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 Dietetics in the Department of Food Science and Human Nutrition.

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

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

      The University's Tier II writing requirement for the Dietetics major is met by completing Human Nutrition and Foods 472. That course is referenced in item 3. a. below.

Effective Fall 2021.

COLLEGE OF ENGINEERING

1. Request to change the requirements in the Bachelor of Science degree in Electrical Engineering in the Department of Electrical and Computer Engineering.

   The optional concentrations in the Bachelor of Science degree in Electrical 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 Electrical Engineering make the following changes:

      (1) In item 3. b. change the total credits from ‘41’ to ‘38’.

      (2) In item 3. b. delete the following course:

      CSE 231 Introduction to Programming I 4

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

      Complete a minimum of 18 credits including at least 12 credits from the focus areas below. The 12 credits must include at least one laboratory course (ECE 402, 404, 405, 407, 410, 415, 417, 420, 430, 431, 445, 458, 476, 477) and at least one 3 or 4 credit course from two different focus areas. Additional credits to meet the 18 credit requirement may be taken from MTH 314, any 400-level engineering course or by completing an approved 3 or 4 credit experiential education experience obtained in a minimum of three out-of-classroom experiences through engineering cooperative education or independent study. Students interested in the experiential education experience must contact the department for approval. Courses at the 400-level outside of Electrical and Computer Engineering may have restrictions or require additional prerequisites not included within this degree program.

      (4) In item 3. d. Computing and Electronics delete the following course:

      ECE 402 Applications of Analog Integrated Circuits 4

      Add the following course:

      ECE 434 Autonomous Vehicles 3
(5) In item 3. d. **Systems** add the following course:

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ECE 424   Electrical Drives       3
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(6) Add the following **Concentrations**:

**Digital Systems and IoT**
This concentration is for students interested in graduate work or employment in the world of digital hardware, software and systems within the internet of things (IoT) industry. To earn a Bachelor of Science degree in Electrical Engineering with a Digital Systems and IoT concentration, students must complete requirements 1., 2., and 3. above and the following:

**CREDITS**

1. Complete at least four courses from the following:
   
   - CSE 231  Introduction to Programming I   4
   - ECE 411  Electronic Design Automation   4
   - ECE 430  Embedded Cyber-Physical Systems   4
   - ECE 431  Smart Sensors Systems   3
   - ECE 442  Introduction to Communication Networks   3
   - ECE 456  Introduction to Communication and Network Security   3
   - ECE 466  Digital Signal Processing   3

**EM, Acoustics ad Optics**
This concentration is for students interested in graduate work or employment in areas related to electromagnetics, acoustics and optics. To earn a Bachelor of Science degree in Electrical Engineering with an EM, Acoustics and Optics concentration, students must complete requirements 1., 2., and 3. above and the following:

**CREDITS**

1. Complete at least four courses from the following:
   
   - ECE 405  Electromagnetic Fields and Waves II   4
   - ECE 407  Electromagnetic Compatibility   4
   - ECE 447  Introduction to Biomedical Imaging   3
   - ECE 449  Fundamentals of Acoustics   3
   - ECE 476  Electro-Optics   4

**RF and Wireless**
This concentration is for students interested in radio frequency technologies and the theories and principles of electronic communication and networking for graduate work or employment in areas related to wireless communication. To earn a Bachelor of Science degree in Electrical Engineering with an RF and Wireless concentration, students must complete requirements 1., 2., and 3. above and the following:

**CREDITS**

1. Completion at least four courses from the following:
   
   - ECE 404  Radio Frequency Electronic Circuits   4
   - ECE 405  Electromagnetic Fields and Waves II   4
   - ECE 407  Electromagnetic Compatibility   4
   - ECE 442  Introduction to Communication Networks   3
   - ECE 457  Communication Systems   3

**Robotics and Automation**
This concentration is for students interested in graduate work or employment in robotics or automation areas. To earn a Bachelor of Science degree in Electrical Engineering with a robotics and automation concentration, students must complete requirements 1., 2., and 3. above and the following:

1. The following course:
   
   - ECE 417  Robotics   4

2. Complete 9 credits from the following:
   
   - ECE 415  Computer Aided Manufacturing   3
   - ECE 416  Digital Control   3
   - ECE 430  Embedded Cyber-Physical Systems   4
   - ECE 431  Smart Sensors Systems   3
   - ECE 434  Autonomous Vehicles   3
**Microelectronics**

This concentration is for students interested in graduate work in electronic materials, devices or circuits or employment in the semiconductor industry. To earn a Bachelor of Science degree in Electrical Engineering with a Microelectronics concentration, students must complete requirements 1., 2., and 3. above and the following:

<table>
<thead>
<tr>
<th>CREDITS</th>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>ECE 404</td>
<td>Radio Frequency Electronic Circuits</td>
</tr>
<tr>
<td>4</td>
<td>ECE 410</td>
<td>VLSI Design</td>
</tr>
<tr>
<td>3</td>
<td>ECE 425</td>
<td>Solid State Power Conversion</td>
</tr>
<tr>
<td>4</td>
<td>ECE 476</td>
<td>Electro-Optics</td>
</tr>
<tr>
<td>3</td>
<td>ECE 477</td>
<td>Microelectronic Fabrication</td>
</tr>
</tbody>
</table>

**Smart Devices**

This concentration is for students interested in the design and implementation of smart devices and systems for graduate work or employment in consumer electronics and wearables fields. To earn a Bachelor of Science degree in Electrical Engineering with a Smart Devices concentration, students must complete requirements 1., 2., and 3. above and the following:

<table>
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<tr>
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<td>ECE 416</td>
<td>Digital Control</td>
</tr>
<tr>
<td>3</td>
<td>ECE 431</td>
<td>Smart Sensors Systems</td>
</tr>
<tr>
<td>3</td>
<td>CSE 445</td>
<td>Biomedical Instrumentation</td>
</tr>
<tr>
<td>3</td>
<td>ECE 477</td>
<td>Microelectronic Fabrication</td>
</tr>
</tbody>
</table>

Effective Fall 2021.

2. Request to change the requirements in the Bachelor of Science degree in Computer Engineering in the Department of Electrical and Computer Engineering.

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

1. In item 3. b. change the total credits from ‘43’ to ‘39’.
2. In item 3. b. delete the following course:
   - CSE 231 Introduction to Programming I 4
3. In item 3. d. **Hardware** delete the following course:
   - ECE 402 Applications of Analog Integrated Circuits 4
4. In item 3. d. **Software Systems** add the following courses:
   - CSE 431 Algorithm Engineering 3
   - CSE 480 Database Systems 3
5. In item 3. d. **Intelligent Systems** add the following courses:
   - CSE 404 Introduction to Machine Learning 3
   - CSE 482 Big Data Analysis 3
   - ECE 434 Autonomous Vehicles 3
   - MTH 314 Matrix Algebra with Computational Applications 3
Add the following Concentrations:

**Cybersecurity**
This concentration is for students interested in the theory and practice of communication networks and security. To earn a Bachelor of Science degree in Computer Engineering with a cybersecurity concentration, students must complete requirements 1., 2., and 3. above and the following:

**CREDITS**

1. All of the following courses (9 credits):
   - ECE 442 Introduction to Communication Networks 3
   - ECE 456 Introduction to Communication and Network Security 3
   - ECE 457 Communication Systems 3

2. Two of the following courses (6 credits):
   - CSE 402 Biometrics and Pattern Recognition 3
   - CSE 410 Operating Systems 3
   - CSE 425 Introduction to Computer Security 3
   - CSE 482 Big Data Analysis 3

**Robotics and Automation**
This concentration is for students interested in graduate work or employment in robotics or automation areas. To earn a Bachelor of Science degree in Computer Engineering with a robotics and automation concentration, students must complete requirements 1., 2., and 3. above and the following:

**CREDITS**

1. The following course:
   - ECE 417 Robotics 4

2. Complete 9 credits from the following:
   - ECE 415 Computer Aided Manufacturing 3
   - ECE 416 Digital Control 3
   - ECE 430 Embedded Cyber-Physical Systems 4
   - ECE 431 Smart Sensors Systems 3
   - ECE 434 Autonomous Vehicles 3
   - ECE 466 Digital Signal Processing 3

**Smart Systems**
This concentration is for students interested in the design and implementation of smart devices and systems for graduate work or employment in consumer electronics, wearables, and internet of things (IoT) fields. To earn a Bachelor of Science degree in Computer Engineering with a smart systems concentration, students must complete requirements 1., 2., and 3. above and the following:

**CREDITS**

1. Complete at least 13 credits from the following:
   - CSE 404 Introduction to Machine Learning 3
   - CSE 420 Computer Architecture 3
   - CSE 440 Introduction Artificial Intelligence 3
   - CSE 476 Mobile Application Development 3
   - CSE 482 Big Data Analysis 3
   - ECE 410 VLSI Design 4
   - ECE 411 Electronic Design Automation 4
   - ECE 430 Embedded Cyber-Physical Systems 4
   - ECE 431 Smart Sensors Systems 3
   - ECE 445 Biomedical Instrumentation 3
   - ECE 466 Digital Signal Processing 3

**Software Systems**
This concentration is for students wishing to focus on software development for graduate work or employment in embedded systems, cloud services and other software intensive fields. To earn a Bachelor of Science degree in Computer Engineering with a software systems concentration, students must complete requirements 1., 2., and 3. above and the following:

**CREDITS**

1. Complete at least 13 credits from the following:
CSE 410 Operating Systems 3  
CSE 415 Introduction to Parallel Programming 3  
CSE 435 Software Engineering 3  
CSE 450 Translation of Programming Languages 3  
CSE 476 Mobile Application Development 3  
ECE 430 Embedded Cyber-Physical Systems 4  

Effective Fall 2021.

LYMAN BRIGGS COLLEGE

1. Request to change the name of the Biological Science-Interdepartmental coordinate major leading to the Bachelor of Science Degree in Lyman Briggs College to Biological Science-Secondary Education.

   Effective Fall 2021.

2. Request to change the name of the Physical Science-Interdepartmental coordinate major leading to the Bachelor of Science Degree in Lyman Briggs College to Physical Science-Secondary Education.

   Effective Fall 2021.
PART II - NEW COURSES AND CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

HNF 472  Medical Nutrition Therapy II
Medical Nutrition Therapy II  (W)
Spring of every year. 4(3-2) P: HNF 471  P: (HNF 471) and completion of Tier I writing requirement
R: Open to juniors or seniors in the Dietetics Major.
  Anatomical, physiological and biochemical changes associated with hematologic,
  musculoskeletal, renal, respiratory, hepatobiliary, cancer, HIV/AIDS, metabolic stress
  and multiple organ failure. Nutrition assessment, nutrition diagnoses, interventions,
  monitoring and evaluation, documentation and quality improvement as guided by
  Academy of Nutrition and Dietetics' Nutrition Care Process. Interactions of diet therapies
  with other therapies including pharmacologic and complementary and alternative
  medicine.
  SA: HNF 470
  Effective Summer 2016  Effective Summer 2021

HNF 834  Advanced Pediatric Nutrition
Summer of every year. 3(3-0) RB: Undergraduate Medical Nutrition Therapy and Lifecycle
Nutrition courses. R: Open to master's students in the Nutrition and Dietetics Major or approval of
department.
NEW  Standards of care, tools and medical nutrition therapy concepts related to the specialty
  area of pediatric nutrition.
  Effective Summer 2021

COLLEGE OF ENGINEERING

MSE 801  Foundations of Materials Science and Engineering
Summer of every year. 3(3-0) RB: Undergraduate degree in science or engineering related to
Materials Science.
  Structure-Property-Processing-Performance interrelationship of metals, ceramics and
  polymers. Phase diagrams, thermomechanical treatments, physical and mechanical
  properties, processing, diffusion, microstructure studies, environmental effects.
  Request the use of the Pass-No Grade (P-N) system.
  Effective Summer 2016  Effective Summer 2021

ECE 201  Circuits and Systems I
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: ((CSE 131 or concurrently) or (CSE 231 or concurrently) or (EGR 102 or concurrently) or (CSE 320 or concurrently)) and ((MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently))
P: (CSE 231 or concurrently) or (EGR 102 or concurrently) or (CSE 220 or concurrently) or (MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently)
  Resistive circuits. Loop and modal analysis. Network theorems, dependent sources.
  Capacitor and inductor circuits. Transient analysis. Introduction to computer-aided
  design.
  SA: ECE 200
  Effective Fall 2013  Effective Fall 2021
COLLEGE OF HUMAN MEDICINE

HM 644  Enhanced Clinical Experience: Women’s Health  
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: HM 556 R: Open to graduate-professional students in the College of Human Medicine. 
NEW  Direct clinical experience emphasizing approach to the patient, data gathering skills, physical examination, clinical reasoning, counseling skills in women presenting with complaints and concerns related to female health. 
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 2021

HM 645  Enhanced Clinical Experience: Inpatient Internal Medicine  
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: HM 556 R: Open to graduate-professional students in the College of Human Medicine. 
NEW  Direct clinical experience emphasizing approach to the patient, data gathering skills, clinical reasoning, and functioning as a member of a hospital team. 
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 2021

HM 646  Enhanced Clinical Experience: Inpatient Family Medicine  
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: HM 556 R: Open to graduate-professional students in the College of Human Medicine. 
NEW  Direct clinical experience emphasizing approach to the patient, data gathering skills, clinical reasoning, and functioning as a member of a hospital team. 
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 2021

HM 647  Enhanced Clinical Experience: Pediatrics  
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: HM 556 R: Open to graduate-professional students in the College of Human Medicine. 
NEW  Direct clinical experience emphasizing approach to the patient, data gathering skills, clinical reasoning, human development, care of infants and children. 
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 2021

COLLEGE OF NATURAL SCIENCE

BS 161  Cell and Molecular Biology  
Fall of every year. Spring of every year. Summer of every year. 3(3-0) interdepartmental with Biochemistry and Molecular Biology and Microbiology and Molecular Genetics P: (CEM 141 or concurrently) or (CEM 151 or concurrently) or (LB 171 or concurrently) or (CEM 181H or concurrently) Not open to students with credit in BS 181H or LB 145. 
SA: BS 111, BS 149H 
Effective Fall 2013 Effective Fall 2021
BS 162  Organismal and Population Biology
Fall of every year. Spring of every year. Summer of every year. 3(3-0) Interdepartmental with Integrative Biology and Plant Biology, Interdepartmental with Plant Biology. P: BS 161 or BS 181H or LB 145 Not open to students with credit in BS 182H or LB 144.
SA: BS 110, BS 148H
Effective Fall 2016 Effective Summer 2021

BS 171  Cell and Molecular Biology Laboratory
Fall of every year. Spring of every year. Summer of every year. 2(1-3) Interdepartmental with Biochemistry and Molecular Biology and Microbiology and Molecular Genetics P: (BS 161 or concurrently) or (BS 181H or concurrently) or (BS 191H or concurrently) or (LB 145 or concurrently) Not open to students with credit in BS 191H or LB 145.
Principles and applications of common techniques used in cell and molecular biology.
SA: BS 111L, BS 159H
Effective Fall 2013 Effective Fall 2021

BS 181H  Honors Cell and Molecular Biology
Spring of every year. 3(3-0) Interdepartmental with Biochemistry and Molecular Biology and Lyman Briggs and Microbiology and Molecular Genetics P: (CEM 141 or concurrently) or (CEM 151 or concurrently) or (CEM 181H or concurrently) or (LB 171 or concurrently) Not open to students with credit in LB 145.
Physicochemical and molecular organization of cells as the unifying framework for genetics, evolution, and the social relevance of biology.
SA: BS 149H, BS 111
Effective Summer 2018 Effective Spring 2021

BS 191H  Honors Cell and Molecular Biology Laboratory
Spring of every year. 2(1-3) Interdepartmental with Biochemistry and Molecular Biology and Lyman Briggs and Microbiology and Molecular Genetics P: BS 181H or concurrently Not open to students with credit in LB 145.
Basic techniques of cellular and molecular biology including experimental design and hypothesis formulation; biochemistry, molecular biology and genetics.
SA: BS 159H
Effective Summer 2017 Effective Spring 2022

BLD 221  Academic Preparation for Medical Laboratory Science I
Fall of every year. 1(1-0) P: BLD 121 R: Open to sophomores or juniors or seniors in the Biomedical Laboratory Science Major. Approval of department.
NEW Academic skill development including time management, self-efficacy, short and long-term goal development, academic communication and personal alignment with Medical Laboratory Science profession.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2021

BLD 321  Academic Preparation for Medical Laboratory Science II
Fall of every year. 1(1-0) P: BLD 121 RB: BLD 221 R: Open to juniors or seniors in the Biomedical Laboratory Science Major. Approval of department.
NEW Academic and professional skill development including strategies to succeed in medical laboratory science core curriculum, career advancement opportunities in medical laboratory professions, professional identity, and effectively communicating your skills in applications, personal statements, and professional interviews.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2021
GLG 435  Geomicrobiology
Spring of every year. Spring of odd years. 4(3-2) Interdepartmental with Microbiology and Molecular Genetics. RB: GLG 201 or MMG 201 or BS 161 or LB 145 R: Open to juniors or seniors or graduate students in the College of Natural Science or in the Lyman Briggs College. Geomicrobiology perspectives on microbial activities in diverse environmental settings, including geological change mediated by microorganisms, microbial evolution driven by geologically diverse habitats. Effective Fall 2019 Effective Spring 2021

NSC 103  Strategies for Success
Fall of every year. Spring of every year. 1(1-0) R: Approval of department.
REINSTATEMENT 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. Effective Fall 2021

COLLEGE OF OSTEOPATHIC MEDICINE

OST 589  Independent Study Project
Fall of every year. Spring of every year. Summer of every year. 1 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. R: Open to graduate-professional students in the College of Osteopathic Medicine.
NEW Individualized Independent Study Project elective with faculty oversight. Request the use of the Pass-No Grade (P-N) system. Effective Summer 2021

OST 621  Leadership in Healthcare
Fall of every year. Spring of every year. Summer of every year. 3(2-2) R: Open to students in the College of Osteopathic Medicine. Develop healthcare-focused leadership skills through review of theory and interactive discussions with experts. This course can be taken only one time. If taken during pre-clerkship, the course cannot be repeated during clerkship. 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 2020 Effective Summer 2021