PART I – NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

1. Request to change the requirements for the Bachelor of Science degree in Crop and Soil Sciences in the Department of Plant, Soil and Microbial Sciences.

The concentrations in the Bachelor of Science degree in Crop and Soil Sciences 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 Crop and Soil Sciences make the following changes:

(1) In item 3. b. change the total credits from '61 to 72’ to '63 to 74’.

(2) In item 3. b. Agronomic Sciences concentration make the following changes:
   (a) Change the total credits from '61 or 62’ to '63 or 64’.

   (b) In item (1) add the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS 226L</td>
<td>Weed Science Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CSS 313</td>
<td>Data Interpretation and Writing in the Agronomic Sciences</td>
<td>2</td>
</tr>
<tr>
<td>CSS 326</td>
<td>Weed Science</td>
<td>2</td>
</tr>
</tbody>
</table>

   Delete the following course:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS 288</td>
<td>Principles of Weed Management</td>
<td>3</td>
</tr>
</tbody>
</table>

(3) In item 3. b. Turfgrass Management concentration make the following changes:

   (a) Change the total credits from '67’ to '69’.

   (b) In item (1) add the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS 226L</td>
<td>Weed Science Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CSS 313</td>
<td>Data Interpretation and Writing in the Agronomic Sciences</td>
<td>2</td>
</tr>
<tr>
<td>CSS 326</td>
<td>Weed Science</td>
<td>2</td>
</tr>
</tbody>
</table>

   Delete the following course:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS 292</td>
<td>Management of Turfgrass Weeds</td>
<td>3</td>
</tr>
</tbody>
</table>

(4) In item 3. b. Advanced Study concentration make the following changes:

   (a) Change the total credits from '72’ to '74’

   (b) In item (1) add the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS 226L</td>
<td>Weed Science Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>CSS 313</td>
<td>Data Interpretation and Writing in the Agronomic Sciences</td>
<td>2</td>
</tr>
<tr>
<td>CSS 326</td>
<td>Weed Science</td>
<td>2</td>
</tr>
</tbody>
</table>

   Delete the following course:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS 288</td>
<td>Principles of Weed Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Effective Fall 2018.
2. Request to change the requirements for the **Minor in Agronomy** in the Department of Plant, Soil and Microbial Sciences.

   a. Under the heading **Minor in Agronomy** make the following changes:

   (1) In item 3. delete the following courses:

       CSS 135 Crop Scouting and Investigation  
       CSS 288 Principles of Weed Management  

   Add the following courses:

       CSS 135 Crop Scouting and Investigation  
       CSS 326 Weed Science  
       CSS 226L Weed Science Laboratory

   Effective Fall 2018.

**COLLEGE OF ENGINEERING**

1. Request to change the **Admission to the College** statement in the College of Engineering. The University Committee on Undergraduate Education (UCUE) will consider this request.

   a. Under the heading **Admission to the College** make the following changes:

      (1) Replace item 1. with the following:

          Complete of at least 28 credits of Michigan State University courses.

      (2) Replace item 3. with the following:

          A minimum grade of 2.0 in all mathematics courses.

   Effective Fall 2018.

2. Request to change the **Graduation Requirements for All Majors** in the College of Engineering. The University Committee on Undergraduate Education (UCUE) will consider this request.

   a. Under the heading **Graduation Requirements for All Majors** make the following changes:

      (1) Change item 1. a., to the following:

          One of the following courses: Biological Science 161; Plant Biology 105; Entomology 205; Integrative Biology 150, Microbiology and Molecular Genetics 141, 201, 301; Physiology 250.

      (2) Change item 1. b., to the following:

          Two of the following courses: Chemistry 141, Chemistry 151, Physics 183 or 183B, Physics 184 or 184B.

      (3) Change item 2.c. to the following:

          Physics 183 or 183B and 184 or 184B.

      (4) Delete item 2.d.
(5) Add the following new item 2.d.:
Engineering 100.

(6) Add the following new item 2.e.:
One technical computing course depending on intended major: CSE 220 (Electrical Engineering), CSE 231 (Computer Science, Computer Engineering, Mechanical Engineering), or EGR 102 (all other engineering majors).

Effective Fall 2018.

3. Request to change the requirements in the Bachelor of Science degree in Environmental Engineering in the Department of Civil and Environmental Engineering.

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

(1) In item 3. a. change the total credits from ‘51’ to ‘52’.

(2) In item 3. a. change the credits of ENE 483 from ‘3’ to ‘4’.

Effective Fall 2018.

COLLEGE OF HUMAN MEDICINE

1. Request to change the requirements for the Master of Public Health degree in Public Health in the College of Human Medicine. The University Committee on Graduate Studies (UCGS) will consider this request at its February 5, 2018 meeting.

a. Under the heading Requirements for the Master of Public Health Degree in Public Health make the following changes:

(1) In item 1. change the total credits from ‘18’ to ‘22’ and add the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM 827</td>
<td>Principles of Public Health Leadership</td>
<td>1</td>
</tr>
<tr>
<td>HM 854</td>
<td>Health Equity Framework for Public Health Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

(2) Add the following new item 2.:

One of the following courses (3 credits):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM 807</td>
<td>Practical Application and Critical Thinking Synthesis in Public Health</td>
<td>3</td>
</tr>
<tr>
<td>HM 853</td>
<td>Public Health Program/Intervention Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>HM 880</td>
<td>Study Design and Research Methods for Public Health Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

(3) Renumber item 2. to item 3. and delete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM 891</td>
<td>Introduction to Public Health Practicum</td>
<td>1</td>
</tr>
<tr>
<td>HM 893</td>
<td>Public Health Capstone</td>
<td>2</td>
</tr>
</tbody>
</table>

Add the following course:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM 893</td>
<td>Public Health Capstone</td>
<td>3</td>
</tr>
</tbody>
</table>

(4) Renumber item 3. to item 4. and change the credits from ‘18’ to ‘12’.
(5) Renumber item 4. to item 5. and replace with the following:

Successfully complete a capstone professional paper.

Effective Summer 2018.

2. Request to change the requirements for the Doctor of Philosophy degree in Biostatistics in the Department of Epidemiology and Biostatistics. The University Committee on Graduate Studies (UCGS) will consider this request at its February 5, 2018 meeting.

a. Under the heading Requirements for the Doctor of Philosophy Degree in Biostatistics change the requirements in item 1. from ‘25’ to ‘27’ to read “Complete 25 credits in the required courses for the chosen emphasis area, and electives”.

Effective Fall 2018.

COLLEGE OF NATURAL SCIENCE

1. Request to change the requirements for the Minor in Environmental and Sustainability Studies in the College of Natural Science.

a. Under the heading Minor in Environmental and Sustainability Studies make the following changes:

(1) Under Biological and Physical Dimensions delete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT 319</td>
<td>Introduction to Earth System Science</td>
<td>3</td>
</tr>
<tr>
<td>ZOL 355</td>
<td>Ecology</td>
<td>3</td>
</tr>
</tbody>
</table>

Add the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW 444</td>
<td>Conservation Biology</td>
<td>3</td>
</tr>
<tr>
<td>IBIO 355</td>
<td>Ecology</td>
<td>3</td>
</tr>
<tr>
<td>ISB 201</td>
<td>Insects, Globalization, and Sustainability</td>
<td>3</td>
</tr>
<tr>
<td>ISB 202</td>
<td>Applications of Environmental and Organismal Biology</td>
<td>3</td>
</tr>
</tbody>
</table>

(2) Under Coupled Human and Natural Systems delete the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEP 320</td>
<td>Environmental Economics</td>
<td>3</td>
</tr>
<tr>
<td>EEP 405</td>
<td>Corporate Environmental Management</td>
<td>3</td>
</tr>
<tr>
<td>FW 211</td>
<td>Introduction to gender and Environmental Issues</td>
<td>3</td>
</tr>
<tr>
<td>PKG 370</td>
<td>Packaging and the Environment</td>
<td>3</td>
</tr>
</tbody>
</table>

Add the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS 418</td>
<td>Animal Agriculture and the Environment</td>
<td>3</td>
</tr>
<tr>
<td>CSUS 320</td>
<td>Environmental Planning and Management</td>
<td>3</td>
</tr>
<tr>
<td>EEM 320</td>
<td>Environmental Economics</td>
<td>3</td>
</tr>
<tr>
<td>EEM 405</td>
<td>Corporate Environmental Management</td>
<td>3</td>
</tr>
<tr>
<td>FW 439</td>
<td>Conservation Ethics</td>
<td>3</td>
</tr>
<tr>
<td>GEO 235</td>
<td>Geography of Environment and Health</td>
<td>3</td>
</tr>
<tr>
<td>HST 391</td>
<td>Environmental History of North America</td>
<td>3</td>
</tr>
<tr>
<td>PKG 470</td>
<td>Packaging Sustainability</td>
<td>3</td>
</tr>
<tr>
<td>WRA 341</td>
<td>Nature and Environmental Writing</td>
<td>3</td>
</tr>
</tbody>
</table>

(3) Under Environmental Policy and Law delete the following course:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZOL 446</td>
<td>Environmental Issues and Public Policy</td>
<td>3</td>
</tr>
</tbody>
</table>
Add the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO</td>
<td>211 Environmental Policy and Practice</td>
<td>3</td>
</tr>
<tr>
<td>IBIO</td>
<td>446 Environmental Issues and Public Policy</td>
<td>3</td>
</tr>
</tbody>
</table>

Effective Summer 2018.

2. Request to change the requirements for the Master of Science in Industrial Mathematics. The University Committee on Graduate Studies (UCGS) will consider this request at its February 5, 2018 meeting.

a. Under the heading Requirements for the Master of Science Degree in Industrial Mathematics make the following changes:

1. Change the total credits required for the degree from ‘36’ to ‘30’.

2. Change item 1. b. to ‘two of the following courses’ and delete the following course:

   MTH 840 Chaos and Dynamical Systems 3

   Add the following course:

   MTH 847 Partial Differential Equations I 3

3. In item 1. c. delete the following courses:

   STT 461 Computations in Probability and Statistics 3
   STT 865 Modern Statistical Methods 3
   STT 886 Stochastic Processes and Applications 3

   Add the following courses:

   STT 802 Statistical Computation 3
   STT 875 R Programming for Data Sciences 3
   STT 886 Stochastic Processes and Applications 4

4. Change item 1. d. to ‘two of the following courses’ and delete the following courses:

   CE 801 Nonlinear Structural Mechanics 3
   CE 829 Mixing and Transport in Surface Waters 3
   CE 863 Applied Numerical Methods for Civil and Environmental Engineers 1
   EC 813B Macroeconomics II 3
   EC 816 Economic Thought II 3
   EC 829 The Economics of Environmental Resources 3
   ECE 466 Digital Signal Processing and Filter Design 3
   ECE 837 Computational Methods in Electromagnetics 3
   ECE 849 Digital Image Processing 3
   ECE 867 Information Theory and Coding 3
   ECE 885 Artificial Neural Networks 3
   ENE 801 Dynamics of Environmental Systems 3
   ENE 804 Biological Processes in Environmental Engineering 3
   ENE 822 Groundwater Modeling 3
   ENE 823 Stochastic Groundwater Modeling 3
   ME 820 Continuum Mechanics 3
   ME 821 Linear Elasticity 3
   ME 851 Linear Systems and Control 3
   ME 860 Theory of Vibrations 3
   MKT 809 Pricing, Profitability and Marketing Metrics 3
   MKT 865 Emerging Topics in Business 3
   SCM 826 Manufacturing Design and Analysis 1
   SCM 827 Competing Through Supply Chain Logistics 1
Add the following courses:

CMSE 801 Introduction to Computational Modeling   3
CMSE 802 Methods in Computational Modeling   3
CMSE 820 Mathematical Foundations of Data Science   3
CMSE 821 Numerical Methods for Differential Equations   3
CMSE 822 Parallel Computing   3
CMSE 823 Numerical Linear Algebra   3
CSE 836 Probabilistic Models and Algorithms in Computational Biology   3
CSE 841 Artificial Intelligence   3
CSE 847 Machine Learning   3
CSE 860 Foundations of Computing   3
CSE 880 Advanced Database Systems   3
EC 813B Macroeconomics II and its Mathematical Foundations   4
EC 821A Cross Section and Panel Data Econometrics I   3
EC 821B Cross Section and Panel Data Econometrics II   3
MKT 816 Marketing Analysis   3
MKT 864 Data Mining in Marketing   3
SCM 815 Emerging Topics in Supply Management   1.5
SCM 826 Manufacturing Design and Analysis   1.5
SCM 854 Integrated Logistics Systems   2

Effective Fall 2018.

3. Request to change the requirements for the Master of Science degree in Astrophysics and Astronomy in the Department of Physics and Astronomy. The University Committee on Graduate Studies (UCGS) will consider this request at its February 5, 2018 meeting.

a. Under the heading Requirements for the Master of Science Degree in Astrophysics and Astronomy make the following changes:

(1) Replace item 2. with the following:

Pass a qualifying master’s exam that tests basic knowledge of undergraduate physics with a grade of B or above before the end of the student's first semester of the second year. A maximum of three attempts is allowed on this exam.

(2) Replace item 3. with the following:

Complete the following core physics courses or their subject examinations, and the following core of astronomy courses, with a grade-point average of 3.0 or higher:

**Physics**

Two of the following:

- PHY 820 Classical Mechanics   3
- PHY 831 Statistical Mechanics   3
- PHY 841 Classical Electrodynamics I   3

**Astronomy**

All of the following:

- AST 810 Radiation Astrophysics   3
- AST 825 Galactic Astronomy   3
- AST 835 Extragalactic Astronomy   3
- AST 840 Stellar Astrophysics   3

(3) Delete item 4.

(4) Add the following:

4. Complete a minimum of 6 credits of additional course work in physics, astrophysics or computation, with a grade-point average of 3.0 or higher at the
800-level or above as chosen in consultation with the student’s guidance committee.
5. Complete training in Responsible Conduct of Research (RCR).

(5) Under the heading Additional Requirements for Plan A replace the entry with the following:

1. Complete 4 to 10 credits of Astronomy 899 Master’s Thesis Research.
2. Pass a final oral examination in defense of the thesis.

The student must form a guidance committee of three regular faculty members: the student's master's thesis advisor, one additional member of the astronomy group and one faculty member from outside the astronomy group.

Effective Fall 2018.

4. Request to change the requirements for the Doctor of Philosophy degree in Astrophysics and Astronomy in the Department of Physics and Astronomy. The University Committee on Graduate Studies (UCGS) will consider this request at is February 5, 2018 meeting.

a. Under the heading Requirements for the Doctor of Philosophy Degree in Astrophysics and Astronomy make the following changes:

(1) Replace item 2. with the following:
Pass the doctoral qualifying exam that tests basic knowledge of undergraduate physics with a grade of A before the end of the student's first semester of the second year. A maximum of three attempts is allowed on this exam.

(2) Replace item 3. with the following:
Complete the following core physics courses or their subject examinations, and the following core of astronomy courses, with a grade-point average of 3.375 or higher:

**Physics**
Two of the following:
- PHY 820 Classical Mechanics 3
- PHY 831 Statistical Mechanics 3
- PHY 841 Classical Electrodynamics I 3
- PHY 851 Quantum Mechanics 3

**Astronomy**
All of the following:
- AST 810 Radiation Astrophysics 3
- AST 825 Galactic Astronomy 3
- AST 835 Extragalactic Astronomy 3
- AST 840 Stellar Astrophysics 3

(3) Renumber item 3. to item 4.

(4) Delete items 4., 5., and 6. and replace with the following:

5. Complete a minimum of 6 credits of additional course work in physics, astrophysics or computation, with a grade-point average of 3.375 or higher at the 800-level or above as chosen in consultation with the student’s guidance committee.

6. Complete training in Responsible Conduct of Research (RCR).

7. Complete one semester as a Teaching Assistant (TA). International students who are not native English speakers must pass the SPEAK test in order to be a TA.


9. Complete a doctoral dissertation on original research, followed by an oral examination in defense of the dissertation.

Effective Fall 2018.
COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

FW 439  Conservation Ethics
Spring of every year. Spring of every year. 3(3-0) P: Completion of Tier I Writing Requirement RB: Additional coursework in ecology, natural resources, philosophy, or environmental sciences. R: Open to juniors or seniors or graduate students.
Ethical concepts and arguments underlying natural resources.
Effective Fall 2014 Effective Fall 2018

HNF 250L  Professional Development and Career Planning in Nutrition
Fall of every year. Spring of every year. 1(0-2) P: HNF 250 or concurrently P: HNF 150 R: Open to students in the Nutritional Sciences Major and open to students in the Lyman Briggs Nutritional Sciences Coordinate Major.
Experiential learning and career opportunities in nutrition. Skills for professional and career development.
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 Spring 2017 Effective Fall 2018

HNF 840  Human Nutrition and Chronic Diseases
Fall of odd years. 3(3-0)
REINSTATEMENT Dietary intervention and treatment of chronic diseases: obesity, cardiovascular disease, diabetes, gastrointestinal disorders and cancer.
Effective Spring 2019

PKG 322  Packaging with Paper and Paperboard
Fall of every year. Spring of every year. 4(3-2) P: ((PKG 221 or concurrently) and PKG 101) and (MTH 133 or MTH 153H or LB 119 or MTH 124) and (CEM 143 or CEM 251 or CEM 351) and (STT 200 or STT 201 or STT 315 or STT 351) P: ((PKG 221 or concurrently) and PKG 101) and (MTH 133 or MTH 153H or LB 119) and (CEM 143 or CEM 251 or CEM 351) and (STT 200 or STT 201 or STT 315 or STT 351) R: Open to sophomores or juniors or seniors or graduate students in the School of Packaging.
Physical and chemical properties, manufacture, conversion, and use of wood, paper, paperboard, and related components in packaging. Design, use, and evaluation of packages.
SA: PKG 325
Effective Fall 2015 Effective Fall 2017

PKG 323  Packaging with Plastics
Fall of every year. Spring of every year. 4(3-2) P: ((PKG 221 or concurrently) and PKG 101) and (MTH 133 or MTH 153H or LB 119 or MTH 124) and (CEM 143 or CEM 251 or CEM 351) P: ((PKG 221 or concurrently) and PKG 101) and (MTH 133 or MTH 153H or LB 119) and (CEM 143 or CEM 251 or CEM 351) and (STT 200 or STT 201 or STT 315 or STT 351) R: Open to sophomores or juniors or seniors or graduate students in the School of Packaging.
Physical and chemical properties of plastics and their relationship to selection, design, manufacture, performance, and evaluation of packages.
SA: PKG 320
Effective Fall 2015 Effective Fall 2017
PKG 455  Food Packaging
Spring of every year. 3(3-1) 4(3-2) P: PKG 322 and PKG 323 R: Open to sophomores or juniors or seniors or graduate students in the School of Packaging. R: Open to sophomores or juniors or seniors or graduate students in the School of Packaging or approval of department.
Effective Fall 2014 Effective Spring 2018

PKG 465  Packaging Value Chain
Fall of every year. Summer of every year. 3(3-0) P: PKG 322 and PKG 323 and PKG 432 P: PKG 322 and PKG 323 R: Open to students in the School of Packaging.
Integrated identification and measurement of packaging supply chain components, from material extraction through processing, shipping, warehousing, sales and disposal. Integration of information technologies. Application and interrelationship of costs and financial aspects to the decision-making processes.
Effective Fall 2016 Effective Summer 2017

COLLEGE OF ENGINEERING

BE 429  Fundamentals of Food Engineering
Spring of every year. 3(3-0) Interdepartmental with Food Science. P: FSC 325 and MTH 124 and PHY 231 P: (FSC 325) and (MTH 124 or MTH 132 or LB 118 or MTH 152H) and (PHY 231 or PHY 183 or PHY 193H or LB 273) RB: FSC 211 R: Not open to students in the College of Engineering.
Definition and measurement of food properties, thermodynamics, fluid mechanics, heat transfer, and mass transfer.
SA: BE 329
Effective Fall 2013 Effective Fall 2018

CHE 802  Research Methods
Fall of every year. 3(3-0) 1(0-2) Interdepartmental with Materials Science and Engineering. R: Open to graduate students in the Department of Chemical Engineering and Materials Science.
Skills required for graduate research. Critically reviewing the literature, defining a fundamental research problem, effective oral and written technical presentations, ethics, and statistics. Skills required for graduate research. Critically reviewing the literature, defining a fundamental research problem, effective oral and written technical presentations.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2006 Effective Fall 2018

CHE 892  Seminar
Fall of every year. Spring of every year. 1(0-2) Interdepartmental with Materials Science and Engineering. A student may earn a maximum of 4 credits in all enrollments for this course. A student may earn a maximum of 2 credits in all enrollments for this course. R: Open only to Chemical Engineering majors. R: Open to master's students in the Chemical Engineering Major or in the Materials Science and Engineering Major.
Presentations of detailed studies of one or more specialized aspects of chemical engineering and materials science.
Request the use of the Pass-No Grade (P-N) system.
Effective Summer 2005 Effective Fall 2018
CHE 992  Seminar
Fall of every year. Spring of every year. 1(0-2) Interdepartmental with Materials Science and Engineering. A student may earn a maximum of 5 credits in all enrollments for this course. R: Open to doctoral students in the Chemical Engineering Major or in the Materials Science and Engineering Major.

NEW  Presentations of detailed studies of one or more specialized aspects of chemical engineering and materials science.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2018

CE 321  Introduction to Fluid Mechanics
Fall of every year. Spring of every year. 4(3-2) P: (MTH 234 or MTH 254H or LB 220) and CE 221 and (((BE 230 or concurrently) or (CE 273 or concurrently) or (CE 274 or concurrently)) and completion of Tier I writing requirement) P: (MTH 235) and CE 221 and Completion of Tier I Writing Requirement R: Open to juniors or seniors in the Department of Civil and Environmental Engineering or in the Biosystems Engineering Major. Not open to students with credit in ME 332. Fluid properties, fluid statics, fluids in motion. Conservation of mass, energy, and momentum. Dimensional analysis and similitude. Internal and external flows. Applications.
Effective Fall 2016 Effective Fall 2018

ENE 421  Engineering Hydrology
Fall of every year. 3(3-0) Interdepartmental with Civil Engineering. P: CE 321 and (GLG 201 or GLG 301) P: (CE 321) and (GLG 201 or GLG 301) and (CE 372 or STT 351) R: Open to juniors or seniors or graduate students in the College of Engineering or in the College of Natural Science or in the Department of Plant, Soil and Microbial Sciences.
Hydrologic design of storm water systems. Equilibrium hydrograph analysis, unit hydrographs, infiltration, hydrograph synthesis, and reservoir routing. Groundwater: Darcy’s law, flow nets, well hydraulics, design of capture wells.
Effective Fall 2014 Effective Fall 2018

ENE 480  Environmental Measurements Laboratory
Fall of every year. 1(0-3) Interdepartmental with Civil Engineering. P: (CEM 161 or CEM 185H or LB 171L) and ENE 280 P: (CEM 161 or CEM 185H or LB 171L) and ENE 280 and (CEM 142 or CEM 152 or CEM 182H or LB 172) and ((ENE 481 or concurrently) or (ENE 483 or concurrently)) and Completion of Tier I Writing Requirement R: Open to juniors or seniors or graduate students in the College of Engineering.
Basic chemical and microbiological methods used in the analysis of environmental media. Laboratory safety, quality assurance, quality control, and statistics used in laboratory analysis. Related technical communication, laboratory report writing.
Effective Fall 2013 Effective Fall 2018

ENE 483  Water and Wastewater Engineering
Fall of every year. 3(3-1) 4(3-2) Interdepartmental with Civil Engineering. P: (ENE 280 or BE 230) and (CE 321 or CHE 311) R: Open to juniors or seniors or graduate students in the College of Engineering.
Engineering and scientific basis and design of physical, chemical and biological methods for the treatment of drinking water and wastewater. Operation process selection and design. Engineering and scientific basis and design of physical, chemical and biological methods for the treatment of drinking water and wastewater. Operation process selection and design. Field trips required.
Effective Fall 2014 Effective Fall 2018

ME 440  Aerospace Engineering Fundamentals
Aerospace Propulsion
Fall of every year. 3(3-0) P: (ME 332 or concurrently) P: ME 332 R: Open to juniors or seniors in the Mechanical Engineering Major.
Aerodynamics, propulsion, and flight mechanics. Vehicle and propulsion engine performance and design characteristics. Fundamentals of thrust and propulsion systems, including gas turbines, ramjets, rockets and electric devices. Compressible flow through nozzles and shocks. Cycle analysis of airbreathing jet propulsion and chemical rocket propulsion. Performance and design of propulsion components.
Effective Fall 2014 Effective Fall 2018
EM 630  Emergency Medicine Clerkship
Fall of every year. Spring of every year. Summer of every year. 6 to 24 credits, 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. P: (FM 608 or MED 608 or PHD 600 or SUR 608) and (FM 608 or MED 608 or PHD 600 or SUR 608) P: {(FM 608 or MED 608 or PHD 600 or SUR 608) or HM 556} R: Open to graduate-professional students in the College of Human Medicine.
Clinical diagnosis and treatment of the undifferentiated patient in the emergency department setting.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
SA: HM 630
Effective Summer 2013 Effective Summer 2018

HM 654  Advanced Skills and Knowledge in Medical School IV
Fall of every year. Summer of every year. 2(2-0) A student may earn a maximum of 6 credits in all enrollments for this course. P: HM 653 R: Open to graduate-professional students in the College of Human Medicine.
Interdisciplinary small group course for advanced medical students combining advanced clinical skills with deep exploration of scientific and humanities literature underlying these skills.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Fall 2018

HM 802  Biostatistics for Public Health
Fall of every year. Spring of every year. Summer of every year. 3(3-0) RB: Academic or professional background in public health or public health-related discipline, undergraduate level math or statistics coursework, RB: College Algebra. Academic or professional background in public health or public health-related discipline, undergraduate level math or statistics coursework. R: Open to master’s students in the Public Health major or in the Public Health Specialization. R: Open to students in the Public Health Major or in the Public Health Graduate Certificate.
Effective Fall 2008 Effective Fall 2017

HM 807  Introduction to Critical Reading in Public Health
Practical Application and Critical Thinking Synthesis in Public Health
Fall of every year. Spring of every year. Summer of odd years. Summer of every year. 3(3-0) RB: Academic or professional background in public health and/or public health related discipline R: Open to students in the Public Health Major or approval of the college.
Understanding and identifying bias. Case study approach to literature in public health problem solving and decision making. Critical thinking, reading skills, explanations, problem solving, and decision making in public health using case studies. Questioning assumptions, identifying bias, determining causality, and application of the scientific method. Reporting guidelines and systematic literature reviews.
Effective Summer 2013 Effective Summer 2018
HM 827  Principles of Public Health Leadership  
FALL OF EVERY YEAR. SPRING OF EVERY YEAR. SUMMER OF EVERY YEAR. 1(1-0) RB: ACADEMIC OR PROFESSIONAL BACKGROUND IN PUBLIC HEALTH AND/OR PUBLIC HEALTH RELATED DISCIPLINE R: OPEN TO STUDENTS IN THE PUBLIC HEALTH MAJOR OR APPROVAL OF COLLEGE.

NEW  CONTEXT, COMPETENCIES AND CORE LEADERSHIP SKILLS, THEORIES AND RESEARCH IN PUBLIC HEALTH AND RELATED ORGANIZATIONS. BEST PRACTICES, LEADERSHIP STYLES, PROFESSIONAL IDENTITY. FUTURE LEADERSHIP CHALLENGES.

EFFECTIVE SUMMER 2018

HM 878  Applied Biostatistics for Public Health Practitioners  
FALL OF EVERY YEAR. SPRING OF EVERY YEAR. 3(3-0) P: HM 802 RB: ACADEMIC OR PROFESSIONAL BACKGROUND IN PUBLIC HEALTH AND/OR PUBLIC HEALTH RELATED DISCIPLINE R: OPEN TO STUDENTS IN THE PUBLIC HEALTH MAJOR OR APPROVAL OF COLLEGE.

APPLICATION OF MULTIVARIATE LOGISTIC AND LINEAR REGRESSION MODELS. DESIGN AND ANALYSIS OF PUBLIC HEALTH INTERVENTION STUDIES. STATISTICAL SAMPLING THEORY AND SURVEY DESIGN. INTRODUCTION TO SAS (STATISTICAL ANALYSIS SYSTEM). INTERMEDIATE TECHNIQUES AND APPLICATIONS OF MULTIVARIABLE LOGISTIC AND LINEAR REGRESSION IN PUBLIC HEALTH. INTERPRETATION OF STATISTICAL MODELS.

EFFECTIVE FALL 2013 EFFECTIVE FALL 2017

HM 880  Quantitative Methods in Public Health Research  
STUDY DESIGN AND RESEARCH METHODS FOR PUBLIC HEALTH PRACTICE  
FALL OF EVERY YEAR. SPRING OF EVERY YEAR. SUMMER OF EVERY YEAR. 3(3-0) P: HM 802 AND HM 803 RB: ACADEMIC OR PROFESSIONAL BACKGROUND IN PUBLIC HEALTH AND/OR PUBLIC HEALTH RELATED DISCIPLINE, EXPERIENCE WITH DATABASES R: OPEN TO STUDENTS IN THE PUBLIC HEALTH MAJOR OR APPROVAL OF COLLEGE. NOT OPEN TO STUDENTS WITH CREDIT IN VM 830.

IDENTIFICATION OF RESEARCH QUESTIONS, STUDY DESIGN, DATA COLLECTION AND QUESTIONNAIRE DESIGN, DATASET MANIPULATION AND ANALYSIS, REPORTING OF FINDINGS. PROPOSAL WRITING, ETHICAL CONSIDERATIONS AND SUBMISSION TO INSTITUTIONAL REVIEW BOARD (IRB). EXAMINATION OF EMPIRICAL AND LOGICAL BASIS OF PUBLIC HEALTH RESEARCH. IDENTIFICATION OF RESEARCH QUESTIONS, STUDY DESIGN, DATA COLLECTION AND QUALITATIVE AND QUANTITATIVE APPROACHES. REPORTING OF FINDINGS. PROPOSAL WRITING. ETHICAL CONSIDERATIONS OF RESEARCH.

EFFECTIVE SUMMER 2015 EFFECTIVE SUMMER 2018

HM 893  Public Health Capstone  
FALL OF EVERY YEAR. SPRING OF EVERY YEAR. SUMMER OF EVERY YEAR. 1 TO 2 CREDITS, 1 TO 3 CREDITS. A STUDENT MAY EARN A MAXIMUM OF 2 CREDITS IN ALL ENROLLMENTS FOR THIS COURSE. A STUDENT MAY EARN A MAXIMUM OF 3 CREDITS IN ALL ENROLLMENTS FOR THIS COURSE. P: HM 801 AND HM 891 AND HM 892 RB: ACADEMIC OR PROFESSIONAL BACKGROUND IN PUBLIC HEALTH AND/OR PUBLIC HEALTH RELATED DISCIPLINE, UNDERGRADUATE LEVEL MATH OR STATISTICS COURSEWORK R: APPROVAL OF COLLEGE.

CAPSTONE EXPERIENCE.

EFFECTIVE SUMMER 2013 EFFECTIVE SUMMER 2018

MED 643  Medicine Critical Care  
FALL OF EVERY YEAR. SPRING OF EVERY YEAR. SUMMER OF EVERY YEAR. 6 CREDITS. P: MED 641 R: OPEN TO GRADUATE-PROFESSIONAL STUDENTS IN THE COLLEGE OF HUMAN MEDICINE.

NEW  HOSPITAL-BASED CLINICAL EXPERIENCE IN EVALUATING AND MANAGING ACUTELY ILL ADULT PATIENTS. REQUEST THE USE OF THE PASS-NO GRADE (P-N) SYSTEM. REQUEST THE USE OF ET-EXTENSION TO POSTPONE GRADING. THE WORK FOR THE COURSE MUST BE COMPLETED AND THE FINAL GRADE REPORTED WITHIN 1 SEMESTER AFTER THE END OF THE SEMESTER OF ENROLLMENT.

EFFECTIVE SUMMER 2018
PHD 643  Pediatrics Critical Care  
Fall of every year. Spring of every year. Summer of every year. 6 credits. P: PHD 641 R: Open to graduate-professional students in the College of Human Medicine.  
NEW  
Hospital-based clinical experience in evaluating and managing acutely ill pediatric patients.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.  
Effective Summer 2018

ANTR 355  Human Gross Anatomy Laboratory  
Fall of every year. Spring of every year. Summer of every year. 1(0-3) P: ANTR 350 or concurrently R: Approval of department. Not open to students with credit in KIN 217.  
Introductory, structured laboratory survey of human regional gross anatomy using prosections, medical imaging, and multimedia for students in allied medical fields. Correct usage and pronunciation of medical terminology.  
SA: ANTR 381  
Effective Spring 2015 Effective Spring 2018

SUR 643  Surgical Critical Care  
Fall of every year. Spring of every year. Summer of every year. 6 credits. P: SUR 641 and SUR 642 R: Open to graduate-professional students in the College of Human Medicine.  
NEW  
Hospital-based clinical experience in evaluating and managing acutely ill surgical patients.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.  
Effective Summer 2018

IBIO 830  Statistical Methods in Ecology and Evolution: Part I  
Fall of every year. 3(3-0) Interdepartmental with Entomology and Plant Biology.  
NEW  
Effective Spring 2018

IBIO 831  Statistical Methods in Ecology and Evolution: Part II  
Spring of every year. 3(3-0) Interdepartmental with Entomology and Plant Biology.  
NEW  
Effective Spring 2018

IBIO 860  Modern Statistical Models in Ecology  
On Demand. 2(2-0) RB: A thorough understanding of probability and distributions, linear models, generalized linear models, and programming knowledge, such as will be provided in IBIO 830-831.  
NEW  
Modern statistical models for analysis of population and community dynamics with an emphasis on practical applications including model development and analysis with open source statistical programs. Topics include: general linear models, state-space models, mark-recapture models, binomial mixture models, occupancy models, and integrated population models.  
Effective Spring 2018
AST 911  Numerical Techniques in Astronomy
Spring of odd years. 2(2-0) P: PHY 810 and PHY 820 or approval of department
REINSTATEMENT Numerical solutions to key problems in astronomy and astrophysics. N-body gravitational calculations, hydrodynamics in astronomy, radiative transfer, and techniques for large datasets. Offered first half of semester.
Effective Spring 2018

PHY 862  Physics and Applications of Accelerators and Beams
Accelerator Systems
Fall of every year, Spring of odd years. 2(2-0) RB: PHY 422 and PHY 482 R: Open to graduate students in the College of Engineering or in the College of Natural Science.
Physics and design of particle accelerators used in various subfields of physics. General introduction to large accelerator systems, including the physics and engineering of accelerators and key components of accelerators
Effective Fall 2014 Effective Fall 2018

PHY 864  Accelerator Technology
Spring of every year. 3(3-0) RB: PHY 422 and PHY 482 R: Open to graduate students in the College of Engineering or in the College of Natural Science.
NEW This course discusses the key technologies for modern accelerator, including but not limited to magnets, the normal conducting and super conducting radio frequency cavities, charged particle sources, diagnostic instruments.
Effective Fall 2018

COLLEGE OF NURSING

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 P: (STT 200 or STT 201 or NUR 332 or NUR 334 or NUR 371) and completion of Tier I writing requirement C: NUR 205 concurrently and NUR 322 concurrently and NUR 324 concurrently. C: NUR 436 concurrently and NUR 437 concurrently and NUR 445 concurrently.
Introduction to basic research methodology and how it informs evidence-based nursing practice.
Effective Fall 2015 Effective Spring 2018

COLLEGE OF OSTEOPATHIC MEDICINE

OST 572  Genitourinary System
Spring of every year. 3(3-0) R: Open to graduate-professional students in the College of Osteopathic Medicine. C: OST 573 concurrently and OST 574 concurrently. C: OST 573 concurrently.
Normal urinary and male reproductive structure and function; principles of diagnosis and management of urinary and male reproductive disorders. Integration of basic science and clinical information related to the urinary and male reproductive systems.
Request the use of the Pass-No Grade (P-N) system.
Effective Summer 2013 Effective Spring 2019

OST 582  Transitions: From the Classroom to the Bedside
Summer of every year. 4(1-0) 5 credits. R: Open to graduate-professional students in the College of Osteopathic Medicine.
Selected topics in preparation for clinical education.
Request the use of the Pass-No Grade (P-N) system.
Effective Summer 2014 Effective Summer 2018
OST 591  Medical Case Study Journal Club
Fall of every year. Spring of every year. Summer of every year. 1(2-0) R: Open to graduate-professional students in the College of Osteopathic Medicine.
NEW The Medical Case Study Journal Club is a 1-credit hour elective that will serve as a platform for applying the knowledge obtained from current and ongoing pre-clerkship courses to the analysis and presentation of clinical case reports in the literature. Students will be instructed in the criteria required to identify case reports published in reputable journals within the last 5 years containing authentic, clinically relevant information consistent with basic science principles, biomedical concepts, and health conditions presented in their courses.
Request the use of the Pass-No Grade (P-N) system.
Effective Summer 2018

COLLEGE OF VETERINARY MEDICINE

LCS 679  Food Animal Production Medicine I
Spring of every year. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine R: Open to graduate-professional students in the College of Veterinary Medicine.
Enter-level principles of production medicine as applied to food animal practice.
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 Spring 2017 Effective Summer 2017

PHM 211  Pharmacology and Toxicology in Society
Fall of odd years. Spring of every year. Summer of every year. 2(2-0)
Effective Fall 2015 Effective Summer 2018