CATALOG OF ONLINE COURSES APPROPRIATE FOR STUDENTS IN DOCTORAL PROGRAMS IN CLINICAL LABORATORY SCIENCE AND AVAILABLE ONLINE TO STUDENTS FROM OTHER INSTITUTIONS 1.6.16 rev

A Project of the Sub-Committee on the Doctorate in Clinical Laboratory Science (DCLS) of the Education Scientific Assembly (ESA) of the American Society for Clinical Laboratory Science (ASCLS)

Note: In all cases, the applicability of a course to a student's program is determined by the student's home institution. Information is accurate as of December 2015. Students are referred to each institution for specifics and updates.

Institution Name	**George Washington University**	**Michigan State University**	**Rutgers - School of Health Professions**	**University of Texas Medical Branch**	**Virginia Commonwealth University**
Name of the department, division, or program at that offers graduate programs for medical laboratory professionals at this institution	Medical Laboratory Sciences Program	Biomedical Laboratory Diagnostics Program	Department of Clinical Laboratory Sciences	Clinical Laboratory Sciences	Department of Clinical Laboratory Sciences
Contact person for prospective students with questions about taking these courses	Marcia Firmani (firmanim@gwu.edu)	Mariane S. Wolfe, setyabu1@msu.edu, 517-432-3805	Dr. Nadine Fydryszewski fydrysna@shp.rutgers.edu	Linda Myers llmyers@utmb.edu	Dr. Teresa Nadder, tsnadder@vcu.edu
URL with information about the on-line graduate courses offered by this institution for non-matriculated students	https://smhs.gwu.edu/crl/programs/mls	https://bld.natsci.msu.edu/online-education/	shp.rutgers.edu/dept/CLS/DCLS	http://shp.utmb.edu/ClinicalLaboratorySciences/GraduateProgram.asp	http://bulletin.vcu.edu/azcourses/clls/
Credit system is used and term length	Semesters (~15 weeks) - three semesters/year	Semesters (~15 weeks) - three semesters/year	Semesters (~15 weeks) - three semesters/year	Semesters (~15 weeks) - three semesters/year	Semesters
COURSE LISTS					
Course number	**MLS 6242**	**BLD 801**	**CLSC5112**	**CLLS 5319**	**CLLS 601**
Course title	Molecular Pathology	Biomedical Laboratory Diagnostics Seminar	Molecular Diagnostics	Biostatistics	Theoretical Blood Banking
Using the credit system specified earlier, number of credits for this course	3	1	3	3	3
Course description	Investigation of human disease processes with an emphasis on the molecular and genetic mechanisms of disease.	Current research topics in clinical laboratory sciences	Concepts in molecular biology, genetics, molecular basis of human disease, techniques, theory and application in diagnosis, monitoring, therapeutic decision-making, and prediction of genetic, hematopathological, infectious, and malignant diseases.	Select and utilize the appropriate bio statistical techniques for classical and practical hypothesis testing, including lack of fit tests, simple categorical data analysis including goodness of fit, and homogeneity of proportions.	A comprehensive study of the blood groups in man, including biochemistry, genetics and clinical significance. Topics relating to problems with antibodies to the blood group antigens are discussed.
Topic areas are addressed by this course	Biochemistry/Cell biology	Communication Skills; Capstone Research Project	Molecular biology/diagnostics	Statistics/biostatistics	Immunohematology
	Immunology				
	Molecular biology/diagnostics				
	Microbiology/infectious diseases				
	Immunohematology/Transfusion services				
	Medical genetics				
Required prerequisites for this course	1) Baccalaureate degree in science or health science	N/A	Baccalaureate degree with coursework in biological sciences and chemistry; previous coursework in molecular biology recommended, but not required.	MLS certification	Permission of instructor
Delivery mode for this course	On-line	On-line	On-line	On-line	On-line
Season in which this course is offered	Summer of each year	Fall of each year	Fall of each year	Fall of each year	Fall semester
	may be offered in other semesters as needed	Spring of each year	Spring of each year		
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Master's students only	Both master's and doctoral students	Both master's and doctoral students	Master's students only
Course number	**MLS 6243**	**BLD 805**	**CLSC5213**	**CLLS 5320**	**CLLS 608**
Course title	Education and Assessment in MLS	Communication in the Sciences	Clinical Laboratory Data Analysis	Laboratory Management	Laboratory Diagnosis of Infectious Diseases
Using the credit system specified earlier, number of credits for this course	3	2	3	3	3
Course description	A study of instructional design as applied to the education and training of MLS professionals; a project-oriented course in which students design, develop, and evaluate a set of MLS instructional materials and assessment tools.	Professional communication in clinical laboratory science, including article and proposal writing, thesis writing, posters, and presentations.	Planning and application of quality control processes for laboratory analyses. Explores QC rules/multirules, method evaluation, biological variation in setting quality specifications, Six Sigma system, QC software application.	Principles, practices, and applications of laboratory utilization, critical pathways, clinical decision making, budgeting and marketing laboratory services; Application of laws, regulations, and standards in laboratory practice and accreditation.	Applies an organ system approach to the laboratory diagnosis of infectious diseases. Emphasizes diagnostic methods to verify infections because of pathogenic micro-organisms and includes related diagnostic microbiology laboratory issues.
Topic areas are addressed by this course	Education	Scientific writing and communications	Statistics/biostatistics	Lab Management	Microbiology/Molecular biology/diagnostics

Required prerequisites for this course	1) Baccalaureate degree from a regionally accredited college or university; 2) MLS Certification	None	Baccalaureate degree with previous course work in statistics and work experience in a clinical laboratory required.	MLS Certification	Microbiology/infectious diseases
Delivery mode for this course	On-line	On-line	On-line	On-line	On-line
Season in which this course is offered	Fall of each year	Summer of every year	Fall of each year	Spring of each year	Fall semester
	may be offered in other semesters as needed	Fall of every year	Spring of each year		
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Both master's and doctoral students	Both master's and doctoral students	Both master's and doctoral students	Master's students only
Course number	**MLS 6244**	**BLD 811**	**CLSC5123**	**CLLS 5311**	
Course title	Research Ethics and Scientific Integrity	Fundamentals of Scientific Research	Advanced Hematology	Clinical Correlations/ Evidence-Based Evidence	
Using the credit system specified earlier, number of credits for this course	3	1	3	3	
Course description	Traditional and modern topics in research ethics and scientific integrity.	Best practices for the research enterprise. Ethical conduct of research. Critical evaluation of scientific literature.	In-depth study of physiology, regulation, hematopoietic system, and the genetic, molecular and cellular mechanisms underlying the pathophysiology of selected anemias, leukemias and lymphomas. Utilization of laboratory tests for screening, diagnosis and prognosis.	Concepts, issues, process and application of EBM as applied to laboratory practice; validity and applicability of research findings, and current medical evidence to make informed clinical decisions.	
Topic areas are addressed by this course	Patient clinical interactions/skills	Research Design	Hematology	Evidence-based Medicine	
		Research ethics			
		Human subject protection			
Required prerequisites for this course	Baccalaureate degree in science or health science	N/A	Baccalaureate degree with previous course work and/or experience in Hematology required.	MLS Certification	
Delivery mode for this course	On-line	On-line	On-line	On-line	
Season in which this course is offered	Spring of each year	Spring of each year	Spring of every other year	Summer of each year	
	may be offered in additional semesters as needed				
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Master's and doctoral students	Both master's and doctoral students	Both master's and doctoral students	
Course number	**MLS 6245**	**BLD 815**	**CLSC5124**	**CLLS 5327**	
Course title	Current Topics in MLS	Cell Biology in Health and Disease I	Advanced Hemostasis	Laboratory Validation Studies	
Using the credit system specified earlier, number of credits for this course	3	2	3	3	
Course description	Exploration of findings within the medical laboratory science field. Current topics will be integrated into the development of a research proposal.	Principles and theories of cell biology and biochemistry are presented with a focus on applications to clinical pathology.	In-depth study of physiology and regulation of hemostasis, genetic, molecular and cellular mechanisms underlying the pathophysiology of selected disorders of hemostasis, utilization of laboratory tests for screening, diagnosis, and monitoring therapy. Advanced laboratory practice issues will also be covered.	Processes/steps involved in method evaluation; evaluate the acceptability of a procedure based on performance characteristics and patient comparison studies	
Topic areas are addressed by this course	Hematology	Biochemistry/Cell biology	Hemostasis	Method Evaluation/Laboratory Validation	
	Hemostasis	Molecular biology/diagnostics			
	Immunology	Microbiology/infectious diseases			
	Molecular biology/diagnostics	Pathophysiology			
	Microbiology/infectious diseases				
	Immunohematology/Transfusion services				
	Medical genetics				
	Grant Writing				
Required prerequisites for this course	Baccalaureate degree in science or health science	Undergraduate course in Biochemistry and Physiology. Experience in a clinical laboratory.	Baccalaureate degree with previous course work and/or experience in hemostasis required.	MLS Certification	
Delivery mode for this course	On-line	On-line	On-line	On-line	
Season in which this course is offered	Fall of each year	Spring of each year	Spring of every other year	Summer of each year	
	Spring of each year				
	Summer of each year				
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Master's and doctoral students	Both master's and doctoral students	Both master's and doctoral students	
Course number	**MLS 6217**	**BLD 816**	**CLSC5133**	**PMCH 6496**	
Course title	Medical Biotechnology	Cell Biology in Health and Disease II	Transfusion Practice	Evidence Based Practice	

Using the credit system specified earlier, number of credits for this course	3	2	3	3	
Course description	This course provides a comprehensive overview of current molecular technologies and how they are used in modern medicine.	Principles and theories of cell biology and biochemistry are presented with a focus on applications to clinical pathology.	In-depth study of the RBC structure, biochemistry, function, hemoglobin and blood group systems. Enhancement of skills in the identification and resolution of complex antibody and compatibility testing problems. Therapeutic indications for transfusion, transfusion requirements in special situations, and the pathophysiology and investigation of adverse transfusion reactions.	Application of Evidence-based laboratory practices to outcome measurements and ways in which laboratory professionals work with other professions to establish clinical guidelines for diagnosis and disease management.	
Topic areas are addressed by this course	Biochemistry/Cell biology	Biochemistry/Cell biology	Immunohematology/ Transfusion services	Evidence Based Practice	
	Molecular biology/diagnostics	Molecular biology/diagnostics			
	Medical genetics	Medical genetics			
		Pathophysiology			
Required prerequisites for this course	Baccalaureate degree in science or health science	BLD 815.	Baccalaureate degree with previous course work and/or experience in Blood Banking.	CLLS 5311	
Delivery mode for this course	On-line	On-line	On-line	Online	
Season in which this course is offered	Summer of each year	Summer of each year	Spring of every other year	Summer	
	may be offered in additional semesters as needed				
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Master's and doctoral students	Both master's and doctoral students	Both master's and doctoral students	
Course number	**MLS 6140**	**BLD 830**	**CLSC5134**		
Course title	Advanced Laboratory Management	Concepts in Molecular Biology	Advanced Clinical Immunology		
Using the credit system specified earlier, number of credits for this course	3	2	3		
Course description	A problem-based approach to the principles of laboratory management and will focus on managerial concepts that will provide opportunities to apply theoretical management models to real-life situations in the clinical laboratory.	Techniques and theories of molecular biology, nucleic acid synthesis and isolation, enzymatic digestion and modification, electrophoresis, hybridization, amplification, library construction, and cloning.	Concepts in cellular, humoral, and molecular immunology. Emphasis on techniques related to clinical applications, diagnostic and therapeutic testing of immune-mediated diseases, pregnancy, anaphylaxis and allergy, immunotherapy and immunotoxicology, transplantation, cancer immunology and immunodeficiency.		
Topic areas are addressed by this course	Health informatics	Biochemistry/Cell biology	Immunology		
	Patient clinical interactions/skills	Molecular biology/diagnostics			
	Management	Microbiology/infectious diseases			
		Medical genetics			
		Clinical Paths/Test Algorithms; Clinical Decision Making; Ethics; Clin.Lab. Data Analysis;			
Required prerequisites for this course	Baccalaureate degree in science or health science from a regionally accredited college or university	One course in biochemistry or concurrently.	Baccalaureate degree with previous coursework and/or experience in clinical immunology.		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Fall of each year	Fall of each year	Summer of every other year		
	may be offered in additional semesters as needed	Spring of each year			
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Master'sand doctoral students	Both master's and doctoral students		
Course number	**MLS 6141**	**BLD 831**	**CLSC5140**		
Course title	Advanced Immunology and Serology	Clinical Application of Molecular Biology	Advanced Topics in Clinical Chemistry		
Using the credit system specified earlier, number of credits for this course	3	2	3		

Course description	This course covers the principles of the immune system and the clinical applications of immunology related to the diagnosis of human diseases.	Molecular diagnostic principles. Diagnostic outcomes in traditional and non-traditional laboratory disciplines.	Focus on advanced topics in clinical chemistry to enhance scientific/technical skills and management skills. Topics include but are not limited to: cardiac and tumor marker, kidney function testing, automation, POCT, Diabetes, Monoclonal Proteins, Vit D Deficiency, TDM, Lab Error, and advanced case studies in clinical chemistry.		
Topic areas are addressed by this course	Immunology	Biochemistry/Cell biology	Biochemistry/Cell biology		
		Hematology			
		Hemostasis			
		Immunology			
		Molecular biology/diagnostics			
		Microbiology/infectious diseases			
		Medical genetics			
		Clinical Decision Making; Critical Paths/Test Algorithms; Bioinformatics; Clin.Lab.Data Analysis			
Required prerequisites for this course	Baccalaureate degree in science or health science from a regionally accredited college or university	Basic biochemistry, medical or research laboratory experience. OR BLD 830	Baccalaureate degree, with course work in Clinical Chemistry and/or work experience in a clinical chemistry laboratory.		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Fall of each year	Spring of each year	Fall of every other year		
	Spring of each year	Summer of each year			
	Summer of each year				
At the home institution, what level students enroll in this course?	Master's and doctoral students	Master's and doctoral students	Both master's and doctoral students		
Course number	**MLS 6114**	**BLD 835**	**CLSC5273**		
Course title	Advanced Clinical Microbiology I	Hemostasis, Thrombosis and Effective Resource Management	Advanced Topics In Clinical Microbiology		
Using the credit system specified earlier, number of credits for this course	3	3	3		
Course description	This course covers the pathogenic characteristics, isolation techniques, specimen collection and handling, laboratory identification, and treatment of medically significant bacteria and viruses.	Theories of coagulation, thrombosis and effective blood product management. Needs and particular stresses during an active bleeding crisis.	In-depth review of current topics in clinical microbiology. Topics include, but are not limited to, molecular methods/applications, bioterrorism, biofilms, outcomes assessment, updates in virology, parasitology, informatics in clinical microbiology, automation/rapid methods, antibiotics resistance testing, and advanced case studies in microbiology.		
Topic areas are addressed by this course	Microbiology/infectious diseases	Hematology	Microbiology/infectious diseases		
		Hemostasis			
		Immunohematology/ Transfusion services			
Required prerequisites for this course	Baccalaureate degree in science or health science from a regionally accredited college or university	Background in hemostasis, thrombosis and blood product management.	Baccalaureate degree with previous course work and/or experience in Clinical Microbiology required.		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Spring of each year	Fall of each year	Spring of every other year		
	Summer of each year				
At the home institution, what level students enroll in this course?	Master's and doctoral students	Master's and doctoral students	Both master's and doctoral students		
Course number	**MLS 6115**	**BLD 836**	**CLSC6112**		
Course title	Advanced Clinical Parasitology and Mycology	Adverse Transfusion Outcomes: Detection, Monitoring and Prevention	Advanced Topics in Molecular Diagnostics		
Using the credit system specified earlier, number of credits for this course	1	2	3		

Course description	A systematic approach to the biology and epidemiology of human parasitic and fungal diseases	Adverse transfusion outcomes (ATO) covering cause, methods of detection, monitoring paradigms and prevention.	In-depth updates in selected topics in molecular diagnostics. Topics include but are not limited to: advanced methods in sequencing and automation, pharmacogenomics and personalized medicine, proteonomics, consumer directed testing, and case studies in molecular oncology, hematopathilogy, genetics, and infectious diseases.		
Topic areas are addressed by this course	Microbiology/infectious diseases	Immunohematology/ Transfusion services	Molecular biology/diagnostics		
		Pharmacology			
		Clinical Decision Making; Critical Paths/Test Algorithms; Utilization Review Safety - Patient/Provider; Medical Error Prevention; Clin. Lab. Data Analysis			
Required prerequisites for this course	Baccalaureate degree in science or health science from a regionally accredited college or university	Medical laboratory sciences professionals.	Baccalaureate degree, completion of CLSC 5112 Molecular Diagnostics		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Fall of each year	Spring of each year	Fall of each year		
	Spring of each year	Summer of each year			
	Summer of each year				
At the home institution, what level students enroll in this course?	Master's and doctoral students	Master's and doctoral students	Both master's and doctoral students		
Course number	**MLS 6124**	**BLD 837**	**CLSC6214**		
Course title	Advanced Clinical Microbiology II	Transfusion Service Operations and Management	Clinical Laboratory Utilization in Quality Health Care Delivery		
Using the credit system specified earlier, number of credits for this course	2	1	3		
Course description	This course presents the etiology of infectious diseases in different body sites using a case-study- based approach.	Management and operational practices needed to meet both the fiscal and regulatory oversight of a transfusion service.	Analysis of the economic, social, regulatory, and professional issues affecting the delivery of cost-effective, quality clinical laboratory services and the appropriate use of laboratory services in clinical decision making. The use of practice guidelines, critical or clinical pathways, algorithms and reflex testing, direct access testing, evidenced-based practice, and outcomes measurements, as well as initiatives to change the practice of laboratory services in all phases (pre-analytical, analytical and post analytical) are covered.		
Topic areas are addressed by this course	Microbiology/infectious diseases	Immunohematology/ Transfusion services	Health informatics		
		Clinical Decision Making; Healthcare Policy/Leg.	Patient clinical interactions/skills		
Required prerequisites for this course	Baccalaureate degree in science or health science from a regionally accredited college or university	Clinical transfusion service practical experience.	Baccalaureate degree plus education or experience in clinical laboratory science.		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Fall of each year	Fall of each year	Fall of each year		
	Spring of each year	Spring of each year			
	Summer of each year				
At the home institution, what level students enroll in this course?	Master's and doctoral students	Master's and doctoral students	Both master's and doctoral students		
Course number	**MLS 6151**	**BLD 842**	**CLSC6215**		
Course title	Advanced Molecular Diagnostics	Managing Biomedical Laboratory Operations	Healthcare Regulations & Laboratory Management		
Using the credit system specified earlier, number of credits for this course	3	2	3		
Course description	This course covers the technology, theory, and methodology of specific molecular utilized within a clinical and research laboratory setting to aid in disease diagnosis, including those of genetic, oncogenic, and infectious origin	Integration of the roles of legislative, regulatory, technological and economic factors that influence the practice and management of biomedical laboratory operations.	Applications of management concepts, policies and regulatory issues in clinical laboratory services, basic management concepts, laboratory finance,human resource management, regulatory issues, compliance, coding and accreditation will be explored.		

	Molecular biology/diagnostics	Health informatics	Management/Operations/Regulations		
Topic areas are addressed by this course	Medical genetics	Utilization Review;Safety-Patient/Provider;Quality Systems;Medical Error Prevention;Comm.skills; Resource Mgmt.; Outcomes Analysis; Analysis of Cost/Benefits; Patient Privacy			
Required prerequisites for this course	Baccalaureate degree in science or health science from a regionally accredited college or university	N/A	Baccalaureate degree plus education or experience in clinical laboratory science.		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Fall of each year	Fall of each year	Fall of every other year		
	Spring of each year	Spring of each year			
	Summer of each year				
At the home institution, what level students enroll in this course?	Master's and docotral students	Master'sand doctoral students	Both master's and doctoral students		
Course number	**MLS 6216**	**BLD 844**	**CLSC6274**		
Course title	Microbial Pathogenesis	Topics in Biomedical Laboratory Operations	Infectious Disease		
Using the credit system specified earlier, number of credits for this course	3	1	3		
Course description	A comprehensive overview of the molecular basis of diseases caused by microbial pathogens with a focus on model microbial systems to illustrate mechanisms of the human infectious disease process.	Current issues relevant to biomedical laboratory operations from an interdisciplinary perspective with an emphasis on efficient laboratory operations.	Explore the agents of infectious disease in a systems approach. Emphasis on bacterial agents, parasites, fungi, viruses, including clinical presentation, pathophysiology, laboratory diagnosis, monitoring, interdisciplinary aspects of the disease state.		
Topic areas are addressed by this course	Microbiology/infectious diseases	Health informatics	Microbiology/infectious diseases		
		Utilization Review;Safety-Patient/Provider;Quality Systems;Medical Error Prevention;Resource Mgmt.; Outcomes Analysis; Analysis of Cost/Benefits; Patient Privacy			
Required prerequisites for this course	Baccalaureate degree in science or health science from a regionally accredited college or university	BLD 842	Baccalaureate degree with previous course work and/or experience in Microbiology required.		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Spring of each year	Spring of each year	Spring of every other year		
	may be offered in additional semesters if needed				
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Master's and doctoral students	Both master's and doctoral students		
Course number	**MLS 6219**	**BLD 846**	**CLSC6280**		
Course title	Molecular Biology	Decision Processes for Biomedical Laboratory Operations	Environment, Public Health and Immunity		
Using the credit system specified earlier, number of credits for this course	3	2	6		
Course description	This course will emphasize the molecular mechanisms of DNA replication, repair, transcription, translation and gene regulation in prokaryotic and eukaryotic cells.	Integrative case studies presented in a problem-based learning format. Strategies for decision-making in the operations of a biomedical laboratory. Cases integrate scientific principles, management principles and regulatory factors.	The course is designed to provide a study of complex environmental and health risks as they relate to clinical laboratory science practitioners. Concepts in the diagnosis and prevention of diseases brought to the community by environmental and/or man-made hazards. The course will integrate concepts derived from the interdisciplinary fields of public health, environmental science and clinical laboratory science.		
Topic areas are addressed by this course	Molecular biology/diagnostics	Health informatics	Immunology		
		Utilization Review;Safety-Patient/Provider;Quality Systems;Medical Error Prevention;Resource Mgmt.; Outcomes Analysis; Analysis of Cost/Benefits; Patient Privacy; Licensure	Microbiology/infectious diseases		
			Public Health		

Required prerequisites for this course	Baccalaureate Degree in sience or health science from a regionally accredited college or university	BLD 842	Baccalaureate degree with course work in clinical laboratory science and/or work experience in a clinical or public health laboratory settings or the biotechnology field.		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Spring of each year	Fall of each year	Spring of every other year		
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Master's students only	Both master's and doctoral students		
Course number	**MLS 6218**	**BLD 850**	**IDST5140**		
Course title	Genetics	Concepts in Immunodiagnostics	Teaching in the Health Professions		
Using the credit system specified earlier, number of credits for this course	3	2	3		
Course description	This course will cover hereditary and molecular genetics, with an emphasis on genomics and human diseases.	Immunology principles and theory applied to diagnostic evaluation of the host immune response during health and disease.	An evidence-based analysis of the skills needed for effective teaching in the health professions. Emphasis on teaching style, philosophy, application of teaching-learning theories, instructional strategies, student evlauation,advising/mentoring, legal/ethical issues and portfolio method to document/assess teaching effectiveness.		
Topic areas are addressed by this course	Medical genetics	Biochemistry/Cell biology	Hematology		
		Immunology	Consultation		
		Molecular biology/diagnostics			
		Medical genetics			
		Pathophysiology			
		Clinical Decision Making; Clin. Lab. Data Analysis;			
Required prerequisites for this course	Baccalaureate Degree in science or health science from a regionally accredited college or university	An undergraduate course in biochemistry or cell biology.	minimum of a bachelor's degree, current credential or experience in health care		
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Fall of each year	Fall of each year	Fall of each year		
	may be offered in additional semesters if needed	Spring of each year			
At the home institution, what level students enroll in this course?	Both master's and doctoral students	Master's and doctoral students	Both master's and doctoral students		
Course number	**MLS 6213**	**BLD 851**	**IDST5750**		
Course title	Seminar in Immunohematology	Clinical Application of Immunodiagnostic Principles	Health Epidemiology		
Using the credit system specified earlier, number of credits for this course	2	2	3		
Course description	Federal, state, and international regulations that govern the blood bank industry; laboratory research related to blood products; new product and practice guidelines; legal, social, and ethical issues related to transfusion medicine.	Immunodiagnostic theories and principles applied to clinical assay development and method evaluation.	An overview of principles, practices and policies in epidemiology within healthcare. Interdisciplinary focus incorporating epidemiology relevant to fields of healthcare management, nutrition, clinical lab sciences, and pharmaceuticals.		
Topic areas are addressed by this course	Immunohematology/Transfusion services	Immunology	Epidemiology		
		Molecular biology/diagnostics			
		Medical genetics			
		Pathophysiology			
		Clinical Decision Makingl Critical Paths/Test Algorithms; Clin.Lab. Data Analysis			
Required prerequisites for this course	Baccalaureate degree in science or health science from a regionally accredited college or university	BLD 850			
Delivery mode for this course	On-line	On-line	On-line		
Season in which this course is offered	Summer of each year	Fall of each year	Fall of each year		
		Spring of each year			
At the home institution, what level students enroll in this course?	Master's and Doctoral students	Master's and doctoral students	Both master's and doctoral students		
Course number		**BLD 853**	**IDST6121**		
Course title		Advanced Flow Cytometry	Data Analysis and Interpretation I		

Using the credit system specified earlier, number of credits for this course		2	3		
Course description		Flow cytometry systems, software and reagents. Data analysis and experimental design of complex flow cytometric assays. Flow cytometry applications in medicine and research.	Covers the selection, application, and interpretation of basic statistical tests and procedures used in the health sciences and methods for effective data communication and presentation. Topics include data and variables, test and instrument validity and reliability, statistical inference, analysis of variance, regression and correlation, nonparametric statistics, and basic epidemiologic data analysis.		
Topic areas are addressed by this course		Immunology	Statistics/biostatistics		
		Bioinformatics; Clinical Decision making; Critical Paths/Test Algorithms, Research Design; Clin.Lab.Data Analysis			
Required prerequisites for this course		BLD 850 and BLD 851 and (BLD 852 or concurrently) or approval of department	minimum of a bachelor's degree, current credential or experience in health care.		
Delivery mode for this course		On-line	On-line		
Season in which this course is offered		Summer of each year	Fall of each year		
			Spring of each year		
At the home institution, what level students enroll in this course?		Master's and doctoral students	Both master's and doctoral students		
Course number		**BLD 870**	**IDST5110**		
Course title		Clinical Mass Spectrometry	Health Services Issues and Trends		
Using the credit system specified earlier, number of credits for this course		2	3		
Course description		Theory and principles of mass spectrometry. Principles of instrumentation, liquid and gas chromatography theory and data analysis as it applies to the clinical laboratory.	An analysis of selected professional and policy issues and trends affecting the present and projected health care delivery system. Issues concerning health are personnel, patients, health care technology, organizational structures and facilities, finance mechanisms, and the role of government are stressed in relation to how they influence health care services delivery.		
Topic areas are addressed by this course		Mass spectrometry	Consultation		
		Immunology	Public Health		
		Clinical laboratory Data Analysis			
		Infectious disease			
Required prerequisites for this course		One course in biochemistry or concurrent	Minimum of a bachelor's degree, current credential or experience in health care		
Delivery mode for this course		On-line	On-line		
Season in which this course is offered		Fall of every year	Spring of each year		
At the home institution, what level students enroll in this course?		Master's and doctoral students	Both master's and doctoral students		
Course number		**BLD 871**			
Course title		Applied Clinical Mass Spectrometry			
Using the credit system specified earlier, number of credits for this course		2			
Course description		Data interpretation and quality control in clinical mass spectrometry. Principles of sample preparation, platform selection, data analysis, and clinical applications as it applies to the clinical laboratory			
Topic areas are addressed by this course		Mass spectrometry			
		Immunology			
		Clinical laboratory Data Analysis			
		Infectious disease			

Required prerequisites for this course		BLD 870 or approval of the department			
Delivery mode for this course		On-line			
Season in which this course is offered		Spring of every year			
At the home institution, what level students enroll in this course?		Master's and doctoral students			
On-campus graduate courses open to non-matriculated students at this institution		BLD 832 Molecular Diagnostics Laboratory 2 cr. BLD 852 Immunology and Flow Cytometry Laboratory 2 cr.			
On-line classes pertinent to a DCLS that are taught in other departments at this institution	HSCI 6263 Biostatistics for Clinical and Translational Research; HSCI 6264 Epidemiology for Clinical and Translational Research; HSCI 6270 Research Methods for Health Professionals I; HSCI 6271 Research Methods for Health Professionals II; HSCI 6241 The Health Care Enterprise HSCI 6223 Topics in Health Care Leadership; HSCI 6240 Issues and Trends in Health Systems				