programs for education toward baccalaureate degree in Clinical Laboratory Sciences. With the scheduled closure of the CLS program at the University of Louisville, programs at UK and Eastern Kentucky University will be more critical to the maintenance of health care in Kentucky. (4,5,6)

The proposed modification to the CLS program continues an already successful effort to articulate community college graduates of CLT programs into mainstream CLS job opportunities. The University of Kentucky, by offering the non-traditional CLT-to-CLS articulation option, is poised to answer the needs of the Commonwealth. As the health care needs of the Commonwealth change, the University can respond with both traditional and non-traditional programs in clinical laboratory science.

Applicant Response

The CLT-to-CLS articulation program is an on-going program that has graduated 8 cohorts of students since its inception 10 years ago. Without advertisement, the UK CLT-to-CLS nontraditional program has received 71 requests for admission into the technology-based, asynchronous CLS program. These applicants have expressed need for greater accessibility of professional courses and are particularly interested in completing the didactic portion of professional courses through Internet-based technology.

Admissions Requirements

Clinical Laboratory Science Admission Criteria

Admission to the CLS professional program is based on:

- a minimum cumulative grade-point average of 2.5,
- a minimum key grade-point average of required science and mathematics courses of 2.3,
- personal interview scores and
- three letters of recommendations.

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

In addition, applicants must have completed University Studies Program (USP) requirements and CLS program pre-requisites as described below.

Applicants will be considered for admission to the fall or spring semester

Clinical Laboratory Science Program Requirements

University Studies Program (USP)

- The University Studies Program (USP) is a program of required subjects that all students must complete in order to receive a baccalaureate degree from the University of Kentucky.
- Previous course work at undergraduate and graduate levels may be applied towards the USP requirement.
- USP requirements must be completed by the start of the professional program.

Requirements for Admission to the CLS Professional Program

Students applying for the professional program must have completed or be enrolled in the following CLS pre-requisite courses at the time of application. Pre-requisite courses must be successfully completed before the start of the professional program:

2 Semesters of General Chemistry with Laboratory
1 Semester of Microbiology with Laboratory
1 Semester of Quantitative Statistics
1 Semester of Human Physiology (or combined course in Anatomy and Physiology)

International Students

In addition to the prerequisite courses, international students must complete the TOEFL examination with a score of 600 or better. An evaluator who is acceptable to the American Society of Clinical Pathology must also evaluate international transcripts.

Immunization Requirements

The University of Kentucky Medical Center requires that any student who has contact with patients (this included all CLS students) must provide documentation for the following immunizations and tests:

- MMR (Measles, Mumps, Rubella)
- DPT (Diphtheria, Pertussis, Tetanus)
- Polio
- Varicella
- Hepatitis B (a 3-vaccination program that should be started prior to matriculation into the professional program)
- Skin test or x-ray for tuberculosis
- And any other immunization or test that is required by clinical sites for student practicum

Curriculum

Curriculum for Clinical Laboratory Sciences

During the CLS curriculum revision to clearly define basic level and advanced level content in the clinical laboratory sciences, a review of objectives identified redundant objectives among discipline specific courses. As a result of revision across courses, curriculum has been streamlined to eliminate redundancy. The revised curriculum fully meets accreditation standards with fewer credit hours.

The academic requirements for the Clinical Laboratory Sciences curriculum are divided into two phases: the Pre-Professional program and the Professional program. The pre-professional program consists of courses that fulfill the USP (required of all students receiving a Bachelor's degree from UK; and pre-requisite courses required by the CLS division.

Requirements of the new curriculum include:

- Completion of University Studies Program requirements
- Completion of CLS pre-requisites
    - Two semesters general chemistry with laboratory
    - One semester quantitative statistics
    - One semester general microbiology with laboratory
    - One semester Human physiology (or combined course in Anatomy and Physiology)
- Completion of basic level courses in the UK CLS program or graduation from an Associate's Degree CLT program
- Advanced level courses in the UK CLS program
    - Clinical biochemistry
    - Clinical immunology
    - Laboratory management and education principles
    - Advanced Clinical Hematology
    - Advanced Clinical Chemistry
    - Advanced Clinical Microbiology
    - Advanced Immunohematology
    - Independent Laboratory Investigation
    - Advanced Clinical Laboratory Practice

Prospective students may choose to complete the Pre-Professional phase at the educational institution of their choice. At the time of application to the Professional Program applicants should have completed or presently be enrolled in the prerequisite courses required for application to the Clinical Sciences Program. All prerequisite courses must be successfully completed before the first day of class work in the professional program.

CLT-to-CLS program applicants will be considered for admission into the fall or spring semester.

REQUEST FOR CHANGE IN CLS UNDERGRADUATE PROGRAM

Program: Clinical Laboratory Sciences
Department: Clinical Sciences
College: College of Allied Health Professions
Degree title: Bachelor of Health Science
Bulletin PP 76
CIP Code: Med Technology 51.1005
Accrediting Agency: National Accrediting Agency for Clinical Laboratory Science (NAACLS)

University Studies Requirements or Recommendations for this program

	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	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
Free Elective	15 credit hours	3 credit hours
Non-western cultural component	Choose from courses listed in bulletin	Choose from courses listed in bulletin

Premajor or Preprofessional Course Requirements

Current	**Proposed**
2 sem General Chemistry with lab	2 sem General Chemistry with lab
1 sem General Microbiology with lab	1 sem General Microbiology with lab
2 sem sequence or 1 sem inclusive course in organic chemistry	Eliminate organic requirement (UK CLS requires biochemistry)
1 sem of Statistical Methods	1 sem Statistical Methods
1 sem of Human Physiology (or combined course in Anatomy and Physiology)	1 sem of Human Physiology (or combined course in Anatomy and Physiology

Summary of University Studies and Pre-profession Credit Hours Required

Current 67 **Proposed** 59

Major or Professional Course Requirements

	Current	**Proposed**
CLS 822 Biochemistry for Clinical Sciences	3	3
CLS 832 Basic Clinical Chemistry	4	5
CLS 833 Basic Hematology	4	5
CLS 835 Clinical Immunology	0	3
CLS 836 Laboratory Organization and Management	3	3
CLS 838 Basic Immunohematology	3	5
CLS 843 Advanced Hematology	3	3
CLS 844 Advanced Clinical Chemistry	4	3
CLS 845 Clinical Immunology and Serology I	3	0
CLS 848 Advanced Immunohematology	4	3
CLS 851 Basic Clinical Microbiology	4	5
CLS 855 Clinical Immunology and Serology II	3	0
CLS 856 Advanced Clinical Microbiology	4	3
CLS 860 Blood Collection I	1	1
CLS 861 Blood Collection II	1	0
CLS 867 Education Principles in CLS	1	0
CLS 880 Clinical Practicum in CLS	8	0
CLS 881 Immunohematology Clinical Practicum	4	5
CLS 882 Chemistry Clinical Practicum	4	5
CLS 883 Hematology Clinical Practicum	4	5
CLS 884 Microbiology Clinical Practicum	4	5
CLS 885 Specialty Clinical Practicum	4	0
CLS 890 Independent Laboratory Investigations	3	3
Elective	9	0

Total	**85**	**65**

Total Hours toward graduation: **Current**: 152 **Proposed**: 124

Rationale for changes: (Accreditation requirements are described in Appendix A and are available upon request)

Changes to pre-professional requirements:

- Organic Chemistry, a course that is not required for accreditation, is no longer a required course for the UK CLS program.
- Clinical Laboratory Sciences as a Career and Introduction to Clinical Laboratory Sciences, CLS 120 and 130, are not included in the semester-by semester sequence for CLS.
- Changes also reflect revision of the cross-disciplinary requirement of the University Studies Program. BIO 150 and 152 are not required in the curriculum as cross-disciplinary requirements with chemistry courses.
- Three credit hours of free electives are required in the revised curriculum, rather than 6 credit hours that were required in the pre-professional program of the current curriculum.
-

Changes to professional program requirements:

- Based on instructor and student comments, the two-semester immunology sequence has been merged into a one-semester course.
- Objectives for Education Principles, CLS 867, are covered in Laboratory Management, CLS 836; therefore, CLS 867 has been dropped.
- Objectives for Blood Collection II, CLS 861, are covered in Blood Collection I, CLS 860; therefore, CLS 860 has been dropped.
- Many objectives for the basic level clinic practicum, CLS 880, are duplicated in discipline specific clinical practicums, CLS 881, 882, 883, and 884; therefore, CLS 880 has been dropped and unduplicated objectives of CLS 880 have been added to discipline specific clinical rotations.
- Opportunities for special clinical practicum, CLS 885, have been developed as graduate programs; therefore, CLS 885 has been dropped.
- Discipline specific courses for clinical chemistry, hematology, clinical microbiology and immunohematology have been reorganized to include objectives for student laboratories in basic level courses of each discipline. In the process of reorganization, hematology and immunohematology gained 1 credit hour each. Advanced level discipline specific courses have been developed to complement clinical rotations, which occur during the same year.
- The requirement for 9 credit hours for elective courses in the 3rd and 4th years has been dropped.

Overall Change:
The revised curriculum more clearly defines the 4th year of the program toward preparation for supervisory and management positions in clinical health care settings. The revision results in better integration of traditional and non-traditional tracks for then Baccalaureate Degree Program in the Clinical Laboratory Sciences. (See attached diagram.)

Note: A Comparison of Traditional and Non-Traditional Curriculum Tracks is available upon request

Clinical Sites
All CLS students are required to complete clinical rotation checklists as part of the requirements of CLS 881, 882, 883 and 884. Clinical rotation activities generally encompass 35-40 daytime hours during the workweek, Monday through Friday. No weekend or evening hours are required. There is no remuneration given to students for work performed during regular clinical rotation hours. (Details are available upon request)

Course Changes:

CLS 832 Basic Clinical Chemistry and Instrumentation (4)
(Change in credits, lecture:lab ratio and description)

Change to:

CLS 832 Basic Clinical Chemistry and Instrumentation (5)
The study of the theory and practice of clinical chemistry laboratory testing, including quality control, instrumentation principles, problem-solving, and appreciation of accuracy of and confidentiality for patient laboratory findings. Lecture: 3 hours; laboratory: 2 hours per week.
Prereq: Admission into the Clinical Laboratory Sciences Professional Program; Biochemistry (may be taken concurrently)

CLS 833 Basic Clinical Hematology and Body Fluid Analysis (4)
(Change in credits, lecture:lab ration and description)

Change to:

CLS 833 Basic Clinical Hematology and Body Fluid Analysis (5)
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. Lecture: 2 hours, laboratory, 3 hours per week.
Prereq: Admission into the Clinical Laboratory Sciences Program or consent of the instructor

CLS 835 Clinical Immunology (4)

(Change in credits, description, and prerequisite)

Change to:

CLS 835 Clinical Immunology (3)
An overview of immunology with a molecular basis for the immune responses and the role of genetics in immunological disorders. Molecular biological techniques in the modern clinical laboratory will be emphasized.
Prereq: Admission into the Clinical Laboratory Sciences Professional Program

CLS 836 Laboratory Organization and Management (3)
(Change in title and description)

Change to:

CLS 836 Laboratory Management (3)
An overview of clinical laboratory management issues. Content will include the management process, managing change, personnel issues, regulatory issues, leadership, quality improvement strategies, principles of education related to the management process and other relevant topics.
Prereq: Admission into the Clinical Laboratory Sciences Professional Program

CLS 838 Introduction to Immunohematology (4)
(Change in title, credits, lecture:lab ratio, description and prerequisite)

Change to:

CLS 838 Basic Immunohematology (5)
Introduction to the principles and practice of blood banking including blood group systems, routine serologic testing, blood collection and processing and component therapy. Lecture: 2 hours, laboratory 3 hours per week.
Prereq: Admission to the Clinical Laboratory Sciences Program and CLS 835 or equivalent

CLS 843 Advanced Clinical Hematology (3)
(Change in title, lecture:lab ratio, description and prerequisite)

Change to:

CLS 843 Advanced Clinical Hematology and Body Fluid Analysis (3)
The theory and practice of clinical hematology laboratory testing as it relates to hematological disorders and disorders of body fluids. Anemias, hemostasis and thrombotic disorders, leukemias and non-malignant leukocyte disorders, and body fluid disorders, including the reproductive system are discussed as they relate to clinical laboratory practice. Special emphasis is placed on pathophysiology, the clinical correlation of laboratory test results with hematological and body fluids disorders, and the interpretation and resolution of discrepant results.
Prereq: CLS 833 or consent of the instructor

CLS 844 Advanced Clinical Chemistry (4)
(Change in credits, description, prerequisite and lecture:lab ratio)

Change to:

CLS 844 Advanced Clinical Chemistry (3)
A study of the theory and evaluation of specialized clinical chemistry testing, including toxicology, therapeutic drug monitoring, endocrine function, and quality assurance issues.
Prereq: Admission into the Clinical Laboratory Sciences Professional Program; biochemistry, immunology (may be taken concurrently) and CLS 832 or equivalent.

CLS 848 Advanced Immunohematology (4)
(Change in credits, description, prerequisite and lecture:lab ratio)

Change to:

CLS 848 Advanced Immunohematology (3
This course emphasizes clinical interpretation and problem solving. Antibody identification, selection of blood components, transfusion complications, hemolytic disease of the newborn, autoimmune hemolytic anemia and quality assurance are included.
Prereq: Admission to the Clinical Laboratory Sciences Program and CLS 838 or equivalent

CLS 851 Introduction to Clinical Bacteriology (4)
(Change in title, credits, description, lecture:lab ratio and prerequisite)

Change to:

CLS 851 Basic Clinical Microbiology (5)
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.
Lecture: 2; laboratory, 3 hours per week.
Prereq: Admission to the Clinical Laboratory Sciences Program

CLS 856 Advanced Microbiology (4)
(Change in title, credits, lecture:lab ratio, description and prerequisite)

Change to:

CLS 856 Advanced Clinical Microbiology (3)
The study of medically important bacteria, with an emphasis on anaerobes and mycobacteria, and clinically significant fungi, parasites and viruses. Clinical bacteriology knowledge will be applied through case studies.
Prereq: Admission to the Clinical Laboratory Sciences program and CLS 851 or equivalent.

CLS 860 Blood Collection I (1)

(Change in title, description and prerequisite)

Change to:

CLS 860 Blood Collection (1)
The theory and practice of blood collection related to routine and special specimen collection for clinical laboratory testing. Particular emphasis is placed on quality assurance and safe practice issues associated with venipuncture and skin puncture. Students perform venipunctures on artificial arms, actual patients and fellow students. The course includes a mandatory clinical component. Experience collecting venous blood specimens for laboratory testing. Students will receive instructions on proper procedures for phlebotomy and will practice on mannequin arms and each other prior to collecting blood from adult ambulatory and bed patients; pediatric patients; and nursery patients. Offered on a Pass/Fail basis only.
Prereq: Admission into the Clinical Laboratory Sciences Professional Program, or consent of the instructor and completion of required immunizations.

CLS 881 Advanced Immunohematology Practicum (1-4)
(Change in title, credits, description and prerequisite)

Change to:

CLS 881 Immunohematology Practicum (1-5)
A supervised practicum in which the student integrates theory and practice of immunohematology in a clinical setting. Offered on a Pass/Fail basis only. Laboratory, 35-40 hours per week. The number of credits will depend on the student's prior experience.
Prereq: Admission into the Clinical Laboratory Sciences Program and CLS 848 (may be taken concurrently)

CLS 882 Advanced Clinical Chemistry Practicum (1-4)
(Change in title, credits, description and prerequisite)

Change to:

CLS 882 Practicum in Clinical Chemistry (1-5)
A supervised practicum in which the student integrates theory and practice of clinical chemistry in a health care setting. Offered on a Pass/Fail basis only. Laboratory, 35-40 hours per week. The number of credits will depend on the student's prior experience.
Prereq: Admission into the Clinical Laboratory Sciences Program and CLS 844 (may be taken concurrently)

CLS 883 Advanced Clinical Hematology Practicum (1-4)
(Change in title, credits, description and prerequisite)

Change to:

CLS 883 Practicum in Clinical Hematology (1-5)

A supervised practicum in which the student integrates theory and practice of clinical hematology in a health care setting. Offered on a Pass/Fail basis only. Laboratory, 35-40 hours per week. The number of credits will depend on the student's prior experience.
Prereq: Admission into the Clinical Laboratory Sciences Program and CLS 843 (may be taken concurrently)

CLS 884 Advanced Clinical Microbiology Practicum (1-4)
(Change in title, credits, description and prerequisite)

Change to:

CLS 884 Practicum in Clinical Microbiology (1-5)
A supervised practicum in which the student integrates theory and practice of clinical microbiology in a health care setting. Offered on a Pass/Fail basis only. Laboratory, 35-40 hours per week. The number of credits will depend on the student's prior experience.
Prereq: Admission into the Clinical Laboratory Sciences Program and CLS 856 (may be taken concurrently)

CLS 890 Research in Clinical Laboratory Sciences (1-5)
(Change in title, credits, lecture:lab ratio, description and prerequisite)

Change to:

CLS 890 Independent Laboratory Investigation (1-3)
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.
Prereq: admission into the clinical laboratory sciences program and STA 291 or equivalent

Drop Courses:

CLS 845 Clinical Immunology and Serology I (3)
CLS 855 Clinical Immunology and Serology II (3)
CLS 861 Blood Collection II (3)
CLS 867 Educational Principles in CLS (1)
CLS 880 Clinical Practicum in Clinical Laboratory Sciences (8)

For Information Only:

Distance Learning Courses

The following course are approved for distance learning; specifics are available in the College:

CLS 835	Clinical Immunology	(4)
CLS 836	Laboratory Management	(3)
CLS 843	Advanced Clinical Hematology and Body Fluid Analysis	(3)
CLS 844	Advanced Clinical Chemistry	(3)
CLS 848	Advanced Immunohematology	(3
CLS 856	Advanced Clinical Microbiology	(3)

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