PART I – NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

COLLEGE OF NATURAL SCIENCE

1. Request to establish a Bachelor of Science degree in Medical Laboratory Science in the Biomedical Laboratory Diagnostics Program. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its September 21, 2017 meeting.

a. Background Information:

The proposed Bachelor of Science Medical Laboratory Science degree program is a revised and updated version of the Clinical Laboratory Science (CLS) degree program. The current CLS degree program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Upon completion of the CLS degree program, students are eligible to take the national Board of Certification exam by the American Society for Clinical Pathology (BOC ASCP). The degree name is being changed from Clinical Laboratory Science to Medical Laboratory Science because of the name change by the profession in 2009. In 2009, the Board of Registry and the National Credentialing Agency merged and one of the results of that merger was the designation for certified laboratory professionals. The new designation is Medical Laboratory Scientist (the older name is Medical Technologist [MT] and Clinical Laboratory Scientists [CLS]). With the updated curriculum, the name change was included to reflect the current professional designation for our graduates. The new MLS degree program will still follow the accreditation as outlined by NAACLS. The current CLS degree program will be placed in moratorium and discontinued.

According to the United States Bureau of Labor Statistics Occupational Outlook Handbook, the Medical Laboratory Science (MLS) profession is expected to grow by 16 percent between 2014 and 2024 (https://www.bls.gov/ooh/Healthcare/Medical-and-clinical-laboratory-technologists-and-technicians.htm accessed 7/26/2017). The NAACLS lists 223 MLS training programs nationwide with 12 of these located in Michigan. Of the 12 accredited programs in Michigan, MSU is one of eight University based-programs. The MLS major will help Michigan to meet the growing demand for medical laboratory scientists. When last analyzed, MSU graduates contributed approximately 75% of the new medical laboratory scientists added to the workforce each year in Michigan.

The Biomedical Laboratory Diagnostics Program was founded at MSU in 1926 to prepare students to become Medical Technologists, now known professionally as Medical Laboratory Scientists (MLS). Medical laboratory science is a career for persons with an interest in the application of the basic sciences to the clinical diagnosis of human disease. The scope of practice of MLS relies heavily on chemistry, biochemistry, mathematics, statistics, cell biology, genetics, physiology, microbiology and physics. Specific professional course work found in these sciences then focuses on all of the major clinical disciplines including hematology, molecular diagnostics, immunology, immunohematology, hemostasis, clinical microbiology, and clinical chemistry. In addition, students take courses in laboratory management, laboratory quality assurance, healthcare ethics, and professional behaviors. Each course is designed to prepare students for their roles as laboratorians.

The faculty in the unit have provided the preparatory course work in the area of medical laboratory sciences. All of the faculty are certified MLS or MLT and have experience in the clinical laboratory. This unit is the only unit on campus whose faculty possess the expertise to offer this curricular option.

b. Academic Programs Catalog Text:

The medical laboratory science major is designed to prepare students for certification in medical laboratory science. The program includes courses in the biomedical laboratory sciences, communications, mathematics and statistics, and medical laboratory sciences coupled with clinical practicum experiences. It is designed to prepare graduates for certification and immediate employment in medical laboratories upon graduation by including a six-month hospital laboratory experience.

The Bachelor of Science degree program in medical laboratory science has been accredited by the National Accrediting Agency for Clinical Laboratory Sciences, 5600 N. River Road, Suite 720, Rosemont, Illinois 60018; phone (773) 714-8880.
Admission

Enrollment in the medical laboratory science major is limited. A new cohort is admitted at the end of the spring semester of the junior year. Applications for admission are due by the end of fall semester of the junior year. Applicant interviews are conducted during the spring semester of junior year. Admission decisions for students admitted to the medical laboratory science major are made following review of final grades from spring semester of junior year. Students are admitted as Biomedical Laboratory Science major until the application process for Medical Laboratory Science is completed.

To be considered for admission, the applicant must meet the following minimum criteria, in addition to the College of Natural Science admission requirements:

1. Have an overall grade-point average of 2.50 or better including courses taken at other institutions.
2. Have a grade-point average of 2.50 or better in the following courses: BLD 204, BLD 213L, BLD 313, and BLD 314L.
3. Have completed BMB 401, MMG 201 or MMG 301, BLD 324, and BLD 434.

Students who present other exceptional credentials, but do not meet the grade-point criterion noted above, may be considered for admission on a provisional basis. Applications for admission to the medical laboratory science major are reviewed by a committee of faculty. Factors considered by the Admission Committee in the applicant’s review and admission action are: (1) academic record including grade-point averages in science and non-science courses; (2) grades for selected preclinical courses; (3) laboratory science exposure; (4) interview; and (5) compositions. Students who are admitted provisionally and requirement additional course work to remedy deficiencies may not count this course work towards the fulfillment of degree requirements.

Requirements for the Bachelor of Science Degree in Medical Laboratory Science

1. A minimum of 134 credits is required for the Bachelor of Science degree in Medical Laboratory Science.

2. The University requirements for bachelor’s degrees as described in the Undergraduate Education section of this catalog.

   The University's Tier II writing requirement for the Medical Laboratory Science major is met by completing Biomedical Laboratory Science 456. That course is referenced in item 4. b. below.

   Students who are enrolled in the College of Natural Science may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading Graduation Requirements in the College statement. Certain courses referenced in requirement 4. below may be used to satisfy the alternative track.

3. The requirements of the College of Natural Science for the Bachelor of Science degree.

   The credits earned in certain courses referenced in requirement 4. below may be counted toward College requirements as appropriate.

4. The following requirements for the major:

   a. Courses outside Biomedical Laboratory Diagnostics (52 to 59 credits):

      (1) All of the following courses (35 credits):

         BS 161  Cell and Molecular Biology  3
         BS 171  Cell and Molecular Biology Laboratory  2
         CEM 141  General Chemistry  4
         CEM 161  Chemistry Laboratory I  1
         CEM 162  Chemistry Laboratory II  1
         CEM 251  Organic Chemistry I  3
         CEM 252  Organic Chemistry II  3
         CEM 333  Instrumental Methods and Applications  3
         MMG 365  Medical Microbiology  3
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMG 365L</td>
<td>Medical Microbiology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MMG 465</td>
<td>Advanced Medical Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>MMG 465L</td>
<td>Advanced Medical Microbiology Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>PHY 231</td>
<td>Introductory Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 232</td>
<td>Introductory Physics II</td>
<td>3</td>
</tr>
<tr>
<td>(2)</td>
<td>One of the following courses (3 credits):</td>
<td></td>
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<tr>
<td>MTH 124</td>
<td>Survey of Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MTH 132</td>
<td>Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>(3)</td>
<td>One of the following courses (3 or 4 credits):</td>
<td></td>
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<tr>
<td>STT 200</td>
<td>Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>STT 201</td>
<td>Statistical Methods</td>
<td>4</td>
</tr>
<tr>
<td>STT 231</td>
<td>Statistics for Scientists</td>
<td>3</td>
</tr>
<tr>
<td>STT 351</td>
<td>Probability and Statistics for Engineering</td>
<td>3</td>
</tr>
<tr>
<td>STT 421</td>
<td>Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>(4)</td>
<td>One of the following, either (a) or (b) (4 or 6 credits):</td>
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</tr>
<tr>
<td>(a) BMB 401</td>
<td>Comprehensive Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>(b) BMB 461</td>
<td>Advanced Biochemistry I</td>
<td>3</td>
</tr>
<tr>
<td>BMB 462</td>
<td>Advanced Biochemistry II</td>
<td>3</td>
</tr>
<tr>
<td>(5)</td>
<td>One of the following, either (a) or (b) (4 or 8 credits):</td>
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<tr>
<td>(a) PSL 310</td>
<td>Physiology for Pre-Health Professionals</td>
<td>4</td>
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<tr>
<td>(b) PSL 431</td>
<td>Human Physiology I</td>
<td>4</td>
</tr>
<tr>
<td>PSL 432</td>
<td>Human Physiology II</td>
<td>4</td>
</tr>
<tr>
<td>(6)</td>
<td>One of the following courses (3 credits):</td>
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<tr>
<td>MMG 201</td>
<td>Fundamentals of Microbiology</td>
<td>3</td>
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<tr>
<td>MMG 301</td>
<td>Introductory Microbiology</td>
<td>3</td>
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<tr>
<td>b.</td>
<td>All of the following Biomedical Laboratory Diagnostics courses (47 credits):</td>
<td></td>
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<tr>
<td>BLD 121</td>
<td>Survive and Thrive Freshman Seminar</td>
<td>1</td>
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<tr>
<td>BLD 204</td>
<td>Mechanisms of Disease</td>
<td>3</td>
</tr>
<tr>
<td>BLD 213L</td>
<td>Clinical Laboratory Methods</td>
<td>2</td>
</tr>
<tr>
<td>BLD 302</td>
<td>Clinical Chemistry</td>
<td>2</td>
</tr>
<tr>
<td>BLD 313</td>
<td>Quality in Clinical Laboratory Practice</td>
<td>3</td>
</tr>
<tr>
<td>BLD 314L</td>
<td>Advanced Clinical Laboratory Methods</td>
<td>1</td>
</tr>
<tr>
<td>BLD 324</td>
<td>Hematology and Hemostasis</td>
<td>3</td>
</tr>
<tr>
<td>BLD 402</td>
<td>Advanced Clinical Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>BLD 424</td>
<td>Advanced Hematology and Hemostasis</td>
<td>2</td>
</tr>
<tr>
<td>BLD 424L</td>
<td>Advanced Hematology, Hemostasis and</td>
<td></td>
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<tr>
<td></td>
<td>Urinalysis Laboratory</td>
<td>1</td>
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<tr>
<td>BLD 430</td>
<td>Molecular Diagnostics</td>
<td>2</td>
</tr>
<tr>
<td>BLD 434</td>
<td>Clinical Immunology</td>
<td>3</td>
</tr>
<tr>
<td>BLD 435</td>
<td>Immunohematology</td>
<td>2</td>
</tr>
<tr>
<td>BLD 435L</td>
<td>Immunohematology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>BLD 445</td>
<td>Medical Laboratory Management</td>
<td>1</td>
</tr>
<tr>
<td>BLD 456</td>
<td>Medical Laboratory Professionalism (W)</td>
<td>2</td>
</tr>
<tr>
<td>BLD 471L</td>
<td>Advanced Clinical Chemistry Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>BLD 473L</td>
<td>Advanced Clinical Hematology and Body Fluids</td>
<td>3</td>
</tr>
<tr>
<td>BLD 475L</td>
<td>Advanced Clinical Immunology and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Immunohematology Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>BLD 477L</td>
<td>Advanced Clinical Microbiology Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>BLD 479</td>
<td>Professional Behavior in Medical Laboratory Science</td>
<td>1</td>
</tr>
<tr>
<td>BLD 480</td>
<td>Medical Laboratory Science Examinations I</td>
<td>1</td>
</tr>
<tr>
<td>BLD 481</td>
<td>Medical Laboratory Science Examinations II</td>
<td>1</td>
</tr>
</tbody>
</table>

**Academic Standards**

To progress to the clinical phase of the curriculum, students must earn a grade-point average of 2.50 or higher in MMG 465, MMG 465L, BLD 402, BLD 430, BLD 435, and BLD 435L. Students who do not meet this progression standard will be dismissed from the medical laboratory science degree and can graduate with a biomedical laboratory science degree.

A specific statement of the policies for the clinical phase is provided in the Student Policies for Medical Laboratory Science Students. These policies are provided to all students upon acceptance.
to the major, but may be obtained earlier from the Biomedical Laboratory Diagnostics Program, 354 Farm Lane, Room N322, East Lansing, MI 48824. Admitted students are responsible for knowing and adhering to these program policies.

Effective Fall 2018.

2. Request to change the requirements for the Bachelor of Science degree in Biomedical Laboratory Science in the Biomedical Laboratory Diagnostics Program.

The concentrations in the Bachelor of Science degree in Biomedical Laboratory Science will be noted on the student's academic record when the requirements for the degree have been completed.

a. Under the heading Requirements for the Bachelor of Science Degree in Biomedical Laboratory Science make the following changes:

(1) In item 1., paragraph two, replace 'BLD 455' with 'BLD 456'.

(2) In item 3. a. change the total credits from '43 to 46' to '44 to 51'.

(3) In item 3. a. (1) delete the following course:

MMG 463 Medical Microbiology     3

Add the following courses:

MMG 365 Medical Microbiology     3
MMG 365L Medical Microbiology Laboratory    1

(4) Replace item 3. a. (5) with the following:

One of the following, either (a) or (b) (4 or 8 credits):
(a) PSL 310 Physiology for Pre-Health Professionals  4
(b) PSL 431 Human Physiology I   4
PSL 432 Human Physiology II   4

(5) Replace item 3. b. with the following:

All of the following Biomedical Laboratory Diagnostics courses (24 credits):
BLD  121  Survive and Thrive Freshman Seminar   1
BLD  204  Mechanisms of Disease   3
BLD  213L Clinical Laboratory Methods   2
BLD  302  Clinical Chemistry   2
BLD  313  Quality in Clinical Laboratory Practice   3
BLD  314L Advanced Clinical Laboratory Methods   1
BLD  324  Hematology and Hemostasis   3
BLD  430  Molecular Laboratory Diagnostics   2
BLD  434  Clinical Immunology   3
BLD  435  Immunohematology   2
BLD  456  Medical Laboratory Professionalism (W)   2

(6) Add the following item 3. c.:

One of the following concentrations or minor:

Clinical Chemistry (12 or 13 credits)
(1) All of the following courses (7 credits):
BLD  402  Advanced Clinical Chemistry   4
CEM  333  Instrumental Methods and Applications   3
(2) Two of the following courses (5 or 6 credits):
BE  230  Engineering Analysis of Biological Systems   3
CEM  255  Organic Chemistry Laboratory   2
CEM  262  Quantitative Analysis   3
CEM  311  Inorganic Chemistry   3
CEM 383 Introductory Physical Chemistry I 3
PHM 350 Introductory Human Pharmacology 3
PHM 421 Clinical Toxicology 3
PHM 430 Human Pharmacology 3
PHM 450 Introduction to Chemical Toxicology 3

**Immunology** (10 or 11 credits)
(1) Both of the following courses (2 credits):
   BLD 435L Immunohematology Laboratory 1
   BLD 452L Immunodiagnostics Laboratory 1
(2) Two of the following courses (2 credits):
   BLD 439 Histocompatibility and Immunogenetics 1
   BLD 446 Immunobiology of Neoplasia 1
   BLD 447 Immunomodulation and Immunotherapy 1
(3) One of the following courses (3 credits):
   MMG 409 Eukaryotic Cell Biology 3
   MMG 461 Molecular Pathogenesis 3
(4) One of the following courses (3 or 4 credits):
   EPI 390 Disease in Society: Introduction to Epidemiology and Public Health 4
   IBIO 341 Fundamental Genetics 4
   MMG 465 Advanced Medical Microbiology 3
   MMG 431 Microbial Genetics 3

**Medical Microbiology** (10 to 12 credits)
(1) All of the following courses (8 credits):
   MMG 465 Advanced Medical Microbiology 3
   MMG 465L Advanced Medical Microbiology Laboratory 2
   MMG 461 Molecular Pathogenesis 3
(2) One of the following courses (2 to 4 credits):
   BE 230 Engineering Analysis of Biological Systems 3
   BLD 366 Infectious Diseases of East Africa 4
   BLD 861 Emerging Infections, Emerging Technology 2
   EPI 290 History of Scientific Reasoning and Critical Thinking in Global Public Health and Epidemiology 3
   EPI 390 Disease in Society: Introduction to Epidemiology and Public Health 4
   HM 801 Introduction to Public Health 3
   IBIO 316 General Parasitology 3
   MMG 413 Virology 3
   MMG 421 Prokaryotic Cell Physiology 3
   MMG 431 Microbial Genetics 3

**Hematology and Hemostasis** (9 to 11 credits)
(1) All of the following courses (5 credits):
   BLD 424 Advanced Hematology and Hemostasis 2
   BLD 424L Advanced Hematology, Hemostasis and Urinalysis Laboratory 1
   BLD 435L Immunohematology Laboratory 1
   BLD 452L Immunodiagnostics Laboratory 1
(2) Two of the following courses (2 credits):
   BLD 439 Histocompatibility and Immunogenetics 1
   BLD 446 Immunobiology of Neoplasia 1
   BLD 447 Immunomodulation and Immunotherapy 1
(3) One of the following courses (2 to 4 credits):
   BLD 815 Cell Biology in Health and Disease I 2
   BLD 835 Hemostasis, Thrombosis and Effective Resource Management 3
   IBIO 408 Histology 4
   IBIO 425 Cells and Development (W) 4
   IBIO 450 Cancer Biology (W) 3
   MMG 409 Eukaryotic Cell Biology 3
   PHM 350 Introductory Human Pharmacology 3

**Medical Laboratory Science** (13 credits)
All of the following courses:
   BLD 402 Advanced Clinical Chemistry 4
   BLD 424 Advanced Hematology and Hemostasis 2
BLD 424L Advanced Hematology, Hemostasis and Urinalysis Laboratory 1
BLD 435L Immunohematology Laboratory 1
MMG 465 Advanced Medical Microbiology 3
MMG 465L Advanced Medical Microbiology Laboratory 2

**Molecular Diagnostics** (10 credits)
(1) All of the following courses (7 credits):
   - BLD 430L Molecular Diagnostics Laboratory 1
   - BLD 460 Advanced Molecular Diagnostics 2
   - CMSE 201 Introduction to Computational Modeling 4
(2) One of the following courses (3 credits):
   - MMG 409 Eukaryotic Cell Biology 3
   - MMG 431 Microbial Genetics 3
   - MMG 433 Microbial Genomics 3

**Minor in Information Technology** (19 credits)
Students must apply to the Minor in Information Technology through the Eli Broad College of Business. Students interested in pursuing the minor must consult with the Biomedical Laboratory Diagnostics advisor prior to completion of the application.

Effective Fall 2018.
PART II - NEW COURSES AND CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

AT 293  Professional Internship in Agricultural Technology
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to freshmen or sophomores or agricultural technology students in the Institute of Agricultural Technology.
Supervised professional experience in agencies, business and industry related to a student's major field of study.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Fall 2014 Effective Spring 2018

ANS 140A  Fundamentals of Young Horse Training
Fall of every year. 2(0-4) RB: ANS 140 R: Open to students in the College of Agriculture and Natural Resources or in the Institute of Agricultural Technology or in the Department of Animal Science or in the Applied Horse Science Major or in the Horse Management Major.
NEW Demonstration and practice of safely working with and training weanlings, yearlings and two year old horses. Halter training and longeing techniques of clippers and bathing. Discussion of application of learning theory Assist with young horse husbandry procedures; e.g. deworming.
Effective Spring 2018

FSC 815  Food Laws and Regulations in Asia
Food Laws and Regulations in China
Summer of every year. 3(3-0) RB: Food science, law, food safety, international development or related disciplines. Not open to students with credit in LAW 810J.
Current issues that have shaped the regulation of food in Asia, regional characteristics and culture, basic food laws, agency responsibilities, product registration requirements, basic standards, food labeling, food safety, food additives, food import systems. Special emphasis will be given to the food regulations of Japan, China, Korea and Southeast Asia (ASEAN). Current issues that have shaped the regulation of food in China, regional characteristics and culture, food laws, agency responsibilities, product registration requirements, basic standards, food labeling, food safety, food additives, and food import systems.
Effective Summer 2012 Effective Fall 2017

HRT 405  Sustainable Practices for Horticultural Food Crop Production
Spring of every year. 1(1-0) P: HRT 203
NEW Considers the effects of horticultural practices on ecosystem services, and integrated efficiency across perennial and annual food crop production systems; impact of crops on the land and biodiversity; management decision-making; and global forces impacting sustainability. Last 5 weeks of spring semester.
Effective Spring 2018

PKG 421  Virtual Design and Prototyping
Spring of every year. 3(2-2) P: PKG 411
NEW Using technology resources to design and integrate packaging structure and graphics. Use of design thinking for package development. Virtual and physical prototyping. Emphasis on packaging for specialized markets.
Effective Spring 2018
PKG 456  Packaging and Shelf Life of Perishable Food  
Fall of every year. 3(3-0) P: PKG 322 and PKG 323 R: Open to sophomores or juniors or seniors or graduate students in the School of Packaging or approval of department.
NEW  Chemical, physical and microbiological changes that affect quality of produce, meat, and seafood, and their relationship to packaging and distribution (cold chain). Packaging and preservation technologies to extend shelf life of perishable food. 
Effective Fall 2018

PKG 499  Undergraduate Research  
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to undergraduate students in the Packaging Major. Approval of school.
NEW  Undergraduate research project designed to enhance critical thinking, problem-solving, teamwork, and communication skills. 
Effective Fall 2017

CSS 126  Introduction to Weed Management  
Fall of every year. 2(2-0) P: CSS 101 or CSS 232 or HRT 109 R: Open to students in the Institute of Agricultural Technology.
NEW  Weed biology, identification, and management of weeds. 
SA: CSS 156  
Effective Fall 2018

CSS 226L  Weed Science Laboratory  
Fall of every year. 1(0-2) P: ((CSS 126 or concurrently) or (CSS 326 or concurrently)) and (CSS 101 or CSS 232 or HRT 203 or HRT 109)  
SA: CSS 156, CSS 302, CSS 402  
Effective Fall 2018

CSS 288  Principles of Weed Management  
Fall of every year. 3(2-2) P: CSS 101 or PLB 105 or BS 161 or HRT 203 or CSS 232 or LB 145 R: Open to undergraduate students or agricultural technology students. 
Cultural, mechanical, biological, and chemical weed management principles and practices. Environmental considerations. Field trips required. 
SA: CSS 402, CSS 156, CSS 302  
DELETE COURSE  
Effective Fall 2018

CSS 313  Data Interpretation and Writing in the Agronomic Sciences  
Spring of every year. 2(2-0) P: (CSS 110 and CSS 210) and (CSS 101 or CSS 232) R: Not open to freshmen. 
NEW  Data analysis, interpretation, integration, and technical writing in Agronomic Sciences  
Effective Fall 2018

CSS 326  Weed Science  
Fall of every year. 2(2-0) P: CSS 101 or CSS 232 or HRT 203 R: Not open to students in the Institute of Agricultural Technology.
NEW  Weed biology and ecology. Integrated weed management including cultural, mechanical, biological, and chemical control practices. Herbicide mode of action, selectivity in plants, environmental considerations. Case studies. 
SA: CSS 302, CSS 402  
Effective Fall 2018
CSS 441  Plant Breeding and Biotechnology  
Spring of even years. 3(3-0) Interdepartmental with Forestry and Horticulture. P: CSS 101 P: (CSS 350 or concurrently) or (IBIO 341 or concurrently)  
- Plant improvement by genetic manipulation. Genetic variability in plants. Traditional and biotechnological means of creating and disseminating recombinant genotypes and cultivars. Importance of plant breeding to our food system, economy, and environment.  
- Plant improvement by genetic manipulation. History of plant breeding. Traditional and biotechnological means of improving plant cultivars by genetic manipulation. Importance of plant breeding to our food system, economy, and environment.  
Effective Spring 2014 Effective Spring 2018  

PLP 407  Diseases and Insects of Forest and Shade Trees  
Spring of every year. 4(3-3) Interdepartmental with Entomology and Plant Biology. Interdepartmental with Entomology and Forestry and Plant Biology P: (PLB 105 or BS 162 or LB 144) and Completion of Tier I Writing Requirement  
- Diseases, insects, and environmental problems affecting trees in forests, parks, suburbs, and nurseries. Methods of control.  
SA: BOT 407  
Effective Spring 2014 Effective Fall 2017  

COLLEGE OF HUMAN MEDICINE  

FM 610  Elective Clerkship in Family Practice  
Outpatient Family Medicine Clerkship  
Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: third or fourth year student. RB: HM 556 or FM 608 R: Open to graduate-professional students in the College of Human Medicine.  
- Experience in family practice in diverse settings. Primary, continuing and comprehensive care. Advances skills and knowledge in interviewing, clinical procedures, diagnosis, use of community resource utilization, and health maintenance in the outpatient healthcare setting.  
- Request the use of the Pass-No Grade (P-N) system.  
- Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2013 Effective Summer 2018  

FM 611  Family Practice Geriatric Clerkship  
Geriatric Clerkship  
Fall of every year. Spring of every year. Summer of every year. 6 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. P: FM 608 or MED 608 R: HM 556 or FM 608 or MED 608 R: Open to graduate-professional students in the College of Human Medicine.  
- Clerkship in the primary medical care of older adults. Diagnosis, treatment, interdisciplinary team evaluation in geriatric medicine. Advanced care directive processes and procedures.  
- Request the use of the Pass-No Grade (P-N) system.  
- Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2013 Effective Summer 2018
FM 612  Inpatient Clerkship in Family Practice

Inpatient Family Medicine Clerkship

Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: HM 556 or FM 608 R: Open to graduate-professional students in the College of Human Medicine.

Demonstration of the role of the family physician in hospital settings. Management of consultations and referrals. Advances skills and knowledge in interviewing, clinical procedures, diagnosis, interdisciplinary evaluation, and use of community resources in the inpatient healthcare setting.

Request the use of the Pass-No Grade (P-N) system.

Request the use of ET-Extension to postpone grading.

The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.

Effective Summer 2013 Effective Summer 2018

FM 617  Sports Medicine Clerkship

Sports Medicine Clerkship

Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: HM 556 or FM 608 R: Open to graduate-professional students in the College of Human Medicine.

Primary care aspects of sports medicine. Care of acute and chronic sports injuries, mostly of collegiate level athletes. Evaluation and treatment of acute and chronic sports injuries in the primary care setting. Acute and emergency care, transportation, and rehabilitation training for collegiate and/or local community athletes. Interdisciplinary care and consultation of athletes. Philosophy and basic science of sports medicine care.

Request the use of the Pass-No Grade (P-N) system.

Request the use of ET-Extension to postpone grading.

The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.

Effective Summer 2013 Effective Summer 2018

FM 618  Palliative Care/End of Life

Palliative & End of Life Care Clerkship

Fall of every year. Spring of every year. Summer of every year. 6(4-0) 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: FM 608 and PHD 600 and MED 608 and PSC 608 and OGR 608 and SUP 608 R: Open to graduate-professional students in the College of Human Medicine.

Basic knowledge and skills necessary to manage patients and families faced with end of life illnesses.

Request the use of the Pass-No Grade (P-N) system.

Request the use of ET-Extension to postpone grading.

The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.

Effective Summer 2013 Effective Summer 2018

HM 611  Hospice Clerkship

Hospice Clerkship

Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: HM 556 R: Open to graduate-professional students in the College of Human Medicine.

NEW Treatment and interdisciplinary team evaluation in hospice medicine. Advanced care directive processes and procedures.

Request the use of the Pass-No Grade (P-N) system.

Request the use of ET-Extension to postpone grading.

The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.

Effective Summer 2018
HM 613  Complementary Medicine Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Evidence based management of disease and symptoms with complementary and alternative medicine.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

HM 614  Student Designed Elective Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Student-designed customized experience of clinical science skills and knowledge. Clinical performance evaluation.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

HM 632  Rural Community Health
Spring of every year. 6(6-0) 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: Completion of preclinical requirements for the Leadership in Rural Medicine Certificate. R: Approval of college.
Patient centered and community based experience in rural medicine and rural medical health systems.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2013 Effective Summer 2018

HM 633  Advanced Rural Community Health
Spring of every year. 6(6-0) 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: Completion of preclinical requirements for the Leadership in Rural Medicine Certificate. R: Approval of college.
Provide students with experiences in rural medicine and rural community health that will enable them to better address the medical needs of rural populations. Advanced clinical skills, knowledge, and experience in rural patient medicine, rural community medicine, and rural medical health systems.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2013 Effective Summer 2018
**HM 691  Research Clerkship**
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: (HM 690) or approval of community research director. RB: approval of community research director. R: Open only to graduate-professional students in the College of Human Medicine. R: Open only to graduate-professional students in the College of Human Medicine.

- Biological, behavioral, or clinical research project. Data gathering, analysis, interpretation, and presentation of a biological behavioral, or clinical research project.
- Request the use of the Pass-No Grade (P-N) system.
- Request the use of ET-Extension to postpone grading.
- The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.

*Effective Spring 1998 Effective Summer 2018*

**HM 801  Introduction to Public Health**
Fall of every year. Spring of every year. Summer of every year. 3(3-0) RB: Academic or professional background in public health or public health-related discipline. R: Open to master's students in the Public Health major or in the Public Health Specialization. R: Open to students in the Public Health Major or in the Public Health Graduate Certificate.

- Philosophy and concepts of the discipline of public health. History and development of the profession. Ethical, legal and political considerations. Provide first introduction to core public health areas. Introduction to public health philosophy and core knowledge areas. Ethical, legal and political considerations. Emphasis on principles and tools for population health, disease prevention and health promotion, health determinants, healthcare and public health systems.

*Effective Fall 2008 Effective Fall 2017*

**MED 609  Hematology Clerkship**
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.

- Request the use of the Pass-No Grade (P-N) system.
- Request the use of ET-Extension to postpone grading.
- The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.

*Effective Fall 1995 Effective Summer 2018*

**MED 610  Oncology Clerkship**
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.

- Request the use of the Pass-No Grade (P-N) system.
- Request the use of ET-Extension to postpone grading.
- The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.

*Effective Fall 1995 Effective Summer 2018*
MED 611 Cardiology Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Evaluation of patients with cardiac diseases. Special diagnostic procedures including cardiac cuticularization, phonocardiography, echocardiography, and electrocardiography. Evaluation of patients with cardiac diseases. Special diagnostic procedures including cardiac cuticularization, phonocardiography, echocardiography, and electrocardiography. Pathobiology of heart disease.
Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. Effective Fall 1995 Effective Summer 2018

MED 612 Nephrology Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Integrated concepts of renal physiology and pathophysiology of renal disease. Clinical experience. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. Effective Fall 1995 Effective Summer 2018

MED 613 Dermatology Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Experience in a dermatologist's office to develop clinical, observational, and diagnostic skills in dermatology. Clinical, observational and diagnostic skills in dermatology. Treatment of common dermatological problems in outpatient and inpatient setting. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. Effective Fall 1995 Effective Summer 2018

MED 614 Pulmonary Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Pulmonary physiology. Evaluation of pulmonary function. Diagnosis and treatment of common pulmonary diseases. Pulmonary pathophysiology. Evaluation of pulmonary function. Diagnosis and treatment of common pulmonary diseases. Principles and practice of mechanical ventilation. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. Effective Fall 1995 Effective Summer 2018
MED 615  Gastroenterology Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

MED 616  Allergy Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Ambulatory and hospital based experience to develop diagnostic skills in allergy. Review of basic therapeutics related to allergic diseases. Ambulatory and hospital based experience to develop diagnostic and management skills in allergy. Therapy for common allergic diseases.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

MED 618  Infectious Diseases Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Clinical problems in infectious and immunologic diseases. Integrated basic science input is provided in seminars. Clinical problems in infectious and immunologic diseases. Integrated pathobiology of host defense and pathogen interactions. Standard and promising pharmacotherapy.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

MED 619  Advanced Internal Medicine Ambulatory
Fall of every year. Spring of every year. Summer of every year. 6(6-0) A student may earn a maximum of 24 credits in all enrollments for this course. P: MED 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Clinical experiences to refine diagnostic and management skills of the complicated general internal medicine patient in the ambulatory setting.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018
MED 621  Advanced Internal Medicine Inpatient  
Fall of every year. Spring of every year. Summer of every year. 6(6-0) A student may earn a maximum of 24 credits in all enrollments for this course. P: MED 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.  
NEW   Clinical experiences to refine diagnostic and management skills of the complicated general internal medicine patient in the inpatient setting.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2018  

MED 622  Endocrinology and Metabolism Clerkship  
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.  
Clinical and/or clinical research clerkship: endocrine diseases, electrolyte abnormalities, endocrine hypertension, or diabetes mellitus. Clinical and/or clinical research experience in endocrine diseases, electrolyte abnormalities, endocrine hypertension, or diabetes mellitus. Pathobiology of major endocrine and metabolic disorders.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
SA: MED 620  
Effective Summer 1995 Effective Summer 2018  

MED 624  Geriatric Clerkship  
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.  
NEW   Clinical experiences to refine diagnostic and management skills in elderly internal medicine patients in the inpatient, outpatient or nursing facility setting.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2018  

MED 626  Physical Medicine and Rehabilitation Clerkship  
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits. 6(6-0) A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.  
Developing regimens for physical medicine procedures, occupational therapy and rehabilitation skills. Rehabilitation medicine using a comprehensive, multidisciplinary approach. Regimens for physical medicine procedures, occupational therapy, rehabilitation skills. Evaluation of disabled patients. Indications for electrodiagnostic procedures.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Fall 1995 Effective Summer 2018
MED 627  Rheumatology Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Combined ambulatory and hospital consultative clerkship for diagnostic skills in areas of rheumatic diseases. Combined ambulatory and hospital consultative clerkship for diagnostic skills and treatment of rheumatic diseases.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

MED 628  Advanced Internal Medicine
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Clinical experiences to refine diagnostic and management skills in general internal medicine. Advanced clinical experiences to refine diagnostic and management skills in complicated general internal medicine patients.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

MED 632  Occupational Medicine Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: MED 608 RB: MED 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Health problems of chemical and mineral dust, radiation, and repetitive trauma. Occupational and environmental differential diagnosis of common diseases due to chemical and mineral dust, radiation, and repetitive trauma. Legal and ethical dimensions.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

OGR 610  Perinatology Clerkship
Fall of every year. Spring of every year. Summer of every year. 4 to 6 credits, 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. P: OGR 641 or OGR 608 RB: OGR 608 R: Open to graduate-professional students or human medicine students in the College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Additional exposure to high risk obstetrics including prenatal diagnosis and counseling, antepartum evaluation, and care of the high risk patient. Management of the intrapartum high risk patient.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2015 Effective Summer 2018
OGR 611  Reproductive Endocrinology and Infertility Clerkship
Fall of every year. Spring of every year. Summer of every year. **4 to 6 credits. 3 to 6 credits.** A student may earn a maximum of 24 credits in all enrollments for this course. P: OGR 608 or OGR 641  
RB: OGR 608  
R: Open to graduate-professional students or human medicine students in the **College of Human Medicine.**  
**R:** Open to graduate-professional students in the College of Human Medicine.  
Added exposure to clinical problems in reproductive endocrinology and female infertility primarily in ambulatory setting. Occasional participation in inpatient experiences. Assisted reproductive technologies.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
**Effective Summer 2015 Effective Summer 2018**

OGR 612  Gynecologic Oncology Clerkship
Fall of every year. Spring of every year. Summer of every year. **4 to 6 credits. 3 to 6 credits.** A student may earn a maximum of 24 credits in all enrollments for this course. P: OGR 608 or OGR 641  
RB: OGR 608  
R: Open to graduate-professional students or human medicine students in the **College of Human Medicine.**  
**R:** Open to graduate-professional students in the College of Human Medicine.  
Added clinical experience in inpatient and ambulatory gynecologic oncology, breast disease, and complicated benign gynecology in the preceptor mode. Pre-treatment evaluation and cancer management, including surgery.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
**Effective Summer 2015 Effective Summer 2018**

PHD 601  Human Development and Pediatric Sub-specialties
Fall of every year. Spring of every year. Summer of every year. **6 to 24 credits. 3 to 6 credits.** A student may earn a maximum of 12 credits in all enrollments for this course. P: PHD 600  
RB: PHD 600  
R: Open only to graduate-professional students in College of Human Medicine.  
**R:** Open to graduate-professional students in the College of Human Medicine.  
Experience in clinical, behavioral, and basic sciences related to pediatrics and human development.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
**Effective Fall 1995 Effective Summer 2018**

PHD 602  Ambulatory Pediatrics
Ambulatory Pediatrics Clerkship  
Fall of every year. Spring of every year. Summer of every year. **6 to 12 credits. 3 to 6 credits.** A student may earn a maximum of 24 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. P: PHD 600  
RB: PHD 600 or HM 556  
R: Open only to graduate-professional students in College of Human Medicine.  
**R:** Open to graduate-professional students in the College of Human Medicine.  
Clinical experience in outpatient and community setting involving ongoing child health care.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
**Effective Fall 1995 Effective Summer 2018**
PHD 603  Pediatric Infectious Diseases Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 RB: PHD 600 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. 
Office, clinic, and inpatient experiences in evaluating and managing pediatric patients with infectious diseases. Interpretation and use of clinical laboratory data. 
Request the use of the Pass-No Grade (P-N) system. 
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. 
Effective Fall 1995 Effective Summer 2018

PHD 605  Pediatric Cardiology Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 RB: PHD 600 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. 
Office, clinic, and hospital experience in diagnostic and therapeutic pediatric cardiology including special diagnostic procedures. 
Request the use of the Pass-No Grade (P-N) system. 
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. 
Effective Fall 1995 Effective Summer 2018

PHD 606  Pediatric Endocrinology and Metabolism Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 RB: PHD 600 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. 
Clinic and hospital experience in evaluating patients with endocrine and metabolic disorders. 
Request the use of the Pass-No Grade (P-N) system. 
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. 
Effective Fall 1995 Effective Summer 2018

PHD 607  Pediatric Hematology and Oncology
Pediatric Hematology and Oncology Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits. 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 RB: PHD 600 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. 
Clinical experience in evaluating and managing pediatric patients with common hematologic and oncologic disorders. 
Request the use of the Pass-No Grade (P-N) system. 
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. 
Effective Fall 1995 Effective Summer 2018
PHD 608  Pediatric Pulmonary Disease Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 RB: PHD 600 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. Inpatient and outpatient clinical experiences in evaluating and managing pediatric patients with pulmonary problems. Diagnostic procedures, clinically relevant physiology, current research. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. Effective Fall 1995 Effective Summer 2018

PHD 609  Pediatric Genetics Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 to 12 credits, 3 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine. Influence of genetic determinants across multiple fields of medicine. Prenatal and developmental history taking. Identification of genetically determine conditions and major and minor anomalies. Use of genetic databases. Family counseling. Selection and interpretation of genetic tests. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. Effective Fall 2009 Effective Summer 2018

PHD 610  Pediatric Allergy-Immunology Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: HM 556 or PHD 600 R: Open to graduate-professional students in the College of Human Medicine. NEW Pathophysiology and evaluation of various atopic and immunologic disorders in pediatric patients. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. Effective Summer 2018

PHD 611  Pediatric Critical Care Medicine Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine. NEW Clinical experience in pediatric critical care medicine including respiratory, acid/base, infectious disease etiologies. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. Effective Summer 2018
PHD 612  Pediatric Gastroenterology Clerkship  
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.  
NEW  Clinical experience in the outpatient and inpatient evaluation and management of pediatric gastrointestinal disease.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2018

PHD 613  Pediatric Emergency Medicine Clerkship  
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.  
NEW  Assessment and management of pediatric patients in emergency care setting.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2018

PHD 614  Pediatric Nephrology Clerkship  
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.  
NEW  Clinical experience in the outpatient and inpatient settings in assessment and management of children with renal disease.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2018

PHD 615  Pediatric Neurology Clerkship  
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.  
NEW  Clinical care of children with neurological disease in the inpatient and outpatient settings.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2018

PHD 616  Pediatric Physical Medicine and Rehabilitation Clerkship  
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.  
NEW  Clinical experience working with children with acute and chronic disabilities  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2018
PHD 617  Pediatric Adolescent Medicine Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Clinical experience and psychosocial dimensions of adolescent medical care in the inpatient or outpatient setting.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

PHD 618  Pediatrics Sub-Internship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Clinical experience in which students take primary responsibility for managing the care of pediatric patients under the supervision of senior residents and/or attending physicians.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

PHD 619  Pediatric Hospital Medicine Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Clinical experience in pediatric medicine in the inpatient setting. Common and uncommon conditions.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

PHD 620  Child Abuse Pediatrics Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: PHD 600 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Clinical assessment and care of children at risk for violence, abuse or neglect in outpatient or inpatient setting.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

PHD 621  Pediatric Rheumatology Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: HM 556 or PHD 600 R: Open to graduate-professional students in the College of Human Medicine.
NEW Pathophysiology and evaluation of pediatric rheumatology patients. Multidisciplinary care of children with chronic rheumatological diseases.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018
SUR 609  Otolaryngology Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 RB: SUR 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. 
Open only to graduate-professional students in College of Human Medicine. 
Common otolaryngologic disorders, emergencies. Diagnosis and treatment. Primary physician’s judgments about management.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. 
Effective Fall 1995 Effective Summer 2018

SUR 610  Plastic Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 RB: SUR 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. 
Open only to graduate-professional students in the College of Human Medicine.
Principles of wound healing and tissue repair. Indications and applications of plastic surgery procedures.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. 
Effective Fall 1995 Effective Summer 2018

SUR 611  Urology Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 RB: SUR 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. 
Open only to graduate-professional students in the College of Human Medicine.
Demonstration of clinical manifestations of genito-urinary disease, investigative methods and techniques of diagnosis and management. Urologic emergencies and performance of basic urologic skills.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. 
Effective Fall 1995 Effective Summer 2018

SUR 613  Orthopedic Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 614 RB: SUR 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. 
Open only to graduate-professional students in the College of Human Medicine. 
Diagnosis and management skills in common orthopedic problems. Orthopedic emergencies.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment. 
Effective Fall 1995 Effective Summer 2018
SUR 614  Neurosurgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608. RB: SUR 608 or HM 556. Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Problems related to common emergent and elective neurosurgery involving the brain, spine, and peripheral nerves. Neurological examinations, diagnostic methods. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1994 Effective Summer 2018

SUR 615  Ophthalmology Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608. RB: SUR 608 or HM 556. Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Medical and surgical treatment of eye diseases. Clinical experiences include private office practice, surgical observations, pre-and post-operative care. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

SUR 616  Thoracic Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608. RB: SUR 608 or HM 556. Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Problem solving in thoracic medicine and surgery. Pulmonary physiology. Diagnostic tools and tests, and indications for surgical procedures. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

SUR 617  Trauma Critical Care
Trauma-Critical Care Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. P: SUR 608. P: SUR 608 or HM 556. Open to graduate-professional students in the College of Human Medicine.
Focused experience in trauma and critical care as part of a surgical team at a Level One Trauma Center. Request the use of the Pass-No Grade (P-N) system. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2000 Effective Summer 2018
SUR 618  Anesthesia Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 RB: SUR 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Common anesthetic agents. Performing anesthetic procedures under faculty supervision.
Common anesthetic agents and procedures. Operative and pos-operative effects, complications, patient risk, cost. Performing anesthetic procedures under faculty supervision.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

SUR 619  Sub-specialty Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 credits. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 RB: SUR 608 or HM 556 R: Open only to graduate-professional students in College of Human Medicine. R: Open to graduate-professional students in the College of Human Medicine.
Surgical domains not covered otherwise or in which students desire further exposure.
Surgical domains not covered in other clerkships experiences in which students desire further exposure.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 1995 Effective Summer 2018

SUR 622  Pediatric Orthopedic Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW
Evaluation and management strategies for common pediatric orthopedic maladies.
Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

SUR 623  Sports Medicine Orthopedic Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW
Evaluation and management strategies for common sports medicine maladies presenting to the orthopedic surgeon. Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018
PART II - NEW COURSES AND CHANGES – continued - 25
November 9, 2017

SUR 624  Vascular Surgery Clerkship
Fall of every year. Spring of even years. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW  Evaluation, management and knowledge of vascular surgical patients. Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

SUR 625  Hand Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW  Evaluation, management and knowledge of hand surgery patients. Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

SUR 626  Pediatric Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW  Evaluation, management and knowledge of general pediatric surgical patients. Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

SUR 627  Burns Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW  Evaluation, management and knowledge of burns in trauma patients. Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

SUR 628  Trauma Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW  Evaluation, management and knowledge of trauma in trauma patients. Technical skill improvement
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018
SUR 629  Colorectal Surgery Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Evaluation, management and knowledge of colorectal surgical patients. Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

SUR 630  Surgical Wound Care Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Evaluation, management and knowledge of wound care in surgical patients. Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

SUR 631  Surgical Oncology Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Evaluation, management and knowledge of surgical oncology patients. Technical skill improvement.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

SUR 632  Surgical Nutrition Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: SUR 608 or HM 556 R: Open to graduate-professional students in the College of Human Medicine.
NEW Evaluation, management and knowledge of nutrition in critically ill surgical patients.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Summer 2018

COLLEGE OF NATURAL SCIENCE

BLD 121  Survive and Thrive Freshman Seminar
Fall of every year. Spring of every year. 1(1-0) R: Open to freshmen or sophomores in the Biomedical Laboratory Science Major or in the Lyman Briggs Biomedical Laboratory Science Coordinate Major or approval of department.
NEW This course provides an introduction to academic skills, communication skills with an emphasis on scientific communication, professional behavior, the history of the medical and the medical laboratory professions, and campus resources for a successful college experience.
Effective Fall 2017
BLD 204  Mechanisms of Disease  
**Fall of every year, Spring of every year, Summer of every year.** 3(3-0) **P: BLD 161 or BLD 145 or BLD 181H**  
P: PSL 310 or PSL 431  
R: Not open to seniors.  
Pathophysiological mechanisms of diseases. Selected applications to organ system pathology.  
SA: MT 204  
**Effective Fall 2014 Effective Fall 2017**

BLD 213L Application of Clinical Laboratory Principles  
Clinical Laboratory Methods  
**Fall of every year, Spring of every year, Summer of every year.** 2(2-2) **P: (CEM 141 and CEM 161) or (LB 171 and LB 171L)**  
RB: BS 171  
R: Open to students in the Human Biology Major or in the Biomedical Laboratory Science Major or in the Lyman Briggs Biomedical Laboratory Science Coordinate Major.  
Lab safety and standards of good laboratory practice including specimen handling and processing. Application of technologies and techniques to the performance of clinical diagnostic testing.  
SA: MT 213  
**Effective Fall 2014 Effective Fall 2017**

BLD 220 Preparing for a Health Professions Career  
**Spring of every year.** 1(1-0)  
R: Open to sophomores or juniors.  
Development of skills needed for success in a health professions career. Historical, economic, sociological and ethical perspectives on the U.S. health professions with focus on medical laboratory careers.  
SA: MT 220  
**DELETE COURSE Effective Fall 2017**

BLD 302 Clinical Chemistry  
**Fall of every year.** 2(2-0) **P: BLD 204 and BLD 313**  
NEW Correlation of common medical laboratory testing and associated disease states, including but not limited to comprehensive metabolic panel, lipid panel, thyroid panel, urinalysis and drugs of abuse screening.  
Effective Spring 2017

BLD 313 Quality in Clinical Laboratory Practice  
**Fall of every year.** Spring of every year. 3(3-0) **P: (BLD 213L) and ((STT 201 or STT 200 or STT 231) and completion of Tier I writing requirement) RB: PHY 232**  
NEW Concepts and principles of clinical laboratory analysis and the statistical evaluation of the data produced as related to quality.  
SA: BLD 414, BLD 417  
Effective Fall 2017

BLD 314L Advanced Clinical Laboratory Methods  
**Fall of every year.** Spring of every year. 1(0-3) **P: BLD 213L RB: BLD 204 and BLD 324**  
R: Open to students in the Biomedical Laboratory Science Major or in the Lyman Briggs Biomedical Laboratory Science Coordinate Major.  
NEW Diagnostics assays across various disciplines within the clinical laboratory including Hematology, Immunohematology, Coagulation, Urinalysis, and Molecular Diagnostics. Also included are data interpretations and problem solving skills.  
Effective Fall 2017
BLD 324  Fundamentals of Hematology, Hemostasis, and Urinalysis
Hematology and Hemostasis
Fall of every year. 3(3-0) P: (BS 161 or concurrently) or (LB 145 or concurrently) or (BS 181H or concurrently) P: BLD 204 or concurrently RB: (PSL 310 or concurrently) or (PSL 250 or concurrently) or (PSL 431 or concurrently)
   Physiology and biochemistry of normal hematologic, hemostatic, and urinary systems. Principles of diagnostic assays to detect diseases affecting those systems. Physiology and biochemistry of normal hematologic and hemostatic systems. Principles of diagnostic assays to detect diseases affecting those systems.
SA: MT 324
Effective Fall 2014 Effective Fall 2017

BLD 324L  Introductory Laboratory in Hematology, Hemostasis and Urinalysis
Fall of every year. 1(0-3) P: BLD 324 or concurrently R: Open to students in the Clinical Laboratory Sciences major.
   Routine laboratory assays used to assess the health of the hematological, hemostatic, and urinary systems.
DELETE COURSE
Effective Fall 2017

BLD 366  Infectious Diseases of East Africa
Summer of every year. Africa 4(1-6) P: (BLD 213) or BLD 214L or (CEM 162 and BS 171) or (LB 145 and LB 172L) RB: Pre-health professional undergraduate students with junior or senior status. R: Approval of department.
NEW
   Study abroad program in Blantyre, Malawi in eastern Africa. The course covers the biology and laboratory diagnosis of the most common infectious disease of the region while exploring themes of health disparities and healthcare system organization. Infectious disease learning is approached through lectures, healthcare system experiences, interaction with clinical and research laboratory practice, and service learning projects.
Effective Summer 2017

BLD 402  Advanced Clinical Chemistry
Spring of every year. 4(4-0) P: (BLD 302 and BMB 401) or (BLD 302 and BMB 461 and BMB 462)
NEW
   Differences in clinical laboratory testing results between normal and diseased populations. The areas of emphasis include: metabolic and endocrine systems, acquired and inherited diseases, therapeutic drug monitoring and toxicology.
Effective Spring 2017

BLD 413  Advanced Biomedical Laboratory Diagnostics Laboratory
Spring of every year. 1(0-3) P: BLD 213 and BLD 324 and BLD 434 and BLD 435 and MMG 463 RB: BLD 424 and BLD 430 R: Open to students in the Diagnostic Molecular Science major or in the Biomedical Laboratory Science major or in the Lyman Briggs Diagnostic Molecular Science Coordinate Major or in the Lyman Briggs Biomedical Science Coordinate major.
   Diagnostic assays across various disciplines within the clinical laboratory (microbiology, immunohematology, hematology and molecular diagnostics) as well as data interpretation and problem solving skills.
DELETE COURSE
Effective Spring 2018

BLD 414  Clinical Chemistry Analysis and Practice
Spring of every year. 3(3-0) P: BLD 213 and (STT 200 or STT 201 or STT 231 or STT 351 or STT 421) RB: PHY 231 or LB 273 R: Open to students in the Biomedical Laboratory Science major or in the Lyman Briggs Biomedical Science Coordinate major. Not open to students with credit in BLD 417.
   Concepts and principles of analytic methods commonly used in the clinical laboratory. Qualitative and quantitative features of instrumental analysis. Issues of quality control and quality assurance, method evaluation and standards of laboratory practice.
SA: MT 417
DELETE COURSE
Effective Summer 2017
BLD 416  Clinical Chemistry
Fall of every year. 4(4-0) P: BLD 213 and (BMB 401 or BMB 461) and (PSL 250 or PSL 310 or PSL 431) RB: BLD 414 or (BLD 417 and CEM 333)
Correlation of laboratory test results with normal physiology and biochemistry and with disease states. Metabolic and endocrine systems. Acquired and inherited diseases. Therapeutic drug monitoring, and toxicology. 
SA: MT 416
DELETE COURSE
Effective Fall 2018

BLD 417  Quality Processes in Diagnostic Laboratory Testing
Spring of every year. 2(2-0) P: BLD 213 and (STT 200 or STT 201 or STT 231 or STT 351 or STT 421) RB: PHY 231 or LB 273 R: Open to students in the Clinical Laboratory Sciences Major. Not open to students with credit in BLD 414.
Statistical methods for validating diagnostic laboratory tests including quality control processes, proficiency testing, method evaluation, related regulatory requirements, laboratory information systems, and laboratory mathematics.
SA: MT 414, MT 417
DELETE COURSE
Effective Summer 2017

BLD 424  Advanced Hematology, Hemostasis and Urinalysis
Advanced Hematology and Hemostasis
Spring of every year. 2(2-0) P: (BLD 324 and BMB 401) or (BLD 324 and BMB 461 and BMB 462) RB: (PSL 310 or concurrently or PSL 250 or concurrently) or PSL 431 and (BLD 424 and (BLD 430 or concurrently) and BLD 434 and (BLD 435 or concurrently)) RB: (BLD 430 and BLD 434 and (BLD 435 or concurrently)) or (PSL 250 or PSL 310) R: Open to undergraduate students in the Biomedical Laboratory Diagnostics Program.
Etiology and pathogenesis of diseases of the hematologic, hemostatic and urinary systems including anemias, leukemias, and hemophilias. Diagnostic testing for such diseases. Etiology and pathogenesis of diseases of the hematologic and hemostatic systems including anemias, leukemias, and hemophilias. Diagnostic testing for such diseases.
SA: MT 422, MT 424
Effective Fall 2014 Effective Spring 2017

BLD 424L  Advanced Laboratory in Hematology, Hemostasis, and Urinalysis
Advanced Laboratory in Hematology, Hemostasis and Urinalysis Laboratory
Spring of every year. 1(0-3) P: BLD 430 and (BLD 434 or concurrently) P: BLD 424 or concurrently) R: Open to undergraduate students in the Biomedical Laboratory Diagnostics Program. C: BLD 424 concurrently.
Specialized and advanced assays used in the diagnosis of diseases of the hematological, hemostatic, and urinary systems.
SA: MT 424L, MT 423
Effective Fall 2014 Effective Spring 2018

BLD 430  Molecular Laboratory Diagnostics
Molecular Diagnostics
Spring of every year. 2(2-0) P: BS 161 or LB 145 or BS 181H P: (BS 161 or LB 145 or BS 181H) and (BLD 204 and BLD 313)
Concepts and principles of molecular analysis applied to medical diagnostics and related applications.
SA: MT 430
Effective Fall 2014 Effective Fall 2017

BLD 430L  Molecular Diagnostics Laboratory
Fall of every year. 1(0-3) P: BLD 430 R: Open to undergraduate students in the Biomedical Laboratory Diagnostics Program or approval of department.
NEW Laboratory in molecular technologies with emphasis on clinical and diagnostic applications.
Effective Fall 2017
BLD 434  Clinical Immunology
Fall of every year. Grand Rapids, Grand Rapids, Grand Rapids, Grand Rapids, Grand Rapids,
Grand Rapids, Spring of every year. Grand Rapids, Grand Rapids, Grand Rapids, Grand Rapids, Grand Rapids,
Grand Rapids, Grand Rapids, Grand Rapids, Grand Rapids, Grand Rapids, Grand Rapids, Grand Rapids
3(3-0) P: BS 161 or LB 145 or BS 181H P: BLD 204
RB: (PSL 310 or PSL 250 or PSL 431) and (BLD 204 and BLD 213 and MMG 201) RB: MMG 201
or MMG 301 Not open to students with credit in MMG 451.
Concepts of innate, cellular, and humoral immunity. Immunodeficiency and autoimmunity.
Principles and applications of immunoassays in medical laboratories. Concepts of innate
and adaptive immunity. Immunodeficiency and autoimmunity. Principles and applications
of immunoassays in medical laboratories.
SA: MT 432, MT 434
Effective Fall 2014 Effective Fall 2017

BLD 435  Transfusion Medicine
Immunohematology
Spring of every year. 2(2-0) 2(3-0) P: BLD 434 or MMG 451 P: (BLD 313) and (BLD 434 or MMG
451)
Principles and practice of transfusion medicine including blood typing. Offered first ten
weeks of semester. Principles and practice of transfusion medicine including blood typing.
Offered first 10 weeks of the semester. Offered first ten weeks of semester.
SA: MT 435, MT 432
Effective Spring 2017 Effective Fall 2017

BLD 433  Clinical Immunology and Immunohematology Laboratory
Immunohematology Laboratory
Spring of every year. 1(0-3) P: BLD 213 and (BLD 435 or concurrently) P: BLD 314L and BLD 435
R: Open to students in the Clinical Laboratory Sciences major. R: Open to undergraduate students
in the Biomedical Laboratory Diagnostics Program.
Immunologic methods for disease detection. Methods of blood typing and pre-transfusion
testing. Methods of blood typing and pre-transfusion testing.
SA: MT 433
Effective Fall 2014 Effective Fall 2018

BLD 437  Clinical Applications of Diagnostic Molecular Science
Spring of every year. 2(2-0) P: BLD 436 Not open to students with credit in BLD 831.
Application of molecular diagnostic methods in clinical and other types of laboratory
disciplines.
SA: MT 437
DELETE COURSE
Effective Spring 2017

BLD 438  Molecular Diagnostic Laboratory
Fall of every year. 2(0-6) P: BLD 436 Not open to students with credit in BLD 832.
Laboratory in molecular techniques with emphasis on clinical and diagnostic applications.
SA: MT 438
DELETE COURSE
Effective Spring 2017

BLD 439  Histocompatibility and Immunogenetics
Spring of every year. 1(1-0) P: BLD 434 or MMG 451 RB: BLD 204 and BLD 435 R: Open to juniors
or seniors in the College of Natural Science or in the Lyman Briggs College.
The theory and principles of histocompatibility and immunogenetics as applied to
transplant medicine.
Effective Spring 2017 Effective Spring 2018
BLD 442  Education and Management in the Clinical Laboratory

Spring of every year. 2(2-0) P: (MTH 103 or MTH 116) or (STT 200 or STT 201 or STT 231 or STT 351 or STT 421) RB: BLD 220 R: Open to students in the Clinical Laboratory Sciences Major.

Basic principles and concepts in education and management in clinical laboratories. Systematic approach to instructional design, delivery and evaluation. Principles of leadership, personnel management, fiscal management, and regulatory compliance.

SA: MT 442

DELETE COURSE

Effective Spring 2018

BLD 443  Introduction to Laboratory Information Systems

Spring of every year. 3(3-0) P: (CSE 201 or CSE 231) and (MTH 124 or MTH 132) and BLD 213L R: Open to students in the Information Technology Minor.

NEW  Purpose and function of information systems components used in medical laboratories. Practical applications of system selection, validation, maintenance, problem resolution and report generation.

Effective Fall 2017

BLD 444  Laboratory Information Technology Practicum and Project Management

Summer of every year. 3(0-40) P: BLD 443 and ITM 311 RB: Biomedical Laboratory Science major. R: Open to students in the Information Technology Minor. Approval of department.

NEW  This 3 month practicum at a clinical or public health laboratory site will provide the student experience in using, maintaining and managing quality of a laboratory information system. Project management principles and application will be covered.

Effective Spring 2018

BLD 445  Medical Laboratory Management

Fall of every year. 1(1-0) P: BLD 442W or concurrently R: Open to students in the Biomedical Laboratory Diagnostics Program. Approval of department.

NEW  This course will address the management of clinical laboratories through adherence to laws and regulations, developing financial and budgeting tools, and assuring a competent workforce.

Effective Fall 2018

BLD 446  Immunobiology of Neoplasia

Spring of every year. 1(1-0) P: BLD 434 or MMG 451 RB: BLD 204 and BLD 435 R: Open to juniors or seniors in the College of Natural Science or in the Lyman Briggs College.

NEW  The biology of neoplastic cells (cancers, leukemias, lymphomas), the immune response to neoplasias, and immunotherapy of cancer.

Effective Spring 2018

BLD 447  Immunomodulation and Immunotherapy

Spring of every year. 1(1-0) P: BLD 434 or MMG 451 RB: BLD 204 and BLD 435 R: Open to juniors or seniors in the College of Natural Science or in the Lyman Briggs College.

NEW  Current applications of Immunology understanding in the immunomodulation and immunotherapy of infectious disease, immunodeficiencies, autoimmune disease, and cancers.

Effective Spring 2018

BLD 450  Eukaryotic Pathogens

Spring of every year. 3(3-0) P: (BS 161 or LB 145 or BS 181H) and (CEM 141 or CEM 151 or CEM 181H or LB 171) RB: MMG 201 or MMG 301

Medically important fungi and parasites. Host-parasite relationships, life cycles, culture, identification, and associated diseases.

SA: MT 450

DELETE COURSE

Effective Fall 2018
**BLD 452L Immunodiagnostics Laboratory**
Spring of every year. 1(0-3) P: BLD 314L and BLD 434 R: Open to students in the Biomedical Laboratory Science Major or approval of department. Not open to students with credit in BLD 852.
NEW Performance of immunopurifications, in vitro diagnostic assays and basic flow cytometry. Data analysis and quality control evaluation.

**Effective Fall 2017**

**BLD 455 Integrating Clinical Laboratory Science Discipline (W)**
Fall of every year. Spring of every year. 2(2-0) P: ((BLD 324 or concurrently) or (BLD 417 or concurrently) or (BLD 416 or concurrently) or (MMG 463 or concurrently) or (BLD 435 or concurrently) or (BLD 436 or concurrently)) and completion of Tier I writing requirement R: Open to undergraduate students in the Clinical Laboratory Sciences major or in the Biomedical Laboratory Science major or in the Diagnostic Molecular Science major.
Problem oriented approach integrating topics from biomedical laboratory diagnostics courses with emphasis on writing experience in the major and on critical thinking skills.
SA: MT 455
DELETE COURSE

**Effective Fall 2018**

**BLD 456 Medical Laboratory Professionalism (W)**
Fall of every year. Spring of every year. 2(2-0) P: (BLD 121 and BLD 313) and completion of Tier I writing requirement RB: (BLD 302 and BLD 324 and BLD 435) and (MMG 201 or MMG 301) R: Open to seniors in the Biomedical Laboratory Diagnostics Program.

**Effective Fall 2018**

**BLD 460 Advanced Molecular Diagnostics**
Fall of every year. 2(2-0) P: BLD 430 R: Open to students in the Lyman Briggs College or in the College of Natural Science.
NEW Common and specialized molecular diagnostic technologies applied to medical diagnostics and related applications.

**Effective Fall 2018**

**BLD 471 Advanced Clinical Chemistry Laboratory**
Fall of every year. Spring of every year. Summer of every year. 3 credits. P: CEM 333 R: Open to students in the Clinical Laboratory Sciences major. R: Open to students in the Biomedical Laboratory Diagnostics Program. Approval of department.
Application and integration of theory and technical skills in clinical chemistry and biochemistry.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 471

**Effective Fall 2014 Effective Summer 2019**

**BLD 472 Advanced Clinical Chemistry**
Fall of every year. Spring of every year. Summer of every year. 1 credit. P: BLD 416 and BLD 417 R: Open to seniors in the Clinical Laboratory Sciences major.
Theoretical aspects of clinical chemistry, chemical and biochemical reactions, statistical analysis, and pathophysiologic relationships. Integration of cognitive material with clinical laboratory test results.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 472
DELETE COURSE

**Effective Fall 2019**
BLD 473
Advanced Clinical Hematology and Body Fluids Laboratory
Fall of every year. Spring of every year. Summer of every year. 3 credits. P: BLD 424L R: Open to seniors in the Clinical Laboratory Sciences major. R: Open to students in the Biomedical Laboratory Diagnostics Program. Approval of department.
Application and integration of theory and technical skills in hematology, hemostasis, and body fluid analysis.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 473
Effective Fall 2014 Effective Summer 2019

BLD 474
Advanced Clinical Hematology and Body Fluids
Fall of every year. Spring of every year. Summer of every year. 1 credit. P: BLD 424 R: Open to seniors in the Clinical Laboratory Sciences major.
Theoretical aspects of advanced hematology, hemostasis and body fluid analysis.
Integration of cognitive material with clinical laboratory test results.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 474
DELETE COURSE
Effective Fall 2019

BLD 475
Advanced Clinical Immunology and Immunohematology Laboratory
Fall of every year. Spring of every year. Summer of every year. 2 credits. P: BLD 433 P: BLD 435L R: Open to seniors in the Clinical Laboratory Sciences major. R: Open to students in the Biomedical Laboratory Diagnostics Program. Approval of department.
Application and integration of theory and technical skills in immunology and immunohematology.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 475
Effective Fall 2014 Effective Summer 2019

BLD 476
Advanced Clinical Immunology and Immunohematology
Fall of every year. Spring of every year. Summer of every year. 1 credit. P: BLD 433 and BLD 434 and BLD 435 R: Open to seniors in the Clinical Laboratory Sciences major.
Theoretical aspects of immunology and immunohematology. Integration of cognitive material with clinical laboratory test results.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 476
DELETE COURSE
Effective Fall 2019

BLD 477
Advanced Clinical Microbiology Laboratory
Fall of every year. Spring of every year. Summer of every year. 3 credits. P: MMC 464 and BLD 459 P: MMC 465L R: Open to seniors in the Clinical Laboratory Sciences major. R: Open to students in the Biomedical Laboratory Diagnostics Program. Approval of department.
Application and integration of theory and technical skills in clinical microbiology and infectious disease.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 477
Effective Fall 2014 Effective Summer 2019
BLD 478  Advanced Clinical Microbiology
Fall of every year. Spring of every year. Summer of every year. 1 credit. P: MMG 463 and BLD 450 and BLD 498 R: Open to seniors in the Clinical Laboratory Sciences major.
  Theoretical aspects of clinical microbiology and infectious disease. Integration of cognitive material with clinical laboratory test results.
  Request the use of ET-Extension to postpone grading.
  The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 478
DELETE COURSE
Effective Fall 2019

BLD 479  Professional Behavior in Clinical Laboratory Science
Fall of every year. Spring of every year. Summer of every year. 1(0-2) P: (BLD 220 and BLD 442) and ((BLD 471 or concurrently) or (BLD 473 or concurrently) or (BLD 475 or concurrently) or (BLD 477 or concurrently)) P: (BLD 442W and BLD 445) and ((BLD 471L or concurrently) and (BLD 473L or concurrently) and (BLD 475L or concurrently) and (BLD 477L or concurrently)) R: Open to students in the Clinical Laboratory Sciences major. R: Open to students in the Biomedical Laboratory Diagnostics Program. Approval of department.
  Application of professional behavior principles to practical experiences in clinical laboratory science. Application of professional behavior principles to practical experiences in medical laboratory science.
  Request the use of ET-Extension to postpone grading.
  The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
SA: MT 479
Effective Fall 2014 Effective Summer 2019

BLD 480  Medical Laboratory Science Examinations I
Fall of every year. Spring of every year. Summer of every year. 1 credit. P: BLD 435L and BLD 402 and BLD 424L and MMG 465L R: Open to students in the Biomedical Laboratory Diagnostics Program. Approval of department.
NEW
  Theoretical aspects of medical laboratory science profession entry level body of knowledge in clinical chemistry, hematology, hemostasis, body fluid analysis, immunology, immunohematology, and clinical microbiology. Integration of cognitive material with clinical laboratory test results.
  Request the use of the Pass-No Grade (P-N) system.
  Request the use of ET-Extension to postpone grading.
  The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
Effective Summer 2019

BLD 481  Medical Laboratory Science Examinations II
Fall of every year. Spring of every year. Summer of every year. 1 credit. P: BLD 435L and BLD 402 and BLD 424L and MMG 465L R: Open to students in the Biomedical Laboratory Diagnostics Program. Approval of department.
NEW
  Theoretical aspects of medical laboratory science profession entry level body of knowledge in clinical chemistry, hematology, hemostasis, body fluid analysis, immunology, immunohematology, and clinical microbiology. Integration of cognitive material with clinical laboratory test results.
  Request the use of the Pass-No Grade (P-N) system.
  Request the use of ET-Extension to postpone grading.
  The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
Effective Summer 2019
BLD 482  **Advanced Diagnostic Molecular Science**  
Spring of every year. 2 credits. R: Open to students in the Diagnostic Molecular Science major. C: BLD 483 concurrently or BLD 484 concurrently or BLD 485 concurrently or BLD 486 concurrently.  
Integration of principles and concepts in diagnostic molecular science with diagnostic laboratory test results.  
**Request the use of ET-Extension to postpone grading.**  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
SA: MT 482  
DELETE COURSE  
Effective Spring 2017

BLD 483  **Molecular Diagnostic Experience in Hematopathology and Oncology**  
Spring of every year. 2 credits. P: BLD 438 R: Open to students in the Diagnostic Molecular Science major. C: BLD 482 concurrently.  
Clinical experience in molecular diagnostic laboratories with applications in hematopathology and oncology.  
**Request the use of ET-Extension to postpone grading.**  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
SA: MT 483  
DELETE COURSE  
Effective Spring 2017

BLD 484  **Molecular Diagnostic Experience in Infectious Disease**  
Spring of every year. 2 credits. P: BLD 438 R: Open to students in the Diagnostic Molecular Science major. C: BLD 437 concurrently.  
Clinical experience in molecular diagnostic laboratories with applications to infectious disease diagnosis.  
**Request the use of ET-Extension to postpone grading.**  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
SA: MT 484  
DELETE COURSE  
Effective Spring 2017

BLD 485  **Molecular Diagnostic Experience in Inherited and Predictive Genetics**  
Spring of every year. 2 credits. P: BLD 438 R: Open to students in the Diagnostic Molecular Science major. C: BLD 482 concurrently.  
Clinical experience in molecular diagnostic laboratories with applications in inherited and predictive genetics.  
**Request the use of ET-Extension to postpone grading.**  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
SA: MT 485  
DELETE COURSE  
Effective Spring 2017

BLD 486  **Molecular Diagnostic Experience in Genotyping and Individual Identification**  
Spring of every year. 2 credits. P: BLD 438 R: Open to students in the Diagnostic Molecular Science major. C: BLD 482 concurrently.  
Clinical experience in molecular diagnostic laboratories with applications to genotyping and identification of individuals.  
**Request the use of ET-Extension to postpone grading.**  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
SA: MT 486  
DELETE COURSE  
Effective Spring 2017
BLD 495  Directed Study  
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.  
R: Open to students in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major or in the Lyman Briggs School Medical Technology Coordinate Major or in the Medical Technology major.  
R: Open to students in the Biomedical Laboratory Science Major or in the Lyman Briggs Biomedical Laboratory Science Coordinate Major.  
Faculty directed study including assigned readings, reviews of appropriate scientific periodicals, research, and laboratory experience.  
SA: MT 495  
Effective Fall 2014 Effective Fall 2017

BLD 498  Focused Problems in Clinical Laboratory Science  
Spring of every year. 2(1-2) P: BLD 417 and BLD 434 and (BLD 424 or concurrently) and (BLD 450 or concurrently) R: Open to students in the Clinical Laboratory Sciences major.  
Case study problems of medical microbiology, hematology, and clinical chemistry.  
SA: MT 454, MT 498  
DELETE COURSE  
Effective Fall 2018

BLD 498L  Infectious Disease Diagnostic Laboratory  
Spring of every year. 1(0-3) P: MMG 464 and (BLD 450 or concurrently) RB: BLD 430 and BLD 434 R: Open to undergraduate students in the Clinical Laboratory Sciences major.  
Applying pre-analytical, analytical, and post-analytical principles to the identification of infectious agents in unknown samples.  
DELETE COURSE  
Effective Fall 2018

BLD 801  Biomedical Laboratory Diagnostics Seminar  
Fall of every year. Spring of every year. 1(1-0) A student may earn a maximum of 2 credits in all enrollments for this course.  
Current research topics in clinical laboratory sciences.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 4 semesters after the end of the semester of enrollment.  
Effective Fall 2009 Effective Fall 2016

BLD 838  Clinical Context of Blood Product Management  
Fall of every year. Summer of every year. 1(1-0) RB: Experience in transfusion medicine  
Effective blood product management in the context of high use, high demand clinical settings.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.  
Effective Summer 2016 Effective Fall 2017

BLD 854  Advanced Flow Cytometry Laboratory  
Summer of every year. 2(0-4) P: BLD 852 RB: Experience in Flow Cytometry R: Open to graduate students. C: BLD 853 concurrently.  
NEW  
Flow cytometry exercises that include controls, reagent titrations, assay validation, determination of assay sensitivity, assay development using 6-8 fluorochromes, flow cytometry data analysis.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.  
Effective Summer 2017
MMG 365  Medical Microbiology  
Spring of every year. 3(3-0) Interdepartmental with Biomedical Laboratory Diagnostics. P: (BS 161 and CEM 141) and (MMG 201 or MMG 301) Not open to students with credit in MMG 463.  
NEW This course covers the laboratory diagnosis, disease and epidemiology of the most common bacterial, viral, fungal and parasitic pathogens and concepts in infectious disease control, prevention and treatment.  
Effective Spring 2018

MMG 365L  Medical Microbiology Laboratory  
Spring of every year. 1(0-2) Interdepartmental with Biomedical Laboratory Diagnostics. P: (MMG 365 or concurrently) and (MMG 201 or MMG 301) Not open to students with credit in MMG 464.  
NEW This course provides practical experience in safely and accurately performing standard clinical microbiology tests to diagnose disease-causing microbes.  
Effective Spring 2018

MMG 465  Advanced Medical Microbiology  
Fall of every year. 3(3-0) Interdepartmental with Biomedical Laboratory Diagnostics. P: MMG 365 Not open to students with credit in MMG 463.  
NEW This course provides practical experience in safely and accurately performing standard clinical microbiology tests to diagnose disease-causing microbes.  
Effective Fall 2018

MMG 465L  Advanced Medical Microbiology Laboratory  
Fall of every year. 2(0-6) Interdepartmental with Biomedical Laboratory Diagnostics. P: MMG 365L and (MMG 465 or concurrently) Not open to students with credit in MMG 464. C: MMG 465 concurrently.  
NEW This course provides practical experience in safely and accurately performing standard clinical microbiology tests to process clinical specimens, identify pathogens and perform and interpret susceptibility testing.  
Effective Fall 2018

NEU 843  Methods for Assessing the Nervous System  
Spring of every year. 2(2-0) 3(3-0) RB: (NEU 840 or concurrently) or (NEU 841 or concurrently) Introduction to the various techniques and methods used to study brain structure and function.  
Effective Spring 2017 Effective Spring 2018

PLB 826  Tropical Biology: An Ecological Approach  
Spring of every year. Summer of every year. 8 credits. Interdepartmental with Zoology. R: Approval of department; application required.  
REINSTATEMENT Principles of tropical ecology at the population, community, and ecosystem levels. Given at various sites in Costa Rica by the Organization for Tropical Studies. Request the use of ET-Extension to postpone grading. The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.  
SA: BOT 826  
Effective Fall 2017

**COLLEGE OF NURSING**

NUR 490  Independent Study in Nursing  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Approval of college.  
Individualized area of study in nursing.  
Request the use of the Pass-No Grade (P-N) system.  
Effective Summer 2017 Effective Spring 2018
NUR 922  Wellness and Risk Reduction Behaviors  
**Fall of even years, Spring of odd years.** 3(3-0) R: Open to graduate students in the College of Nursing.  
Current state of the science related to wellness and risk reduction behaviors and interventions to improve health outcomes for various populations across the lifespan.  
*Effective Fall 2017*  *Effective Spring 2018*  

NUR 923  Self and Symptom Management in Chronic Illness  
**Fall of odd years, Spring of even years.** 3(3-0) R: Open to graduate students in the College of Nursing.  
Current state of the science related to self and symptom management and interventions to improve chronic illness outcomes for various populations across the lifespan.  
*Effective Fall 2017*  *Effective Spring 2018*  

**COLLEGE OF VETERINARY MEDICINE**  

PHM 483  Antimicrobial Chemotherapy  
Fall of every year. Spring of every year. 3(3-0) P: (PHM 350 or concurrently) and (PHM 461 or concurrently) RB: ((PHM 350 or concurrently) or (PHM 461 or concurrently)) and Completion of Tier I Writing Requirement and background in biology, microbiology and/or biochemistry required. R: Open to seniors and open to human medicine students or osteopathic medicine students or veterinary medicine students and open to master’s students in the Integrative Pharmacology Major or in the Pharmacology and Toxicology Major. Approval of department.  
NEW  An integrated and multidisciplinary approach to major human bacterial, viral, and fungal infections including disease characteristic, epidemiologic and clinical features, pathology, laboratory diagnosis, case reviews, and pharmacologic treatment including drug kinetics, dynamics, drug interactions and patient considerations.  
*Effective Fall 2018*  

PHM 805  Receptor Pharmacology  
Fall of every year. 1(1-0) A student may earn a maximum of 1 credit in all enrollments for this course. R: Not open to doctoral students in the Department of Pharmacology and Toxicology. Approval of department. R: Not open to doctoral students in the Department of Pharmacology and Toxicology. Approval of department. A student may earn a maximum of 1 credits  
NEW  Fundamental principles and current theories of receptor pharmacology, drug receptor pharmacodynamics and signal transduction mechanisms.  
*Effective Fall 2018*  

PSL 536  Basic Principles of Cell Biology and Physiology  
Fall of every year. 3(2-2) Interdepartmental with Human Anatomy and Biochemistry and Molecular Biology. R: Open to graduate-professional students in the College of Osteopathic Medicine.  
Modern concepts of cell biology as a basis for understanding the structure (histology) and function (physiology) of human tissues in health and disease.  
Request the use of the Pass-No Grade (P-N) system.  
DELETE COURSE  
*Effective Fall 2016*  

VM 513  Ethical and Animal Welfare Issues in the Veterinary Profession  
**Fall of every year, Spring of every year.** 2(1-2) R: Open to graduate-professional students in the College of Veterinary Medicine.  
Identifying and communicating ethical challenges and animal welfare issues in the veterinary profession.  
*Effective Spring 2017*  *Effective Fall 2018*
VM 514  Comparative Lifestage Nutrition  
Fall of every year. 1(1-0) R: Open to graduate-professional students in the College of Veterinary Medicine.  
Effective Fall 2017  Effective Spring 2018

VM 826  Creating a Food Safety Culture  
Summer of odd years. 3(3-0) RB: Professional or graduate status with knowledge of food safety. R: Open to graduate students in the College of Veterinary Medicine or in the Department of Large Animal Clinical Sciences or in the Food Safety Major or approval of department.  
Explores proven, evidence-based ways to change or strengthen the food safety culture of an organization and influence employee behavior.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2016  Effective Summer 2017

VM 834  Current Issues in Food Safety  
Fall of every year. Summer of every year. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to graduate students in the College of Veterinary Medicine or in the Department of Large Animal Clinical Sciences or in the Food Safety Major or approval of department.  
Current issues in food safety including: allergen control in the manufacturing setting, microbial control in the manufacturing setting, good manufacturing practices, ingredient safety, preventative control, produce food safety. Other topics as needed.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Summer 2016  Effective Fall 2017

VM 836  Food Safety Issues by Commodity  
Spring of every year. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to graduate students in the College of Veterinary Medicine or in the Department of Large Animal Clinical Sciences or in the Food Safety Major or approval of department.  
Food safety issues specific to different commodity groups or segments of food industry including meat safety, dairy safety, beverage safety, pet food safety, ingredient safety, and food waste recovery.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Spring 2017  Effective Spring 2018