PART I – NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

COLLEGE OF HUMAN MEDICINE

1. Request to establish a Graduate Certificate in Applied Parasitology and Public Health in the College of Human Medicine. The University Committee on Graduate Studies (UCGS) recommended approval of this request at its April 7, 2014 meeting.

The Graduate Certificate in Applied Parasitology and Public Health is a Type 2 graduate certificate and will appear on the transcript as “Graduate Certificate Program in Applied Parasitology and Public Health”.

a. Background Information:

The proposed Graduate Certificate in Applied Parasitology for Public Health will allow students and professionals who do not have a background in parasitology to gain critical insight the impact parasites have on public health. The series of courses address the multitude of challenges on a local, national, and global level, applying the core principle of public health, prevention, in a scientific and systematic manner impacting entire populations. The certificate will provide an overview of the different epidemiological factors involved in the prevalence, transmission, and pathogenicity of the parasitic diseases; demonstrate the importance of the different techniques used in surveillance, prevention, and control of parasitic infection; stress the importance of understanding the host-parasite relationship as the bases for prevention, protection, and morbidity control; provide the skill-set that students may apply in program development within their local communities; and provide an opportunity for students to share experiences from their own communities.

The certificate is the natural progression of both the changes in medical education related to the developing world, and the research and field activities that have been carried out at MSU for the past 20 years. It replaces a missing component of medical education at MSU – medical parasitology which was dropped from the medical microbiology curriculum. This area is an increasingly important discipline in infectious diseases as international travel and the global population rapidly increase. MSU is uniquely able to provide a very practical program through the hands on field level experiences of its faculty.

b. Academic Programs Catalog Text:

The Graduate Certificate in Applied Parasitology for Public Health provides students the knowledge necessary for augmenting existing graduate and medical programs by contributing to the development, implementation, and maintenance of field-based health programs aimed at controlling or eliminating parasitic infections. The Graduate Certificate in Applied Parasitology for Public Health is available only online.

Requirements for the Graduate Certificate in Applied Parasitology for Public Health

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM 863</td>
<td>Parasitic Diseases and Public Health in</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Developing Countries</td>
<td></td>
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<tr>
<td>HM 881</td>
<td>Pathogenesis of Parasitic Infections Important</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>to Public Health</td>
<td></td>
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<tr>
<td>HM 886</td>
<td>Public Health Diagnosis and Interpretation of</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Parasitic Infections</td>
<td></td>
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<tr>
<td>HM 887</td>
<td>Control and Eradication of Parasitic Infections</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>of Public Health Importance</td>
<td></td>
</tr>
<tr>
<td>HM 888</td>
<td>Field Methodology for Investigating Parasitic</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Diseases of Public Health Importance</td>
<td></td>
</tr>
</tbody>
</table>

Effective Summer 2014
COLLEGE OF NATURAL SCIENCE

1. Request to establish a Linked Bachelor of Science Degree in Physiology and Master of Science Degree in Physiology in the Department of Physiology in the College of Natural Science, College of Human Medicine, College of Osteopathic Medicine, and the College of Veterinary Medicine. The College of Natural Science is the primary administrative unit. The University Committee on Undergraduate Education (UCUE) will consider this request. The University Committee on Graduate Studies (UCGS) recommended approval of this request at its April 7, 2014 meeting.

Per University policy:

A candidate for a Linked Bachelor's-Master's Degree from Michigan State University may request the application of up to 9 credits toward the master's program for qualifying 400-level and above course work taken at the undergraduate level at Michigan State University or an external accredited institution. The number of approved credits, not to exceed 9, are applied toward the credit requirement of the master's degree. Credits applied to the Linked Bachelor's-Master's Program are not eligible to be applied to any other graduate degree program.

a. Add the following statement in the Department of Physiology:

**LINKED BACHELOR'S-MASTER'S DEGREE IN PHYSIOLOGY**

*Bachelor of Science Degree in Physiology*

*Master of Science Degree in Physiology*

The department welcomes applications from Michigan State University Physiology undergraduate students in their junior and senior year. Admission applications must be made during the prior spring semester for an anticipated spring graduation or the prior fall semester for an anticipated fall graduation to allow admission before the final semester as a Physiology undergraduate. Admission to the program requires a minimum undergraduate grade-point average of 3.5 and an approved program of study for the Master of Science degree in Physiology at the time of admission. Admission to the Linked Bachelor's-Master's program allows the application of up to 9 credits toward the master's program for qualifying 400-level and above course work taken at the undergraduate level at Michigan State University or an external accredited institution. The number of approved credits, not to exceed 9, are applied toward the credit requirement of the master's degree. Credits applied to the Linked Bachelor's-Master's program are not eligible to be applied to any other graduate degree program.

Effective Spring 2015.

2. Request to change the requirements for the Bachelor of Arts degree in Zoology in the Department of Zoology.

a. Under the heading **Requirements for the Bachelor of Arts Degree in Zoology** make the following changes:

(1) In item 1., change paragraph two to the following:

The University’s Tier II writing requirement for the Zoology major is met by completing two of the following courses: Zoology 328, 353, 355L, 384, 415, 425, 445, 450, and 483. Those courses are referenced in item 3. below.

(2) Replace item 3. a. (2) with the following:

First year competency in a foreign language, Computer Science and Engineering 101 or 131, Mathematics 124 or 132 or 152H or Lyman Briggs 118, and Statistics and Probability 201, 224, 231, or 421.

Students who pass a waiver examination for Computer Science and Engineering 101 will not be required to complete Computer Science and Engineering 101 or 131.

Mathematics 124 or 132 or 152H or Lyman Briggs 118 and Statistics and Probability 201, 224, 231, or 421 may be used to satisfy both the requirement referenced in item 3. a. (2) and the requirement referenced in items 3. e. and 3. f. below.
(3) Replace item 3. e. with the following:

**e.** One of the following courses (3 or 4 credits):
- LB 118 Calculus I 4
- MTH 124 Survey of Calculus I 3
- MTH 132 Calculus I 3
- MTH 152H Honors Calculus I 3

**f.** One of the following courses (3 or 4 credits):
- LB 119 Calculus II 4
- MTH 126 Survey of Calculus II 3
- MTH 133 Calculus II 4
- MTH 153H Honors Calculus II 4
- STT 201 Statistical Methods 4
- STT 224 Introduction to Probability and Statistics for Ecologists 3
- STT 231 Statistics for Scientists 3
- STT 421 Statistics I 3

Mathematics 124 or 132 or 152H or Lyman Briggs 118 and Statistics and Probability 201, 224, 231, or 421 may be used to satisfy both the requirement referenced in item 3. a. (2) and the requirement referenced in items 3. e. and 3. f.

(4) Reletter item 3. f. to item 3. g.

Effective Spring 2015.

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3. Request to change the requirements for the *Bachelor of Science* degree in Zoology in the Department of Zoology.

*The concentrations in the Bachelor of Science degree in Zoology are 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 Zoology* make the following changes:

(1) Replace item 1., paragraph two with the following:

The University’s Tier II writing requirement for the Zoology major is met by completing two of the following courses: Zoology 328, 353, 355L, 384, 415, 425, 445, 450, and 483. Those courses are referenced in item 3. e. below. These courses also fulfill requirements in concentrations below.

(2) Replace item 3. c. with the following:

One of the following courses (3 or 4 credits):
- LB 118 Calculus I 4
- MTH 124 Survey of Calculus I 3
- MTH 132 Calculus I 3
- MTH 152H Honors Calculus I 3

(3) Add the following new item 3. d.:

One of the following courses (3 or 4 credits):
- LB 119 Calculus II 4
- MTH 126 Survey of Calculus II 3
- MTH 133 Calculus II 4
- MTH 153H Honors Calculus II 4
- STT 201 Statistical Methods 4
- STT 224 Introduction to Probability and Statistics for Ecologists 3
- STT 231 Statistics for Scientists 3
- STT 421 Statistics I 3
(4) Reletter item 3. d. to item 3. e.

(5) In item 3. e. under the General Zoology concentration make the following changes:

(a) Add total credits of ‘33 credits’.

(b) In item (2) change the total credits from ‘11 or 12’ to ‘10 to 12’ and add the following course to (c):

\[
\text{MMG 409 Eukaryotic Cell Biology} \quad 3
\]

(c) Replace item (3) with the following:

A minimum of 4 laboratory courses at the 300-400 level selected from the following:

\[
\begin{align*}
\text{ANS 313} & \quad \text{Principles of Animal Feeding and Nutrition} & 4 \\
\text{MMG 302} & \quad \text{Introductory Laboratory for General and Allied Health Microbiology} & 1 \\
\text{ZOL 306} & \quad \text{Invertebrate Biology} & 4 \\
\text{ZOL 320} & \quad \text{Developmental Biology} & 4 \\
\text{ZOL 328} & \quad \text{Comparative Anatomy and Biology of Vertebrates (W)} & 4 \\
\text{ZOL 343} & \quad \text{Genetics Laboratory} & 3 \\
\text{ZOL 355L} & \quad \text{Ecology Laboratory (W)} & 1 \\
\text{ZOL 360} & \quad \text{Biology of Birds} & 4 \\
\text{ZOL 365} & \quad \text{Biology of Mammals} & 4 \\
\text{ZOL 384} & \quad \text{Biology of Amphibians and Reptiles (W)} & 4 \\
\text{ZOL 408} & \quad \text{Histology} & 4 \\
\text{ZOL 425} & \quad \text{Cells and Development (W)} & 4 \\
\end{align*}
\]

A laboratory course taken to satisfy item (1) or (2) may also be applied to this requirement.

(d) Replace item (4) with the following:

Additional credits in 300-400 level Zoology courses as needed to meet the requirement of at least 33 credits. Students may complete more than one course, or pair of courses, from item (2). Additional courses completed from item (2) may be counted as Zoology electives toward the 33 credits. Courses beyond those taken to satisfy items (1), (2), or (3) may come from other departments with the approval of the student’s academic advisor.

(6) In item 3. e. under the Cell and Developmental Biology concentration make the following changes:

(a) Add total credits of ‘33 credits’.

(b) In item (3) add the following courses:

\[
\begin{align*}
\text{BMB 401} & \quad \text{Comprehensive Biochemistry} & 4 \\
\text{MMG 404} & \quad \text{Human Genetics} & 3 \\
\end{align*}
\]

(c) In item (3) replace the note with the following:

Biochemistry and Molecular Biology 461 and 462 combined, may be substituted for Biochemistry and Molecular Biology 401. If ZOL 320 and 425 are both completed in item (2), students only need to complete 14 credits in course work to fulfill this requirement.

(d) Delete item (4).
(7) In item 3. e. under the **Ecology, Evolution, and Organismal Biology** concentration make the following changes:

   (a) Add total credits of ‘33 credits’.

   (b) Replace item (4) with the following:

   One of the following courses, or pair of courses (3 or 4 credits):

   - FW 419 Applications of Geographic Information Systems to Natural Resource Management 4
   - GEO 221 Introduction to Geographic Information 3
   - GEO 221L Introduction Geographic Information Laboratory 1
   - GEO 325 Geographic Information Systems 3
   - GLG 434 Evolutionary Paleobiology 4
   - PLB 418 Plant Systematics 3
   - ZOL 446 Environmental Issues and Public Policy 3

   GEO 221 and 221L combined must be completed to satisfy this requirement.

   (c) Replace item (5) with the following:

   Additional credits in 300-400 level Zoology courses as needed to meet the requirement of at least 33 credits. Students may complete more than one course, or pair of courses, from items (2), (3), or (4). Additional courses completed from items (2), (3), or (4) may be counted as Zoology electives toward the 33 credits. Courses beyond those taken to satisfy items (1), (2), (3), or (4) may come from other departments with the approval of the student’s academic advisor.

(8) In item 3. e. under the **Genetics** concentration make the following changes:

   (a) Add total credits of ‘33 credits’.

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

   A minimum of 4 credits completed in a genetics laboratory or field experience arranged in consultation with the student’s academic advisor.

   (c) Replace item (4) with the following:

   Additional credits in 300-400 level Zoology courses as needed to meet the requirement of at least 33 credits. If both BMB 472 and ZOL 425 are completed in item (2), the second course may be counted as a Zoology elective. Additional courses completed from items (1), (2), or (3) may come from other departments with the approval of the student’s academic advisor.

(9) In item 3. e. under the **Neurobiology and Animal Behavior** concentration make the following changes:

   (a) Change the name to **Animal Behavior and Neurobiology**.

   (b) Add total credits of ‘33 credits’.

   (c) In item (3) add the following courses:

   - ANS 405 Endocrinology of Reproduction 4
   - ANS 455 Avian Physiology 4
   - FW 364 Ecological Problem Solving 3
   - FW 419 Applications of Geographic Information Systems to Natural Resource Management 4
   - LIN 463 Introduction to Cognitive Science 3
SOC 412 Animals, People and Nature 3

Delete the following courses:

ANS 482 Advanced Companion Animal Management 3
PSY 463 Introduction to Cognitive Science 3

(d) Replace item (4) with the following:

Additional credits in 300-400 level Zoology courses as needed to meet the requirement of at least 33 credits. Students may complete more than one course, or pair of courses, from items (2) or (3). Additional courses completed from items (2) or (3) may be counted as Zoology electives toward the 33 credits. Courses beyond those taken to satisfy items (1), (2), or (3) may come from other departments with the approval of the student’s academic advisor.

(10) In item 3. e. under the Zoo and Aquarium Science concentration make the following changes:

(a) Add total credits of ’44 credits’.

(b) Replace item (6) with the following:

Zoology courses that are not listed above must be approved in advance by the student’s academic advisor. Courses offered by other departments may be substituted for Zoology courses if approved in advance by the student’s academic advisor.

(11) In item 3. e. under the Marine Biology concentration make the following changes:

(a) Add total credits of ’33 credits’.

(b) Delete item (3).

(c) Renumbe items (4) and (5) to items (3) and (4) respectively.

(d) Replace item (3) with the following:

A minimum of at least 1 credit must be completed in an aquatic biology field experience, through consultation with the student’s academic advisor or students may choose one of the following courses (3 or 4 credits):

ENT 469 Biomonitoring of Streams and Rivers 3
PLB 424 Algal Biology 4
ZOL 440 Field Ecology and Evolution 4

Courses not listed above must have the approval of the student’s academic advisor.

(e) Replace item (4) with the following:

Additional credits in 300-400 level Zoology courses as needed to meet the requirement of at least 33 credits. Students may complete more than one course, or pair of courses, from item (2). Additional courses completed from item (2) may be counted as Zoology electives toward the 33 credits. Courses beyond those taken to satisfy items (1), (2), or (3) may come from other departments with the approval of the student’s academic advisor.

Effective Spring 2015.
COLLEGE OF NURSING

1. Request to change the requirements for the Bachelor of Science in Nursing degree in Nursing in the College of Nursing. The University Committee on Undergraduate Education (UCUE) will consider this request.

   a. Change the heading Admission as a Junior to Admission to the College and replace with the following:

      Admission to the College of Nursing is competitive. Minimal criteria for application to the College are:
      1. Completion of at least 28 credits acceptable to the College of Nursing with a cumulative grade-point average of 2.75 or higher.
      2. Completion of the following prenursing foundation courses:
         ANTR 350 Human Gross Anatomy for Pre-Health Professionals 3
         BS 161 Cell and Molecular Biology 3
         CEM 141 General Chemistry 4
         MTH 103 College Algebra 3
      3. Completion of the university’s Tier I writing requirement.
      4. Satisfactory community service, work experience and letters of recommendation.

      Applications for admission to the nursing major are reviewed twice each year. A limited number of positions are available during each selection period. Students may be admitted to the nursing major either for the fall semester or the spring semester.

      Students who wish to be considered for admission to the nursing major must submit their applications to the College of Nursing by May 1 for admission to the fall semester and December 1 for admission to the spring semester. Applicants are encouraged to meet with a college undergraduate program advisor prior to the submission of their application materials.

   b. Under the heading Requirements for the Bachelor of Science in Nursing Degree in Nursing make the following changes:

      (1) Replace item 1. with the following:

      The University requirements for bachelor’s degrees as described in the Undergraduate Education section of the catalog; 120 credits, including general elective credits, are required for the Bachelor of Science in Nursing degree.
      The completion of Mathematics 103 and Statistics and Probability 200 referenced below will also satisfy the University mathematics requirement.
      Students who place into Statistics and Probability 200 on the mathematics placement test and complete Statistics and Probability 200 are not required to complete Mathematics 103.
      The University’s Tier II writing requirement for the Nursing major is met by completing Nursing 375, 460, and 481. Those courses are referenced in item 2. below.

      (2) Replace item 2. with the following:

      a. All of the following Foundation courses with a minimum grade-point average of 2.0:
         CEM 143 Survey of Organic Chemistry 4
         HDFS 225 Lifespan Human Development in the Family 3
         HNF 260 Principles of Human Nutrition 3
         MMG 201 Fundamentals of Microbiology 3
         MMG 302 Introductory Laboratory for General and Allied Health Microbiology 1
         PHM 350 Introductory Human Pharmacology 3
         PSL 250 Introductory Physiology 4
         Or
         PSL 310 Physiology for Pre-Health Professionals 4
         PSY 101 Introductory Psychology 4
         STT 200 Statistical Methods 3
b. All of the following Nursing courses with a minimum grade-point average of 2.0:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUR 205</td>
<td>Introduction to Professional Nursing</td>
<td>4</td>
</tr>
<tr>
<td>NUR 301</td>
<td>Clinical Pathophysiology</td>
<td>3</td>
</tr>
<tr>
<td>NUR 322</td>
<td>Nursing Care of Acute and Chronically Ill Patients I</td>
<td>4</td>
</tr>
<tr>
<td>NUR 324</td>
<td>Health Promotion and Disease and Injury Prevention I</td>
<td>3</td>
</tr>
<tr>
<td>NUR 332</td>
<td>Nursing Care of Acute and Chronically Ill Patients II</td>
<td>5</td>
</tr>
<tr>
<td>NUR 334</td>
<td>Health Promotion and Disease and Injury Prevention II</td>
<td>3</td>
</tr>
<tr>
<td>NUR 371</td>
<td>Behavioral Health Nursing</td>
<td>4</td>
</tr>
<tr>
<td>NUR 375</td>
<td>Research and Evidence-Based Practice</td>
<td>2</td>
</tr>
<tr>
<td>NUR 436</td>
<td>Nursing Care of Children and Their Families</td>
<td>2</td>
</tr>
<tr>
<td>NUR 437</td>
<td>Nursing Care of the Childbearing Family</td>
<td>2</td>
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<td>NUR 445</td>
<td>Nursing Care of Acute and Critically Ill Patients</td>
<td>6</td>
</tr>
<tr>
<td>NUR 460</td>
<td>Leadership in Clinical Practice</td>
<td>5</td>
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<tr>
<td>NUR 471</td>
<td>Public Health Nursing</td>
<td>3</td>
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<tr>
<td>NUR 475</td>
<td>Ethical Practice</td>
<td>2</td>
</tr>
<tr>
<td>NUR 481</td>
<td>Scholarship for Nursing Practice (W)</td>
<td>2</td>
</tr>
</tbody>
</table>

c. Under the heading Admission to the Second Bachelor's Degree Program make the following changes:

1. Following NUR 300 add:

   Or

   NUR 301 Clinical Pathophysiology 3

2. Add the following course:

   PHM 350 Introductory Human Pharmacology 3

3. Change the note to the following:

   Nursing 300 or 301 must be completed within five years of program start.

Effective Fall 2015.
PART II - NEW COURSES AND CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

AE 053  Engine and Equipment Maintenance
Spring of every year. 2(2-2) R: Open to students in the Institute of Agricultural Technology.
Principles of two-stroke and four-stroke engines. Fuel systems, ignition systems, lubrication, carburation, differentials, clutches and transmissions, and hydraulic systems. Operation and maintenance procedures. Offered first ten weeks of semester.
DELETE COURSE
Effective Summer 2015

AE 101  Electrical Wiring Maintenance for Residential and Agricultural Facilities
Fall of every year. Spring of every year. Summer of every year. 2(2-0) R: Not open to students in the Electrical Technology Major. Not open to students with credit in AE 072.
NEW  Introduction to electrical circuit maintenance, safety issues, and installation practices for residential and agricultural facilities.
Effective Fall 2014

AE 102  Electrical Lighting for Residential & Agricultural Facilities
Fall of every year. Spring of every year. Summer of every year. 2(2-0) R: Not open to students in the Electrical Technology Major. Not open to students with credit in AE 085.
NEW  Introduction to electrical lighting sources, efficacies, productivity enhancement, and basic lighting design practices for residential and agricultural facilities.
Effective Fall 2014

AE 150  Metal Fabrication Technology
Fall of every year. 2(1-2)
Physical principles and safety techniques for electric and gas welding. Soldering, brazing, cutting, tool use, machine shop equipment use, and hot and cold metalworking.
SA: ATM 150
DELETE COURSE
Effective Summer 2015

AE 151  Fabrication Technology
Fall of every year. Spring of every year. 2(1-2)
NEW  Introduction to principles and practices for shop fabrication including assembly options, fabrication nomenclature, drawing interpretation, 3D printing, tool and equipment use, welding and safety practices.
SA: AE 150
Effective Fall 2015

AE 153  Engine and Equipment Technology
Spring of every year. 2(2-2)
SA: AE 053, AE 252
Effective Fall 2015

AE 252  Gasoline and Diesel Engine Technology
Fall of every year. 3(2-2)
Operating principles of gasoline and diesel engines and their systems. Operation and maintenance requirements.
SA: ATM 252
DELETE COURSE
Effective Summer 2015
ENT 205  Pests, Society and Environment  
Fall of every year. Spring of every year. Summer of every year. 3(3-0) Not open to students with credit in ENT 404. 

HRT 211A  Landscape Plants I A  
Fall of every year. 2(2-0) 
Identification, adaptation, and evaluation of shade trees, narrow-leaved evergreens, shrubs, woody vines, herbs, ornamental grasses, and other herbaceous perennials. DELETE COURSE Effective Fall 2012

HRT 218  Irrigation Systems for Horticulture  
Spring of every year. 3(2-2) R: Open to undergraduate students or agricultural technology students. Design, installation and maintenance of irrigation systems for turfgrass and landscape plants. Design hydraulics, equipment selection, pump stations, water features, water quality and conservation. Offered the first ten weeks of the semester. Design, installation and maintenance of irrigation systems for turfgrass and landscape plants. Design hydraulics, equipment selection, pump stations, water features, water quality and conservation. Effective Fall 2014 Effective Spring 2015

HRT 244  Culinary and Medicinal Herbs  
Summer of every year. 1(1-0) Field and greenhouse species and variety selection. Planting, organic production, and harvesting methods and schedules. Postharvest storage and maintenance of quality. Herbal teas, salves, oils, and tinctures. Field trip required. DELETE COURSE Effective Fall 2012

HRT 245  Specialty Cut Flowers  
Summer of every year. 1(1-0) Field and greenhouse cut flower species and variety selection. Planting, organic production methods, and harvesting and scheduling. Bouquet assembly. Postharvest handling and marketing. Value for biological diversity and farm scaping. Field trip required. DELETE COURSE Effective Fall 2012

HRT 252  Organic Certification and Farm Plans  
Fall of every year. 1(1-0) P: HRT 251 Organic certification requirements as specified by the USDA National Organic Program and implemented by certifying agencies. Methods of record keeping and farm plans for specialty crop, field crop, perennial fruit, and livestock farms. Organic processing and marketing. DELETE COURSE Effective Fall 2012

HRT 256  Organic Produce Direct Marketing  
Fall of every year. 1(1-0) Food chain and produce marketing; values added versus value added. Community supported agriculture (CSA). Multi-farm CSA, farmers’ markets, roadside markets, u-pick, restaurants. Crop scheduling and rotation strategies. Estimating cost, income, profit, yield. Field trip required. DELETE COURSE Effective Fall 2012
HRT 257  Organic Produce Wholesale Marketing  
Fall of every year. 1(1-0)  
Marketing options for high volume sales of organic produce. Farmer cooperatives.  
Produce suppliers handling organic produce; retailers handling exclusively organic.  
Retailers diversifying into organic. Requirements for storing, handling and displaying  
organic produce. Organic labeling requirements.  Field trip required.  
DELETE COURSE  
Effective Fall 2012

HRT 259A  Student Organic Farm Practicum I  
Spring of every year. 3(0-9) R: Open to agricultural technology students.  
Intensive organic vegetable, fruit, herb, and flower farming by direct involvement in the  
weekly activities and operation of the MSU Student Organic Farm. Local food systems,  
farm operations, transplanting, community-supported agriculture management, winter  
hoophouse, and edible forest gardening.  
SA: HRT 259  
DELETE COURSE  
Effective Fall 2012

HRT 259B  Student Organic Farm Practicum II  
Summer of every year. 4(0-12) P: HRT 259A R: Open to agricultural technology students.  
Intensive organic vegetable, fruit, herb, and flower farming by direct involvement in the  
weekly activities and operation of the MSU Student Organic Farm. Equipment basics, soil  
fertility, field cultivation, harvesting, post-harvest handling, summer hoophouse, and farm  
stand operations.  
SA: HRT 259  
DELETE COURSE  
Effective Fall 2012

HRT 259C  Student Organic Farm Practicum III  
Spring of every year. 3(0-9) P: HRT 259B R: Open to agricultural technology students.  
Intensive organic vegetable, fruit, herb, and flower farming by direct involvement in the  
weekly activities and operation of the MSU Student Organic Farm. Harvest and post-  
harvest handling, crop storage, fall hoophouses, cover crops, crop specialty planting,  
organic farm plan, crop plan, farm stand, and community-supported agriculture.  
SA: HRT 259  
DELETE COURSE  
Effective Fall 2012

COLLEGE OF ENGINEERING

AESC 290  Independent Study in Applied Engineering Sciences  
Fall of every year. Spring of every year. 1 to 3 credits. A student may earn a maximum of 3 credits  
in all enrollments for this course. R: Open to freshmen or sophomores in the Applied Engineering  
Sciences Major.  Approval of department.  
NEW  Supervised individual study in an area of Applied Engineering Sciences  
Effective Fall 2014

AESC 291  Selected Topics in Applied Engineering Sciences  
Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 9 credits  
in all enrollments for this course. R: Open to freshmen or sophomores.  Approval of department.  
NEW  Topics selected to supplement and enrich existing courses and lead to the development of  
ew courses.  
Effective Fall 2014
AESC 310  Sustainable Systems Analysis
Fall of every year. 3(0-3) P: (AESC 210 and (STT 315 or concurrently)) and completion of Tier I writing requirement R: Open to juniors or seniors in the College of Engineering or approval of department. R: Open to juniors or seniors in the College of Engineering and open to juniors or seniors in the Department of Supply Chain Management.
Concepts of sustainable systems; computational analysis tools for project management, life-cycle analysis, system-level representation, and six-sigma approaches. Case studies. Modeling and computational analysis.
SA: EGR 300, EGR 310
Effective Fall 2013 Effective Fall 2014

AESC 410  System Methodology
Capstone Project in Applied Engineering Sciences
Spring of every year. 3(1-4) P: (AESC 310) and completion of Tier I writing requirement R: Open to seniors in the Applied Engineering Sciences Major. Approval of department; application required.
System analysis experience involving analysis tools and practices appropriate to the project, oral and written communication, professional ethics. Participation in a professional work group of other AES students working on sponsor defined project. Application of necessary elements from the AES curriculum, application as necessary of other skills and competencies to complete the project.
SA: MSM 400, SYS 410, EGR 410 SA: EGR 410, MSM 400, SYS 410
Effective Fall 2013 Effective Summer 2015

AESC 490  Independent Study in Applied Engineering Sciences
Fall of every year. Spring of every year. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. R: Open to juniors or seniors. Approval of department.
NEW Supervised individual study in an area of Applied Engineering Sciences
Effective Fall 2014

AESC 491  Selected Topics in Applied Engineering Sciences
Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open to juniors or seniors in the Applied Engineering Sciences Major.
NEW Topics selected to supplement and enrich existing courses and lead to the development of new courses.
Effective Fall 2014

EGR 811  Foundations of Engineering Education
Fall of every year. 3(3-0) RB: Teaching experience (e.g. TA) and interest in becoming a higher education faculty member as a career. R: Open to graduate students in the College of Engineering. Approval of department.
Introduces the theoretical foundations of engineering education, student learning theories, educational research, and instructional design. Students will learn how to effectively teach, manage, and assess student performance.
Effective Fall 2012 Effective Fall 2014

MSE 200  Materials and Society
Fall of every year. 2(2-0) RB: High school physics and chemistry.
PCR Material capabilities, limitations, and their utilization in the service and advancement of society. Role of materials in our day-to-day lives. Resource and environmental concerns including current material-related issues.
Effective Fall 2008 Effective Fall 2014

MSE 250  Materials Science and Engineering
Fall of every year. Spring of every year. Summer of every year. 3(2-3) P: CEM 141 or CEM 151 or LB 171
PCR Structure of metals, ceramics and polymers. Phase diagrams, thermomechanical treatments, physical and mechanical properties, diffusion, microstructure studies, environmental effects.
SA: MSM 250
Effective Fall 2009 Effective Fall 2014
MSE 260  Electronic, Magnetic, Thermal, and Optical Properties of Materials  
Spring of every year. 3(3-0) P: MSE 250 and (PHY 184 or concurrently) Not open to students with credit in MSE 350.  
PCR  Processing, structures, and properties of ceramics, polymers, and composites. Electrical, thermal, magnetic and optical properties of materials. Materials selection and design.  
   Effective Fall 2013  Effective Fall 2014

MSE 310  Phase Equilibria in Materials  
Fall of every year. 3(3-0) P: (MSE 250 or concurrently) and ((MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently)) R: Open to juniors or seniors in the College of Engineering.  
PCR  Enthalpy. Entropy. Free energy. Phase changes in metal, ceramic, and polymer materials systems. Application to alloying, phase diagram determination, and electrochemistry.  
SA: MSE 351  
   Effective Fall 2012  Effective Fall 2014

MSE 320  Mechanical Properties of Materials  
Fall of every year. 3(3-0) P: (ME 222 or concurrently) and MSE 250 R: Open to juniors or seniors in the Materials Science and Engineering major or approval of department.  
SA: MSE 355  
   Effective Fall 2013  Effective Fall 2014

MSE 331  Materials Characterization Methods I  
Fall of every year. 2(1-3) R: Open to juniors or seniors in the Materials Science and Engineering Major. C: MSE 310 concurrently.  
PCR  Thermal analysis. Optical and Scanning Electron Microscopy Laboratory for characterizing microstructure-property relationships. Effects of processing on microstructures, properties, and fracture surfaces in metal, ceramic and polymer systems. Thermal analysis, microindentation techniques, quantitative optical microscopy, effects of alloying on creep deformation, slip systems in ionic crystals, environmental effects including galvanic corrosion, passivation.  
SA: MSE 375  
   Effective Fall 2013  Effective Fall 2014

MSE 360  Fundamentals of Microstructural Design  
Spring of every year. 3(3-0) P: ME 201 or MSE 310 or CHE 321 or PHY 215 RB: ((MTH 235 or concurrently) or (MTH 340 or concurrently) or (MTH 347H or concurrently) or (MTH 255H or concurrently)) and (MSE 260 or concurrently) R: Open to juniors or seniors in the Department of Chemical Engineering and Materials Science or approval of department.  
PCR  Fick's laws of diffusion. Models of solid state diffusion. Arrhenius plots. Use of non-equilibrium energy storage from solidification, phase changes, and deformation to predict and control microstructural changes and stability during processing in metal, ceramic, and polymer systems.  
SA: MSE 352  
   Effective Fall 2013  Effective Fall 2014

MSE 370  Synthesis and Processing of Materials  
Spring of every year. 3(3-0) P: (ME 201 or PHY 215 or MSE 310 or CHE 321) and MSE 250 RB: MSE 260 or concurrently R: Open to students in the Department of Chemical Engineering and Materials Science or approval of department; application required.  
PCR  Chemical and physical processing of materials. Powder synthesis and processing, consolidation, casting, microdevice fabrication and surface treatments, corrosion mitigation.  
SA: MSE 365, MSE 380  
   Effective Fall 2013  Effective Fall 2014
MSE 381  Materials Characterization Methods II  
Spring of every year. 2(1-3) P: MSE 331 and (MSE 260 or concurrently) R: Open to juniors or seniors in the Materials Science and Engineering Major. C: MSE 360 concurrently and MSE 370 concurrently.

**PCR**
- X-ray and infrared spectroscopic analysis laboratory for the characterization of microstructure-property relationships. Effects of processing on microstructures, properties, and fracture surfaces in metal, ceramic, and polymer systems. Characterization of materials by electron microscopy, X-ray diffraction and fluorescence spectroscopy. Fractography, surface analysis, dynamic mechanical analysis, electrical and thermal property measurements.

SA: MSE 376
**Effective Fall 2012 Effective Fall 2014**

MSE 410  Materials Foundations for Energy Applications  
Fall of every year. 3(3-0) RB: MSE 310 or ME 201 or CHE 321 R: Open to seniors in the Department of Chemical Engineering and Materials Science.

**PCR**
- Survey of materials that enable new energy generation, storage, and distribution technologies; thermoelectric materials, electrochemistry of batteries, semiconductors for solar cells, radiation tolerant materials, processing of biobased fuels, greenhouse gas mitigation approaches.

**Effective Fall 2013 Effective Fall 2014**

MSE 425  Biomaterials and Biocompatibility  
Spring of every year. 3(3-0) Interdepartmental with Biomedical Engineering. P: MSE 250 RB: PSL 250 R: Open to juniors or seniors in the College of Engineering.

**PCR**
- Materials science of human implants. Design requirements imposed by the human body, and need for bodily protection.

SA: BME 424, MSE 324  
**Effective Fall 2012 Effective Fall 2014**

MSE 460  Electronic Structure and Bonding in Materials and Devices  
Spring of every year. 3(3-0) P: MSE 260 R: Open to seniors in the Department of Chemical Engineering and Materials Science or approval of department; application required.

**PCR**

**Effective Fall 2012 Effective Fall 2014**

MSE 465  Design and Application of Engineering Materials  
Spring of every year. 3(3-0) P: MSE 250 R: Open to seniors or graduate students in the College of Engineering.

**PCR**
- Fundamental principles of strengthening: toughening, specific strength, and stiffness. Material development based on environmental, temperature, wear, damping, fatigue, and economic considerations.

SA: MSM 465  
**Effective Spring 2011 Effective Fall 2014**

MSE 466  Design and Failure Analysis (W)  
Spring of every year. 3(2-3) P: ((MSE 320 and MSE 381)or approval of department) and completion of Tier I writing requirement R: Open to seniors in the College of Engineering.

**PCR**

SA: MSM 466  
**Effective Fall 2012 Effective Fall 2014**

MSE 454 Ceramic and Refractory Materials  
Fall of every year. 3(3-0) P: MSE 260 or approval of department RB: MSE 370 and MSE 381 R: Open to seniors in the College of Engineering.

**PCR**
- Ceramic and glassy materials. High temperature processes. Mechanical and physical properties of technical ceramics.

SA: MSM 454 SA: MSM 454, MSE 454  
**Effective Fall 2012 Effective Summer 2015**
MSE 476  Physical Metallurgy of Ferrous and Aluminum Alloys
Fall of every year. 3(3-0) P: MSE 250 RB: MSE 310 R: Open only to seniors in the College of Engineering.
PCR Heat treatment and properties of ferrous and aluminum alloys. Casting and solidification. Effects of alloying elements, high strength low alloy steels, hardenability, and case hardening. Joining of materials, such as welding.
SA: MSM 476
Effective Summer 2005 Effective Fall 2014

MSE 451  Spectroscopic and Diffraction Analysis of Materials
MSE 481  Spring of every year. 3(2-3) P: PHY 184 or PHY 184B or PHY 234B RB: MSE 260 and MSE 381 R: Open to juniors or seniors or graduate students in the College of Engineering or in the College of Natural Science.
SA: MSM 451 SA: MSE 451, MSM 451
Effective Fall 2012 Effective Summer 2015

MSE 490  Independent 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 only to juniors or seniors in the College of Engineering. Approval of department.
PCR Individualized reading and research.
SA: MSM 490
Effective Fall 2003 Effective Fall 2014

MSE 491  Selected Topics
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 only to students in the Department of Chemical Engineering and Materials Science.
PCR Topics of current interest in materials science or engineering.
SA: MSM 491
Effective Fall 2003 Effective Fall 2014

MSE 499  Senior Research and Design Project (W)
Fall of every year. Spring of every year. Summer of every year. 2 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: Completion of Tier I writing requirement. R: Open only to seniors in the Materials Science and Engineering or Applied Engineering Sciences major. Approval of department. R: Open to students in the Department of Chemical Engineering and Materials Science or in the Materials Science and Engineering Major. Approval of department.
PCR Design and analysis to solve materials and/or mechanics related problem. Preparation of written report, oral presentation, and defense of the project. 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: MSM 499
Effective Fall 2003 Effective Fall 2014
CSE 812  Advanced Operating Systems
Distributed Systems
Spring of every year. 3(3-0) RB: CSE 410 and CSE 420  RB: (CSE 410) or CSE 410  R: Open only to Computer Science or Electrical Engineering majors, R: Open only to students in the Electrical Engineering Major or in the Computer Science Major.

PCR  Parallel and distributed operating systems. Load sharing, scheduling, reliability, recovery, memory management. Distributed file systems, distributed agreement, and object oriented operating systems. Principles, paradigms, techniques used in distributed systems; Assurance techniques for distributed systems; Fault-tolerance and security issues in distributed systems; Research issues in the design and implementation of distributed systems.
SA: CPS 812
Effective Summer 2000 Effective Summer 2015

CSE 898  Master's Project
Spring of every year. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to students in the Department of Computer Science and Engineering. Approval of department.
NEW  In depth student project where the student performs original research, research replication, or survey and reporting on a topic such as system design and development, or system conversion or installation.
Effective Fall 2014

ECE 302  Electronic Circuits
Fall of every year. Spring of every year. 3(3-0) P: ECE 202 and (ECE 280 or concurrently) P: ECE 202  R: Open to students in the Department of Electrical and Computer Engineering and open to students in the Department of Computer Science and Engineering. R: Open to students in the Electrical Engineering Major and open to students in the Computer Engineering Major.
Volt-ampere characteristics of diodes and transistors. Modeling using SPICE software. Differential, multistage, and integrated circuit amplifiers. High frequency effects.
SA: EE 302
Effective Fall 2013 Effective Fall 2014

ECE 320  Energy Conversion and Power Electronics
Fall of every year. Spring of every year. 3(3-0) P: ECE 302 and ECE 303 and ECE 305 P: ECE 302 and (ECE 305 or concurrently) R: Open to students in the Department of Electrical and Computer Engineering and open to students in the Department of Computer Science and Engineering. R: Open to students in the Electrical Engineering Major and open to students in the Computer Engineering Major.
SA: EE 320
Effective Fall 2013 Effective Fall 2014

ME 802  Advanced Classical Thermodynamics
ME 810  Fall of every year. 3(3-0) P: ME 391 RB: ME 391 and ME 411 RB: (ME 391) and ME 391 R: Open to graduate-professional students in the College of Engineering.
SA: ME 802
Effective Fall 1995 Effective Fall 2015

ME 804  Micro-Scale Fluid Mechanics and Heat Transfer
ME 811  Spring of odd years. 3(3-0) RB: ME 332 and ME 410 RB: (ME 332) and ME 332
Effective Spring 2003 Effective Fall 2015
ME 822  Combustion
Spring of even years. Spring of every year. 3(3-1) RB: ME 490 and ME 802
RB: (ME 490 and ME 802) and ME 490 and ME 802
Effective Summer 2004 Effective Fall 2015

COLLEGE OF HUMAN MEDICINE

HM 629  Leadership in Medicine for Underserved or Vulnerable Communities
Spring of every year. 6 credits. P: PHD 600 and MED 608 and PSC 608 and OGR 608 and SUR 608
RB: Open to graduate-professional students in the College of Human Medicine. Approval of college.
Issues involved in securing access to medical care and community resources for families in medically underserved communities.
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 629
Effective Summer 2011 Effective Fall 2014

HM 816  Human Risk Assessment and Management in Public Health
Fall of even years. 3(3-0) P: HM 802 and HM 803 or approval of college RB: Coursework in
statistics and probability assessment.
R: Open to students in the Public Health Major or approval of college.
NEW Prepare students to conduct a human risk assessment; fundamentals of risk assessment in public health; existing tools and data sources for conducting risk assessment in public health practice; use of risk assessment to inform programs and policies.
Effective Summer 2014

HM 817  Population Healthcare Analytics
Fall of every years. 3(3-0) RB: Background in public health, health care, or other health related fields.
R: Open to students in the Public Health Major or approval of college.
NEW Introduction to healthcare analytics, the healthcare industry and the synergy between the two. Data manipulation, analyses and presentation of results. Highlights peculiarities, irregularities, and limitations of the healthcare industry and related data. Introduces analytic tools and techniques that may be used to create descriptive reports and predictive insights.
Effective Summer 2014

ANTR 585  Directed Study in Human Prosection
Fall of every year. Spring of every year. Summer of every year. 1 to 5 credits. A student may earn a maximum of 15 credits in all enrollments for this course.
P: ANTR 551 P: ANTR 551 or ANTR 510
R: Open only to graduate-professional students in the College of Human Medicine or College of Osteopathic Medicine and approval of department.
R: Approval of department. C: ANTR 551 concurrently.
Prosection of selected regions and isolated structures of preserved human cadavers. Oral presentation.
Effective Summer 2002 Effective Fall 2013

ANTR 890  Topics in Anatomy and Structural Biology
Fall of every year. Spring of every year. Summer of every year. 1 to 2 credits, 1 to 4 credits. A student may earn a maximum of 5 credits in all enrollments for this course. A student may earn a maximum of 8 credits in all enrollments for this course.
R: Open to graduate students. Approval of department.
Independent study in gross anatomy, histology, virtual microscopy, neuroanatomy, physical anthropology or forensic radiology.
Effective Spring 2009 Effective Summer 2015
COLLEGE OF NATURAL SCIENCE

NSC 100  Drew Freshman Seminar
Fall of every year. 2(2-0) P: (MTH 1825 or concurrently) or (MTH 116 or concurrently) or (MTH 132 or concurrently) R: Approval of college.
PCR Academic and non-academic skills and strategies for successful college transition.
SA: NSC 201
Effective Summer 2010 Effective Fall 2014

NSC 102  Preprofessional Freshman Seminar
Fall of every year. Spring of every year. 1(1-0) R: Open to freshmen or approval of department.
PCR Overview of human health care professions with emphasis on academic and nonacademic undergraduate preparation, campus resources, communication and computer skills, and collaborative learning.
Effective Fall 2013 Effective Fall 2014

NSC 103  Strategies for Success
Fall of every year. Spring of every year. 1(1-0) R: Approval of department.
PCR Development of effective academic, problem-solving, and other strategies necessary for college and career success. Discussion groups, study groups, and peer mentoring. Connections with University resources.
DELETE COURSE
Effective Fall 2014

NSC 104  Freshman Seminar Away in Natural Sciences
Fall of every year. 2(1-2) R: Open to freshmen in the College of Natural Science. Approval of college.
PCR Introduction to scientific scholarship and academic inquiry via an intensive empirical learning experience. Strategies for academic success in science and enhancing the college experience.
Effective Fall 2010 Effective Fall 2014

NSC 192  Environmental Issues Seminar
Fall of every year. Spring of every year. 1 credit. Interdepartmental with Agriculture and Natural Resources and Communication Arts and Sciences and Engineering and Social Science. A student may earn a maximum of 4 credits in all enrollments for this course. R: Open only to students in the College of Agriculture and Natural Resources or College of Engineering or College of Natural Science or College of Communication Arts and Sciences or College of Social Science. Approval of college. R: Open to students in the College of Communication Arts and Sciences or in the College of Engineering or in the College of Natural Science or in the College of Social Science. Approval of college.
PCR Environmental issues and problems explored from a variety of perspectives, including legal, scientific, historical, political, socio-economic, and technical points of view.
Effective Spring 2002 Effective Fall 2014

NSC 200  Drew Sophomore Seminar
Fall of every year. 2(2-0) P: NSC 100 or approval of college R: Approval of college.
PCR Career exploration and preparation through service-learning experience.
SA: NSC 202
Effective Summer 2010 Effective Fall 2014

NSC 203  Drew Laboratory Directed Studies
Fall of every year. Spring of every year. Summer of every year. 1 to 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to students in the Charles Drew Science Enrichment Laboratory.
PCR Using topics related to a faculty member's ongoing research, students explore the relationship between science and technology and social issues.
Effective Spring 2013 Effective Fall 2014
NSC 292  Applications in Environmental Studies
Fall of every year. Spring of every year. 2(1-2) Interdepartmental with Agriculture and Natural Resources and Communication Arts and Sciences and Engineering and Social Science. P: NSC 192 R: Open only to students in the Specialization in Environmental Studies. R: Open to students in the Environmental Studies Specialization.
PCR Community engagement project. Projects vary depending on student's major and area of environmental interest. Effective Fall 2004 Effective Fall 2014

NSC 390  Special Problems
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: Approval of department.
PCR Faculty directed individualized study of an interdisciplinary problem. Effective Summer 2000 Effective Fall 2014

NSC 475  International Field Studies in Natural Science
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; application required.
PCR Contemporary issues in environmental, geological, biological or human health-related sciences of a specific study abroad location. 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 2010 Effective Fall 2014

NSC 476  Natural Science Field Studies in Selected U.S.A. Locations
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; application required.
PCR Contemporary issues in environmental, geological, biological or human health-related sciences of a selected domestic study away location. 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 Summer 2010 Effective Fall 2014

NSC 490  Special Problems
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of department.
PCR Faculty directed individualized study of an interdisciplinary problem. Effective Summer 2000 Effective Fall 2014

NSC 491  Selected Topics
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: Approval of department.
PCR Selected interdisciplinary topics not normally covered in other courses. Effective Summer 2000 Effective Fall 2014
NSC 493  Cooperative Education
Internships in Natural Science
Fall of every year. W. K. Kellogg Biological Station. W. K. Kellogg Biological Station. W. K. Kellogg Biological Station
Spring of every year. W. K. Kellogg Biological Station. W. K. Kellogg Biological Station. W. K. Kellogg Biological Station
Summer of every year. W. K. Kellogg Biological Station. W. K. Kellogg Biological Station. W. K. Kellogg Biological Station
1 credit. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. P: Completion of Tier I Writing Requirement. R: Approval of college; application required. R: Open to sophomores or juniors or seniors in the College of Natural Science. Approval of college; application required. A student may earn a maximum of 3 credits NSC 497. Not open to students with credit in NSC 497.
PCR  Educational employment experiences in industry and government related to the student's major. Educational employment experience applying scientific and or research training in industry, government and non-profit.
Request the use of the Pass-No Grade (P-N) system.
Effective Summer 2008  Effective Summer 2015

NSC 495  Capstone in Human Biology (W)
Fall of every year. Spring of every year. 2(2-0) P: Completion of Tier I writing requirement. R: Open only to seniors in the Human Biology or Lyman Briggs Human Biology major. R: Open to seniors in the Human Biology Major.
PCR  Integration of human biology disciplines with a focus on health and disease.
Effective Spring 2003  Effective Fall 2014

NSC 496  Directed Study in Human Biology
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. P: Completion of Tier I writing requirement.
PCR  Directed studies in human biology.
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

NSC 497  Internship in Human Biology
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. P: Completion of Tier I writing requirement.
PCR  Practical experience applying human biology training outside the classroom 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 Spring 2000  Effective Fall 2014

NSC 498  Research in Human Biology
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. P: Completion of Tier I writing requirement.
PCR  Research in faculty laboratories.
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 2000  Effective Fall 2014

NSC 499  Research
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: Completion of Tier I writing requirement.
PCR  Research in faculty laboratories. Oral and written presentations.
Effective Summer 2000  Effective Fall 2014
PART II - NEW COURSES AND CHANGES – continued - 21
September 11, 2014

BLD 204  Mechanisms of Disease
Spring of every year. 3(3-0) P: BS 161 or LB 145 or BS 181H
PCR  Pathophysiological mechanisms of diseases. Selected applications to organ system pathology.
SA: MT 204
Effective Fall 2011  Effective Fall 2014

BLD 213  Application of Clinical Laboratory Principles
Fall of every year. Summer of every year. 2(1-3) 2(2-2) P: (CEM 141 and CEM 161) or (LB 171 and LB 171L) RB: BS 171 R: Open to students in the Biomedical Laboratory Science major or in the Lyman Briggs Biomedical Laboratory Science Coordinate major or in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major or in the Lyman Briggs Diagnostic Molecular Science Coordinate Major or in the Human Biology major. R: Open to students in the Human Biology Major or in the Biomedical Laboratory Science Major or in the Clinical Laboratory Sciences Major or in the Lyman Briggs Biomedical Laboratory Science Coordinate Major.
PCR  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 2011  Effective Fall 2014

BLD 220  Preparing for a Health Professions Career
Spring of every year. 1(1-0) R: Open to sophomores or juniors.
PCR  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
Effective Fall 2011  Effective Fall 2014

BLD 324  Fundamentals of Hematology, Hemostasis, and Urinalysis
Fall of every year. 3(3-0) P: (BS 161 or concurrently) or (LB 145 or concurrently) or (BS 181H or concurrently) RB: (PSL 310 or concurrently) or (PSL 250 or concurrently) or (PSL 431 or concurrently)
PCR  Physiology and biochemistry of normal hematologic, hemostatic, and urinary systems. Principles of diagnostic assays to detect diseases affecting those systems.
SA: MT 324
Effective Fall 2011  Effective Fall 2014

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.
PCR  Routine laboratory assays used to assess the health of the hematological, hemostatic, and urinary systems.
Effective Fall 2010  Effective Fall 2014

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.
PCR  Diagnostic assays across various disciplines within the clinical laboratory (microbiology, immunohematology, hematology and molecular diagnostics) as well as data interpretation and problem solving skills.
Effective Fall 2011  Effective Fall 2014
BLD 414  Clinical Chemistry Analysis and Practice  
Spring of every year. 3(3-0) P: (STT 200 or concurrently) or (STT 201 or concurrently) or (STT 231 or concurrently) or (STT 351 or concurrently) or (STT 421 or concurrently) P: BLD 213 and (STT 200 or STT 201 or STT 231 or STT 351 or STT 421) RB: BLD 213 and PHY 231 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.

PCR  
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  
Effective Fall 2011  Effective Fall 2014

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)

PCR  
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  
Effective Fall 2011  Effective Fall 2014

BLD 417  Quality Processes in Diagnostic Laboratory Testing  
Spring of every year. 2(2-0) P: (STT 200 or concurrently) or (STT 201 or concurrently) or (STT 424 or concurrently) or (STT 351 or concurrently) or (STT 231 or concurrently) P: BLD 213 and (STT 200 or STT 201 or STT 231 or STT 351 or STT 424) RB: BLD 213 and PHY 231 RB: PHY 231 or LB 273 R: Open to students or students in the Clinical Laboratory Sciences major or in the Diagnostic Molecular Science major or in the Lyman Briggs Diagnostic Molecular Science Coordinate Major. R: Open to students in the Clinical Laboratory Sciences Major. Not open to students with credit in BLD 414.

PCR  
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  
Effective Spring 2010  Effective Fall 2014

BLD 424  Advanced Hematology, Hemostasis and Urinalysis  
Spring of every year. 2(2-0) P: BLD 324 RB: ((PSL 310 or concurrently) or (PSL 250 or concurrently) or PSL 431) and (BLD 416 and (BLD 430 or concurrently) and BLD 434 and (BLD 435 or concurrently))

PCR  
Etiology and pathogenesis of diseases of the hematologic, hemostatic and urinary systems including anemias, leukemias, and hemophilies. Diagnostic testing for such diseases.
SA: MT 422, MT 424  
Effective Fall 2011  Effective Fall 2014

BLD 424L  Advanced Laboratory in Hematology, Hemostasis, and Urinalysis  
Spring of every year. 1(0-3) P: BLD 324L and (BLD 424 or concurrently)

PCR  
Specialized and advanced assays used in the diagnosis of diseases of the hematological, hemostatic, and urinary systems.
Effective Summer 2008  Effective Fall 2014

BLD 430  Molecular Laboratory Diagnostics  
Spring of every year. 2(2-0) P: BS 161 or LB 145 or BS 181H

PCR  
Concepts and principles of molecular analysis applied to medical diagnostics and related applications.
SA: MT 430  
Effective Fall 2011  Effective Fall 2014
BLD 433  Clinical Immunology and Immunohematology Laboratory
Spring of every year. 1(0-3) P: BLD 213 and (BLD 435 or concurrently) R: Open to students in the Clinical Laboratory Sciences major.
PCR
Immunologic methods for disease detection. Methods of blood typing and pre-transfusion testing.
SA: MT 433
Effective Fall 2011 Effective Fall 2014

BLD 434  Clinical Immunology
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: BS 161 or LB 145 or BS 181H RB: BLD 204 and BLD 213 RB: (PSL 310 or PSL 250 or PSL 431) and (BLD 204 and BLD 213 and MMG 201) Not open to students with credit in MMG 451.
PCR
Concepts of innate, cellular, and humoral immunity. Immunodeficiency and autoimmunity. Principles and applications of immunoassays in medical laboratories.
SA: MT 432, MT 434
Effective Fall 2011 Effective Fall 2014

BLD 435  Transfusion and Transplantation Medicine
Spring of every year. 3(3-0) P: BLD 434 or MMG 451
PCR
Principles and practice of transfusion medicine including blood typing. Principles and practices of transplantation medicine. Transplantation immunology, organ procurement, and rejection detection.
Effective Fall 2011 Effective Fall 2014

BLD 436  Principles of Diagnostic Molecular Science
Spring of every year. 2(2-0) P: BMD 461 and (BS 161 or LB 145 or BS 181H) and ZOL 341 Not open to students with credit in BLD 830. C: BMD 462 concurrently.
PCR
Principles and techniques of molecular diagnostic assays including applicable regulations.
SA: MT 436
Effective Fall 2011 Effective Fall 2014

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.
PCR
Application of molecular diagnostic methods in clinical and other types of laboratory disciplines.
SA: MT 437
Effective Summer 2008 Effective Fall 2014

BLD 438  Molecular Diagnostic Laboratory
Fall of every year. 2(0-6) P: BLD 436 Not open to students with credit in BLD 832.
PCR
Laboratory in molecular techniques with emphasis on clinical and diagnostic applications.
SA: MT 438
Effective Summer 2008 Effective Fall 2014

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 or in the Diagnostic Molecular Science major. R: Open to students in the Clinical Laboratory Sciences Major.
PCR
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
Effective Summer 2012 Effective Fall 2014

BLD 450  Eukaryotic Pathogens
Spring of every year. 3(3-0) P: BS 161 or LB 145 or BS 181H 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
PCR
Medically important fungi and parasites. Host-parasite relationships, life cycles, culture, identification, and associated diseases.
SA: MT 450
Effective Fall 2011 Effective Fall 2014
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 (CEM 332 or concurrently) or (BLD 435 or concurrently) or (CEM 332 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.
PCR 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
Effective Fall 2011 Effective Fall 2014

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.
PCR 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 2009 Effective Fall 2014

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. C: BLD 471 concurrently.
PCR 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
Effective Fall 2009 Effective Fall 2014

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.
PCR 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 2009 Effective Fall 2014

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. C: BLD 473 concurrently.
PCR 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
Effective Fall 2009 Effective Fall 2014
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  R: Open to seniors in the Clinical Laboratory Sciences major.  
PCR  
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 2009  Effective Fall 2014

BLD 476  Advanced Clinical Immunology and Immunohematology  
Fall of every year. Spring of every year. Summer of every year. 1 credit. P: BLD 435 and BLD 434  
P: BLD 433 and BLD 434 and BLD 435  R: Open to seniors in the Clinical Laboratory Sciences major.  
C: BLD 475 concurrently.  
PCR  
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  
Effective Fall 2009  Effective Fall 2014

BLD 477  Advanced Clinical Microbiology Laboratory  
Fall of every year. Spring of every year. Summer of every year. 3 credits. P: MMG 464 and BLD 450  
R: Open to seniors in the Clinical Laboratory Sciences major.  
PCR  
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 2009  Effective Fall 2014

BLD 478  Advanced Clinical Microbiology  
Fall of every year. Spring of every year. Summer of every year. 1 credit. P: MMG 463 or BLD 450 or BLD 498  
P: MMG 463 and BLD 450 and BLD 498  R: Open to seniors in the Clinical Laboratory Sciences major.  
C: BLD 477 concurrently.  
PCR  
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  
Effective Fall 2009  Effective Fall 2014

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))  
R: Open to students in the Clinical Laboratory Sciences major.  
PCR  
Application of professional behavior principles to practical experiences in clinical 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 2009  Effective Fall 2014
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.

PCR 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

Effective Summer 2008 Effective Fall 2014

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.

PCR 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

Effective Summer 2008 Effective Fall 2014

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.

PCR 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

Effective Summer 2008 Effective Fall 2014

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.

PCR 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

Effective Summer 2008 Effective Fall 2014

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.

PCR 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

Effective Summer 2008 Effective Fall 2014
PART II - NEW COURSES AND CHANGES – continued - 27

September 11, 2014

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.

PCR
Faculty directed study including assigned readings, reviews of appropriate scientific periodicals, research, and laboratory experience.
SA: MT 495

Effective Summer 2008 Effective Fall 2014

BLD 498  Focused Problems in Clinical Laboratory Science
Spring of every year. 2(1-2) P: (MMC 463 or concurrently) and (MMC 464 or concurrently) 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.

PCR
Case study problems of medical microbiology, hematology, and clinical chemistry.
SA: MT 454, MT 498

Effective Fall 2010 Effective Fall 2014

BLD 498L  Infectious Disease Diagnostic Laboratory
Spring of every year. 1(0-3) P: MMG 463 and MMG 464 and BLD 434 and (BLD 450 or concurrently) P: MMG 464 and (BLD 450 or concurrently) R: BLD 430 R: BLD 430 and BLD 434 R: Open to undergraduate students in the Clinical Laboratory Sciences major.

PCR
Applying pre-analytical, analytical, and post-analytical principles to the identification of infectious agents in unknown samples.

Effective Spring 2012 Effective Fall 2014

NEU 301  Introduction to Neuroscience I
Fall of every year. 3(3-0) P: (BS 161 or BS 181H or LB 145) and (BS 162 or BS 191H or LB 145) RB: PSY 101 R: Open to undergraduate students in the Program in Neuroscience.

PCR
Survey of the field of neuroscience, including molecular, cellular, and autonomic, sensory and motor systems.

Effective Fall 2012 Effective Fall 2014

NEU 302  Introduction to Neuroscience II
Spring of every year. 3(3-0) P: NEU 301 RB: PSY 101 R: Open to undergraduate students in the Program in Neuroscience.

PCR
Survey of brain-based behavioral and cognitive systems and related human diseases.

Effective Fall 2012 Effective Fall 2014

NEU 311L  Neuroscience Laboratory (W)
Fall of every year. Spring of every year. 2(1-3) P: ((NEU 301 or concurrently) and completion of Tier I writing requirement) and (STT 201 or STT 231 or STT 421) and (BS 171 or BS 191H or LB 145) RB: PSY 101 R: Open to undergraduate students in the Program in Neuroscience.

PCR
Overview of neuroscience research methodology, including experimental design, data analysis, and presentation of results.

Effective Fall 2012 Effective Fall 2014

NEU 420  Neurobiology of Disease
Spring of every year. 3(3-0) P: NEU 301 and NEU 302 R: Open to undergraduate students in the Program in Neuroscience.

PCR
Genetic, molecular, cellular, systems, and behavioral abnormalities that contribute to the manifestation of neurologic and psychiatric diseases and disorders that affect the nervous system.

Effective Fall 2012 Effective Fall 2014
NEU 490  Special Problems in Neuroscience
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. P: (PSY 101 and NEU 301) and (STT 201 or STT 231 or STT 421) RB: NEU 302 and NEU 311L R: Open to juniors or seniors. Approval of department. R: Open to juniors or seniors. Approval of department. A student may earn a maximum of 15 credits A student may earn a maximum of 15 credits in NEU 490 and NEU 492.
PCR Students work under the direction of a faculty member on a selected research problem. Effective Fall 2013 Effective Fall 2014

NEU 492  Special Topics in Neuroscience
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. RB: PSY 101 R: Open to sophomores or juniors or seniors. Approval of department. R: Open to sophomores or juniors or seniors. Approval of department. A student may earn a maximum of 15 credits A student may earn a maximum of 15 credits in NEU 490 and NEU 492.
PCR Current topics proposed by faculty that supplement regular course offerings. Effective Fall 2013 Effective Fall 2014

PHY 234B  Calculus Concepts in Physics II
Spring of every year. Summer of every year. 2 credits. P: (PHY 232 or PHY 232C) and ((MTH 133 or concurrently) or (MTH 153H or concurrently) or (LB 119 or concurrently)) Not open to students with credit in LB 274 or PHY 184 or PHY 232 or PHY 232c or PHY 184B. Not open to students with credit in LB 274 or PHY 184 or PHY 184B.
Electricity and magnetism. This course is given in the competency based instruction format. Effective Fall 2014

COLLEGE OF NURSING

NUR 110  Exploring Nursing
Fall of every year. Spring of every year. 2(2-0)
PCR Introduction to the bio-psycho-social conceptual model of persons in relation to nursing and health. Core concepts and theoretical foundations that frame the art and science of nursing. Development of the profession from inception into contemporary practice and its relationship to the U.S. healthcare system. DELETE COURSE Effective Fall 2014

NUR 205  Introduction to Professional Nursing
Fall of every year. Spring of every year. Summer of every year. 4(2-2) P: CEM 143 and PSY 101 RB: Not open to RN-BSN students. Only open to the following major codes 4008, 4009, 4023 R: Open to students in the Nursing Major. C: NUR 300 concurrently or NUR 301 concurrently. NEW Principles and practices of holistic nursing care that allow for analysis of a comprehensive collection of patient data to provide basic clinical care to the adult population. Effective Fall 2015

NUR 300  Pathophysiology
Fall of every year. Spring of every year. Summer of every year. 4(4-0) P: (ANTR 350) and (PSL 310 or PSL 250) P: ANTR 350 and (PSL 310 or PSL 250) RB: Preprofessional students entering patient care disciplines. Not open to students with credit in NUR 341.
PCR How disrupting normal structures and functions of the human body leads to disease processes from the cellular to the multi-system level. Critical examination of the mechanisms underlying signs and symptoms. SA: NUR 341 Effective Spring 2008 Effective Summer 2015
NUR 301  Clinical Pathophysiology
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: ((PSL 250 or PSL 310) or (PSL 431 and PSL 432)) and ANTR 350
NEW  How disrupting normal structures and functions of the human body leads to disease processes from the cellular to the multisystem level. Critical examination of the mechanisms underlying signs and symptoms of diseases.
Effective Fall 2015

NUR 322  Nursing Care of Acute and Chronically Ill Patients I
Fall of every year. Spring of every year. Summer of every year. 4(2-2) P: NUR 301 or NUR 300 C: NUR 205 concurrently and PHM 350 concurrently.
NEW  Focuses on using the nursing process and clinical judgment at a beginning level to provide care for acute and chronically ill patients.
Effective Fall 2015

NUR 324  Health Promotion and Disease and Injury Prevention I
Fall of every year. Spring of every year. Summer of every year. 3(2-1) P: HDFS 225 and HNF 260 C: NUR 205 concurrently and NUR 322 concurrently.
NEW  Principles and practices of health education, health promotion/behavior change, and health literacy through understanding epidemiology, determinants of health, and protective and predictive factors of health and well-being.
Effective Fall 2015

NUR 325  Transitions to BSN Practice
Fall of every year. Spring of every year. 2(2-0) P: NUR 300 or NUR 301 R: Open to students in the Nursing Major.
PCR  Application of curricular concepts to nursing practice, role differentiation and contribution of BSN nurse to healthcare.
Effective Fall 2012 Effective Summer 2014

NUR 330  Health Assessment and Nursing Therapeutics
Fall of every year. Spring of every year. Summer of every year. 7(3-10) P: NUR 300 R: Open to students in the Nursing Major. C: PHM 350 concurrently and NUR 340 concurrently.
PCR  Normal physiology and pathophysiology. Theories of growth and development across the life span. Therapeutic communication and physical, psychosocial, cultural and spiritual assessment techniques and mastery of basic nursing therapeutics. Understanding the significance of abnormal physiological health transitions of the adult.
Effective Fall 2012 Effective Summer 2014

NUR 332  Nursing Care of Acute and Chronically Ill Patients II
Fall of every year. Spring of every year. Summer of every year. 5(2-3) P: (NUR 322 and NUR 324) and (MMG 201 or MMG 301) C: NUR 334 concurrently and NUR 371 concurrently.
NEW  Focuses on using the nursing process and clinical judgment at an intermediate level to manage care for acute and chronically ill patients.
Effective Fall 2015

NUR 334  Health Promotion and Disease and Injury Prevention II
Fall of every year. Spring of every year. 3(2-1) P: NUR 322 and NUR 324 C: NUR 332 concurrently and NUR 371 concurrently.
NEW  Principles and practices of health promotion, risk reduction, and injury prevention to provide nursing care for individuals, families, and communities across the lifespan.
Effective Fall 2015

NUR 336  Health Promotion for the BSN
Spring of every year. Summer of every year. 4(4-0) RB: Registered Nurse admitted to the RN-BSN program. R: Open to students in the Nursing Major.
PCR  Health promotion and risk reduction for individuals across the lifespan in the context of their families and environments including those from diverse and vulnerable populations.
Effective Fall 2012 Effective Summer 2014
NUR 340  Foundations of Nursing Practice  
Fall of every year. Spring of every year. Summer of every year. 4(4-0) P: (NUR 300) and completion of Tier I writing requirement P: (NUR 300 or (NUR 325 or concurrently)) and completion of Tier I writing requirement C: PHM 350 concurrently or NUR 330 concurrently. C: NUR 325 concurrently.

PCR  
Theories and principles underlying professional nursing practice. Development of basic principles for using empirical evidence and the research process to guide practice.  
Effective Fall 2012 Effective Summer 2014

NUR 355  Integrative Seminar I  
Spring of every year. Summer of every year. 2(2-0) P: NUR 300 P: NUR 325 and NUR 340 RB: Registered Nurse admitted to the RN-BSN program. R: Open to students in the Nursing Major. C: NUR 340 concurrently.

PCR  
Critical appraisal of literature related to health promotion and risk reduction in preparation for an evidence based practice project. Request the use of the Pass-No Grade (P-N) system.  
Effective Fall 2012 Effective Summer 2014

NUR 360  Acute Nursing Care of Adults and Older Adults  
Fall of every year. Spring of every year. 8(4-12) P: NUR 330 and NUR 340 C: NUR 370 concurrently.

PCR  
Integration of concepts and theories into beginning level Nursing practice. Examination of dynamic interrelationship between professional, scholarly nursing practice, and the health and wellness of diverse persons and populations across the life span.  
Effective Summer 2012 Effective Spring 2014

NUR 370  Mental Health and Psychiatric Nursing  
Fall of every year. Spring of every year. 4(2-6) P: NUR 330 and NUR 340 C: NUR 360 concurrently.

PCR  
Extension of foundational social science concepts into nursing therapeutics aimed at mental health and the care of persons with mental illnesses. Medication and non-medications, group interventions, and therapeutic environments.  
Effective Summer 2012 Effective Spring 2014

NUR 371  Behavioral Health Nursing  
Fall of every year. Spring of every year. 4(2-2) P: NUR 322 and NUR 324 C: NUR 332 concurrently and NUR 334 concurrently.

NEW  
Extension of foundational social science concepts into nursing therapeutics aimed at behavioral health and the care of persons with mental illnesses.  
Effective Fall 2015

NUR 375  Research and Evidence-Based Practice  
Fall of every year. Spring of every year. Summer of every year. 2(2-0) P: (STT 200 or STT 201) and completion of Tier I writing requirement C: NUR 205 concurrently and NUR 322 concurrently and NUR 324 concurrently.

NEW  
Introduction to basic research methodology and how it informs evidence-based nursing practice.  
Effective Fall 2015

NUR 400  Pharmacology for Nurses  
Spring of every year. 3(3-0) P: NUR 313 and NUR 319 and NUR 341

PCR  
Principles of nursing management in drug therapy, drug classifications and patient-related variables. Assessment and evaluation of patient responses in relation to health, age, lifestyle, gender, ethnicity and other cultural factors.  
DELETE COURSE  
Effective Fall 2014
NUR 402  Global Health  
Spring of every year. Abroad, Africa 3(3-0)  
PCR  Factors and dynamics that affect the health of human populations and population status. Role of national governments and international agencies in the policy and planning of health care resources and services.  
DELETE COURSE  
Effective Fall 2014

NUR 422  Nursing in London  
Summer of every year. 5(5-0) R: Approval of college; application required.  
PCR  Historical evolution of nursing in the National Health Service: British nursing education, hospital and community health nursing, standards of care, research, and management. Influence of professional nursing upon British national health policies. 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 Summer 2014 Effective Fall 2014

NUR 424  History of Nursing in the United States  
Spring of every year. On Demand. 2(2-0)  
PCR  Development of professional nursing education and practice from its inception in the United States. Reading historical documents and identifying specific concepts relative to nursing history. Historical research as a valid means of scholarly inquiry.  
Effective Spring 2005 Effective Spring 2014

NUR 426  Theoretical Basis for Critical Care  
Fall of every year. Spring of every year. Summer of every year. 2(2-0) R: Open to seniors in the College of Nursing.  
PCR  Nursing care of clients in critical care, requiring synthesis of pathophysiologic, pharmacologic, and therapeutic concepts. Family theory, stress-adaptation, psychosocial concepts and legal and ethical issues.  
Effective Summer 2008 Effective Spring 2014

NUR 429  Health Care in Ghana  
Summer of every year. Abroad, Africa 2(2-0) R: Approval of college.  
PCR  Major health issues and health care system in western and traditional Ghana culture. Health status indicators and determinants; major programs and strategies; organization of the health care system; access to and payment for care; role, image and status of health care providers; and the interface between western and traditional Ghana health care.  
DELETE COURSE  
Effective Summer 2014

NUR 435  Nursing Care of the Childbearing Family  
Fall of every year. Spring of every year. 4(2-6) P: NUR 360 and NUR 370 C: NUR 440 concurrently.  
PCR  Health promotion and risk assessment of individuals and families during pregnancy and birth. Therapeutic communication and assessment skills for providing holistic care to culturally diverse childbearing families during the prenatal, intrapartum, and postpartum periods. Caring for mother and baby in utero and after birth.  
Effective Summer 2012 Effective Spring 2014

NUR 436  Nursing Care of Children and Their Families  
Fall of every year. Spring of every year. 2(1-1) P: NUR 332 and NUR 334 and NUR 371 and NUR 375 C: NUR 437 concurrently.  
NEW  Theoretical concepts and clinical application of nursing care for ill children and adolescents using a holistic perspective in varied settings.  
Effective Fall 2015
NUR 437  Nursing Care of the Childbearing Family
Fall of every year. Spring of every year. 2(1-1) P: NUR 332 and NUR 334 and NUR 371 and NUR 375 C: NUR 436 concurrently and NUR 445 concurrently.
NEW Theoretical concepts and clinical application of nursing care for the normal and at risk childbearing families using a holistic perspective in varied settings.
Effective Fall 2015

NUR 440  Nursing Care of Children, Adolescents and Their Families
Fall of every year. Spring of every year. 4(2-6) P: NUR 360 and NUR 370 C: NUR 435 concurrently.
PCR Theoretical concepts and clinical application of nursing care of infants, children, and adolescents in varied health care and community settings. Synthesis of pathophysiologic, pharmacologic, and therapeutic concepts. Family-centered care of children within developmental, cultural, ethnic, religious, and social structures.
Effective Summer 2012 Effective Spring 2014

NUR 445  Nursing Care of Acute and Critically Ill Patients
Fall of every year. Spring of every year. 6(3-3) P: NUR 332 and NUR 334 and NUR 371 and NUR 375 C: NUR 436 concurrently and NUR 437 concurrently.
NEW Focuses on using the nursing process and clinical judgment at an advanced level to manage and evaluate care for acute and critically ill patients.
Effective Fall 2015

NUR 450  Integrative Seminar
Fall of every year. Spring of every year. 2(4-0) C: NUR 435 concurrently or NUR 440 concurrently.
PCR Integration of concepts and theories into intermediate-level nursing practice. Dynamic interrelationship between professional, evidence-based practice, and health and wellness throughout the lifespan.
Effective Spring 2013 Effective Spring 2014

NUR 455  Integrative Seminar II
Fall of every year. Summer of every year. 2(2-0) P: NUR 340 and NUR 336 and NUR 355 and NUR 400 P: NUR 336 and NUR 355 RB: Registered Nurse admitted to the RN-BSN program. R: Open to students in the Nursing Major. Not open to students with credit in NUR 450. C: NUR 465 concurrently.
PCR Integration of professional and scholarly nursing practice culminating in an evidence based practice project.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2012 Effective Spring 2014

NUR 460  Leadership Clinical Immersion
Leadership in Clinical Practice
Fall of every year. Spring of every year. Summer of every year. 5(2-3) P: (NUR 435 and NUR 440 and NUR 450) and completion of Tier I writing requirement P: (NUR 445 and NUR 436 and NUR 437) and completion of Tier I writing requirement C: NUR 470 concurrently or NUR 480 concurrently. C: NUR 475 concurrently.
PCR Theories, principles, and practices of leadership, management, and nursing care delivery systems in a variety of agency settings. Application of theories and principles in a mentored practicum. A capstone course that includes a precepted practicum to facilitate the student’s transition to professional practice. The focus is on the application of leadership concepts, theories, and principles.
Effective Fall 2013 Effective Fall 2015

NUR 465  Leadership Immersion
Fall of every year. Summer of every year. 4(3-1) P: NUR 355 and NUR 340 and NUR 336 and NUR 400 P: NUR 355 and NUR 336 RB: Registered Nurse admitted to the RN-BSN program. R: Open to students in the Nursing Major. Not open to students with credit in NUR 460. C: NUR 455 concurrently.
PCR Integration and application of theories, principles and practices of nursing leadership and management into contemporary practice settings.
Effective Fall 2012 Effective Spring 2014
NUR 470  Community and Population Health Nursing  
Fall of every year. Spring of every year. Summer of every year. 4(2-6) P: NUR 435 and NUR 440 and NUR 450  
P: NUR 435 or (NUR 455 and NUR 465) C: NUR 460 concurrently and NUR 480 concurrently.  

PCR  Theoretical and practicum basis for community-oriented population nursing practice.  
Promoting and protecting the health of the public using health promotion, risk reduction,  
and disease management and control strategies with vulnerable persons and populations.  
Community assessment, epidemiologic, environmental, change, political action, and case-  
management frameworks are used to guide evidence-based nursing care delivery to  
persons, families, and populations in community settings.  
Effective Fall 2012 Effective Spring 2014

NUR 471  Public Health Nursing  
Fall of every year. Spring of every year. Summer of every year. 3(2-1) P: NUR 445 and NUR 436 and NUR 437 C: NUR 475 concurrently.  

NEW  Use of the public health system to care for populations, including application of the  
principles and practices of public health nursing.  
Effective Fall 2015

NUR 475  Ethical Practice  
Fall of every year. Spring of every year. Summer of every year. 2(2-0) C: NUR 460 concurrently.  

NEW  Ethical theory, reasoning, and decision-making with application to clinical practice both as  
ethical comportment in clinical relationships and resolution of situations of ethical  
uncertainty and conflicts.  
Effective Fall 2015

NUR 480  Role Transition Seminar  
Fall of every year. Spring of every year. Summer of every year. 3(6-0) P: (NUR 450) and completion of Tier I writing requirement  
P: (NUR 435 and NUR 440 and NUR 450) and completion of Tier I writing requirement C: NUR 460 concurrently or NUR 470 concurrently.  

PCR  Advanced-level evidence-based practice for transition to entry-level nursing. Ethical  
decision and policy-making at the organization level.  
Effective Spring 2013 Effective Spring 2014

NUR 481  Scholarship for Nursing Practice  (W)  
Fall of every year. Spring of every year. Summer of every year. 2(2-0) P: (NUR 445 and NUR 436 and NUR 437) and completion of Tier I writing requirement C: NUR 475 concurrently.  

NEW  Examines the dynamic interrelationship among professional scholarly nursing practice, the  
health and wellness of diverse populations and high quality safe health care organizations.  
Effective Fall 2015

NUR 485  Integrative Seminar III  
Fall of every year. Spring of every year. 2(2-0) P: NUR 355 and NUR 340 and NUR 400 and NUR 455 and NUR 336  
P: NUR 455 and NUR 465 RB: Registered Nurse admitted to the RN-BSN program. R: Open to students in the Nursing Major. Not open to students with credit in NUR 480. C: NUR 470 concurrently.  

PCR  Examination of the influence and responsibility of professional nursing to society  
Request the use of the Pass-No Grade (P-N) system.  
Effective Fall 2013 Effective Summer 2014

NUR 490  Independent Study in Nursing  
Fall of every year. Spring of every year. Summer of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to students in the College of Nursing. Not open to PreNursing majors. Approval of college. R: Approval of college.  

PCR  Individualized area of study in Nursing.  
Effective Fall 1998 Effective Summer 2014
NUR 491  Special Topics  
Fall of every year, Spring of every year, Summer of every year, On Demand. 2 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to students in the College of Nursing. Not open to PreNursing majors. R: Approval of college.

PCR  
Exploration of selected issues in nursing.  
Effective Fall 1998 Effective Summer 2014

NUR 806  Research for Advanced Practice Nurses  
Fall of every year, Spring of every year. 3(3-0) P: NUR 802 and NUR 804 R: Open to graduate students in the College of Nursing.

Prepares advanced practice nurses who are proficient in the ethical utilization and clinical application of research including problem identification and evaluation to provide high quality care and improve practice. Prepares advanced practice nurses to be proficient in the ethical and clinical application of research including problem identification and critically evaluate the evidence to provide high quality care and improve practice.  
Effective Fall 2012 Effective Summer 2014

NUR 836  Primary Care Management of the Adult and Aged I  
Spring of every year. 5(3-6) P: NUR 835 P: NUR 835 and NUR 807 R: Open to graduate students in the Master of Science in Nursing or in the Nurse Practitioner Graduate Certificate.

Principles and issues of health care management for adult and gerontological advanced practice nurses. Health promotion, risk identification, disease prevention, and acute problems for the adult and aged from culturally diverse backgrounds. The role of risk factors and normal aging changes on health. Analysis of adult and aging health topics using appropriate models, frameworks, and evidence-based research.  
Effective Fall 2012 Effective Fall 2014

NUR 930  Methods In Clinical Research  
Spring of every year, Summer of every year. 3(3-0) R: Open to doctoral students in the College of Nursing or approval of college.

Advanced research designs, measurement and data collection strategies. Draws on a broad range of behavioral and health disciplines relevant to nursing. Logic of statistical models used in the evaluation of research designs and measures.  
Effective Spring 2012 Effective Summer 2014

NUR 989  DNP Synthesis Project  
Spring of every year. 1 to 3 credits, 1 to 4 credits. A student may earn a maximum of 16 credits in all enrollments for this course. P: NUR 962 and NUR 920 and NUR 964 R: Open to doctoral students in the College of Nursing.

Application of nursing and leadership theories for the development implementation and evaluation of an evidence-based intervention to improve health care outcomes for a selected population or system outcomes for a selected organization. Demonstrate synthesis of didactic coursework and application to practice by learning a practice change innovation to address a health care problem and improve health outcomes.  
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
**COLLEGE OF OSTEOPATHIC MEDICINE**

**OST 602**  
Primary Care Ambulatory Clerkship  
Fall of every year. Spring of every year. Summer of every year. 1 to 36 credits. A student may earn a maximum of 36 credits in all enrollments for this course.

**REINSTATEMENT**  
A 24-week ambulatory care continuity experience involving 12 weeks in a multidisciplinary environment (family medicine, pediatrics, and internal medicine), 4 weeks in family medicine and 8 weeks in specialty areas (internal medicine, surgery, pediatrics, and obstetrics and gynecology). Didactic sessions are scheduled concurrently.

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 2014

**FCM 591**  
OMM in HOSPICE  
Fall of every year. Spring of every year. Summer of every year. 1 to 24 credits. A student may earn a maximum of 24 credits in all enrollments for this course. P: ANTR 510 R: Open to students in the College of Osteopathic Medicine.

NEW  
MSUCOM preclerkship students will have the opportunity to evaluate and treat, using Osteopathic Manipulative Medicine (OMM) Hospice patients under the guidance of COM faculty.

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

Effective Fall 2014

**IM 665**  
Emergency Medicine Advanced Clerkship  
Fall of every year. Spring of every year. Summer of every year. 1 to 20 credits. A student may earn a maximum of 30 credits in all enrollments for this course. P: IM 657 R: Open to graduate-professional students in the College of Osteopathic Medicine.

Advanced acute evaluation and management of patients in the hospital emergency department and other locations.

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 4 semesters after the end of the semester of enrollment.

Effective Summer 2014

**COLLEGE OF VETERINARY MEDICINE**

**LCS 829**  
Design and Conduct of Epidemiological Studies and Clinical Trials  
Spring of every year. 3(2-2) Interdepartmental with Epidemiology. P: (VM 533 or EPI 810) and EPI 808 P: (VM 533 or EPI 810) and (EPI 808 or EPI 808B)


Effective Spring 2013 Effective Fall 2014

**PHM 802**  
Cellular, Molecular and Integrated Systems Pharmacology  
Spring of every year. 4(4-0) P: (BMB 801 or BMB 802) and (PHM 827 or PSL 828 or PSL 829) R: Open to doctoral students or approval of department.

Cellular and molecular mechanisms of drug actions on organ systems of humans and other mammals.

Effective Spring 2014 Effective Spring 2015

**SCS 564**  
Applied Small Animal Nutrition  
Fall of every year. 1(1-0) RB: Completion of year 1 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.

REINSTATEMENT  
Principles of life stage nutrition and making dietary recommendations for healthy and sick small animal patients.

Effective Fall 2014
SCS 643  Neurology Clerkship
Fall of every year. Spring of every year. Summer of every year. 3 credits. RB: Completion of semester 5 of the professional veterinary program. R: Open to graduate-professional students in the College of Veterinary Medicine.
- Diagnosis, medical and surgical treatment of small animal neurological disorders.
- 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 Summer 2013 Effective Summer 2014