# MICHIGAN STATE UNIVERSITY

### Report of

**THE UNIVERSITY COMMITTEE ON CURRICULUM**

**to the Faculty Senate October 11, 2022**

*The effective date for new programs subject to Statewide Academic Program review is implemented in accordance with the Statewide Academic Program Review calendar.*

TO: Faculty Senate

MICHIGAN STATE UNIVERSITY

University Committee on Curriculum

October 12, 2022

This report is prepared and distributed for the following purposes:

1. To report new academic programs, changes in academic programs, discontinuations of academic programs, new courses, permanent changes in courses, and deletions of courses.
2. To notify the initiating colleges, schools, and departments of approval by the University Committee on Curriculum of their requests for new academic programs, changes in academic programs, discontinuations of academic programs, new courses, permanent changes in courses, and deletions of courses. Any items not approved by the Faculty Senate will be reported to the appropriate college and department or school.
3. To provide information to members of the faculty in each department about academic programs and courses in all colleges, departments, and schools of the University.

Reports of the University Committee on Curriculum to the Faculty Senate are organized as follows: PART I - NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES:

Organized by colleges in alphabetical order. For a given college, academic units are organized in alphabetical order. For a given academic unit, degrees, majors, and specializations are organized in alphabetical order.

PART II - NEW COURSES:1

Organized by academic units in alphabetical order; All-University courses appear last. For a given academic unit, courses are organized according to the names associated with course subject codes, in alphabetical order. Courses with the same subject code are in numerical order.

PART III - COURSE CHANGES:1

Organized by academic units in alphabetical order; All-University courses appear last. For a given academic unit, courses are organized according to the names associated with course subject codes, in alphabetical order. Courses with the same subject code are in numerical order.

Not all of the above categories, and not all of the colleges and academic units, will necessarily appear in any given Senate Report.

1One or more of the abbreviations that follow may be included in a course entry:

|  |  |  |
| --- | --- | --- |
| P: | = | Prerequisite monitored in SIS |
| C: | = | Corequisite |
| R: | = | Restriction |
| RB: | = | Recommended background |
| SA: | = | Semester Alias |

MICHIGAN STATE UNIVERSITY

October 11, 2022

TO: Faculty Senate

FROM: University Committee on Curriculum

SUBJECT: New Academic Programs and Program Changes: New Courses and Course Changes

# PART I - NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

## COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

1. Change the requirements for the **Bachelor of Science** degree in **Agriculture, Food and Natural Resources Education** in the Department of Community Sustainability. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **Requirements for the Bachelor of Science Degree in Agriculture, Food and Natural Resources Education** make the following changes:
      1. In item 3. a. change the total credits from ’56 to ‘61’.
      2. In item 3. a. delete the following courses:

CSUS 223A Seminar in AFRNE Leadership Theory I 1

CSUS 223B Seminar in AFRNE Leadership Theory II 1

CSUS 223C Seminar in AFRNE Leadership Theory III 1

TE 101 Social Foundations of Justice and Equity in Education 3

TE 150 Reflections on Learning 3

Add the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| CEP | 240 | Diverse Learners in Multicultural Perspective | 3 |
| CSUS | 316 | Campus Apprenticeship in Agriculture, Food, and Natural |  |
|  |  | Resources Education | 3 |
| CSUS | 317 | Foundations of Teaching Agriculture, Food, and Natural |  |
|  |  | Resources | 3 |
| CSUS | 493 | Professional Internship in Community Sustainability | 6 |

* + 1. Replace item 3. d. with the following:

All of the following courses for students admitted into the secondary teacher education program (12 credits):

|  |  |  |  |
| --- | --- | --- | --- |
| CSUS | 417 | Agriculture, Food, and Natural Resources |  |
|  |  | Apprenticeship/Clinical Experience | 3 |
| CSUS | 817 | Instructional Design and Assessment in Agriculture, |  |
|  |  | Food, and Natural Resources Education | 3 |
| CSUS | 818 | Theory and Practice of Program Planning in Agriculture, |  |
|  |  | Food, and Natural Resources Education | 3 |
| CSUS | 819 | Instructional Theory and Practice in Agriculture, Food, |  |
|  |  | and Natural Resources Education | 3 |

* + 1. Replace item 3. e. with the following:

All of the following courses for students not pursuing secondary teacher education certification (12 credits):

CSUS 430 Non-Profit Organizational Management for Community

Sustainability 3

CSUS 433 Grant Writing and Fund Development 3

An additional 6 credits of electives approved by the student’s academic advisor.

Effective Fall 2023.

1. Change the requirements for the **Master of Arts** degree in **Agriculture, Food and Natural Resources Education** in the Department of Community Sustainability. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Requirements for the Master of Arts Degree in Agriculture, Food and Natural Resources Education** make the following changes:
      1. In item 2., delete the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| TE | 801 | Professional Roles and Teaching Practice I | 3 |
| TE | 802 | Reflection and Inquiry in Teaching Practice I | 3 |
| TE | 803 | Professional Roles and Teaching Practice II | 3 |
| TE | 804 | Reflection and Inquiry in Teaching Practice II | 3 |

Add the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| CSUS | 430 | Non-Profit Organizational Management for |  |
|  |  | Community Sustainability | 3 |
| CSUS | 817 | Instructional Design and Assessment in |  |
|  |  | Agriculture, Food, and Natural |  |
|  |  | Resources Education | 3 |
| CSUS | 818 | Theory and Practice of Program Planning in |  |
|  |  | Agriculture, Food, and Natural |  |
|  |  | Resources Education | 3 |
| CSUS | 819 | Instructional Theory and Practice in Agriculture, |  |
| Effective Fall 2023. |  | Food, and Natural Resources Education | 3 |

1. Change the requirements for **Disciplinary Teaching Minor** in **Agriculture, Food and Natural Resource Education** in the Department of Community Sustainability. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **AGRICULTURE, FOOD AND NATURAL RESOURCE EDUCATION** make the following changes:
      1. Replace item 3. with the following: The following course (3 credits):

CSS 210 Fundamentals of Soil Science 3

* + 1. Replace item 5.b. with the following:

CSUS 317 Foundations of Teaching Agriculture, Food

and Natural Resources 3

CSUS 417 Agriculture, Food, and Natural Resources

Apprenticeship/Clinical Experience 3

Effective Fall 2023.

1. Change the requirements for **Master of Science** degree in **Community Sustainability** in the Department of Community Sustainability. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Requirements for the Master of Science Degree in Community Sustainability** make the following changes:
      1. Under the heading **Requirements for Plan A and Plan B** make the following changes:
         1. Delete the following course:

CSUS 805 Proposal Development for Interdisciplinary Inquiry 1

* + - 1. Change the total credits from ‘10’ to ‘9’.
      2. In item 2., change the credits from ‘11’ to ‘12’.

Effective Spring 2023.

1. Change the requirements for **Master of Science** degree in **Sustainable Tourism and Protected Area Management** in the Department of Community Sustainability. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Requirements for the Master of Science Degree in Sustainable Tourism and Protected Area Management** make the following changes:
      1. Under the heading **Requirements for Plan A and Plan B** change the total credits from ‘13’ to ’12’ and delete the following course:

CSUS 805 Proposal Development for Interdisciplinary Inquiry 1

* + 1. In item 2., change the credits from ‘8’ to ‘9’.

Effective Spring 2023.

## COLLEGE OF ARTS AND LETTERS

1. Change the requirements in the **Minor** in **Arts and Cultural Management** in the College of Arts and Letters.
   1. Under the heading **Requirements for the Minor in Arts and Cultural Management** make the following changes:
      1. In item 2. add the following course:

ACM 469 Advocating for Arts and Cultural Organizations 3

* + 1. Following item 2., add the following note:

Students may take up to three 1-credit special topics courses.

Effective Spring 2023.

1. Change the requirements for the **Minor in Museum Studies** in the College of Arts and Letters.
   1. Under the heading **Requirements for the Minor in Museum Studies** make the following changes:
      1. In item 1. b. add the following course:

MUSM 489 Museum Collections Management and Care 3

Effective Spring 2023.

1. Change the requirements for the **Master of Arts** degree in **Arts, Cultural Management and Museum Studies** in the College of Arts and Letters. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Requirements for the Master of Arts Degree in Arts, Cultural Management and Museum Studies** make the following changes:
      1. In item 2., delete the following course:

MUSM 895 Special Topics in Museum Studies 1 to 3 Add the following course:

MUSM 892 Special Topics in Museum Studies 1 to 3

* + 1. Under the heading ***Additional Requirements for Plan B*** make the following changes in item 1.:

Delete the following courses:

ACM 871 Internship in Arts and Cultural Management 1 to 3

MUSM 893 Museum Internship 1 to 3

Add the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| ACM | 896 | Internship in Arts and Cultural Management | 1 to 3 |
| MUSM | 896 | Museum Internship | 1 to 3 |
| MUSM | 897 | Practicum in Museum Studies | 1 to 3 |

Effective Spring 2023.

1. Change the requirements for the **Graduate Certificate** in **Arts and Cultural Management** in the College of Arts and Letters. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Requirements for the Graduate Certificate in Arts and Cultural Management** make the following changes:
      1. Delete item 2.
      2. Change item 3. to item 2., as “Two of the following courses (6 credits)”.
      3. In item 2., delete the note ‘ACM 868 and ACM 869 may not be used to fulfil both requirement 2. and 3.’
      4. Renumber item 4. to item 3.
      5. In item 3., change ‘ACM 871’ to ‘ACM 896’ and add the following note:

With department approval, requirement 3. may be substituted for a like offering in another department.

Effective Spring 2023.

1. Change the requirements for the **Graduate Certificate** in **Museum Studies** the College of Arts and Letters. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.

*The Graduate Certificate in Museum Studies is a Type 2 graduate certificate and will appear on the transcript as “Graduate Certificate Program in Museum Studies”.*

* 1. Under the heading **Requirements for the Graduate Certificate in Museum Studies** make the following changes:
     1. In item 2., delete the following course:

MUSM 895 Special Topics in Museum Studies 3

Add the following course:

MUSM 892 Special Topics in Museum Studies 1 to 3

* + 1. In item 3., delete the following course:

MUSM 893 Museum Internship 3

Add the following course:

MUSM 896 Museum Internship 3

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Arts** degree in **Arabic** in the Department of Linguistics, Languages and Cultures. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **Requirements for the Bachelor of Arts Degree in Arabic** make the following changes:
      1. In item 3. b. delete the following course:

ARB 360 Arabic Language and Society 3

* + 1. In item 3. b. change the total credits from ‘9’ to ‘6’.
    2. Delete item 3. d. (Cognate requirement)
  1. Under the heading ***Additional Major in Arabic*** replace the entire entry with the following:

This option is designed to encourage students to combine a major in Arabic with a major in another field such as business, economics, history, international relations, political science, or another foreign language. Students electing this option must meet the requirements of the College of Arts and Letters for the Bachelor of Arts degree and must complete the requirements 3. a. as well as select one of the courses listed in 3. b. (Arabic 460 or 461) in the Bachelor of Arts degree in Arabic above to fulfill the requirement of 27 semester credits.

Effective Spring 2023.

1. Change the requirements for the **Minor** in **Arabic** in the Department of Linguistics, Languages and Cultures.
   1. Under the heading **Requirements for the Minor in Arabic** make the following changes:
      1. Change the total credits for the minor from ‘19’ to ‘16’.
      2. In item 2. Change the requirement from ‘Two of the following courses to ‘One’ of the following courses (3 credits) and delete the following course:

ARB 360 Arabic Language and Society 3

Effective Spring 2023.

1. Change the requirements for the **Disciplinary Teaching Minor** in **Arabic** that is available for elementary and secondary teacher certification in the Department of Linguistics, Languages and Cultures. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **Arabic** make the following change:
      1. In item 2., delete the following course:

ARB 360 Arabic Language and Society 3

Effective Spring 2023.

## ELI BROAD COLLEGE BUSINESS

1. Change the requirements for the **Minor** in **Sports Business Management** in the Department of Management. The University Committee on Undergraduate Education (UCUE) approved this request at its September 1, 2022 meeting.
   1. Add the following section **Admission**:

Students applying to the sports business management minor must have completed at least 56 credits by the end of the Spring semester in which they are applying. Admission decisions will be distributed to students in early April each year. Admission is highly competitive and therefore not guaranteed. By applying to the minor, you are agreeing to allow the admissions committee to review your grades.

* 1. Under the heading **Requirements for the Minor in Sports Business Management**

replace the entire entry with the following:

Students must complete a minimum of 18 credits from the following:

### Curriculum Foundations in Sports Business Management

All of the following courses (6 credits):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| MGT | 479 | Sports Business Management | | 3 |
| MGT | 493A | Sports Business: Internship | | 3 |
| or |  |  | |  |
| MGT | 493B | Sports Business: Fieldwork Seminar | | 3 |
| **Foundations in Management**  1. One of the following courses (3 credits): | | | | |
| HRLR | | 201 | Human Capital and Society | 3 |
| MGT | | 315 | Managing Human Resources and Organizational Behavior | 3 |
| MGT | | 325 | Management Skills and Processes | 3 |

1. One of the following courses (3 credits):

HRLR 313 Employment Relations 3

MGT 411 Organizational Staffing 3

MGT 412 Compensation and Reward Systems 3

|  |  |  |  |
| --- | --- | --- | --- |
| MGT | 414 | Diversity in the Workplace | 3 |
| MGT | 460 | Capstone for Management Majors (W) | 3 |
| MGT | 475 | Negotiation and Conflict Management | 3 |

**Relevant Electives** (6 credits)

Complete at least 6 credits from the following courses:

*Customers and Sales*

|  |  |  |  |
| --- | --- | --- | --- |
| ADV | 352 | Media Sales | 3 |
| HB | 376 | Hospitality Sales Process | 3 |
| or |  |  |  |
| MKT | 313 | Consultative Selling | 3 |
| MKT | 302 | Consumer Behavior | 3 |
| *Media and Branding* | | | |
| ADV | 431 | Monitoring and Measuring Social Media of Brands | 3 |
| JRN | 218 | Sports in Contemporary Media | 3 |
| MI | 334 | eSports and Online Broadcasting | 3 |
| PR | 330 | Social Media Management | 3 |
| *Planning, Operations, and Strategy* | | | |
| EC | 370 | Economics of Sports | 3 |
| GEO | 215 | Sports Geography | 3 |
| HRLR | 314 | Legal Environment of Work | 3 |
| HB | 420 | The Business of Golf | 3 |
| HB | 425 | Golf Operations and Management | 3 |
| KIN | 454 | Facility Planning and Construction | 3 |
| KIN | 456 | Ethical Issues in Athletics | 2 |
| *Sports and Society* | | | |
| GBL | 323 | Introduction to Business Law | 3 |
| HST | 324 | History of Sports in America | 3 |
| HST | 329 | College Sports in the United States | 3 |
| HST | 397 | Global Soccer | 3 |
| ISS | 328 | The Social Science of Sports (I) | 4 |

*Special Topics*

Selection of either of these courses requires approval by the Department of Management to ensure appropriate content.

ADV 492 Special Topics in Advertising: Sports and Entertainment Public

Relations 3

MGT 491 Special Topics in Management: Women Leadership in Sports 3

A maximum of 3 credits of internship or other work experience may be earned, used as elective credits towards the following degrees: Finance, Human Resource Management, Management, Marketing, Supply Chain Management; a maximum of 2 credits of internship or other work experience may be earned toward the Accounting degree.

Effective Spring 2023.

## COLLEGE OF EDUCATION

1. Change the requirements for the **Master of Science** degree in **Athletic Training** in the Department of Kinesiology. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Admission** make the following change:
      1. Replace item 3. with the following:

Competitive scores on the Test of English as a Foreign Language (for international students).

Effective Spring 2023.

## COLLEGE OF NATURAL SCIENCE

1. Change the requirements for the **Bachelor of Science** degree in **Human Biology** in the College of Natural Science.
   1. Under the heading **Requirements for the Bachelor of Science Degree in Human Biology** make the following changes:
      1. In item 3. b. delete the following course:

NSC 495 Capstone in Human Biology (W) 3

Add the following course:

HBIO 495 Capstone in Human Biology (W) 3

* + 1. In item 3. g., add the following:

(7) PHY 173 Studio Physics for Scientists and Engineers I 5

PHY 174 Studio Physics for Scientists and Engineers II 5

* + 1. In item 3. i., add the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| ANP | 204 | Introduction to Medical Anthropology | 3 |
| ANP | 206 | Introduction to Physical Anthropology | 3 |
| ANP | 425 | Issues in Medical Anthropology | 3 |
| ANP | 443 | Human Adaptability | 3 |
| BLD | 213L | Clinical Laboratory Methods | 2 |
| BLD | 430 | Molecular Diagnostics | 2 |
| HBIO | 295 | Human Biology and Society | 2 |

Change the note following 3. i. to the following:

With the approval of the director of the human biology major, a maximum of 3 credits in research (HBIO 498), internship (HBIO 497) or independent study (HBIO 496) courses may be used to satisfy this requirement.

Courses used to fulfill requirement 3. h. may not be used to fulfill requirement 3. i.

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Science** degree in **Neuroscience** in the College of Natural Science.
   1. Under the heading **Requirements for the Bachelor of Science Degree in Neuroscience** make the following changes:
      1. In item 3. b., add the following:

(3) LB 271 Organic Chemistry 3

CEM 252 Organic Chemistry II 3

* + 1. Add the following to item 3. c.:

(5) PHY 221 Studio Physics for Life Scientists I 4

PHY 222 Studio Physics for Life Scientists II 4

* + 1. In item 3. k. under the **Cellular and Developmental Neuroscience**

concentration delete the following courses:

IBIO 343 Genetics Laboratory 3

|  |  |  |  |
| --- | --- | --- | --- |
| NEU | 425 | Computational Modeling in Neuroscience | 3 |
| NEU | 435 | Ion Channels of Excitable Membranes | 3 |
| PLB | 400 | Introduction to Bioinformatics | 3 |

Add the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| NEU | 417 | Instrumental Methods of Analysis in Neuroscience | 3 |
| NEU | 450 | The Autonomic Nervous System | 3 |
| NEU | 460 | Current Approaches in Molecular and Cellular |  |
|  |  | Neuroscience | 3 |

* + 1. In item 3. k. under the **Behavioral and Systems Neuroscience** concentration delete the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| IBIO | 403 | Integrative Neurobiology | 3 |
| NEU | 425 | Computational Modeling in Neuroscience | 3 |
| PSY | 310 | Psychology and Biology of Human Sexuality | 3 |
| PSY | 402 | Sensation and Perception (W) | 3 |
| PSY | 493 | Issues in Psychology (W) | 3 |

Add the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| IBIO | 405 | Neural Basis of Animal Behavior | 3 |
| NEU | 310 | Psychology and Biology of Human Sexuality | 3 |
| NEU | 417 | Instrumental Methods of Analysis in Neuroscience | 3 |
| NEU | 440 | Synaptic Transmission | 3 |
| NEU | 450 | The Autonomic Nervous System | 3 |
| NEU | 460 | Current Approaches in Molecular and Cellular Neuroscience | 3 |
| PHM | 422 | Fundamentals of Neuropharmacology | 3 |
| PSY | 302 | Sensation and Perception | 3 |
| PSY | 333 | The Neurobiology of Food Intake and Overeating | 3 |

Remove PSY 493 from the note following.

* + 1. In item 3. k. under the **Cognitive and Computational Neuroscience**

concentration delete the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| NEU | 425 | Computational Modeling in Neuroscience | 3 |
| PSL | 429 | Biomedical Imaging Methods | 3 |
| PSY | 402 | Sensation and Perception (W) | 3 |
| PSY | 493 | Issues in Psychology (W) | 3 |

Add the following courses:

|  |  |  |  |
| --- | --- | --- | --- |
| NEU | 417 | Instrumental Methods of Analysis in Neuroscience | 3 |
| PSY | 302 | Sensation and Perception | 3 |

Remove PSY 493 from the note following.

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Science** degree in **Actuarial Science** in the Department of Mathematics.
   1. Under the heading **Requirements for the Bachelor of Science Degree in Actuarial Science** make the following changes:
      1. In item 3. c., change the total credits from ‘8’ to ‘8 or 10’.
      2. In item 3. c., add the following item:

(4) PHY 173 Studio Physics for Scientists and Engineers I 5

PHY 174 Studio Physics for Scientists and Engineers II 5

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Arts** degree in **Computational Mathematics** in the Department of Mathematics.
   1. Under the heading **Requirements for the Bachelor of Arts Degree in Computational Mathematics** make the following changes:
      1. In item 3. a., change the total credits from ’21’ to ’19 or 20’.
      2. In item 3. a. (2) change the total credits from ‘4’ to ‘4 or 5’.
      3. In item 3. a. (2), add the following courses:

PHY 173 Studio Physics for Scientists and Engineers I 5

PHY 193H Honors Physics I – Mechanics 4

* + 1. In item 3. c. (2), change the credits of ‘MTH 254H’ from ‘3’ to ‘4’.

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Science** degree in **Computational Mathematics** in the Department of Mathematics.
   1. Under the heading **Requirements for the Bachelor of Science Degree in Computational Mathematics** make the following changes:
      1. In item 3. a., change the total credits from ’28 or 29’ to ’27 to 31’.
      2. In item 3. a. (4) change the total credits from ‘8’ to ‘8 to 10’.
      3. In item 3. a. (4) (a), add the following courses:

PHY 173 Studio Physics for Scientists and Engineers I 5

PHY 193H Honors Physics I – Mechanics 4

* + 1. In item 3. a. (4) (b), add the following courses:

PHY 174 Studio Physics for Scientists and Engineers II 5

PHY 294H Honors Physics II – Electromagnetism 4

* + 1. In item 3. c. (2), change the credits of ‘MTH 254H’ from ‘3’ to ‘4’.

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Science** degree in **Mathematics** in the Department of Mathematics. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **Requirements for the Bachelor of Science Degree in Mathematics**

make the following changes:

* + 1. In item 3. a. change the total credits from ’20 or 21’ to ’19 to 23’.
    2. Replace item 3. a. (3) with the following:

One of the following groups of courses (8 to 10 credits):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (a) | PHY | 183 | Physics for Scientists and Engineers I | 4 |
|  | PHY | 184 | Physics for Scientists and Engineers II | 4 |
| (b) | PHY | 193H | Honors Physics I – Mechanics | 4 |
|  | PHY | 294H | Honors Physics II – Electromagnetism | 4 |
| (c) | LB | 273 | Physics I | 4 |
|  | LB | 274 | Physics II | 4 |
| (d) | PHY | 173 | Physics I | 5 |
|  | PHY | 174 | Physics II | 5 |

* + 1. In item 3. c. (1) change the total credits from ‘6 to 8’ to ‘7 or 8’.
    2. In item 3. c. (1) (b) change the credits of MTH 153H from ‘3’ to ‘4’.
    3. In item 3. c. (5) delete the following statement:

Students may use no more than one of Mathematics 309, 314, 317H to satisfy this requirement.

Add the following statement:

Students with credit in MTH 235 prior to entering the Mathematics major, only need 24 credits to fulfill this requirement.

* + 1. Replace items 3. c. (6) and (7) with the following:
       1. One of the following courses (3 credits):

|  |  |  |  |
| --- | --- | --- | --- |
| MTH | 310 | Abstract Algebra I and Number Theory | 3 |
| MTH | 418H | Honors Algebra I | 3 |
| One of the following courses (3 credits): | | | |
| MTH | 320 | Analysis I | 3 |
| MTH | 327H | Honors Analysis I | 3 |

(7)

* + - 1. Add the following item 3. c. (9):

One course selected from two of the following groups (6 credits):

|  |  |  |  |
| --- | --- | --- | --- |
| a. MTH | 411 | Abstract Algebra II | 3 |
| MTH | 414 | Linear Algebra II | 3 |
| MTH | 416 | Introduction to Algebraic Coding | 3 |
| MTH | 417 | Topics in Number Theory | 3 |
| MTH | 419H | Honors Algebra II | 3 |
| b. MTH | 421 | Analysis II | 3 |
| MTH | 425 | Complex Analysis | 3 |
| MTH | 428H | Honors Complex Analysis | 3 |
| MTH | 429H | Honors Real Analysis | 3 |
| MTH | 442 | Partial Differential Equations | 3 |
| c. MTH | 441 | Ordinary Differential Equations II | 3 |
| MTH | 451 | Numerical Analysis I | 3 |
| MTH | 457 | Introduction to Financial Math | 3 |
| MTH | 461 | Metric and Topological Spaces | 3 |
| MTH | 481 | Discrete Mathematics I | 3 |

Students with credit in MTH 418H may not use MTH 411 to satisfy this requirement.

* + - 1. Add the following item 3. d.:

One of the following courses (4 credits):

CMSE 202 Computational Modeling and Data Analysis II 4

CSE 231 Introduction to Programming I 4

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Arts** degree in **Mathematics, Advanced** in the Department of Mathematics. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **Requirements for the Bachelor of Arts Degree in Mathematics, Advanced** make the following changes:
      1. Change the total credits of 3. a. from ’12 or 13’ to ’13 or 14’.
      2. In item 3. a. (3) make the following changes:
2. Change the total credits from ‘4’ to ‘4 or 5’.
3. Add the following course:

PHY 173 Studio Physics for Scientists and Engineers I 5

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Science** degree in **Mathematics, Advanced** in the Department of Mathematics. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **Requirements for the Bachelor of Science Degree in Mathematics, Advanced** make the following changes:
      1. Change the total credits of 3. a. from ’17 to 21’ to ’21 to 25’.
      2. In item 3. a. (3) make the following changes:
2. Change the total credits from ‘6 or 8’ to ‘8 or 10’.
3. Reletter item (c) to item (d).
4. Add the following item (c):

PHY 173 Studio Physics for Scientists and Engineers I 5

PHY 174 Studio Physics for Scientists and Engineers II 5

Effective Spring 2023.

1. Change the requirements for the **Bachelor of Arts** degree in **Physics** in the Department of Physics and Astronomy. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **Requirements for the Bachelor of Arts Degree in Physics** replace item 3. a. with the following:
      1. One of the following courses (3 to 5 credits):

|  |  |  |  |
| --- | --- | --- | --- |
| BS | 161 | Cell and Molecular Biology | 3 |
| BS | 162 | Organismal and Population Biology | 3 |
| BS | 181H | Honors Cell and Molecular Biology | 3 |
| BS | 182H | Honors Organismal and Population Biology | 3 |
| ENT | 205 | Pests, Society and Environment | 3 |
| IBIO | 150 | Integrating Biology: From DNA to Populations | 3 |
| LB | 144 | Biology I: Organismal Biology | 4 |
| LB | 145 | Biology II: Cellular and Molecular Biology | 5 |
| MMG | 141 | Introductory Human Genetics | 3 |
| MMG | 201 | Fundamentals of Microbiology | 3 |

|  |  |  |  |
| --- | --- | --- | --- |
| PLB | 105 | Plant Biology | 3 |
| PSL | 250 | Introductory Physiology | 4 |

* + 1. One of the following groups of courses (5 to 6 credits):

1. CEM 141 General Chemistry 4

CEM 161 Chemistry Laboratory I 1

1. CEM 151 General and Descriptive Chemistry 4

CEM 161 Chemistry Laboratory I 1

1. CEM 181H Honors Chemistry I 4

CEM 185H Honors Chemistry Laboratory I 2

1. LB 171 Principles of Chemistry I 4

LB 171L Introductory Chemistry Laboratory I 1

* + 1. One of the following groups of Mathematics courses (14 or 15 credits):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (a) | MTH | 132 | Calculus I | 3 |
|  | MTH | 133 | Calculus II | 4 |
|  | MTH | 234 | Multivariable Calculus | 4 |
|  | MTH | 235 | Differential Equations | 3 |
| (b) | MTH | 152H | Honors Calculus I | 3 |
|  | MTH | 153H | Honors Calculus II | 4 |
|  | MTH | 254H | Honors Multivariable Calculus | 4 |
|  | MTH | 235 | Differential Equations | 3 |
|  | or |  |  |  |
|  | MTH | 340 | Ordinary Differential Equations I | 3 |
| (c) | LB | 118 | Calculus I | 4 |
|  | LB | 119 | Calculus II | 4 |
|  | LB | 220 | Calculus III | 4 |
|  | MTH | 235 | Differential Equations | 3 |
|  | or |  |  |  |
|  | MTH | 340 | Ordinary Differential Equations I | 3 |

* + 1. The following course (4 credits):

CMSE 201 Computational Modeling and Data Analysis I 4

* + 1. One additional mathematics courses at the 300-level or above of at least 3 credits. PHY 415 Methods of Theoretical Physics may be used towards the fulfillment of this requirement.
  1. Under the heading **Requirements for the Bachelor of Arts Degree in Physics** replace item 3. b. with the following:

The following courses in the Department of Physics and Astronomy (33 to 38 credits):

* + 1. One of the following groups of courses (8 to 10 credits):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (a) | PHY | 183 | Physics for Scientists and Engineers I | 4 |
|  | PHY | 184 | Physics for Scientists and Engineers II | 4 |
|  | PHY | 191 | Physics Laboratory for Scientists, I | 1 |
|  | PHY | 192 | Physics Laboratory for Scientists, II | 1 |
| (b) | PHY | 193H | Honors Physics I - Mechanics | 4 |
|  | PHY | 294H | Honors Physics II - Electromagnetism | 4 |
|  | PHY | 191 | Physics Laboratory for Scientists, I | 1 |
|  | PHY | 192 | Physics Laboratory for Scientists, II | 1 |
| (c) | PHY | 173 | Studio Physics for Scientists and Engineers I | 5 |
|  | PHY | 174 | Studio Physics for Scientists and Engineers II | 5 |
| (d) | LB | 273 | Physics I | 4 |
|  | LB | 274 | Physics II | 4 |
| All of the following courses (12 credits): | | | | |
| PHY | 215 | Thermodynamics and Modern Physics | | 3 |
| PHY | 321 | Classical Mechanics I | | 3 |
| PHY | 410 | Thermal and Statistical Physics | | 3 |
| PHY | 471 | Quantum Physics I | | 3 |
| One of the following courses (3 or 4 credits): | | | | |
| PHY | 431 | Optics I | | 3 |
| PHY | 440 | Electronics | | 4 |

* + 1. One of the following groups of courses (4 or 6 credits):

1. PHY 490 Physics Senior Thesis 4

Students must complete two enrollments of this course for a total of 4 credits.

1. Two of the following courses:

PHY 491 Introduction to Condensed Matter Physics 3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | PHY | 492 | Introduction to Nuclear Physics | 3 |
| PHY | 493 | Introduction to Elementary Particle Physics | 3 |
| Effective Spring 2023. | PHY | 494 | Survey of Physics Education Research (W) | 3 |

1. Change the requirements for the **Bachelor of Science** degree in **Physics** in the Department of Physics and Astronomy. The Teacher Education Council (TEC) approved this request at its September 12, 2022 meeting.
   1. Under the heading **Requirements for the Bachelor of Science Degree in Physics**

make the following changes:

* + 1. In item 3. a. change the total credits from ’33 to 39’ to ’35 to 40.
    2. In item 3. b. (1) add the following new item (c) and reletter item (c) to item (d): PHY 173 Studio Physics for Scientists and Engineers I 5

PHY 174 Studio Physics for Scientists and Engineers II 5

* + 1. In item 3. b. (4) (b) add the following course:

PHY 494 Survey of Physics Education Research (W) 3

Effective Spring 2023.

1. Establish a **Graduate Certificate** in **Instrumentation in High Energy Physics** in Department of Physics and Astronomy. The University Committee on Graduate Studies (UCGS) approved this request at its March 21, 2022 meeting.

### Background Information:

In 2021, the Department of Energy (DOE) solicited proposals to meet the need for a highly trained workforce in High Energy Physics (HEP) instrumentation. This workforce is critical to carry out the development and operation of large-scale precision particle physics experiments. The presence of this workforce is important for U.S. scientific leadership and economic growth. MSU has a long history of instrumentation projects since the HEP group was established in 1968, with effort currently on upgrades to the ATLAS experiment and the successful operation of CMB-S4 and DUNE experiments. These projects are done with partners at national laboratories around the US, including SLAC Accelerator

Laboratory in California, Fermi National Accelerator Laboratory in Illinois, Brookhaven National Laboratory in New York, and Argonne National Laboratory in Illinois. Most of the

instrumentation used in HEP is also applicable and valuable for nuclear physics (NP). This is highly relevant as MSU is also the host of the Facility for Rare Isotope Beams (FRIB) facility, which is a nuclear physics laboratory and will host multiple experiments over the coming decades.

With funding from the DOE, MSU now has an opportunity to provide an exciting training opportunity in instrumentation leveraging these strengths. The Instrumentation in High Energy Physics certificate will make use of the partnerships, expertise, and projects

underway at MSU and at FRIB. Students who are a part of this certificate program will join a dedicated cohort, have formal and informal mentoring, and the opportunity to work with

experts at the national labs, including FRIB. Partnering academic programs at MSU include the Department of Chemistry in the College of Natural Science and can expand to include related engineering fields. The certificate will address all the major need areas highlighted in the recent DOE report: (1) advanced sensors for particle and radiation detection, including quantum devices;

(2) application-specific front-end electronics and data acquisition; (3) systems design and engineering for complex instrumentation, including in extreme radiation, temperature, and low- background environments.

Students completing the certificate will be certified, well-trained, and ready for productive careers in HEP instrumentation where there are critical workforce needs nationally.

### Academic Programs Catalog Text:

The Graduate Certificate in Instrumentation in High Energy Physics complements a graduate students’ degree in the field of instrumentation applicable to high energy physics. The TRAIN-MI program will bring together MSU’s strengths to formulate a curriculum addressing three major areas: (1) advanced sensors for particle and radiation detection, including quantum devices; (2) application-specific front-end electronics and data acquisition’ and (3) systems design and engineering for complex instrumentation, including in extreme radiation, temperature, and low- background environments.

### Requirements for the Graduate Certificate in Instrumentation in High Energy Physics

CREDITS

Students must complete 9 credits from the following:

1. One of the following courses that includes instruction on particle interactions with matter. The topic must be approved by the Physics and Astronomy Graduate Program Director.

CEM 985 Selected Topics in Nuclear Chemistry 3

Or

PHY 959 Special Topics in High-Energy Physics 3

1. Complete 6 credits from the following list of approved courses,

or any other 800 or 900- level accelerator science-focused courses as approved by the Physics and Astronomy Graduate Program Director.

|  |  |  |  |
| --- | --- | --- | --- |
| CEM | 985 | Selected Topics in Nuclear Chemistry | 3 |
| HRT | 860 | Scientific Writing Workshop | 3 |
| PHY | 905 | Special Problems | 3 |
| PHY | 959 | Special Topics in High-Energy Physics | 3 |

Topics in CEM 985 and PHY 959 must be different than the topic used to fulfill requirement 1. above and must be approved by the Physics and Astronomy Graduate Program Director.

Students are expected to maintain a minimum cumulative grade-point average of 3.0 in all courses in the certificate.

Effective Spring 2023.

## COLLEGE OF NURSING

1. Change the requirements for the **Doctor of Philosophy** degree in **Nursing**. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Requirements for the Doctor of Philosophy Degree in Nursing** add the following statement:

### Part-time Students

Although some students (post-BSN or post-master’s in nursing; post-DNP) choose to enroll in the Doctor of Philosophy degree program in Nursing on a part-time basis, all Ph.D. degree candidates will be expected to maintain minimum degree progress standards established by the College of Nursing and published in the College of Nursing Doctor of Philosophy Degree in Nursing Student Handbook. Students are also expected to complete at least one course per semester until the degree is earned.

Effective Spring 2023.

## COLLEGE OF SOCIAL SCIENCE

1. Change the requirements for the **Master of International Planning Studies** degree in **International Planning Studies** in the School of Planning, Design and Construction. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Requirements for the Master of International Planning Studies Degree** replace the entire entry with the following:

The program is available only online under Plan B (without thesis). The student must complete at least 30 credits as specified below.

CREDITS

The student must

* + 1. Complete the following core courses (10 credits):

2.

|  |  |  |  |
| --- | --- | --- | --- |
| UP | 801 | Planning History and Theory | 3 |
| UP | 854 | Economics of Planning and Development | 3 |
| UP | 884 | Community Engagement: Charrette Systems | 4 |
| Complete one of the following courses (5 credits): | | | |
| UP | 890 | Independent Study | 5 |
| UP | 893 | Internship in Urban Planning | 5 |

1. Complete a minimum of 15 elective credits approved by the student’s academic advisor. The electives are tailored to each student's needs and include environment and sustainability, transportation and technology, environmental planning, housing and real estate, with a focus on international content.
2. Complete a final evaluation.

Effective Fall 2023.

* + 1. Change the requirements for the **Master in Urban and Regional Planning** degree in **Urban and Regional Planning** in the School of Planning, Design and Construction. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
       1. Under the heading **Requirements for the Master in Urban and Regional Planning Degree in Urban and Regional Planning** replace the entire entry with the following:

#### *Requirements for Both Plan A and Plan B:*

* + - * 1. Urban planning core courses (25 credits):

|  |  |  |  |
| --- | --- | --- | --- |
| UP | 801 | Planning History and Theory | 3 |
| UP | 814 | Methods for Investigation of Urban Systems | 3 |
| UP | 823 | Planning Process and Development Review | 3 |
| UP | 824 | Geographic Information Systems for Planning | 3 |
| UP | 854 | Economics of Planning and Development | 3 |
| UP | 855 | Environmental Planning and Climate Change | 3 |
| UP | 865 | Planning and Development Law and Ethics | 3 |
| UP | 894 | Planning Practicum | 4 |

* + - * 1. **Electives**: In addition to the core courses, all students complete 9 credits of electives from UP courses at the 400-level and above.

#### *Additional Requirements for Plan A*:

1. Complete the following course (credits):

UP 816 Advanced Research Methods for Planning

and Development 3

1. Students will complete the following two courses in a two-step process by enrolling in 2 credits of UP 889 Master’s Research with their major faculty advisor who will chair their research before they can enroll in 4 credits of UP 899 Master’s Thesis Research or additional elective course work usually in their second year. A maximum of 6 credits combined can be taken in UP 889 and UP 899.

#### *Additional Requirements for Plan B*:

* 1. Nine additional credits in two courses approved by the student’s academic advisor.
  2. Pass a final evaluation.

Effective Fall 2023.

## COLLEGE OF VETERINARY MEDICINE

1. Change the requirements for the **Doctor of Veterinary Medicine** degree in **Veterinary Medicine** in the College of Veterinary Medicine. The University Committee on Graduate Studies (UCGS) approved this request at its September 19, 2022 meeting.
   1. Under the heading **Admission to the Professional Program in Veterinary Medicine**

make the following changes:

* + 1. Replace item 1. with the following:

Academic performance: A minimum last-3-semester grade-point average (GPA) in combination with a minimum science prerequisite GPA of 3.0 is required for an application to receive review.

* + 1. Delete the following paragraph:

All prerequisite courses must be completed by the spring semester of the year of matriculation with a minimum grade of 2.0 in each course. One Hundred percent of the science prerequisite courses must be complete at the time of application, with a minimum grade of 2.0 in each course.

Add the following paragraph:

All science prerequisite courses must be completed at the time of application with a minimum grade of 2.0 in each course and a minimum science prerequisite GPA of 3.0. Up to 50% of the science prerequisite requirements may be satisfied with binary grading. General education requirements must be completed by July 1 prior to fall matriculation. Each course must receive a minimum grade of 2.0.

* + 1. Under the heading **General Education Requirements** add the following statement:

Prerequisite individual General Education courses must receive a minimum grade of 2.0 (C) on a 4.0 scale. All general education requirements must be completed by July 1 of the matriculation year. If a bachelor's degree will be earned by July 1 of the matriculation year, all general education requirements are considered fulfilled and individual courses will not be reviewed. A Baccalaureate degree is not required.

Effective Spring 2023.

# PART II - NEW COURSES

## DEPARTMENT OF AEROSPACE STUDIES

AS 496 Field Study in Aerospace Studies

Fall of every year. Spring of every year. 1 to 3 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Approval of department.

Directed studies in Aerospace Studies in experiential settings Request the use of the Pass-No Grade (P-N) system.

Effective Fall Semester 2022

## DEPARTMENT OF AGRICULTURAL, FOOD, AND RESOURCE ECONOMICS

AFRE 811 Proofs Strategies and Analysis for Advanced Microeconomic Theory Spring of every year. 3(3-0) P: EC 301 or AFRE 805

Logic, proof strategies, and real analysis relevant to advanced microeconomic theory, with economic applications

Effective Spring Semester 2023

## DEPARTMENT OF COMMUNITY SUSTAINABILITY

CSUS 316 Campus Apprenticeship in Agriculture, Food, and Natural Resources Education Fall of every year. 3(1-4) R: Not open to freshmen.

Application of approaches to teaching and learning in place-based agriculture, food, and natural resources settings.

Effective Fall Semester 2023

CSUS 317 Foundations of Teaching Agriculture, Food, and Natural Resources

Spring of every year. 3(2-2) RB: CSUS 222A and CSUS 222B R: Not open to freshmen.

Foundations of teaching agriculture, food, and natural resources education in formal and non-formal environments. Multiple literacies.

Effective Fall Semester 2023

CSUS 417 Agriculture, Food and Natural Resources Apprenticeship/Clinical Experience

Fall of every year. 3(1-4) P: CSUS 317 R: Open to students in the Agriscience Secondary Teaching Major.

Analyzing contemporary teaching practices in Agriculture, Food, and Natural Resources Education through clinical experiences in public school settings.

Effective Fall Semester 2023

CSUS 817 Instructional Design and Assessment in Agriculture, Food, and Natural Resources Education

Fall of every year. 3(3-0) P: CSUS 317 R: Open to students in the Agriscience Secondary Teaching Major.

Instructional design and assessment development and dissemination for diverse learners in agriculture, food, and natural resources education.

Effective Fall Semester 2023

CSUS 818 Theory and Practice of Program Planning in Agriculture, Food, and Natural Resources Education Fall of every year. 3(3-0) P: CSUS 317 R: Open to students in the Agriscience Secondary Teaching Major.

Examining the facilitation and evaluation of classroom instruction, student engagement in FFA, and supervised agricultural experiences within a school-based agriculture, food, and natural resources education program.

Effective Fall Semester 2023

CSUS 819 Instructional Theory and Practice in Agriculture, Food and Natural Resources Education

Spring of every year. 3(3-0) P: CSUS 417 and CSUS 817 and CSUS 818 R: Open to students in the Agriscience Secondary Teaching Major. C: CSUS 493 concurrently.

Exploring the theoretical foundations and practical utilization of advanced pedagogical approaches within agriculture, food, and natural resources education.

Effective Fall Semester 2023

## DEPARTMENT OF FINANCE

FI 824 Deep Learning and Neural Networks in Finance Spring of every year. 3(3-0)

Basic concepts in deep learning and neural networks in finance and economics. Practical experience implementing deep learning methods with state-of-the-art algorithms in a variety of machine learning packages with applications such as forecasting, algorithmic trading, and fraud detection.

Effective Spring Semester 2023

## DEPARTMENT OF INTEGRATIVE BIOLOGY

IBIO 483 Environmental Physiology (W)

Spring of every year. 4(4-0) P: ((BS 161 or LB 145 or BS 181H) and completion of Tier I writing requirement) and (BS 162 or LB 144 or BS 182H) and (CEM 141 or CEM 151 or CEM 181H or LB 171)

REINSTATEMENT Aspects of physiology important to the environmental relations of vertebrates and invertebrates: energetics, thermal relations, osmotic-ionic relations, and exercise physiology.

SA: ZOL 483

Effective Spring Semester 2023

## DEPARTMENT OF LARGE ANIMAL CLINICAL SCIENCES

LCS 643 Essentials for the Equine Practitioner

Spring of every year. 6(6-0) P: LCS 616

Advanced clerkship focusing on large animal medicine and surgery as well as equine theriogenology

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 Semester 2023

## MSU COLLEGE OF LAW

LAW 535U Trade Secrets, Restrictive Covenants, and Unfair Competition

On Demand. 0 to 6 credits. R: Open to Law students or law advanced students in the MSU College of Law.

Origin, theory, and elements of trade secret, restrictive covenant, and unfair competition law, with a special emphasis on how these cases are litigated, and the proper drafting of enforceable restrictions.

Effective Spring Semester 2023

## DEPARTMENT OF LINGUISTICS, LANGUAGES AND CULTURES

GRM 115 Intensive First Year German

Summer of every year. 5(5-0)

Intensive study of German language, civilization, and culture for beginning students. Continued work on all language skills with emphasis on speaking.

Effective Fall Semester 2022

GRM 215 Intensive Second Year German

Fall of every year. Spring of every year. Summer of every year. 5(5-0) P: (GRM 102 or GRM 115) or designated score on German Placement test

Intensive intermediate-level work on all language skills, based on topics such as popular music, literature, film, current events, and culture. Transition course to advanced work in German studies.

Effective Fall Semester 2022

## DEPARTMENT OF MARKETING

MKT 200 Professional Development in Marketing

Fall of every year. Spring of every year. 1(1-0) R: Open to undergraduate students in the Eli Broad College of Business and The Eli Broad Graduate School of Management or in the Business - Admitted major or approval of department.

Explores the various specialty areas within the field of marketing, including career options for new college graduates and employment trends.

Request the use of the Pass-No Grade (P-N) system. Effective Spring Semester 2023

## PROGRAM IN NEUROSCIENCE

NEU 101 Frontiers in Neuroscience

Fall of every year. Spring of every year. 1(1-0) R: Open to undergraduate students in the Neuroscience Major or in the Lyman Briggs Neuroscience Coordinate Major.

Introduction to the field of neuroscience and recent trends in neuroscience research, including an overview of careers with a degree in neuroscience. Campus and internet resources to achieve academic success and career goals.

Request the use of the Pass-No Grade (P-N) system. Effective Fall Semester 2022

NEU 401 Cellular and Molecular Neuroscience

Fall of every year. Spring of every year. 3(3-0) P: NEU 301 and NEU 302 R: Open to undergraduate students in the Neuroscience Major or in the Lyman Briggs Neuroscience Coordinate Major.

In-depth examination of cellular and molecular mechanisms that regulate function of neurons of the autonomic, sensory, motor, and central nervous systems.

Effective Fall Semester 2022

## COLLEGE OF NURSING

NUR 221 Future of Nursing: Explore Potential Career Opportunities and Graduate Education

Spring of every year. 2(2-0) R: Open to students in the Nursing or Prenursing Major or approval of college.

Fosters student motivation in pursuing advanced degrees in nursing. The course will examine perspectives related to the future of nursing and provide the opportunity for students to explore post-BSN career opportunities and the options for graduate education in nursing.

Effective Spring Semester 2023

## DEPARTMENT OF PHYSICS AND ASTRONOMY

PHY 494 Survey of Physics Education Research (W)

On Demand. 3(3-0) P: (PHY 471 or concurrently) and completion of Tier I writing requirement R: Open to undergraduate students in the Department of Physics and Astronomy or in the Lyman Briggs Physics Coordinate Major or approval of department.

Historical background of physics education research including central findings and relevant learning theories. Topics include student learning and engagement, assessment, attitudes and beliefs, epistemology and framing, and issues of diversity and inclusivity.

Effective Fall Semester 2022

## SCHOOL OF PLANNING, DESIGN AND CONSTRUCTION

UP 816 Advanced Research Methods for Planning and Development

Spring of every year. 3(3-0) P: UP 814 or concurrently R: Open to students in the Master in Urban and Regional Planning Major and open to doctoral students.

Advanced qualitative and quantitative data analysis and research methods for academic research in urban planning and related fields.

Effective Spring Semester 2023

UP 884 Community Engagement: Charrette Systems

On Demand. 3 to 4 credits. R: Open to students in the Master in Urban and Regional Planning Major.

Introduction to Charrettes. Emphasis on collaboration by design, along with advanced collaborative innovation processes.

Effective Fall Semester 2023

## COLLEGE OF SOCIAL SCIENCE

ESP 810 Understanding Trust in the Environmental Governance Context

Fall of odd years. 3(3-0) RB: A basic understanding of the social sciences.

Environmental governance questions through discussions of the nature and dynamics of trust within and among public and governmental stakeholders.

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 Semester 2023

## DEPARTMENT OF TEACHER EDUCATION

TE 910 Youth Language and Literacy in Schools and Communities

Fall of even years. 3(3-0) RB: Courses or work experiences in education, youth or adolescent development and programming, literacy, urban studies, ethnic studies, sociolinguistics

REINSTATEMENT Contemporary research, theory, and practice critically situate school and beyond school language and literacy learning in the lives of youth and their communities. Focus on social justice-oriented work with youth of color and other young people marginalized by systemic inequalities. Increasing understanding of the oral and written communication many young people engage in through their participation in youth cultures. A study of race, class, gender identity, sexuality, ability, and citizenship status as they are lived through languages and literacies by youth and their communities.

Effective Spring Semester 2023

## COLLEGE OF VETERINARY MEDICINE

VM 850 Independent Study

Fall of every year. Spring of every year. Summer of every year. 1 to 9 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.

Non-thesis research for Plan B master's students. Request the use of the Pass-No Grade (P-N) system. Effective Spring Semester 2023

VM 860 Grant Writing in the Biomedical Sciences

Fall of every year. 2(2-0) RB: Minimum 1 year completed in a graduate program and active engagement in biomedical research R: Open to graduate students in the College of Veterinary Medicine or in the Comparative Medicine and Integrative Biology Major.

Practical approach to grant application development, preparation, and submission Effective Spring Semester 2023

# PART III – COURSE CHANGES

## DEPARTMENT OF AGRICULTURAL, FOOD, AND RESOURCE ECONOMICS

AFRE 851 Agribusiness Operations Management

~~Sprin~~g ~~o~~f ~~ever~~y year. On Demand. 3(3-0)

Managerial processes for agribusiness operations control. Applications of linear programming. Budgets, simulations, and dynamic programming. Statistical process control. Predictive and prescriptive analysis.

SA: AEC 851

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2015 Effective Spring Semester 2023

AFRE 865 Agricultural Benefit-Cost Analysis

Fa~~l~~l ~~o~~f ~~ever~~y year. On Demand. 3(3-0)

Benefit-cost analysis of agricultural and natural resource projects, including financial and economic analysis. Case studies in project design and appraisal in low and high income countries.

SA: AEC 865

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2015 Effective Spring Semester 2023

AF~~R~~E 900B

AFRE 900 Appli~~e~~d Microec~~onomic~~s II

Applied Microeconomics

Fall of every year. 3 credits. 3(3-0) P: (AFRE 805 or EC 812A) and (AFRE 835 or EC 820A) Extended empirical analysis of microeconomic problems with emphasis on applications to agriculture, natural resources, and the food sector.

~~SA~~: ~~AE~~C ~~900~~B SA: AFRE 900B

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2020 Effective Spring Semester 2023

AFRE 900A Applied Microeconomics I

Spring of every year. 3 credits. P: (AFRE 805 or EC 812A) and (AFRE 835 or EC 820A) Empirical analysis of microeconomic problems with emphasis on applications to agriculture, natural resources, and the food sector.

SA: AEC 900A DELETE COURSE

Effective Spring Semester 2023

AFRE 930 Dynamic Analysis in Agriculture and Natural Resources

Fa~~l~~l ~~o~~f ~~ever~~y year. On Demand. 3(3-0) RB: AFRE 801 and EC 812A R: Open to doctoral students in the College of Agriculture and Natural Resources or in the Eli Broad College of Business and The Eli Broad Graduate School of Management or in the College of Social Science or approval of department.

Methods of dynamic optimization and their application to agricultural and natural resources problems. Discrete time dynamic programming, calculus of variations, and discrete time maximum principle.

SA: AEC 991E, AEC 930

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2020 Effective Spring Semester 2023

AFRE 932 Information Economics and Institutions in Agriculture and Natural Resources

Fa~~l~~l ~~o~~f ~~ever~~y year. Fall of odd years. 3(3-0) RB: (AFRE 810 or AFRE 841) and (EC 812A and EC 812B) R: Open to doctoral students in the College of Agriculture and Natural Resources or in the Eli Broad College of Business and The Eli Broad Graduate School of Management or in the College of Social Science.

Applications to issues in agriculture, agribusiness, the food system, natural resources, and the environment. Asymmetric information, incomplete markets, principal/agent issues, transaction costs, and the design of contracts and other institutions.

SA: AEC 932

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2015 Effective Spring Semester 2023

## DEPARTMENT OF ART, ART HISTORY, AND DESIGN

ATD 439 Portfolio Development and Exhibition (W)

Fall of every year. 3(3-0) P: (ATD 323) and completion of Tier I writing requirement RB: ATD 335 R: Open to juniors or seniors.

Apparel and textile design philosophies, roles and ethics. Professional portfolio and exhibition(s). Capstone course.

Requ~~es~~t ~~th~~e use ~~o~~f ET~~-Extensio~~n ~~t~~o postpone grading.

T~~h~~e ~~wor~~k ~~fo~~r ~~th~~e ~~cours~~e ~~mus~~t ~~b~~e comp~~lete~~d ~~an~~d ~~th~~e final gr~~ad~~e re~~porte~~d wi~~thi~~n 1 semester ~~afte~~r ~~th~~e ~~en~~d ~~o~~f ~~th~~e ~~semeste~~r ~~o~~f enrollment.

SA: HED 439

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2018 Effective Spring Semester 2023

## COLLEGE OF ARTS AND LETTERS

ACM 868 ~~Non-Profi~~t ~~fo~~r ~~Arts~~, ~~Cultural~~, ~~an~~d Mus~~eu~~m Management

Non-Profit Law for Arts, Cultural, and Museum Management

Fall of every year. Spring of every year. 3(3-0) P: ACM 801 or concurrently R: Open to graduate students in the College of Arts and Letters or approval of college.

Legal issues pertaining to the creation and operation of cultural business entities, including nonprofit organizations. Exploration of relevant aspects of nonprofit and business law, finances and taxes, contracts, intellectual property, constitutional law, artists’ moral and economic rights, estate planning for individuals and organizations. Historical and contemporary examination of reparations of cultural property.

SA: AL 868

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2021 Effective Spring Semester 2023

DH 861 Digital Humanities Pedagogy

Spring of every year. 3(3-0) ~~P~~: ~~(D~~H ~~86~~5 ~~o~~r co~~ncurrently~~) ~~o~~r (H~~S~~T ~~81~~2 ~~o~~r concurrently)

Teaching with digital tools, technologies, and spaces in the humanities. Key concepts, issues, and approaches for digital pedagogy in different course spaces (physical, digital). Course planning, curricular development, engagement and learning, and evaluation and assessment related to digital humanities pedagogy. Methods for research and scholarship on digital humanities pedagogy (teacher scholarship).

~~SA~~: ~~A~~L 861

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

DH 865 Digital Humanities Methods Seminar

Fall of every year. 3 credits. Not open to students with credit in HST 812.

Brainstorming, creating, and managing digital humanities research projects. Selecting appropriate methodologies, methods, and tools for digital humanities research. Applying project management tools. Seeking funding and support for digital humanities research projects.

~~SA~~: ~~A~~L 865

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

## DEPARTMENT OF COMMUNITY SUSTAINABILITY

CSUS 223B Seminar in Leadership Theory II - Agriculture, Food and Natural Resources Education Spring of every year. 1(1-0) P: CSUS 223A

Practical applications of leadership theory in agriculture, food and natural resources education within Michigan communities.

DELETE COURSE

Effective Fall Semester 2023

CSUS 223C Seminar in Leadership Theory III - Agriculture, Food and Natural Resources Education Spring of every year. 1(1-0) P: CSUS 223B

Applied mentoring and leadership evaluation in formal and nonformal agriculture, food, and natural resources education.

DELETE COURSE

Effective Fall Semester 2023

CSUS 474 Advanced Topics in Tourism Management

Spring of every year. 3(3-0) P: CSUS 273 or HB 100 or GEO 259 R: Open to juniors or seniors or graduate students.

Tourism as a form of economic and community development. Tourism planning, marketing and management. Tourism and sustainability. Tourism research.

SA: PRR 474 DELETE COURSE

Effective Fall Semester 2023

CSUS 826 International Development: Theory and Practice

Fall of even years. ~~Sprin~~g ~~o~~f ev~~er~~y year. 3(3-0) Interdepartmental with Anthropology and Forestry and Political Science and Social Science.

Evolution of international development theory across disciplines. Changing conceptualizations, measurements, processes and effects of development and poverty. Ethnicity, social class, gender, and community influences on socioeconomic processes. Current issues, concerns, and strategic alternatives.

SA: ACR 826, RD 826

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2016 Effective Fall Semester 2022

## COLLEGE OF ENGINEERING

AESC 210 Global Systems: Economics, Engineering, Environment

Fall of every year. Spring of every year. 3(3-0) ~~P~~: ~~(EG~~R ~~10~~2 ~~o~~r ~~CS~~E ~~23~~1 ~~o~~r ~~CS~~E ~~220~~) a~~n~~d (MTH ~~13~~3 ~~o~~r ~~L~~B 1~~1~~9 ~~o~~r MTH 153H) P: (EGR 102 or CSE 231 or CSE 220 or CMSE 202) and (MTH 133

or LB 119 or MTH 153H) R: Not open to freshmen.

Globalization as a process driven by economics, enabled by engineering, and constrained by the environment. Development of systems analysis tools for understanding how these themes interact globally. Enhancement of communication skills through teaming, presentations, and active listening.

SA: EGR 210

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2018 Effective Spring Semester 2023

## DEPARTMENT OF EPIDEMIOLOGY AND BIOSTATISTICS

~~LC~~S 829

EPI 829 Design and Co~~nduc~~t ~~o~~f Epidemiological Stud~~ie~~s and Clinical Trials Principles and Methods of Epidemiologic Study Design

Spring of every year. 3(2-2) 3(3-0) ~~Interdepartmental with Epidemiology P: (VM 533 or EPI 810)~~ ~~an~~d ~~(EP~~I ~~80~~8 or ~~EP~~I 808B) P: EPI 810 RB: EPI 810 R: Open to graduate students in the Department of Epidemiology and Biostatistics or in the Department of Large Animal Clinical Sciences or approval of department.

Applied analytical methods in experimental design. Assessment of health and disease status of animal and human populations. Risk assessment and interpretation of clinical ~~trials~~. Principles and methods of epidemiologic study design to maximize etiologic inference in human populations. Covers randomized trials, cohort studies, case-control studies, cross-sectional studies, ecological studies, and sources of bias.

SA: LCS 829

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

## DEPARTMENT OF FAMILY MEDICINE

~~H~~M 618

FM 619 Telemedicine Experiences in Rural Clinical Settings

On Demand. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. P: HM 556 R: Open to graduate-professional students in the College of Human Medicine.

Clinical, biopsycosocial, documentation, and ethical aspects of telehealth to address health conditions and patient needs.

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 618

~~Effectiv~~e Spring ~~Semeste~~r 2020 Effective Spring Semester 2023

## DEPARTMENT OF GEOGRAPHY, ENVIRONMENT, AND SPATIAL SCIENCES

GEO 201 Introduction to Plant Geography

Spring of even years. 3(3-0) R: ~~No~~t ~~ope~~n ~~t~~o gradu~~at~~e students.

Geographic distribution and characteristics of plants throughout the world; relationships between biomes and aspects of the physical environment (climate, soils, landforms, disturbance); plant ecology; human impacts on vegetation; optional field trip on campus. ~~Effectiv~~e Spring ~~Semeste~~r 2024 Effective Spring Semester 2023

GEO 302 Climates of the World

Fall of odd years. 3(3-0) RB: GEO 206 or GEO 203 ~~R~~: ~~No~~t open ~~t~~o freshmen.

Regional climates and underlying atmospheric circulation patterns. Climate classification, physical climatic processes, spatial and temporal aspects of climate, climate changes.

Sources and use of climate data.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 333 Geography of Michigan and the Great Lakes Region ~~Sprin~~g ~~o~~f ~~ever~~y year. Spring of odd years. 3(3-0)

Michigan's physical, historical, and economic geography. Interrelationships between the physical environment (rocks, landforms, soils, climate, vegetation, hydrology) and historical and contemporary land uses. Demographic and agricultural patterns. Human history and settlement patterns. Contemporary recreational opportunities.

SA: GEO 233

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 401 Global Plant Geography

Fall of odd years. 3(3-0) P: GEO 201 or FOR 101 or FOR 204 or PLB 218 or IBIO 355 or approval of department ~~R~~: ~~No~~t ~~ope~~n ~~t~~o freshmen.

Patterns of global plant distributions. Plant-atmosphere interactions, ecological processes, biogeographic patterns and predictive models of plant distributions.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2021 Effective Spring Semester 2023

GEO 402 Agricultural Climatology

Fall of even years. 3(3-0) Interdepartmental with Biosystems Engineering. P: MTH 110 or MTH 116 ~~R~~: ~~No~~t ~~ope~~n ~~t~~o ~~freshme~~n ~~o~~r sophomores.

Relationships between climate and agriculture in resource assessment, water budget analysis, meteorological hazards, pests, crop-yield modeling, and impacts of global climate change.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 403 Dynamic Meteorology (W)

Spring of odd years. 3(3-0) P: (MTH 234 and GEO 203) and completion of Tier I writing requirement RB: GEO 405 ~~R~~: ~~Ope~~n ~~t~~o juniors ~~o~~r seni~~or~~s ~~o~~r master's stude~~nt~~s ~~o~~r ~~doctora~~l students.

Principles of fluid dynamics and their application to the atmosphere. ~~Effectiv~~e Spring ~~Semeste~~r 2019 Effective Spring Semester 2023

GEO 408 Soil Geomorphology

Fall of odd years. 4(3-2) P: CSS 210 or GEO 306 or GLG 201 or GEO 206 or ISP 203A or ISP 203B or ISP 203L or approval of department ~~R~~: ~~No~~t ~~ope~~n ~~t~~o freshmen.

Soil formation and its relationship to landforms and landscapes. Common geographic relationships among soils, landforms, and vegetation. Description, analysis, and genesis of soils, surficial processes and landscapes.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2020 Effective Spring Semester 2023

GEO 410 Geography of Food and Agriculture

Fall of even years. 3(3-0) RB: GEO 113 or GEO 151 or GEO 204 or GEO 206 ~~R~~: ~~No~~t open to ~~freshme~~n ~~o~~r sophomores.

Spatial patterns of contemporary global agriculture and food systems. Human- environment geography of select agricultural practices and food systems. Effects of agricultural practices on natural and human resources.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 411 Stream Systems and Landforms

Spring of even years. 3(3-0) RB: GEO 206 or GEO 306 or GLG 201 or GLG 431 ~~R~~: ~~No~~t ~~ope~~n to ~~freshme~~n ~~o~~r sophomores.

Themes associated with stream systems. Evolution of drainage basins and channel hydrology. The nature of flowing water, stream discharge, and flooding. Controls of stream behavior. Channel patterns and landform development. Character of Michigan stream systems. Field project.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 413 Urban Geography

Spring of every year. 3(3-0) Interdepartmental with Urban Planning. ~~R~~: ~~No~~t open ~~t~~o ~~freshme~~n or sophomores.

Theories and models of urban spatial form. Underlying structures and processes. Socio- spatial dimensions of modern urbanism. Differentiation and locational conflict in residential, commercial, and industrial space.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 414 Geography of Transportation

Fall of odd years. 3(3-0) Interdepartmental with Urban Planning. P: GEO 113 ~~R~~: ~~No~~t open to freshmen.

Spatial principles of transportation. Theories of interaction, network structures, and location-allocation models. Role of transport and transport planning.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 415 Location Theory and Land Use Analysis

Fall of even years. 3(3-0) Interdepartmental with Urban Planning. P: GEO 113 or UP 201 RB: EC 201 or EC 202 ~~R~~: ~~No~~t ~~ope~~n ~~t~~o ~~freshme~~n ~~o~~r sophomores.

Classical and neoclassical, static and dynamic models of industrial location and spatial organization. Land rent theory. Central place theory. Multi-locational organization. Growth transmission.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 418 The Ghetto

Fall of odd years. 3(3-0) Interdepartmental with Urban Planning. ~~R~~: ~~No~~t ~~ope~~n ~~t~~o freshmen or sophomores.

Analysis of the ghetto including its spatial organization and structure. Distribution of racial and ethnic populations. Emphasis on U.S. cities.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 435 Geography of Health and Disease

Fall of every year. 3(3-0) ~~R~~: ~~No~~t ~~ope~~n ~~t~~o fres~~hme~~n ~~o~~r sophomores.

Spatio-environmental concepts and techniques applied to health problems. Disease transmission cycles, community nutrition, and health-care planning.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 436 Spatial Analysis of Populations

Spring of odd years. 3(3-0) ~~R~~: ~~No~~t open ~~t~~o ~~freshme~~n ~~o~~r sophomores.

Concepts and methods to measure and evaluate geo-spatial and temporal trends in populations and their components, such as natality, mortality, migration, and characteristics at different geographic scales. Sources of spatial population data. Visualization and analysis of data in a geographical information system.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 440 ~~Critica~~l Geopolitics Geopolitics

Spring of even years. 3(3-0) R: ~~No~~t ~~ope~~n ~~t~~o freshmen.

Political geographies of origins and conduct of nation-states. Identity-place dynamics. Colonialism and imperialism. Geopolitics and geopolitical ideas. Resource and environmental politics. Resistance and terrorism.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 441 Cultural Geography

Spring of odd years. 3(3-0) ~~RB: GEO 151 R~~: ~~No~~t ~~ope~~n ~~t~~o freshmen.

Survey of the geographic study of world cultures, cultural ecologies, cultural landscapes, and cultural influences on societies’ patterns of spatial organization.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2017 Effective Spring Semester 2023

GEO 480 ~~Semina~~r in Geogra~~phy~~, Environmen~~t~~, ~~an~~d S~~patia~~l Scienc~~e~~s (W) Undergraduate Seminar in Geography (W)

Fall of every year. 3(3-0) P: Completion of Tier I Writing Requirement RB: For undergraduate students with a major or minor in the Department of Geography, Environment, and Spatial Sciences

Professio~~na~~l developmen~~t~~, ~~history~~, philosoph~~y~~, ~~an~~d methodology ~~i~~n geography, environme~~nt~~, ~~an~~d spatial scien~~ces~~. Professional development, history, philosophy, and methodology in the geographic discipline.

Effective Spring Semester 2023

## DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY STUDIES

HDFS 322L Interaction and Curriculum for Infants and Toddlers–Laboratory

Fall of every year. Spring of every year. 1(0-2) 2(0-4) R: Open to students in the Department of Human Development and Family Studies. C: HDFS 322 concurrently.

Applying principles of interaction to individuals and small groups of infants and toddlers in early childhood settings. Planning developmentally supportive learning opportunities.

Supervised practice implementing and evaluating individualized learning opportunities in group care and education settings.

~~Effectiv~~e Spring ~~Semeste~~r 2018 Effective Spring Semester 2023

HDFS 960 Applied Multivariate Data Analysis

Fa~~l~~l ~~o~~f ~~ever~~y year. Spring of every year. 3(3-0) RB: HDFS 881 R: Open to graduate students in the Department of Human Development and Family Studies.

Application of quantitative techniques to the analysis of multivariate data. ~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2018 Effective Fall Semester 2023

## SCHOOL OF HUMAN RESOURCES AND LABOR RELATIONS

HRLR 819 Negotiation and Conflict Resolution

Spring of every year. 3(3-0) ~~P~~: ~~HRL~~R 813 ~~o~~r HRLR 858 P: HRLR 813 or approval of school R: Open to graduate students in the School of Human Resources and Labor Relations or approval of school.

Negotiation and conflict resolution in the employment relationship. Use of experiential simulations to develop bargaining styles and interpersonal process skills.

SA: LIR 860

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2020 Effective Spring Semester 2023

HRLR 821 Talent Acquisition and Deployment

Spring of every year. 3(3-0) ~~P~~: ~~HRL~~R 820 R: Open to graduate students in the School of Human Resources and Labor Relations or approval of school.

Process by which organizations acquire, retain, and deploy the organization’s workforce. Planning, recruiting, selecting, placing, and managing turnover and evaluation.

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2020 Effective Spring Semester 2023

HRLR 825 Compensation

Fall of every year. Spring of every year. 3(3-0) ~~P~~: ~~HRL~~R 820 R: Open to graduate students in the School of Human Resources and Labor Relations or approval of school.

Concepts, principles, theories, tools and techniques in the design and administration of employee compensation systems. Strategic, managerial, and operational considerations and roles in compensation system design.

SA: LIR 825

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2013 Effective Spring Semester 2023

HRLR 899 Master's Thesis Research

Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: 9 graduate credits. R: Open to students in the School of Human Resources and Labor Relations. Approval of school.

Master's thesis research.

Request the use of the Pass-No Grade (P-N) system. SA: LIR 899

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2013 Effective Spring Semester 2023

## DEPARTMENT OF LINGUISTICS, LANGUAGES AND CULTURES

ARB 360 Arabic Language and Society

Fall of every year. 3(3-0) P: (ARB 202) and completion of Tier I writing requirement

Historical, social, linguistic and cultural developments in the Arabic-speaking world as revealed in textual material in Arabic, including literature, essays, and film. Taught in Arabic and English.

DELETE COURSE

Effective Spring Semester 2023

FLT 807 Foreign Language Teaching Methods

Fall of every year. Summer of every year. 3(3-0) ~~R~~: ~~Ope~~n ~~t~~o grad~~uat~~e studen~~t~~s ~~i~~n ~~th~~e Foreign Langua~~g~~e Teac~~hin~~g Ma~~jo~~r ~~o~~r appr~~ova~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department.

History of methods in foreign language instruction. Current practices in language teaching, materials design, and classroom management. Techniques in teaching culture, listening, speaking, reading, and writing at various levels of student proficiency in the foreign language. How to motivate and maintain motivation. Strategies instruction and targeting advanced proficiency.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

FLT 808 Assessment for Foreign Language Teaching

Spring of every year. 3(3-0) ~~R~~: ~~Ope~~n ~~t~~o gradua~~t~~e ~~student~~s in ~~th~~e Foreign Langu~~ag~~e Teachi~~n~~g Major ~~o~~r appr~~ova~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department. Not open to students with credit in LLT 808.

Classroom diagnostic and achievement assessment. Reliability and validity of language tests. Standardized and performance-based testing. Program-level assessment.

Measuring language proficiency in listening, speaking, reading, writing, and grammar, and as integrated skills. Formative and summative assessment. Alternative assessment methods.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

FLT 815 Teaching Culture in Foreign Language Courses

Spring of every year. 3(3-0) ~~R~~: ~~Ope~~n ~~t~~o gradua~~t~~e ~~student~~s in ~~th~~e Foreign Langu~~ag~~e Teachi~~n~~g Major ~~o~~r appr~~ova~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department.

Methodologies for teaching culture in foreign language courses. Definitions of culture. Interrelatedness of language and culture. Application of theory to development of culture teaching strategies for any foreign language course.

SA: AL 815

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

FLT 817 Foreign Language Program Development and Administration

Spring of every year. 3(3-0) ~~R~~: ~~Ope~~n ~~t~~o gradua~~t~~e ~~student~~s in ~~th~~e Foreign Langu~~ag~~e Teachi~~n~~g Major ~~o~~r appr~~ova~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department.

Current issues in language program administration and development. Practical application of theory in foreign language program development, marketing, articulation, technology integration, supervision, curriculum design, program evaluation, and teacher training.

SA: AL 817

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

FLT 841 Topics in Foreign Language Teaching

Fall of odd years. 3(3-0) ~~R~~: ~~Ope~~n ~~t~~o gradua~~t~~e st~~udent~~s ~~i~~n the Foreign Language Teachi~~n~~g ~~Majo~~r or appr~~ova~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department. Not open to students with credit in LLT 841.

Selected topics and issues in foreign language learning and teaching. ~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

FLT 845 Language Concepts for Foreign Language Teaching

Fall of every year. 3(3-0) ~~R~~: ~~Ope~~n ~~t~~o gradua~~t~~e ~~student~~s ~~i~~n the Foreign Language Teachi~~n~~g ~~Majo~~r or appr~~ova~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department.

Methodologies for teaching phonological, morphological, syntactic, lexical, discourse and pragmatic systems in foreign language courses.

SA: AL 845

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

FLT 860 Foreign Language Acquisition

Spring of every year. Summer of every year. 3(3-0) ~~R~~: ~~Ope~~n ~~t~~o graduate stude~~nt~~s ~~i~~n ~~th~~e Foreign Langua~~g~~e Teac~~hin~~g Ma~~jo~~r ~~o~~r appr~~ova~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department. Not open to students with credit in LLT 860.

Factors in foreign language learning such as age, motivation, language input and interaction, social influences, the role of the native language, and language universals. ~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

FLT 881 Teaching Foreign Language with Technology

Fall of every year. 3(3-0) ~~R~~: ~~Ope~~n ~~t~~o gradua~~t~~e ~~student~~s ~~i~~n the Foreign Language Teachi~~n~~g ~~Majo~~r or appr~~ova~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department. Not open to students with credit in AL 881.

Teaching a foreign language with technology. Web applications for online foreign language instruction, hybrid learning, and distance learning. Feedback in online environments, including within computer-mediated communication. Online materials development. Creating interaction online. Online task development, evaluation of online tasks. Creating foreign language class web pages.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

FLT 898 Master’s Comprehensive Foreign Language Teaching Portfolio Examination

Fall of every year. Spring of every year. Summer of every year. 1(1-0) ~~R~~: ~~Ope~~n ~~t~~o graduate ~~student~~s ~~i~~n the Fo~~reig~~n Langu~~ag~~e Teaching ~~Majo~~r ~~o~~r approv~~a~~l ~~o~~f department. R: Open to graduate students in the Foreign Language Teaching Major or in the Foreign Language Teaching Graduate Certificate or approval of department. Not open to students with credit in LLT 899.

Final comprehensive portfolio exam.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2021 Effective Spring Semester 2023

GRM 461 Applied Linguistics for German Learners and Teachers

Spring of even years. 3(3-0) P: GRM 301 or GRM 302 or GRM 303 or GRM 304 or GRM 311 or approval of department ~~C~~: ~~GR~~M ~~46~~0 concurrently.

Overview of applied linguistic topics relevant for both students of German and future teachers of German. Issues of contemporary language use, the connection between culture and language. Overview of second language acquisition principles. Introduction to effective audiodidactic or pedagogical techniques for language and culture learning.

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2020 Effective Spring Semester 2023

## DEPARTMENT OF MANAGEMENT

MGT 460 Capstone for Management Majors (W)

Fall of every year. Spring of every year. 3(2-2) 3(3-0) P: (MGT 315 or concurrently) or (MGT 325 or concurrently) R: Open to seniors in the Human Resource Management Major or in the Management Major or in the Retail Management Minor or in the Sports Business Management Minor.

Topics in management and organizational behavior.

~~Effectiv~~e Spring ~~Semeste~~r 2017 Effective Spring Semester 2023

## COLLEGE OF NATURAL SCIENCE

NSC 820 Scanning Electron Microscopy; Energy Dispersive X-ray Microanalysis

Fall of every year. Spring of every year. 3(2-2) RB: NSC 802 or concurrently

~~Us~~e ~~o~~f scanning electron microscope ~~an~~d en~~erg~~y dispersive ~~x-ra~~y microan~~alysis~~. Machine variab~~les~~, artifa~~cts~~, quantitative ana~~lysis~~, spec~~ime~~n prepar~~ation~~, darkr~~oo~~m procedures.

Scanning electron microscopy and energy dispersive x-ray microanalysis theory and practice. Machine variables, artifacts, quantitative analysis, specimen preparation ~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2000 Effective Spring Semester 2023

## COLLEGE OF NURSING

NUR 220 Introduction to Nursing Scholarship

Fall of every year. ~~Sprin~~g ~~o~~f ev~~er~~y year. 2(2-0) RB: Open to other majors with College approval. R: Open to students in the Prenursing major or in the Nursing major.

Prepares students to become consumers of research who critically evaluate and base their nursing care on evidence. Research methodologies essential to providing evidence- based nursing care.

~~Effectiv~~e Spring ~~Semeste~~r 2013 Effective Spring Semester 2023

NUR 921 Scientific Foundations of Nursing Knowledge Development

Fall of every year. 3(3-0) R: Open to graduate students in the College of Nursing.

Philosophical, epistemological, ontological, ~~an~~d ethical foundatio~~n~~s ~~o~~f nursi~~ng~~. Historical ~~factor~~s ~~an~~d new persp~~ective~~s ~~i~~n ~~th~~e evolution ~~o~~f nursing ~~theory~~. The course will focus on a systematic search and literature synthesis plus identification of a clinical problem and gap in the science related to the students’ area of interest. Students will analyze a concept of research interest and evaluate theoretical models and frameworks for exploring the clinical problem.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2018 Effective Spring Semester 2023

NUR 939 Improving Health Outcomes: Scientific Foundations

Spring of every year. 4(4-0) 3(3-0) P: NUR 921 or approval of college R: Open to doctoral students in the College of Nursing or in the Nursing Major.

Application of the state of the science to wellness, risk reduction and chronic illness outcomes for populations across the lifespan from a nursing perspective.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2018 Effective Spring Semester 2023

## DEPARTMENT OF PHYSICS AND ASTRONOMY

AST 207 The Science of Astronomy

Fall of every year. 3(3-0) ~~P~~: ~~((PH~~Y ~~23~~1 ~~o~~r concu~~rrently~~) ~~o~~r (P~~H~~Y ~~231~~C ~~o~~r concurre~~ntly~~) or (PHY ~~18~~3 ~~o~~r concurr~~ently~~) ~~o~~r ~~(PH~~Y ~~183~~B ~~o~~r concurrent~~ly~~) ~~o~~r ~~(IS~~P ~~20~~5 ~~o~~r concurr~~ently~~) ~~o~~r ~~(L~~B 2~~7~~3 or concurre~~ntly)~~) ~~an~~d ~~((MT~~H 114 ~~o~~r concurrent~~ly~~) ~~o~~r ~~(MT~~H ~~11~~6 ~~o~~r concurrent~~ly~~) ~~o~~r ~~(MT~~H ~~13~~2 or concurrently)) P: ((PHY 231 or concurrently) or (PHY 231C or concurrently) or (PHY 183 or concurrently) or (PHY 183B or concurrently) or (PHY 173 or concurrently) or (LB 273 or concurrently)) and ((MTH 114 or concurrently) or (MTH 116 or concurrently) or (MTH 132 or concurrently))

In-depth study of one topic in astronomy with emphasis on key discoveries. Topics may be cosmology, the solar system, and the life of stars.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2013 Effective Spring Semester 2023

AST 208 Planets and Telescopes

Spring of every year. 3(2-2) P: (PHY 183 or PHY 183B or PHY 193H or LB 273) and ((MTH 103 or concurrently) or (MTH 114 or concurrently) or (MTH 116 or concurrently) or (MTH 132 or concurrently) or (LB 118 or concurrently)) RB: AST 207 R: Open to undergraduate students in the Astrophysics Major or in the LB-Astrophysics Coordinate Major.

Origin and nature of the solar system. Planets of the solar system and other star systems. Determination of time and celestial coordinates. Astronomical instruments and observational methods.

SA: AST 303, AST 312

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2013 Effective Spring Semester 2023

PHY 174 Studio Physics for Scientists and Engineers II

Fall of every year. Spring of every year. 5(4-2) ~~P~~: ~~{(PH~~Y ~~17~~3 ~~o~~r ~~L~~B ~~273~~) ~~o~~r (P~~H~~Y ~~18~~3 a~~n~~d ~~PH~~Y 191) ~~o~~r ~~(PH~~Y ~~183~~B ~~an~~d ~~PH~~Y 1~~91~~) ~~o~~r ~~(PH~~Y 193H ~~an~~d ~~PH~~Y 1~~91)~~} ~~an~~d ~~((MT~~H 133 ~~o~~r concurrent~~ly~~) or (MTH ~~153~~H ~~o~~r concurre~~ntly~~) or ~~(L~~B ~~11~~9 ~~o~~r concurrently)) P: (PHY 173 or LB 273 or PHY 183 or PHY 183B or PHY 193H) 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 184B or PHY 192 or PHY 222 or PHY 232 or PHY 232c or PHY 234b or PHY 242 or PHY 294H.

Basic principles of electricity and magnetism, development of scientific skills and problem- solving through integrated physics laboratory and discussion.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2020 Effective Spring Semester 2023

PHY 321 Classical Mechanics I

Fall of every year. Spring of every year. 3(3-0) ~~P~~: ~~((PH~~Y ~~21~~5 ~~o~~r concurrently) ~~o~~r ~~(PH~~Y ~~215~~B or concurre~~ntly~~) or (MTH ~~23~~5 ~~o~~r concurre~~ntly~~) or (MTH ~~34~~0 ~~o~~r concurre~~ntly~~) or (MTH ~~347~~H or concurre~~ntly)~~) ~~an~~d ~~CMS~~E 201 P: ((MTH 235 or concurrently) or (MTH 340 or concurrently) or (MTH 347H or concurrently)) and CMSE 201 and ((PHY 215 or concurrently) or (PHY 215B or concurrently))

Newtonian point particles. Oscillations. One-particle chaos. Central-force motion. Systems of particles.

~~Effectiv~~e Spring ~~Semeste~~r 2020 Effective Spring Semester 2023

## SCHOOL OF PLANNING, DESIGN AND CONSTRUCTION

UP 801 Concep~~t~~s ~~an~~d I~~ssue~~s ~~i~~n Planni~~n~~g and Development Planning History and Theory

Fall of every year. 4(4-0) 3(3-0)

~~Urba~~n ~~an~~d regi~~ona~~l planni~~n~~g a~~n~~d developme~~nt~~. Histo~~r~~y ~~o~~f ~~th~~e planni~~n~~g prof~~ession~~. Current urban ~~issue~~s a~~n~~d plann~~in~~g approac~~hes~~. Examines the concepts, history and theory of urban planning and development in the United States.

~~Effectiv~~e Spring ~~Semeste~~r 2018 Effective Fall Semester 2023

UP 814 Appli~~e~~d Resear~~c~~h ~~Method~~s for Planni~~n~~g a~~n~~d Development Methods for Investigation of Urban Systems

Spring of every year. 4(3-2) 3(3-0) RB: UP 801

Techniques in urban and regional planning analysis. Forecasting models. Methods of urban project evaluation.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2016 Effective Fall Semester 2023

UP 823 ~~Urba~~n Land Management and ~~th~~e Environment Planning Process and Development Review

Fall of every year. 3(3-0) RB: UP 801 or concurrently

Concep~~ts~~, prin~~ciples~~, tool~~s~~, ~~an~~d techniqu~~e~~s ~~o~~f ~~urba~~n a~~n~~d region~~a~~l l~~an~~d manag~~ement~~. Land ~~us~~e plann~~ing~~, p~~ubli~~c faci~~lities~~, in~~frastructur~~e lo~~cation~~, and environmen~~ta~~l sens~~itivit~~y ~~i~~n land managemen~~t~~. Introduction to land use including history, approaches, policy, current challenges, and techniques employed by the private and public sector to manage the use of land.

~~Effectiv~~e ~~Summe~~r ~~Semeste~~r 2012 Effective Fall Semester 2023

UP 824 Geogra~~phi~~c Info~~rmatio~~n Systems ~~an~~d Desi~~g~~n T~~ool~~s ~~fo~~r Planning Geographic Information Systems for Planning

Fall of every year. 3(0-3) R: Open to graduate students in the Master in Urban and Regional Planning or approval of school.

Introduction to geographic information systems and its applicability to planning. Methods and techniques for analyzing land use and planning issues.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2020 Effective Fall Semester 2023

UP 844 Planning Theory and Ethics

Fall of every year. 3(3-0) RB: UP 801

The planning and development process. Decision making in a political context. Professional ethics and practice. Gender, class, race and ethnicity in relationship to planning and development.

DELETE COURSE

Effective Spring Semester 2024

UP 854 Economics of Planning and Development

Fall of every year. 4(4-0) 3(3-0) RB: UP 801

Physical urban environment and local economic development. ~~Effectiv~~e Spring ~~Semeste~~r 2018 Effective Fall Semester 2023

UP 855 ~~Urba~~n Sustainabili~~t~~y ~~an~~d Clim~~at~~e Change

Environmental Planning and Climate Change

Fall of even years. 3(3-0) Not open to students with credit in UP 455.

Urban sustainability in the context of the global climate change, tools for sustainability planning, adaptation to climate change, risk and vulnerability in different climate zones ~~Effectiv~~e Spring ~~Semeste~~r 2021 Effective Fall Semester 2023

UP 865 Planning ~~an~~d Developm~~en~~t Law

Planning and Development Law and Ethics Spring of every year. 3(3-0) RB: UP 801

Constitutional and statutory bases for planning and development. Effects of case law on design, administration, and implementation of regulations.

~~Effectiv~~e Spring ~~Semeste~~r 2018 Effective Fall Semester 2023

UP 889 Master's Research

Fall of every year. Spring of every year. Summer of every year. 1 ~~t~~o 3 credits. 2(2-0) A ~~studen~~t may ~~ear~~n a maximum ~~o~~f ~~1~~2 ~~credit~~s ~~i~~n ~~al~~l enrollmen~~t~~s ~~fo~~r ~~thi~~s course. R: Open to master's students in the Master in Urban and Regional Planning. Approval of school.

Supervis~~e~~d individu~~a~~l research ~~fo~~r ~~Pla~~n B master's. Supervised individual master's research.

Request the use of the Pass-No Grade (P-N) system. ~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2015 Effective Fall Semester 2023

UP 899 Master's Thesis Research

Fall of every year. Spring of every year. Summer of every year. 1 ~~t~~o 4 credits. 1 to 6 credits. ~~A~~ ~~studen~~t ~~ma~~y ea~~r~~n a maximum ~~o~~f 8 ~~credit~~s ~~i~~n ~~al~~l enrollments ~~fo~~r ~~thi~~s course. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open to master's students in the Master in Urban and Regional Planning. Approval of school.

Master's thesis research.

Request the use of the Pass-No Grade (P-N) system. ~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2021 Effective Fall Semester 2023

## DEPARTMENT OF POLITICAL SCIENCE

PLS 491H Senior Honors Thesis

Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. ~~P~~: ~~PL~~S 481H P: PLS 200 and PLS 201 or approval of department

Original research and writing under direction of a faculty member. ~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2014 Effective Spring Semester 2023

## DEPARTMENT OF STATISTICS AND PROBABILITY

STT 200 Statistical Methods

Fall of every year. Spring of every year. Summer of every year. 3(4-0) ~~P~~: (MTH ~~10~~1 ~~o~~r MTH ~~10~~2 or MTH 103 or MTH 110 or MTH 116 or MTH 124 or MTH 132 or LB 118) or designated score on ~~Mathematic~~s Placement test P: (MTH 102 or MTH 103 or MTH 116 or LB 117 or MTH 124 or MTH 132 or LB 118) or designated score on Mathematics Placement test R: Open to undergraduate students. Not open to students with credit in STT 201 or STT 421.

Data analysis, probability models, random variables, estimation, tests of hypotheses, confidence intervals, and simple linear regression.

~~Effectiv~~e Spring ~~Semeste~~r 2018 Effective Spring Semester 2023

STT 201 Statistical Methods

Fall of every year. Spring of every year. Summer of every year. 4(3-2) ~~P~~: (MTH ~~10~~1 ~~o~~r MTH ~~10~~2 or MTH 103 or MTH 110 or MTH 116 or MTH 124 or MTH 132 or LB 118) or designated score on ~~Mathematic~~s Placement test P: (MTH 102 or MTH 103 or MTH 116 or LB 117 or MTH 124 or MTH 132 or LB 118) or designated score on Mathematics Placement test R: Open to undergraduate students. Not open to students with credit in STT 200 or STT 421.

Probability and statistics with computer applications. Data analysis, probability models, random variables, tests of hypotheses, confidence intervals, simple linear regression. Weekly lab using statistical software.

~~Effectiv~~e Spring ~~Semeste~~r 2018 Effective Spring Semester 2023

STT 464 Statistics for Biologists

Fall of every year. 3(3-0) Interdepartmental with Animal Science and Crop and Soil Sciences. P: MTH ~~10~~3 ~~o~~r MTH ~~11~~0 ~~o~~r MTH ~~11~~6 ~~o~~r MTH 132 P: MTH 103 or MTH 116 or MTH 124 or MTH 132 RB: STT 421

Biological random variables. Estimation of population parameters. Testing hypotheses. Linear correlation and regression. Analyses of counted and measured data to compare several biological groups including contingency tables and analysis of variance.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2016 Effective Spring Semester 2023

## OFFICE OF THE PROVOST

UGS 200H Honors Research Seminar

Fall of every year. 1 ~~t~~o 4 credits. 3(2-2) A ~~studen~~t ~~ma~~y earn a ~~maximu~~m ~~o~~f 4 ~~credit~~s ~~i~~n all enrol~~lment~~s ~~fo~~r ~~thi~~s course. R: Open to freshmen or sophomores in the Honors College or approval of college.

Introduction to research and inquiry. Special disciplinary research topics proposed to engage the interests of Honors College students in the scholarly life of the university. 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.

~~Effectiv~~e Fa~~l~~l ~~Semeste~~r 2015 Effective Fall Semester 2023