

SUBCOMMITTEE A – AGENDA

**437 Administration Building**  
February 14, 2019  
**1:30 p.m.**

**PART I – NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES**

**COLLEGE OF AGRICULTURE AND NATURAL RESOURCES**

1. Request to change the requirements for the **Agricultural Technology Certificate** in **Agricultural Operations** in The Institute of Agricultural Technology.
  - a. Under the heading **Requirements for Agricultural Operations** make the following change:
    - (1) In item 3., add the following community partner:
      3. Complete 26 credits of additional course work through the College of Agriculture and Natural Resources, a community college partner (**Bay de Noc Community College**, Delta, College, Glen Oaks Community College, Kellogg Community College, Monroe Community College, Montcalm Community College, Muskegon Community College, Southwestern Michigan College, West Shore Community College) or an approved transferring institution. All course work must be approved by the program coordinator in the Institute of Agricultural Technology.

Effective Fall 2019.

**COLLEGE OF ENGINEERING**

1. Request to change the requirements in the **Bachelor of Science** degree in **Chemical Engineering** in the Department of Chemical Engineering and Materials Science.

*The concentrations in the Bachelor of Science degree in Chemical Engineering 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 Chemical Engineering** make the following changes:
  - (1) In the **Concentrations in Chemical Engineering** make the following changes:

- (a) Under the heading **Environmental** delete the following courses from the elective listing:

EEP	255	Ecological Economics	3
EEP	320	Environmental Economics	3
EEP	405	Corporate Environmental Management (W)	3

Add the following courses to the elective listing:

EEM	255	Ecological Economics	3
EEM	320	Environmental Economics	3
EEM	405	Corporate Environmental Management (W)	3

Effective Fall 2019.

2. Request to change the requirements for the **Bachelor of Science** degree in **Biosystems Engineering** in the Department of Biosystems and Agricultural Engineering.

*The concentrations in the Bachelor of Science degree in Biosystems Engineering 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 Biosystems Engineering** make the following changes:

- (1) In item 3., make the following changes:

- (a) In item d. delete the following course:

BLD	450	Eukaryotic Pathogens	3
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Add the following course:

MMG	365	Medical Microbiology	3
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- (b) In item e. add the following course:

BE	484	Water Resource Recovery Engineering	3
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- b. Under the heading **Concentration in Biosystems Engineering** make the following changes:

- (1) In the **Bioenergy Bioenergy and Bioproduct Engineering** concentration make the following change:

- (a) In item 2. delete the following course:

BE	457	Bioenergy Feedstock Systems Analysis	3
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- (2) In the **Biomedical Engineering** concentration make the following changes:

- (a) In item 2. delete the following course:

BLD	450	Eukaryotic Pathogens	3
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Add the following course:

MMG	365	Medical Microbiology	3
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- (b) In item 3. delete the following course:

BLD	450	Eukaryotic Pathogens	3
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Add the following courses:

BLD	313	Quality in Clinical Laboratory Practice	3
MMG	365	Medical Microbiology	3

- (3) In the **Ecosystems Engineering** concentration make the following changes:

- (a) In item 2. delete the following courses:

FOR	404	Forest Ecology	3
FW	443	Restoration Ecology	3

Add the following courses:

FOR	340	Forest Ecology	3
PLB	443	Restoration Ecology	3

3. Request to change the requirements in the **Bachelor of Science** degree in **Mechanical Engineering** in the Department of Mechanical Engineering.

*The concentrations in the Bachelor of Science degree in Mechanical Engineering 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 Mechanical Engineering** make the following changes:

- (1) Under the heading **Aerospace Engineering** concentration replace the requirements with the following:

Both of the following courses (6 credits):

ME	440	Aerospace Propulsion	3
ME	441	Aerodynamics and Aircraft Performance	3

One of the following courses (3 credits):

ME	423	Intermediate Mechanics of Deformable Solids	3
ME	426	Introduction to Composite Materials	3
ME	475	Computer Aided Design of Structures	3

One of the following courses (3 credits):

ME	422	Introduction to Combustion	3
ME	433	Introduction to Computational Fluid Dynamics	3
ME	442	Turbomachinery	3

- (2) Under the heading **Energy** concentration replace the requirements with the following:

Both of the following courses (6 credits):

ME	416	Computer Assisted Design of Thermal Systems	3
ME	417	Design of Alternative Energy Systems	3

Two of the following courses (6 credits):

ME	422	Introduction to Combustion	3
ME	440	Aerospace Propulsion	3
ME	442	Turbomachinery	3
ME	444	Automotive Engines	3

Effective Fall 2019.

### **COLLEGE OF NATURAL SCIENCE**

1. Request to change the requirements for the **Graduate Specialization in Ecology, Evolutionary Biology and Behavior** in the College of Natural Science. The University Committee on Graduate Studies (UCGS) will consider this request at its February 11, 2019 meeting.

- a. Under the heading **Requirements for the Graduate Specialization in Ecology, Evolutionary Biology and Behavior**, add the following item 3. to the **Required Core Courses**:

3. Two 3-credit courses in statistical methods at the 800-900 level. A list of approved courses is available from the office of the ecology, evolutionary biology and behavior program.

Effective Fall 2019.

2. Request to change the requirements for the **Dual Major in Ecology, Evolutionary Biology and Behavior** in the College of Natural Science. The University Committee on Graduate Studies (UCGS) will consider this request at its February 11, 2019 meeting.
  - a. Under the heading **Requirements for the Dual Major in Ecology, Evolutionary Biology and Behavior**, replace item 3. with the following:
    3. Two 3-credit courses in statistical methods at the 800-900 level. A list of approved courses is available from the office of the ecology, evolutionary biology and behavior program.

Effective Fall 2019.

3. Request to change the requirements for the **Master of Science** degree in **Neuroscience** in the Program in Neuroscience. The University Committee on Graduate Studies (UCGS) will consider this request at its February 11, 2019 meeting.
  - a. Under the heading **Admission** make the following change:
    - (1) In paragraph three, delete item 3.:

Have the results of the Graduate Record Examination (GRE) General Test forwarded to the College of Natural Science.
  - b. Under the heading **Requirements for the Master of Science Degree in Neuroscience** make the following changes:
    - (1) Under the heading **Requirements for Plan A and Plan B** replace the entire entry with the following:
      1. Complete all of the following courses (17 credits):

NEU	801	Molecular, Cellular and Developmental Neuroscience I	3
NEU	802	Systems and Behavioral Neuroscience I	3
NEU	803	Molecular, Cellular and Developmental Neuroscience II	3
NEU	805	Systems and Behavioral Neuroscience II	3
NEU	807	Strategies in Neuroscience Research	2
NEU	815	Quantitative Skills in Neuroscience Research	3
      2. The following course (3 credits):

PHM	830	Experimental Design and Data Analysis	3
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      3. Complete a minimum of 6 credits in Neuroscience 800 or 899. Plan A students must complete 4 credits of Neuroscience 899.
      4. Complete an additional 4 credits of elective courses related to the student's research and approved by the student's guidance committee.
      5. Complete a one-semester laboratory rotation with each of two neuroscience faculty in the first year of study. Students will select the two laboratories in which they will rotate at the beginning of fall semester based on discussions and mutual agreement with neuroscience faculty members.
      6. All students must complete Responsible Conduct of Research Training. All students are required to complete the laboratory safety and animal use training tutorials and put together an Individual Development Plan based on their career goals.

Effective Fall 2019.

4. Request to change the requirements for the **Doctor of Philosophy** degree in **Neuroscience** in the Program in Neuroscience. The University Committee on Graduate Studies (UCGS) will consider this request at its February 11, 2019 meeting.

a. Under the heading **Requirements for the Doctor of Philosophy Degree in Neuroscience** make the following changes:

(1) Replace items 1. and 2. with the following:

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|----|--|---|---|
| 1. | Complete all of the following courses (17 credits):                      |   |   |
|    | NEU 801  | Molecular, Cellular and Developmental Neuroscience I  | 3 |
|    | NEU 802  | Systems and Behavioral Neuroscience I                 | 3 |
|    | NEU 803  | Molecular, Cellular and Developmental Neuroscience II | 3 |
|    | NEU 805  | Systems and Behavioral Neuroscience II                | 3 |
|    | NEU 807  | Strategies in Neuroscience Research                   | 2 |
|    | NEU 815  | Quantitative Skills in Neuroscience Research          | 3 |
|    | PHM 830  | Experimental Design and Data Analysis                 | 3 |
| 2. | Complete two elective courses relevant to neuroscience (4 to 6 credits). |   |   |

Effective Fall 2019.

5. Request to change the name of the **Doctor of Philosophy** degree in **Genetics to Genetics and Genome Sciences** in the College of Natural Science. The University Committee on Graduate Studies (UCGS) will consider this request at its February 11, 2019 meeting.

Students admitted to the major prior to Fall 2019 will be awarded a Doctor of Philosophy Degree in Genetics.

Students admitted to the major Fall 2019 and forward will be awarded a Doctor of Philosophy Degree in Genetics and Genome Sciences.

Effective Fall 2019.

6. Request to change the requirements for the **Doctor of Philosophy** degree in **Genetics and Genome Sciences** in the College of Natural Science. The University Committee on Graduate Studies (UCGS) will consider this request at its February 11, 2019 meeting.

a. Under the heading **Admission** replace the entire entry with the following:

To be considered for admission to the Doctor of Philosophy degree program with a major in genetics and genome sciences, a student must have a bachelor's degree with a minimum grade–point average of 3.0 and appropriate background in the biological and physical sciences. Admission to the program is through the BioMolecular Science Gateway – First Year. In special cases an applicant who has deficiencies, may be admitted on a provisional basis. Applicants admitted on a provisional basis must remove these deficiencies within one year of admission to the genetics and genome sciences program.

b. Under the heading **Requirements for the Doctor of Philosophy Degree in Genetics and Genome Sciences** replace the entire entry with the following:

The program of study is planned by the student in consultation with the major professor and a guidance committee. Specific courses in genetics, as well as courses in other areas considered relevant to the student's interests and chosen research area, are included in the program. Students in the program will write and defend a research dissertation which shows original treatment of an important research problem. A detailed description of the genetics and genome sciences program and of the research interests of the genetics and genome sciences faculty may be found at <https://genetics.natsci.msu.edu>.

Effective Fall 2019.

## **PART II - NEW COURSES AND CHANGES**

### **COLLEGE OF AGRICULTURE AND NATURAL RESOURCES**

~~FW 419~~

FOR 419

Applications of Geographic Information Systems to Natural Resources Management  
Spring of every year. 4(2-4) ~~Interdepartmental with Biosystems Engineering and Forestry and Geography.~~ Interdepartmental with Biosystems Engineering and Fisheries and Wildlife and Geography RB: GEO 221  
Application of geographic information systems, remote sensing, and global positioning systems to integrated planning and management for fish, wildlife, and related resources.  
~~Effective Fall 2014~~ Effective Summer 2019

### **COLLEGE OF ENGINEERING**

BE 484

Water Resource Recovery Engineering  
Spring of every year. 3(3-0) P: BE 360 or approval of department R: Open to juniors or seniors or graduate students in the College of Agriculture and Natural Resources or in the College of Engineering.

NEW

Municipal, industrial, and rural wastewater characteristics. Conversion of scientifically and empirically derived data for wastewater recovery, design of treatment units, and systems and operational protocols. Selection of best site- and management-specific treatment strategy, including the influence of governmental policy and societal needs.  
Effective Fall 2019

CHE 210

Modeling and Analysis of Transport Phenomena  
Fall of every year. Spring of every year. 3(3-0) ~~P: ((MTH 235 or concurrently) or (MTH 340 or concurrently) or (MTH 347H or concurrently) or CHE 201) and CHE 201~~ P: ((MTH 235 or concurrently) or (MTH 340 or concurrently) or (MTH 347H or concurrently)) and CHE 201  
Steady and unsteady state material and energy balances. Fluxes and rate processes. Shell balances. Balance equations for mass, heat, and momentum transport. Analogies among mass, heat, and momentum transport. Analytical and numerical solutions. Application of computational methods to problem solutions.  
~~Effective Fall 2017~~ Effective Fall 2019

ME 222

Mechanics of Deformable Solids  
Fall of every year. Spring of every year. Summer of every year. ~~3(3-0)~~ 3(2-2) P: MTH 234 and CE 221  
Tension compression and shear stresses. Axially loaded bars. Torsion of circular shafts. Beam theory. Combined stresses. Mohr's circles. Columns.  
SA: MSM 211  
~~Effective Fall 2014~~ Effective Fall 2019

ME 370

Mechanical Design and Manufacturing I  
Fall of every year. Spring of every year. 3(3-0) ~~P: (ME 222 and (ME 300 or concurrently) and ME 391) and completion of Tier I writing requirement~~ P: (ME 222 and (ME 300 or concurrently) and (ME 391 or concurrently)) and completion of Tier I writing requirement R: Open to juniors or seniors in the Mechanical Engineering Major.  
Engineering design of machine elements and mechanical systems. Computer-based analysis in support of design. Design for static and fatigue strength, deflection, and reliability.  
SA: ME 471  
~~Effective Fall 2018~~ Effective Fall 2019

- ME 456            Mechatronic System Design  
Fall of every year. 3(2-3) P: (ECE 345 or concurrently) and (ME 391 or concurrently) R: Open to juniors or seniors in the Department of Mechanical Engineering.
- REINSTATEMENT    Application of imbedded microcontrollers to the design of mechatronic systems. Introduction to feedback and feedforward control concepts. Design of software and hardware for systems with mechanical, electrical and fluid components plus imbedded control systems. Laboratory exercises and design projects. Application to automotive, consumer, industrial and commercial systems.  
Effective Fall 2019

### **COLLEGE OF HUMAN MEDICINE**

- HM 615            Global Health Experience in India  
Spring of every year. 3 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course. RB: HM 556 R: Open to students in the College of Human Medicine or in the College of Osteopathic Medicine.
- NEW                Rural health delivery in India. Pre-travel preparation and instruction in culture followed by experiences in pediatrics, women's health, mental health, and tropical disease.  
Request the use of the Pass-No Grade (P-N) system.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.  
Effective Spring 2019

### **COLLEGE OF NATURAL SCIENCE**

- CMSE 201            ~~Introduction to Computational Modeling~~  
Introduction to Computational Modeling and Data Analysis  
Fall of every year. Spring of every year. 4(4-0) P: MTH 124 or MTH 132 or MTH 152H or LB 118  
Computational modeling using a wide variety of applications examples. Algorithmic thinking, dataset manipulation, model building, data visualization, and numerical methods all implemented as programs.  
SA: NSC 204  
~~Effective Fall 2016~~ Effective Fall 2019
- CMSE 202            Computational Modeling Tools and Techniques  
Fall of every year. Spring of every year. 4(4-0) P: CMSE 201  
Continuation of introduction to computational modeling focusing on standard methods and tools used for modeling and data analysis. Topics may include statistical analysis, symbolic math, linear algebra, simulation techniques, data mining.  
SA: NSC 205  
~~Effective Fall 2018~~ Effective Fall 2019
- CMSE 401            Methods for Parallel Computing  
Spring of odd years. 4(4-0) P: (CMSE 202 and CSE 232) and (MTH 235 or MTH 340 or MTH 347H)  
Not open to students with credit in CSE 415.  
Core principles, techniques, and use of parallel computation using modern supercomputers. Parallel architectures and programming models. Message-passing and threaded programming. Principles of parallel algorithm design. Performance analysis and optimization.  
~~Effective Fall 2017~~ Effective Fall 2019
- CMSE 402            ~~Visualization of Scientific Datasets~~  
Data Visualization Principles and Techniques  
Spring of even years. 3(3-0) P: (CMSE 202) and (MTH 234 or MTH 254H or LB 220)  
Core principles, methods, and techniques of effective data visualization. Visualization toolkits. Vector and scalar data. Multivariate visualization. Relationship between data analysis and visualization.  
~~Effective Fall 2017~~ Effective Fall 2019

CMSE 410	Bioinformatics and Computational. Biology Spring of every year. 3(2-2) Interdepartmental with Biochemistry and Molecular Biology and Microbiology and Molecular Genetics and Plant Biology. P: {(CMSE 201 and LB 144 and LB 145) or (CMSE 201 and BS 161 and BS 162) or (CMSE 201 and BS 181H and BS 182H)} and (STT 200 or STT 201 or STT 231 or STT 421 or STT 351 or ECE 280) Not open to students with credit in CSE 415.
NEW	Computational approaches in modern biology with a focus on applications in genomics, systems biology, evolution, and structural biology. Effective Fall 2019
CMSE 411	Computational Medicine Fall of odd years. 3(3-0) Interdepartmental with Biochemistry and Molecular Biology and Microbiology and Molecular Genetics. P: (CMSE 201 and LB 144 and LB 145) or (CMSE 201 and BS 161 and BS 162) or (CMSE 201 and BS 181H and BS 182H)
NEW	Computational approaches in biology with a focus on medicine. Effective Fall 2019
NSC 495	Capstone in Human Biology (W) Fall of every year. Spring of every year. <del>2(2-0)</del> 3(3-0) P: Completion of Tier I writing requirement. R: Open to seniors in the Human Biology Major. Integration of human biology disciplines with a focus on health and disease. <del>Effective Fall 2014</del> <u>Effective Fall 2019</u>
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 182H or LB 144) RB: PSY 101 <del>R: Open to undergraduate students in the Lyman Briggs College or in the College of Natural Science or in the Program in Neuroscience.</del> <u>R: Open to undergraduate students in the Program in Neuroscience or in the Lyman Briggs Neuroscience Coordinate Major.</u> Survey of the field of neuroscience, including molecular, cellular, and autonomic, sensory and motor systems. <del>Effective Spring 2017</del> <u>Effective Fall 2019</u>
NEU 304	Neuroanatomy: Structure and Function of the Nervous System in Art, History, and Dissection (Proposed) Summer of every year. England, Florence, Italy 3(3-0) P: Completion of Tier I Writing Requirement R: Not open to freshmen. Approval of department; application required.
NEW	Structure and basic function of human nervous system, including the influence of art and cultural values on neuroanatomical knowledge throughout history. Effective Summer 2019
NEU 306	History of Neuroscience Summer of every year. England, Florence, Italy 3(3-0) P: Completion of Tier I Writing Requirement R: Not open to freshmen. Approval of department; application required.
NEW	Exploration of specific topics in the history of neuroscience with an emphasis on the influence of cultural values on theories and discoveries Effective Summer 2019
NEU 307	Topics in History of Neuroscience (W) Summer of every year. England, Florence, Italy 3(3-0) P: Completion of Tier I Writing Requirement R: Not open to freshmen. Approval of department; application required.
NEW	Exploration of a specific topic in the history of neuroscience. Independent library research and group tutorial work aimed at critical analysis of the role that cultural values and historical events played in the specific topic investigated Effective Summer 2019



- 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.~~ R: Open to undergraduate students in the Program in Neuroscience or in the Lyman Briggs Neuroscience Coordinate Major.  
Overview of neuroscience research methodology, including experimental design, data analysis, and presentation of results.  
~~Effective Fall 2014~~ Effective Fall 2019
- 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 Lyman Briggs College or in the College of Natural Science or in the Program in Neuroscience.~~ R: Open to undergraduate students in the Program in Neuroscience or in the Lyman Briggs Neuroscience Coordinate Major.  
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 Spring 2018~~ Effective Fall 2019
- 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 in the Neuroscience Major or in the Lyman Briggs Neuroscience Coordinate Major. 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.  
Current topics proposed by faculty that supplement regular course offerings.  
~~Effective Fall 2014~~ Effective Fall 2018
- NEU 801 Molecular, Cellular and Developmental Neuroscience I  
Fall of every year. 3(3-0) RB: B.S., B.A. or M.S. degree in the biological or psychological sciences. R: Open to graduate students in the College of Natural Science or in the Program in Neuroscience or in the Neuroscience Major or in the Neuroscience Major or in the Neuroscience-Environmental Toxicology Major. Approval of department.
- NEW The course will cover the genetics, molecular and cellular biology of the developing and the adult nervous system.  
Effective Fall 2019
- NEU 805 Systems and Behavioral Neuroscience II  
Spring of every year. 3(3-0) RB: B.S., B.A. or M.S. in the biological or psychological sciences. R: Open to graduate students in the Neuroscience Major or in the Neuroscience Major or in the Neuroscience-Environmental Toxicology Major. Approval of department.
- NEW Anatomy and physiology of multicellular olfactory, visual, auditory, motor, somatosensory and autonomic nervous systems.  
Effective Fall 2019
- NEU 815 Neuroinformatics and Quantitative Reasoning  
Fall of every year. 3(3-0) R: Open to graduate students in the Medical Neuroscience Graduate Certificate or in the Neuroscience Major or in the Neuroscience-Environmental Toxicology Major. Approval of department.
- NEW Quantitative reasoning and statistical methods for querying internet databases and understanding basic neuroscience models for graduate students  
Effective Fall 2019

### **COLLEGE OF OSTEOPATHIC MEDICINE**

- OST 580      Respiratory System  
Spring of every year. 6(4-4) R: Open to graduate-professional students in the College of Osteopathic Medicine.  
~~Systems biology approach to the entire respiratory system, including the ear, nose, throat, sinuses, and related structures of the thorax. Includes certification in Basic and Advanced Cardiac Life Support. Systems biology approach to the entire respiratory system, including the ear, nose, throat, sinuses, and related structures of the thorax.~~  
Request the use of the Pass-No Grade (P-N) system.  
~~Effective Spring 2018~~ Effective Spring 2019

### **COLLEGE OF VETERINARY MEDICINE**

- PHM 802      Cellular, Molecular and Integrated Systems Pharmacology  
Spring of every year. 3(3-0) ~~P: (BMB 801 or BMB 802) and (PHM 827 or PSL 828 or PSL 829) P: PHM 801~~ 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 2018~~ Effective Spring 2019
- PHM 809      Drug Discover and Medicinal Chemistry  
Spring of even years. 2(2-0) Interdepartmental with Chemistry. RB: BS in Biomedical science discipline (including, but not limited to chemistry, biochemistry, pharmacology, chemical engineering, molecular biology, biology, pharmacy, human biology, physiology.) R: Open to doctoral students in the Department of Chemistry or in the Department of Pharmacology and Toxicology or approval of department.
- NEW            Drug discover is a complicated and fascinating adventure, engaging multiple disciplines, strategic decision-making and problem-solving skills. In this course, we will cover the fundamentals necessary for the drug discover process including but not limited to basic chemical knowledge, drug design principles, high-throughput screening, computational modeling and drug metabolic pathway. The goal of this course is to equip students with the fundamentals of discovery pharmaceutical research and to prepare them ultimately to work as a team-member in a discovery program.  
Effective Spring 2020