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

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
November 8, 2016

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 Construction Management in the School of Planning, Design and Construction to the following. The University Committee on Undergraduate Education (UCUE) approved this request at its October 6, 2016 meeting.

a. Under the heading Admission as a Junior make the following changes:

   (1) Replace item 2. with the following:

   Completion of the following courses with a minimum grade of 2.0 in each course:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 124</td>
<td>Survey of Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 231</td>
<td>Introductory Physics I</td>
<td>3</td>
</tr>
<tr>
<td>STT 200</td>
<td>Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>STT 201</td>
<td>Statistical Methods</td>
<td>4</td>
</tr>
<tr>
<td>STT 315</td>
<td>Introduction Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STT 421</td>
<td>Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>EC 201</td>
<td>Introduction to Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>EC 202</td>
<td>Introduction to Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>CMP 101</td>
<td>Principles of Construction Management</td>
<td>2</td>
</tr>
<tr>
<td>CMP 124</td>
<td>Residential Construction Materials and</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Methods</td>
<td></td>
</tr>
<tr>
<td>CMP 210</td>
<td>Commercial Construction Methods</td>
<td>3</td>
</tr>
<tr>
<td>CMP 211</td>
<td>Building Codes</td>
<td>3</td>
</tr>
<tr>
<td>CMP 222</td>
<td>Statics and Strengths of Materials</td>
<td>3</td>
</tr>
<tr>
<td>CMP 230</td>
<td>Utility Systems</td>
<td>4</td>
</tr>
</tbody>
</table>

   (2) Add the following item 3.:

   Have either a cumulative grade-point average of 3.00 in the CMP courses listed in item 2. or a cumulative MSU grade-point average of 3.00.

   (3) Replace paragraph three with the following:

   While meeting all of the criteria above is necessary to be considered for admission to the Bachelor of Science Degree in Construction Management, it does not guarantee admission. Other factors such as work experience, personal experience, and diversity may also be considered.

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

   (1) In item 3. a. add the following note:

   Students must have a minimum grade-point of 2.00 in each of the following courses: CMP 305, 311, 315, 322, 325, 328, 385, 401, 415, and 423.

Effective Spring 2017.
COLLEGE OF ARTS AND LETTERS

1. Change the name of the Minor in American Indian Studies to Minor in American Indian and Indigenous Studies in the College of Arts and Letters.

Students admitted to the minor prior to Spring 2017 will be awarded a Minor in American Indian Studies.

Students admitted to the minor Spring 2017 and forward will be awarded a Minor in American Indian and Indigenous Studies.

Effective Spring 2017.

2. Change the requirements for the Minor in American Indian and Indigenous Studies in the College of Arts and Letters.

a. Under the heading Requirements for the Minor in American Indian and Indigenous Studies replace the entire entry with the following:

The student must complete a minimum of 15 credits from the following:

<table>
<thead>
<tr>
<th>CREDITS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The following course (3 credits): AL 202 Introduction to American Indian and Indigenous Studies 3</td>
<td></td>
</tr>
<tr>
<td>2. Complete at least three of the courses from two colleges (9 credits):</td>
<td></td>
</tr>
<tr>
<td>College of Arts and Letters</td>
<td></td>
</tr>
<tr>
<td>ENG 354 Readings in Native American Literature 3</td>
<td></td>
</tr>
<tr>
<td>HA 253 Native North American Art 3</td>
<td></td>
</tr>
<tr>
<td>HA 254 Latin American Art 3</td>
<td></td>
</tr>
<tr>
<td>LL 151 First-Year Less Commonly Taught Language I 4</td>
<td></td>
</tr>
<tr>
<td>LL 152 First-Year Less Commonly Taught Language II 4</td>
<td></td>
</tr>
<tr>
<td>LL 251 Second-Year Less Commonly Taught Language I 4</td>
<td></td>
</tr>
<tr>
<td>LL 252 Second-Year Less Commonly Taught Language II 4</td>
<td></td>
</tr>
<tr>
<td>REL 306 Native American Religions 3</td>
<td></td>
</tr>
<tr>
<td>LL 151, LL 152, LL 251, and LL 252 must be approved in advance by the program director to ensure appropriate content. LL 151 and LL 152 may be used for this requirement only if they are not also being used to satisfy a college or departmental language requirement.</td>
<td></td>
</tr>
<tr>
<td>College of Social Science</td>
<td></td>
</tr>
<tr>
<td>ANP 411 North American Indian Ethnography 3</td>
<td></td>
</tr>
<tr>
<td>ANP 432 American Indian Women 3</td>
<td></td>
</tr>
<tr>
<td>ANP 433 Contemporary American Indian Communities 3</td>
<td></td>
</tr>
<tr>
<td>ANP 452 North American Archaeology 3</td>
<td></td>
</tr>
<tr>
<td>HST 378 Native Americans in North American History to 1830 3</td>
<td></td>
</tr>
<tr>
<td>HST 379 Native Americans in North American History from 1830 3</td>
<td></td>
</tr>
<tr>
<td>Other courses may be used to satisfy this requirement with approval of the Director of the American Indian and Indigenous Studies program.</td>
<td></td>
</tr>
<tr>
<td>3. Complete one of the following, either a. or b. (3 credits):</td>
<td></td>
</tr>
<tr>
<td>a. A 3-credit internship by enrollment in AL 493A Arts and Letters Internship. Students will work on a semester project with or for a tribal community, with an off-reservation Indigenous organization, or engage in an approved activity in consultation with a supervising faculty member.</td>
<td></td>
</tr>
<tr>
<td>b. A 3-credit independent study by enrollment in AL 490 Independent Study. Students will complete a capstone project through directed readings, or research with a supervising faculty member.</td>
<td></td>
</tr>
</tbody>
</table>

Effective Spring 2017.
3. Change the requirements in the **Minor in Arts and Cultural Management** in the College of Arts and Letters.

   a. Under the heading **Requirements for the Minor in Arts and Cultural Management** make the following changes:

   (1) In item 1. delete the following courses:
   
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL 271</td>
<td>Introduction to Arts and Cultural Management</td>
<td>3</td>
</tr>
<tr>
<td>AL 461</td>
<td>Strategies of Arts and Cultural Management</td>
<td>3</td>
</tr>
<tr>
<td>AL 462</td>
<td>Promotional and e-Commerce in Arts and Cultural Management</td>
<td>3</td>
</tr>
<tr>
<td>AL 463</td>
<td>Event Production and Planning for Arts and Culture</td>
<td>3</td>
</tr>
</tbody>
</table>

   Add the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACM 271</td>
<td>Introduction to Arts and Cultural Management</td>
<td>3</td>
</tr>
<tr>
<td>ACM 461</td>
<td>Strategies of Arts and Cultural Management</td>
<td>3</td>
</tr>
<tr>
<td>ACM 462</td>
<td>Promotional and e-Commerce in Arts and Cultural Management</td>
<td>3</td>
</tr>
<tr>
<td>ACM 463</td>
<td>Event Production and Planning for Arts and Culture</td>
<td>3</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL 492</td>
<td>Special Topics in Museum Studies</td>
<td>1 to 3</td>
</tr>
<tr>
<td>AL 485</td>
<td>Foundations of Museum Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

   Add the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSM 492</td>
<td>Special Topics in Museum Studies</td>
<td>1 to 3</td>
</tr>
<tr>
<td>MUSM 485</td>
<td>Foundations of Museum Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL 471</td>
<td>Arts and Cultural Management Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

   Add the following course:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACM 471</td>
<td>Arts and Cultural Management Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

   Effective Fall 2017.

4. Change the requirements for the **Graduate Certificate in Digital Humanities** in the College of Arts and Letters. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

   a. Under the heading **Requirements for the Graduate Certificate in Digital Humanities** replace the entire entry with the following:

   Students must complete 9 credits from the following:

   1. One of the following courses (3 credits):
      
      | Course   | Title                                           | Credits |
      |----------|-------------------------------------------------|---------|
      | DH 865   | Digital Humanities Methods Seminar             | 3       |
      | HST 812  | History in the Digital Age                      | 3       |

   2. Complete a minimum of 6 credits from the following:
      a. A digital humanities pedagogy experience which may be fulfilled through a teaching-related course. A specific, focused, supervised pedagogy project may also fulfill this requirement with approval from the College of Arts and Letters Associate Dean for Graduate Studies. The following courses may be used to fulfill this requirement:
      
      | Course   | Title                                           | Credits |
      |----------|-------------------------------------------------|---------|
      | AL 881   | Special Topics in Teaching with Technology in Arts and Humanities | 3       |
      | AL 891   | Special Topics in Arts and Humanities           |         |
      | DH 861   | Digital Humanities Pedagogy                     |         |
      | DH 891   | Special Topics in Digital Humanities            |         |
Students who use AL 891 must enroll in the Practicum in Blending and Online Learning section.

b. A digital humanities research experience fulfilled by participating in a digital humanities project, completion of the digital cultural heritage field school, completion of a digital humanities portfolio, or work as a Humanities, Arts, Science, and Technology Alliance and Collaboratory (HASTAC) scholar, or other research experience with approval of the Associate Dean for Graduate Studies in the College of Arts and Letters.

The following courses may be used to fulfill this requirement:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DH 863 Digital Humanities Research</td>
<td>3</td>
</tr>
</tbody>
</table>

Effective Fall 2017.

5. Change the requirements for the **Minor in Digital Humanities** in the College of Arts and Letters.

a. Under the heading **Minor in Digital Humanities**, replace the entire entry with the following:

The student must complete a minimum of 15 credits from the following:

<table>
<thead>
<tr>
<th>CREDITS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The following core courses (6 credits):</td>
<td></td>
</tr>
<tr>
<td>DH 285 Introduction to Digital Humanities</td>
<td>3</td>
</tr>
<tr>
<td>DH 340 Digital Humanities Seminar</td>
<td>3</td>
</tr>
<tr>
<td>2. Complete a minimum of 6 credits in digital humanities courses approved in advance by the Digital Humanities undergraduate advisor.</td>
<td></td>
</tr>
<tr>
<td>3. A capstone course or experiential activity (3 credits):</td>
<td></td>
</tr>
<tr>
<td>DH 491 Special Topics in Digital Humanities</td>
<td>3</td>
</tr>
<tr>
<td>DH 493D Digital Humanities Internship</td>
<td>3</td>
</tr>
</tbody>
</table>

Another internship or portfolio seminar with a significant digital component or documented configuration of experiential activities such as volunteering, participating in workshops, or attending seminars may be used to fulfill this requirement if approved in advance by the Digital Humanities undergraduate advisor.

Effective Fall 2017.

6. Change the requirements for the **Bachelor of Arts** degree in **Global Studies in the Arts and Humanities** in the College of Arts and Letters.

a. Under the heading **Requirements for the Bachelor of Arts Degree in Global Studies in the Arts and Humanities**, make the following changes:

1. In item 2., replace paragraph two with the following:

   Proficiency in a second language as certified by the assessment coordinator in the Center for Language Teaching-Advancement or completion of a major or minor in a language other than English with a grade-point average of 3.0 in that language or successful completion of AFR 450, FRN 321, GRM 302, ITL 320, PRT 320, SPN 342. For other languages the student must complete at least one course at the 300-level or above as approved the program advisor.

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

   All of the following courses (11 credits):
   - GSAH 220 Global Interactions and Identities | 3 |
   - GSAH 230 Values, Experience, and Difference in Global Contexts | 3 |
   - GSAH 450 Global Concepts and Theories Seminar (W) | 3 |
   - GSAH 499 Senior Thesis in Global Studies in the Arts and Humanities (W) | 2 |

3. Reletter items b. and c. to items c. and d. respectively.
(4) Add the following item 3. b.:

Complete 9 or 10 credits from the following courses:

- GSAH 310 Conflict and Justice in a Global Setting 3
- GSAH 311 Crossing Boundaries/Changing Worlds 3
- GSAH 312 Media Mobility: Change, Access, Representation 3
- GSAH 391 Special Topics in Global Studies in the Arts and Humanities 1 to 4

No more than 4 credits in GSAH 391 may be used to fulfill this requirement.

Effective Spring 2017.

7. Change the requirements for the Minor in Global Studies in the Arts and Humanities in the College of Arts and Letters.

a. Under the heading Requirements for the Minor in Global Studies in the Arts and Humanities make the following changes:

(1) Replace item 1. With the following:

Both of the following courses (6 credits):
- GSAH 220 Global Interactions and Identities 3
- GSAH 230 Values, Experience, and Difference in Global Contexts 3

(2) Renumber item 2. to item 3.

(3) Add the following item 2.:

Complete 9 or 10 credits from the following courses:
- GSAH 310 Conflict and Justice in a Global Setting 3
- GSAH 311 Crossing Boundaries/Changing Worlds 3
- GSAH 312 Media Mobility: Change, Access, Representation 3
- GSAH 391 Special Topics in Global Studies in the Arts and Humanities 1 to 4

Effective Spring 2017.

8. Change the requirements for the Bachelor of Arts degree in Spanish in the Department of Romance and Classical Studies. The Teacher Education Council (TEC) approved this request at its October 3, 2016 meeting.

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

(1) In item 3. a. (2) add the following course:

- SPN 491 Special Topics in Spanish 3

(2) In item 3. b. delete item (1) and renumber items (2) and (3) to items (1) and (2) respectively.

Effective Spring 2017.
1. Change the administrative responsibility of the Graduate Specialization in Economics of Education in the College of Education to the Department of Educational Administration. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Effective Spring 2017.

2. Change the requirements for the Graduate Specialization in Economics of Education in the Department of Educational Administration. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

a. Under the heading Requirements for the Graduate Specialization in Economics of Education replace the entire entry with the following:

Students must complete the following (18 or 19 credits):
1. One of the following groups of courses, either a., b., or c.:
   a. EAD 946A Regression Analysis for Education Policy 3
      EAD 946B Econometric Analysis for Education Policy 3
   b. EC 820A Econometrics IA 3
      EC 820B Econometrics IB 3
   c. CEP 934 Multivariate Data Analysis I 3
      CEP 935 Advanced Topics in Multivariate Data Analysis II 3
2. One additional 3- or 4-credit graduate-level advanced statistics or econometrics course as determined by the student’s guidance committee.
3. One of the following courses (3 credits):
   AFRE 805 Microeconomic Analysis 3
   EC 812A Microeconomics I 3
   PPL 805 Microeconomic Theory 3
4. Both of the following courses (6 credits):
   EAD 945 Advanced Economics of Education 3
   EAD 949 Advanced Seminar in Education Policy 3
5. Complete a substantial research paper on a topic in the economics of education.

Effective Spring 2017.

3. Change the name of the Doctor of Philosophy degree in Educational Policy in the Department of Educational Administration to Education Policy. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Students admitted to the major prior to Spring 2017 will graduate with a Doctor of Philosophy Degree in Educational Policy.

Students admitted to the major Spring 2017 and forward will graduate with a Doctor of Philosophy Degree in Education Policy.

Effective Spring 2017.

4. Change the requirements for the Doctor of Philosophy degree in Education Policy in the Department of Educational Administration. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

a. Under the heading Requirements for the Doctor of Philosophy Degree in Education Policy replace the entire entry with the following:

Students must complete the requirements specified below:

1. Education Policy Core. All of the following courses (12 credits):
   EAD 942 Economics of Education 3
   EAD 943 Politics of Education 3
   EAD 944 Social Context of Education 3
   EAD 947 Comparative International Education Policy 3
2. Education Inquiry and Research.
   a. All of the following courses (10 to 12 credits):
      - CEP 930 Educational Inquiry 3
      - EAD 946A Regression Analysis for Education Policy 3
      - EAD 946B Econometric Analysis for Education Policy 3
      - EAD 995 Research Practicum in Educational Administration 1 to 3
   b. One 3-credit qualitative research methods course.
   c. One 3-credit advanced research methods course.

3. Concentration in Education Policy (12 credits):
   Four courses in disciplinary or policy studies selected to provide the student with competence in a specialized area of research, including at least 3 credits of EAD 949 Advanced Seminar in Education Policy.


Effective Spring 2017.

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**COLLEGE OF NATURAL SCIENCE**

1. Establish a Graduate Certificate in Medical Neuroscience in the Program in Neuroscience. The University Committee on Graduate Studies (UCGS) approved this request at its March 14, 2016 meeting.

   a. **Background Information:**

      The proposed Graduate Certificate in Medical Neuroscience provides post-baccalaureate credentials and career development for students seeking to improve their academic profile or employment qualifications. The certificate is aimed at students interested in applying to graduate or professional school and individuals working in the pharmaceutical or medical device industries. The health care field is changing with new medical research advancing scientific knowledge at a rapid pace, and the program aims at helping students to navigate developments in the field of neuroscience.

      Admission to graduate or professional schools has become a complex and highly competitive process. Changes to admission exams, like the MCAT, shifts focus from testing what the applicants know to testing how they apply and use what they know. This certificate program will give students the skills to think critically, work in teams, and communicate effectively, all important skills necessary for success in graduate school, professional school, or industry.

      A review of academic enhancing post-baccalaureate certificate programs targeted to individuals interested in graduate or professional schools found only one other fully-online program. As an online program, the certificate provides students the opportunity to further their education while having the flexibility to gain additional volunteer and/or shadowing experiences or continue in their current professional role without a strict course schedule.

      By obtaining the Graduate Certificate in Medical Neuroscience, students will be able to obtain and apply knowledge of topics including nervous system disorders; drug use; abuse, and interactions; neurotechnologies; brain interventions; general neuroscience principles; development; working successfully in team-based settings; analyzing and interpreting data from published peer-reviewed papers; assessing ethical, legal, and social implications of neuroscientific research; tools, and discoveries; and effectively and accurately communicating scientific findings. These educational objectives align with the learning goals set by the university, specifically the goals associated with analytical thinking, effective citizenship, effective communication, and integrated reasoning.

   b. **Academic Programs Catalog Text:**

      The Graduate Certificate in Medical Neuroscience is aimed at students who are currently working in the pharmaceutical or medical device industries interested in applying to graduate or professional school. It provides post-baccalaureate credentials and career development for students seeking to improve their academic profile or employment qualifications meeting the needs of both working professionals and full-time students. The certificate is available online only.
Admission

To be considered for admission to the Graduate Certificate in Medical Neuroscience, students must:

1. have a bachelor’s degree in a biological science background.
2. have a minimum cumulative undergraduate grade-point average of 2.5.
3. write a reflective essay describing how the certificate will enhance their professional and personal development.

Requirements for the Graduate Certificate in Medical Neuroscience
Students must complete a minimum of 12 credits from the following courses:

<table>
<thead>
<tr>
<th>CREDITS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Both of the following courses (6 credits):</td>
<td></td>
</tr>
<tr>
<td>NEU 841</td>
<td>Medical Neuroscience</td>
</tr>
<tr>
<td>NEU 846</td>
<td>Neurobiology of Nervous System Disorders</td>
</tr>
<tr>
<td>2. At least 6 credits from the following courses:</td>
<td></td>
</tr>
<tr>
<td>NEU 842</td>
<td>Neuroethics</td>
</tr>
<tr>
<td>NEU 843</td>
<td>Methods for Assessing the Nervous System</td>
</tr>
<tr>
<td>NEU 844</td>
<td>The Science and Ethics of Brain Interventions</td>
</tr>
<tr>
<td>NEU 847</td>
<td>Development of the Nervous System</td>
</tr>
<tr>
<td>PHM 431</td>
<td>Pharmacology of Drug Addiction</td>
</tr>
</tbody>
</table>

Effective Spring 2017.

2. Change the administrative responsibility for the Bachelor of Science degree in Environmental Geosciences in the Department of Geological Sciences to the Department of Earth and Environmental Sciences. This department name change was effective July 1, 2016.

Effective Fall 2017.

3. Change the administrative responsibility for the Bachelor of Science degree in Geological Sciences in the Department of Geological Sciences to the Department of Earth and Environmental Sciences. This department name change was effective July 1, 2016.

Effective Fall 2017.

4. Change the administrative responsibility for the Master of Science degree in Environmental Geosciences in the Department of Geological Sciences to the Department of Earth and Environmental Sciences. This department name change was effective July 1, 2016. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Effective Fall 2017.

5. Change the administrative responsibility for the Doctor of Philosophy degree in Environmental Geosciences in the Department of Geological Sciences to the Department of Earth and Environmental Sciences. This department name change was effective July 1, 2016. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Effective Fall 2017.

6. Change the administrative responsibility for the Doctor of Philosophy degree in Environmental Geosciences-Environmental Toxicology in the Department of Geological Sciences to the Department of Earth and Environmental Sciences. This department name change was effective July 1, 2016. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Effective Fall 2017.
7. Change the administrative responsibility for the **Master of Science** degree in **Geological Sciences** in the Department of Geological Sciences to the Department of Earth and Environmental Sciences. This department name change was effective July 1, 2016. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Effective Fall 2017.

8. Change the administrative responsibility for the **Doctor of Philosophy** degree in **Geological Sciences** in the Department of Geological Sciences to the Department of Earth and Environmental Sciences. This department name change was effective July 1, 2016. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Effective Fall 2017.

**COLLEGE OF SOCIAL SCIENCE**

1. Change the administrative responsibility for the **Bachelor of Science** degree in **Economic Geography** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016.

Effective Fall 2017.

2. Change the administrative responsibility for the **Bachelor of Science** degree in **Environmental Geography** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016.

Effective Fall 2017.

3. Change the administrative responsibility for the **Bachelor of Science** degree in **Geographic Information Science** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016.

Effective Fall 2017.

4. Change the administrative responsibility for the **Bachelor of Arts** degree in **Human Geography** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016.

Effective Fall 2017.

5. Change the administrative responsibility for the **Minor in Geography** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016.

Effective Fall 2017.

6. Change the administrative responsibility for the **Minor** degree in **Geographic Information Science** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016.

Effective Fall 2017.

7. Change the administrative responsibility for the **Disciplinary Teaching Minor** in **Geography** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016. The Teacher Education Council (TEC) approved this request at its October 3, 2016 meeting.

Effective Fall 2017.
8. Change the administrative responsibility for the **Master of Science** degree in **Geography** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Effective Fall 2017.

9. Change the administrative responsibility for the **Doctor of Philosophy** degree in **Geography** in the Department of Geography to the Department of Geography, Environment, and Spatial Sciences. This department name change was effective July 1, 2016. The University Committee on Graduate Studies (UCGS) approved this request at its October 10, 2016 meeting.

Effective Fall 2017.
PART II - NEW COURSES

DEPARTMENT OF ANIMAL SCIENCE

ANS 111  Livestock Industries Seminar  
Fall of every year. 1(1-0) R: Open to students in the Institute of Agricultural Technology. 
Academic and career planning and professional development in the animal agriculture industry. 
Effective Fall 2016

ANS 115  Meats Technology Clerkship  
Fall of every year. Spring of every year. 3(0-6) R: Open to students in the Institute of Agricultural Technology. 
Facility maintenance and sanitation. Personnel management. 
Request the use of the Pass-No Grade (P-N) system. 
Effective Fall 2016

ANS 151  Poultry Production Clerkship  
Fall of every year. 2(0-4) R: Open to students in the Institute of Agricultural Technology. 
Hands-on experience in poultry production, including nutrition, health, and reproduction. 
Housing. Records and personnel management. 
Request the use of the Pass-No Grade (P-N) system. 
Effective Fall 2016

ANS 162  Sheep Production Clerkship  
Spring of every year. 2(0-4) R: Open to students in the Institute of Agricultural Technology. 
Hands-on experience in sheep production, including nutrition, health, and reproduction. 
Housing. Records and personnel management. Environmental management. 
Request the use of the Pass-No Grade (P-N) system. 
Effective Fall 2016

COLLEGE OF ARTS AND LETTERS

AL 202  Introduction to American Indian and Indigenous Studies  
Spring of every year. 3(3-0) 
Introduction to the study of American Indian and other Indigenous peoples, including issues related to culture, knowledge, language, governance, colonization, sovereignty, and ongoing revitalization efforts. 
Effective Spring 2017

DH 490  Digital Humanities Independent Study  
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: DH 285 or concurrently 
Special project, directed reading and research arranged by an undergraduate student and a faculty member in areas supplementing regular course offerings. 
Effective Fall 2017

DH 491  Special Topics in Digital Humanities  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: DH 285 or concurrently 
Special topics supplementing regular course offerings proposed by faculty on group study basis. 
Effective Fall 2017

DH 890  Digital Humanities Independent Study  
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: (DH 865 or concurrently) or (HST 812 or concurrently) 
Special project, directed reading, and research arranged by a graduate student and a faculty member in areas supplementing regular course offerings. 
Effective Fall 2017
PART II – NEW COURSES

DH 891  Special Topics in Digital Humanities
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (DH 865 or concurrently) or (HST 812 or concurrently)
    Special topics supplementing regular course offerings proposed by faculty on group study basis.
    Effective Fall 2017

DH 893  Digital Humanities Internship
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: (DH 865 or concurrently) or (HST 812 or concurrently)
    Supervised professional experience.
    Effective Fall 2017

GSAH 391  Special Topics in Global Studies in the Arts and Humanities
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. P: GSAH 220 and GSAH 230 or approval of department
    Special topics supplementing regular course offerings proposed by faculty on a group study basis.
    Effective Fall 2016

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

EAD 944  Social Context of Education
Fall of every year. 3(3-0) R: Open to graduate students.
    Evolution of educational institutions and practices in response to economic, political, demographic and social change. Legacies of change for instruction, curriculum, segmentation of students, and students’ school experiences. Effect of family and community on students and schools. Conflicting goals/purposes of public education. Struggles for educational equity and opportunity.
    Effective Fall 2016

EAD 946A  Regression Analysis for Education Policy
Spring of every year. 3(2-2) Interdepartmental with Counseling, Educational Psychology and Special Education. P: CEP 932 RB: Knowledge of: central tendency and dispersion, correlations and cross-tabulations, sampling distribution, hypothesis testing, confidence intervals, testing differences in means, tests of associations. R: Open to graduate students.
    Foundations of regression analysis. Underlying assumptions. Applications to education policy with attention to challenges of establishing causal relations. STATA software skills for independent scholarly investigations.
    Effective Spring 2017

EAD 946B  Econometric Analysis for Education Policy
Fall of even years. 3(3-0) RB: Prior courses in basic economic theory and statistical methods. R: Open to graduate students.
    Effective Fall 2016

EAD 947  Comparative International Education Policy
Fall of every year. 3(3-0) Interdepartmental with Teacher Education. R: Open to graduate students.
    Effective Fall 2016


EAD 948  Advanced Economics of Education
Spring of odd years. 3(3-0) P: EC 820B or approval of department RB: Prior graduate level course work in econometrics and undergraduate or graduate level course work in economic theory. R: Open to graduate students.
Advanced research in the intersection of economics and education. Returns to education, education production, school choice, teacher quality and compensation, financial aid, and postsecondary access.
Effective Spring 2017

EAD 949  Advanced Seminar in Education Policy
Fall of every year. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. R: Open to graduate students.
Seminars on rotating topics in advanced, contemporary education policy research.
Effective Fall 2016

EAD 991C  Special Topics in Education Policy
Fall of every year. Spring of every year. Summer of every year. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. R: Open to graduate students.
Special topics in education policy.
Effective Fall 2016

DEPARTMENT OF HISTORY

HST 220  History of Food and Alcohol
Spring of every year. 3(3-0) Interdepartmental with Human Nutrition and Foods.
How food and alcohol have shaped world history. Relationship to politics, nationalism, religion, economics and culture. Consumption, trade, migration, slavery, globalization, environmental impacts.
Effective Spring 2017

HST 495  History Harvest
Fall of every year. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: HST 251 or AL 285 R: Not open to freshmen.
Identification, collection, and digitization of oral histories and historical artifacts in the local community. Family heirlooms, lived experiences of everyday people, stories passed down through generations. Emphasis on digital history techniques.
Effective Spring 2017

DEPARTMENT OF INTEGRATIVE BIOLOGY

IBIO 492  Interdisciplinary Studies in Conservation Medicine
Spring of every year. 4(4-0) Interdepartmental with Fisheries and Wildlife. P: (BS 161 and BS 162) or (BS 181H and BS 182H) or (LB 144 and LB 145) R: Approval of department.
Interdisciplinary studies focused on "health" as defined by the interactions of animal health, ecosystem health, and human health, viewed through the lens of human culture in an off-campus, multicultural setting.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Spring 2017
PART II – NEW COURSES

IBIO 492L Advanced Research Applications in Conservation Medicine
Spring of every year. 4(0-12) Interdepartmental with Fisheries and Wildlife. P: (BS 161 and BS 162) or (BS 181H and BS 182H) or (LB 144 and LB 145) R: Approval of department.
Field and laboratory techniques for assessing and monitoring biodiversity and health of humans, animals, and ecosystems in an off-campus, multicultural setting. Tools and techniques will be drawn from ecology, microbiology, molecular biology, genetics, histopathology, bioinformatics and statistics.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Spring 2017

IBIO 493 International Communications in Conservation Medicine (W)
Spring of every year. 4(4-0) P: ((BS 161 and BS 162) and completion of Tier I writing requirement) or ((BS 181H and BS 182H) and completion of Tier I writing requirement) or ((LB 144 and LB 145) and completion of Tier I writing requirement)
Development of communication skills (written and oral) to convey scientific information to scientists, health professionals, general public, and indigenous communities.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Spring 2017

DEPARTMENT OF KINESIOLOGY

KIN 113V Boxing Conditioning II
Fall of every year. Spring of every year. Summer of every year. 1(0-2) RB: (KIN 103V) or equivalent skills R: Students are limited to a combined total of 8 credits in KIN 101-108 and KIN 111-118.
Intense boxing specific conditioning. Fundamentals and techniques.
Effective Summer 2017

KIN 113W Boxing Conditioning III
Fall of every year. Spring of every year. Summer of every year. 1(0-2) RB: (KIN 113V) or equivalent skills R: Students are limited to a combined total of 8 credits in KIN 101-108 and KIN 111-118.
Advanced boxing specific conditioning and techniques.
Effective Summer 2017

DEPARTMENT OF LARGE ANIMAL CLINICAL SCIENCES

LCS 641 Food Animal Theriogenology Clerkship
Summer of every year. 3(3-0) P: LCS 679 RB: Completion of Semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.
Techniques for evaluating the reproductive performance of individual food animals and populations, primarily on cattle, but other species including swine and small ruminants.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Summer 2017

DEPARTMENT OF LINGUISTICS AND GERMANIC, SLAVIC, ASIAN AND AFRICAN LANGUAGES

GRM 250 German Literature and Culture in English
Fall of every year. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
REINSTATEMENT Selected representative texts or themes in the cultures of German-speaking countries.
Effective Spring 2016
DEPARTMENT OF MANAGEMENT

MGT 371  Retail Planning and Buying  
Fall of every year. Spring of every year. 3(3-0) R: Open to students in the Retail Management Minor or approval of department.  
Role of a retail buyer in consumer products/fashion industries. Market and trend research, target customer needs, assortment planning, strategic buying, international sourcing, merchandise planning and control, and product development.  
Effective Fall 2017

PROGRAM IN NEUROSCIENCE

NEU 841  Medical Neuroscience  
Fall of every year. 3(3-0) RB: Undergraduate degree in the biological sciences Not open to students with credit in NEU 839.  
Detailed survey of nervous system structure and function with an emphasis on medical applications  
Effective Fall 2016

NEU 842  Neuroethics  
Summer of every year. 2(2-0) RB: (NEU 840 or concurrently) or (NEU 841 or concurrently)  
Introduction to the field of neuroethics and the responsible application of advances in neuroscience research.  
Effective Summer 2017

NEU 843  Methods for Assessing the Nervous System  
Spring of every year. 2(2-0) RB: (NEU 840 or concurrently) or (NEU 841 or concurrently)  
Introduction to the various techniques and methods used to study brain structure and function.  
Effective Spring 2017

NEU 844  The Science and Ethics of Brain Interventions  
Summer of every year. 2(2-0) RB: (NEU 840 or concurrently) or (NEU 841 or concurrently)  
Introduction to cognitive enhancement to improve intellect and cognition, and legal and ethical implications of this.  
Effective Summer 2017

NEU 846  Neurobiology of Nervous System Disorders  
Spring of every year. 3(3-0) RB: NEU 841 or concurrently  
Overview of abnormalities that contribute to central nervous system, peripheral nervous system, and psychological diseases and disorders examined at genetic, cellular, and behavioral levels.  
Effective Spring 2017

NEU 847  Development of the Nervous System  
Fall of every year. 3(3-0) RB: NEU 841 or concurrently  
Introduction to processes involved in the development of the nervous systems and their clinical application.  
Effective Fall 2016
COLLEGE OF OSTEOPATHIC MEDICINE

OST 687  Peru Medical Service
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. RB: Fluency in Spanish to interact with patients. R: Open to graduate-professional students in the College of Osteopathic Medicine.
Healthcare services under the supervision of licensed U.S. physicians working in tandem with local providers. Offered second half of semester.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Fall 2016

OST 688  Cuban Health Care System and Culture
Fall of every year. Spring of every year. Summer of every year. 3 to 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. R: Open to graduate-professional students in the College of Osteopathic Medicine.
On site observation of healthcare delivery in community health clinics, maternal health, pediatric care, and geriatric care. In patient care in teaching hospitals in Havana, Cuba.
Offered second half of semester.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.
Effective Spring 2017
**PART III – COURSE CHANGES**

**DEPARTMENT OF ANTHROPOLOGY**

**ANP 362  Archaeology of Foragers to Farmers**  
Fall of odd years. 3(3-0)  
P: ANP 101 or ANP 203 or ANP 264  
P: ANP 203 or ANP 264  
Theories, problems, and issues in the study of foraging and farming as adaptive strategies. Archaeological evidence for the appearance and development of food production in prehistory.  
*Effective Fall 2015 Effective Fall 2016*

**COLLEGE OF ARTS AND LETTERS**

**AL 271**  
ACM 271  
Introduction to Arts and Cultural Management  
Fall of every year. Spring of every year. Summer of every year. 3(3-0)  
Arts and cultural organization administration and management. Operations and procedures of art and humanities-based agencies. Funding and financial structures involving audience development and promotion.  
SA: AL 271  
*Effective Fall 2013 Effective Fall 2017*

**AL 461**  
ACM 461  
Strategies of Arts and Cultural Management  
Fall of every year. Spring of every year. 3(2-2)  
P: AL 271  
P: ACM 271  
R: Approval of college.  
Strategic theory and approaches for arts and cultural organization administration and management. Budget development and strategy; fundraising and financial strategy. Staffing and human resource management.  
SA: AL 461  
*Effective Fall 2013 Effective Fall 2017*

**AL 462**  
ACM 462  
Promotion and e-Commerce in Arts and Cultural Management  
Fall of every year. Spring of every year. 3(2-2)  
P: AL 271  
P: ACM 271  
R: Approval of college.  
Publicity, promotion, and outreach principles for arts and cultural management. Promoting research and strategy, outreach and education, e-Commerce strategies and social media management.  
SA: AL 462  
*Effective Fall 2013 Effective Fall 2017*

**AL 463**  
ACM 463  
Event Production and Planning for Arts and Culture  
Fall of every year. Spring of every year. 3(2-2)  
P: AL 271  
P: ACM 271  
R: Approval of college.  
Technical aspects of event planning, production and management. Operational procedures of presenting, producing and programming events and cultural activities. Technical and venue management procedures.  
SA: AL 463  
*Effective Fall 2013 Effective Fall 2017*

**AL 464**  
ACM 464  
Education and Outreach for Arts and Cultural Management  
Fall of every year. Spring of every year. 3(3-0)  
P: AL 271 or approval of college  
P: ACM 271 or approval of college  
R: Open to graduate students in the College of Arts and Letters or approval of college.  
Arts and cultural organization education and outreach. Understanding of K-12 school and community programs.  
SA: AL 464  
*Effective Summer 2014 Effective Fall 2017*
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
<th>Effective Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL 465</td>
<td>ACM 465 Leadership and Innovation for Arts and Cultural Management</td>
<td>Fall of every year. Spring of every year. 3(3-0) P: AL 271 or approval of college P: ACM 271 or approval of college R: Open to graduate students in the College of Arts and Letters and open to undergraduate students in the Entrepreneurship &amp; Innovation Minor or approval of college. R: Open to graduate students in the College of Arts and Letters and open to undergraduate students in the Entrepreneurship and Innovation Minor or approval of college. Development of leadership abilities, creative, and innovative planning in arts and cultural management through readings and practical application. SA: AL 465</td>
<td>Effective Spring 2016 Effective Fall 2017</td>
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<tr>
<td>AL 467</td>
<td>ACM 467 Development and Public Relations for Arts and Cultural Management</td>
<td>Fall of every year. Spring of every year. 3(3-0) P: AL 271 or approval of college P: ACM 271 or approval of college R: Open to graduate students in the College of Arts and Letters or approval of college. Arts and cultural organization development and public relations. Investigation of foundation, government, corporate and individual funding sources. Membership and subscription services, press releases, strategies and advertising campaigns. SA: AL 467</td>
<td>Effective Summer 2014 Effective Fall 2017</td>
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<tr>
<td>AL 468</td>
<td>ACM 468 Facilities and Operations for Arts and Cultural Management</td>
<td>Fall of every year. Spring of every year. 3(3-0) P: AL 271 or approval of college P: ACM 271 or approval of college R: Open to graduate students in the College of Arts and Letters or approval of college. Address the complex skills involved in the management of both private and public arts and cultural venues. Understand and analyze the skills required for building operations, policies, vendor contracting, scheduling, maintenance, daily operations, event coordination, additional fundraising opportunities; and policies required for public safety and control. Internal and external relationships required for complex arts and cultural venues. SA: AL 468</td>
<td>Effective Summer 2014 Effective Fall 2017</td>
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<tr>
<td>AL 471</td>
<td>ACM 471 Arts and Cultural Management Seminar</td>
<td>Fall of every year. Spring of every year. Summer of every year. 3(2-2) P: AL 271 and (AL 461 or AL 462 or AL 463) P: (ACM 271) and (ACM 461 or ACM 462 or ACM 463) R: Approval of college. Seminar covering key topics and approaches in arts and cultural management, and the preparation of academic and professional portfolios. SA: AL 471</td>
<td>Effective Fall 2014 Effective Fall 2017</td>
</tr>
<tr>
<td>AL 285</td>
<td>DH 285 Introduction to Digital Humanities</td>
<td>Fall of every year. 3(3-0) R: Open to undergraduate students in the College of Arts and Letters. Critical technology theory and practice. Critique and analysis of technology. Production and creativity with digital tools. SA: AL 285</td>
<td>Effective Summer 2015 Effective Fall 2017</td>
</tr>
<tr>
<td>AL 340</td>
<td>DH 340 Digital Humanities Seminar</td>
<td>Spring of every year. 3(3-0) P: (AL 285 or approval of college) and completion of Tier I writing requirement P: (DH 285 or approval of college) and completion of Tier I writing requirement R: Approval of college. Digital humanities issues and research explored from a variety of humanities-based perspectives. SA: AL 340</td>
<td>Effective Summer 2015 Effective Fall 2017</td>
</tr>
</tbody>
</table>
**AL 480**
Digital Humanities Portfolio Workshop
Spring of every year. 3(3-0) P: ((AL 285 and AL 340) and completion of Tier I writing requirement) and ((AL 401 or concurrently) or (AL 493D or concurrently)) P: ((DH 285 and DH 340) and completion of Tier I writing requirement) and ((DH 491 or concurrently) or (DH 493 or concurrently)) R: Open to seniors. Approval of college.
Workshop covering key topics and approaches in digital humanities, preparing professional portfolios in print and digital formats, including application materials for career, graduate study, and professional positions.
SA: AL 480
Effective Summer 2015 Effective Fall 2017

**AL 493D**
Digital Humanities Internship
Fall of every year. Spring of every year. Summer of every year. 3 to 4 credits. P: (AL 285) and completion of Tier I writing requirement P: (DH 285) and completion of Tier I writing requirement R: Open to seniors. Approval of college. R: Approval of department.
Supervised preprofessional field experience in digital humanities.
Effective Summer 2015 Effective Fall 2017

**AL 861**
Digital Humanities Pedagogy
Spring of every year. 3 credits. 3(3-0) P: (DH 865 or concurrently) or (HST 812 or concurrently)
SA: AL 861
Effective Fall 2012 Effective Fall 2017

**AL 863**
Digital Humanities Research
Fall of every year. 3 credits. 3(3-0) P: (DH 865 or concurrently) or (HST 812 or concurrently)
Methodological and theoretical approaches for digital humanities research. Ethical issues and human subjects considerations. Analysis and application of qualitative and quantitative methods, including data analysis, and database creation and management, social media analyses, visualization projects, and geospatial mapping.
SA: AL 863
Effective Fall 2012 Effective Fall 2017

**AL 865**
Digital Humanities Methods Seminar
Fall of every year. 3 credits.
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: AL 865
Effective Fall 2012 Effective Fall 2017

**AL 485**
Foundations of Museum Studies
Fall of every year. 3(3-0) Interdepartmental with Anthropology and History of Art. R: Open to juniors or seniors or graduate students.
Activities, functions, and organization of museums. Changing role of museums as cultural institutions.
SA: AL 485
Effective Fall 2015 Effective Fall 2017
**AL 488**

**MUSM 488**

Museum Curatorial Practices
Spring of every year. 3(3-0) Interdepartmental with Anthropology and History of Art. R: Open to juniors or seniors or graduate students.
Methods and practices for the development, care, and use of museum collections in research, education, and exhibition activities.
SA: HA 488 SA: HA 488, AL 488
Effective Fall 2015 Effective Fall 2017

**AL 492**

**MUSM 492**

Special Topics in Museum Studies
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. Interdepartmental with Anthropology and History of Art. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to juniors or seniors or graduate students.
Special topics supplementing regular course offerings.
SA: AL 492
Effective Fall 2015 Effective Fall 2017

**AL 494**

**MUSM 494**

Museum Exhibitions: Theory and Development
Fall of every year. Spring of every year. 3(2-2) Interdepartmental with Anthropology and History of Art R: Open to juniors or seniors or graduate students.
Theoretical and practical approaches to the planning, design, development, installation, and evaluation of museum exhibitions.
SA: AL 494
Effective Summer 2016 Effective Fall 2017

**AL 496**

**MUSM 496**

Museum Studies Internship
Fall of every year. Spring of every year. Summer of every year. 3 credits. Interdepartmental with History of Art. A student may earn a maximum of 6 credits in all enrollments for this course. P: AL 485 RB: AL 498 and AL 494 RB: MUSM 496 and MUSM 494 R: Approval of college.
A capstone course consisting of supervised professional experience in learning environments such as museums, zoos, botanical gardens, and historic homes.
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.
SA: AL 496
Effective Summer 2015 Effective Fall 2017

**AL 497**

**MUSM 497**

Practicum in Museum Studies
Fall of every year. Spring of every year. 1 to 3 credits. Interdepartmental with Anthropology and History of Art and History. A student may earn a maximum of 6 credits in all enrollments for this course. P: AL 485 RB: MUSM 485 R: Open to students in the Museum Studies Minor and open to students in the Museum Studies Graduate Certificate or approval of college.
Practical experience in museum studies.
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: AL 497
Effective Spring 2016 Effective Fall 2017

**AL 498**

**MUSM 498**

Learning in Museums
Spring of every year. 3(3-0) Interdepartmental with History of Art. RB: AL 485 RB: MUSM 485 R: Open to juniors or seniors or graduate students.
Theoretical and practical approaches to understanding and enhancing ways visitors experience museums, zoos, botanical gardens, and other informal learning environments.
Creating educational programs, exhibits, and media.
SA: HA 487 SA: HA 487, AL 498
Effective Summer 2015 Effective Fall 2017
## BIOMEDICAL LABORATORY DIAGNOSTICS PROGRAM

### BLD 811  Fundamentals of Scientific Research
- **Fall of every year**. Spring of every year. 1(1-0) R: Open to master's students in the Biomedical Laboratory Diagnostics Program.
- Best practices for the research enterprise. Ethical conduct of research. Critical evaluation of scientific literature.
- SA: MT 810
- **Effective Summer 2014** Effective Fall 2016

### BLD 815  Cell Biology in Health and Disease I
- **Spring of every year**. 2(2-0) RB: Undergraduate course in Biochemistry and Physiology. Experience in a clinical laboratory
- Principles and theories of cell biology and biochemistry are presented with a focus on applications to clinical pathology.
- Request the use of ET-Extension to postpone grading.
- **Effective Summer 2008** Effective Summer 2017

### BLD 816  Cell Biology in Health and Disease II
- **Summer of every year**. 2(2-0) P: BLD 815 RB: Undergraduate course in biochemistry and physiology. Experience in a clinical laboratory
- Continuation of BLD 815.
- Request the use of ET-Extension to postpone grading.
- **Effective Summer 2009** Effective Summer 2017

### BLD 831  Clinical Application of Molecular Biology
- **Spring of every year**. Summer of every year. 2(2-0) P: BLD 830 RB: Basic biochemistry, medical or research laboratory experience
- Molecular diagnostic principles. Diagnostic outcomes in traditional and non-traditional laboratory disciplines.
- Request the use of ET-Extension to postpone grading.
- **Effective Fall 2008** Effective Summer 2017

### BLD 832  Molecular Pathology Laboratory
- **Summer of every year**. 2(0-4) P: BLD 831 or concurrently
- Equipment operation, DNA extraction and measurement, electrophoresis, hybridization and transfers, amplification and detection including techniques and automated sequencing. Clinical applications.
- Request the use of ET-Extension to postpone grading.
- **Effective Summer 2009** Effective Summer 2017
BLD 835  Hemostasis, Thrombosis and Effective Resource Management  
Fall of every year. 3(3-0) RB: Background in hemostasis, thrombosis and blood product management.  
Theories of coagulation, thrombosis and effective blood product management. Needs and particular stresses during an active bleeding crisis.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 4 semesters after the end of the semester of enrollment. The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.  
Effective Spring 2016 Effective Summer 2017

BLD 850  Concepts in Immunodiagnostics  
Fall of every year. Spring of every year. 2(2-0) RB: An undergraduate course in biochemistry or cell biology.  
Immunology principles and theory applied to diagnostic evaluation of the host immune response during health and disease.  
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. The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.  
SA: MT 850  
Effective Summer 2008 Effective Summer 2017

BLD 851  Clinical Application of Immunodiagnostic Principles  
Spring of every year. Summer of every year. 2(2-0) P: BLD 850  
Immunodiagnostic theories and principles applied to clinical assay development and method evaluation.  
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. The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.  
SA: MT 851  
Effective Summer 2008 Effective Summer 2017

BLD 852  Immunodiagnostics Laboratory  
Summer of every year. 2(2-0) P: BLD 850  
Performance of immunopurifications, in vitro diagnostic assays and basic flow cytometry.  
Data analysis and quality control evaluation.  
Request the use of ET-Extension to postpone grading.  
The work for the course must be completed and the final grade reported within 4 semesters after the end of the semester of enrollment. The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.  
Effective Summer 2008 Effective Summer 2017

BLD 853  Advanced Flow Cytometry  
Summer of every year. 2(2-0) P: BLD 850 and BLD 851 and (BLD 852 or concurrently) or approval of department  
Flow cytometry systems, software and reagents. Data analysis and experimental design of complex flow cytometric assays. Flow cytometry applications in medicine and research.  
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. The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.  
Effective Summer 2014 Effective Summer 2017
DEPARTMENT OF COMMUNITY SUSTAINABILITY

CSUS 814 Sustainable Tourism and Protected Area Management: Theories and Applications
Fall of every year. Fall of odd years. 3(3-0)
Historical antecedents and current concepts of leisure, travel, and tourism. Tourism theory and applications.
SA: PRR 874, ACR 814 SA: ACR 814, PRR 874
Effective Fall 2016 Effective Fall 2017

DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES

ES 800 Special Problems in Earth Science
Fall of every year. Spring of every year. Summer of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department. R: Open to graduate students. Approval of department.
Individual faculty directed study on topics in earth science. Effective Spring 1993 Effective Fall 2017

GLG 201 The Dynamic Earth
Fall of every year. Spring of every year. 4(3-2) Not open to students with credit in GLG 301.
Physical and chemical processes related to the past, present and future behavior of the earth system, and the energy systems that drive these processes. A study of the earth's materials, the earth's surface and the earth's interior.
Effective Fall 2014 Effective Fall 2017

GLG 202 Geology of Michigan
Fall of every year. 3(2-2) P: Completion of Tier I Writing Requirement R: Not open to students in the Department of Geological Sciences or in the Lyman Briggs Earth Science Major or in the Lyman Briggs Earth Science-Interdepartmental Coordinate Major or in the Lyman Briggs Environmental Geosciences Coordinate Major or in the Lyman Briggs Geological Sciences Coordinate Major. R: Not open to students in the Department of Earth and Environmental Sciences or in the Lyman Briggs Earth Science Major or in the Lyman Briggs Earth Science-Interdepartmental Coordinate Major or in the Lyman Briggs Environmental Geosciences Coordinate Major or in the Lyman Briggs Geological Sciences Coordinate Major. Not open to students with credit in GLG 304 or GLG 201.
Integration of the geological evolution of Michigan with its social and economic development. Field trips are required.
SA: GLG 302
Effective Summer 2015 Effective Fall 2017

GLG 301 Geology of Continents and Oceans
Geology of the Great Lakes Region
Spring of every year. 3(3-0) P: MTH 132 or LB 118 or MTH 152H P: (PHY 231 or PHY 183 or LB 273 or PHY 193H) and (CEM 141 or CEM 151 or LB 171 or CEM 181H) RB: Physical science, environmental engineering, civil engineering R: Open to undergraduate students in the Department of Civil and Environmental Engineering. Not open to students with credit in GLG 201.
Effective Summer 2015 Effective Fall 2017

GLG 304 Physical and Biological History of the Earth
Spring of every year. 4(3-2) P: GLG 201 or ISP 203A
SA: GLG 202
Effective Fall 2014 Effective Fall 2017
GLG 321  Mineralogy and Geochemistry  
Fall of every year. 4(3-2) P: GLG 201 and (CEM 142 or CEM 152 or CEM 182H or LB 172) and (MTH 132 or MTH 152H or LB 118)  
Earth materials and their origin, modification, structure, dynamics and history. Crystallography and crystal chemistry, and geochemical properties and processes in mineral crystallization and recrystallization. Analytical identification and characterization of minerals in their lithologic context.  
**Effective Fall 2014 Effective Fall 2017**

GLG 361  Igneous and Metamorphic Geochemistry and Petrology  
Spring of every year. 4(3-2) P: GLG 321  
Evolution, origin, occurrence and tectonic setting of igneous and metamorphic rocks. Phase relations of igneous and metamorphic systems. Studies of rocks in thin sections. Field trip required.  
SA: GLG 461  
**Effective Summer 2015 Effective Fall 2017**

GLG 401  Global Tectonics and Earth Structure (W)  
Fall of every year. 4(3-2) P: ((GLG 304) and completion of Tier I writing requirement) and (MTH 114 or MTH 116 or MTH 124 or MTH 132 or MTH 152H or LB 118) and (PHY 183 or PHY 183B or PHY 231 or PHY 231C or LB 273 or PHY 193H) R: Open to seniors or graduate students.  
Structural geology, geological and geophysical methods of studying the structure and dynamics of the earth and planets. Plate kinematics and global geodynamic processes, plate margin processes and evolution, marine geology. Field trip required.  
SA: GLG 371  
**Effective Fall 2014 Effective Fall 2017**

GLG 411  Hydrogeology  
Fall of every year. 3(3-0) RB: MTH 114 or MTH 116 or MTH 124 or MTH 126 or MTH 132 or MTH 133 or LB 118 or LB 119 or MTH 152H or LB 273 or MTH 153H R: Not open to freshmen or sophomores.  
Source, occurrence, and movement of groundwater emphasizing geologic factors and controls.  
**Effective Fall 2014 Effective Fall 2017**

GLG 412  Glacial Geology and the Record of Climate Change  
Spring of every year. 3(3-0) 4(3-2) Interdepartmental with Geography. RB: GLG 201 or GEO 306 or GEO 408 or GLG 301 R: Not open to freshmen or sophomores.  
In-depth analysis of glacial geology and the record of climate change, with emphasis on North America and Europe. Field trip required.  
**Effective Fall 2014 Effective Spring 2018**

GLG 421  Environmental Geochemistry  
Spring of every year. 4(3-2) RB: GLG 201 and (CEM 141 or CEM 151 or CEM 181H or LB 171)  
Natural and anthropogenic processes affecting the chemistry of the environment with an emphasis on the water cycle. Equilibria and kinetic balances, biogeochemical cycling, contaminant chemicals, chemical origins, environmental health.  
**Effective Fall 2014 Effective Fall 2017**

GLG 431  Sedimentology and Stratigraphy  
Spring of every year. 4(3-2) P: GLG 324 P: GLG 321 and GLG 304  
Sediments, sedimentary rocks, sedimentary processes, and depositional environments through geologic time. Facies event correlation. Fossils as tools in stratigraphy and environmental analysis. Biostratigraphy, paleoecology and taphonomy. Field trip required.  
**Effective Fall 2014 Effective Fall 2017**

GLG 433  Vertebrate Paleontology  
Fall of even years. 4(3-2) Interdepartmental with Integrative Biology. P: IBIO 328 or GLG 304 or IBIO 360 or IBIO 365 or IBIO 384 or IBIO 445 or GLG 434 or FW 471  
Fossil vertebrates with emphasis on evolution and interrelationships of major groups. Modern techniques of identification and interpretation of fossils.  
**Effective Fall 2016 Effective Fall 2017**
GLG 434  Evolutionary Paleobiology
Fall of odd years. 4(3-2) Interdepartmental with Integrative Biology. RB: BS 162 or GLG 304 or LB 144 or BS 182H
Patterns and processes of evolution known from the fossil record
Effective Fall 2016 Effective Fall 2017

GLG 435  Geomicrobiology
Fall of every year. 4(3-2) Interdepartmental with Microbiology and Molecular Genetics. RB: GLG 201 or MMG 201 or BS 161 or LB 145 R: Open to juniors or seniors or graduate students in the College of Natural Science or in the Lyman Briggs College.
Geological and microbiological perspectives on microbial activities in diverse environmental settings, including geological change mediated by microorganisms, microbial evolution driven by geologically diverse habitats, including the evolution of life on Earth, the search for life on other planets, the study of life in extreme environments, and industrial applications of geomicrobiology.
Effective Fall 2016 Effective Fall 2017

GLG 440  Planetary Geology
Spring of every year. 3(2-2) P: GLG 201 and GLG 304 and GLG 321 or approval of department RB: (PHY 232 or PHY 184 or PHY 294H or LB 274) and (MTH 132 or MTH 152H or LB 118) Surficial and internal properties and processes of planets and their natural satellites, asteroids, comets, and meteorites. Origin, composition, structure, tectonics, volcanism, impact phenomena, atmospheric evolution, atmosphere-surface interactions, and history of solar system bodies. Results of recent space exploration programs, projects and missions.
Effective Fall 2014 Effective Fall 2017

GLG 446  Ecosystems Modeling, Water and Food Security
Fall of every year. 3(3-0) R: Open to juniors or seniors or approval of department.
Impacts of climate variability and change on water availability, food security and global environmental change. Integrated models to identify adaption and mitigation strategies to such changes and to enhance the efficiency of natural resources use.
Effective Fall 2016 Effective Fall 2017

GLG 470  Solid Earth Geophysics and Geodynamics
Spring of odd years. 3(3-0) P: GLG 201 and (MTH 133 or LB 119 or MTH 153H) and (PHY 183 or PHY 183B or PHY 193H or PHY 233B or LB 273) RB: (MTH 234 or concurrently) or (LB 220 or concurrently) or (MTH 254H or concurrently) Theory and applications of solid-earth geophysics including geochronology, geothermics, geomagnetism and paleomagnetism, geodesy and gravity, rheology, and seismology.
SA: GLG 472
Effective Summer 2015 Effective Fall 2017

GLG 471  Applied Geophysics
Spring of every year. 4(3-2) P: ((MTH 133 or concurrently) or (LB 119 or concurrently) or (MTH 153H or concurrently)) and ((PHY 184 or concurrently) or (PHY 184B or coincidentally)) or (PHY 232 or concurrently) or (PHY 232C or concurrently) or (PHY 294H or concurrently) or (LB 274 or concurrently)) R: Not open to freshmen or sophomores.
Application of seismic, gravity, magnetic, resistivity, and electromagnetic methods to problems related to engineering studies, mineral and oil exploration, groundwater, subsurface mapping, pollution, and hazardous waste.
Effective Fall 2014 Effective Fall 2017

GLG 481  Reservoirs and Aquifers
Spring of odd years. 3(2-2) P: GLG 431 or concurrently
Effective Fall 2014 Effective Fall 2017
GLG 491  Field Geology - Summer Camp (W)
Summer of every year. 6 credits. P: (GLG 431 and GLG 361) or (GLG 431 and GLG 401) or ((GLG 361 and GLG 401) and completion of Tier I writing requirement) R: Open to students in the Department of Geological Sciences or in the Lyman Briggs Geological Sciences Coordinate Major or in the Lyman Briggs Environmental Geosciences Coordinate Major. Approval of department.
Effective Fall 2014 Effective Fall 2017

GLG 493  Field Studies in Geological Sciences
On Demand. 1 to 6 credits. A student may earn a maximum of 8 credits in all enrollments for this course. P: GLG 201 and GLG 304 RB: Specific programs may have additional prerequisites. R: Open to juniors or seniors or graduate students in the Department of Geological Sciences or in the Lyman Briggs Environmental Geosciences Coordinate Major or in the Lyman Briggs Geological Sciences Coordinate Major. Approval of department.
Field experiences in solid earth and environmental geosciences within the US and abroad. Field trips required.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Summer 2016 Effective Fall 2017

GLG 498  Topics in Geological Sciences
On Demand. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. P: GLG 201 and GLG 304 or approval of department R: Open to juniors or seniors or graduate students in the Department of Geological Sciences or in the Lyman Briggs Environmental Geosciences Coordinate Major or in the Lyman Briggs Geological Sciences Coordinate Major.
Selected topics in geological and geoenvironmental sciences supplementing or expanding specific topics, or examining topics not covered in regular courses.
Effective Spring 2016 Effective Fall 2017

GLG 499  Independent Study in Geological Sciences
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course, R: Open to seniors or juniors in the Department of Geological Sciences or in the Lyman Briggs Earth Science-Interdepartmental Coordinate Major or in the Lyman Briggs Environmental Geosciences Coordinate Major or in the Lyman Briggs Geological Sciences Coordinate Major. Approval of department; application required.
Advanced individual study of special topics in the geological sciences.
Effective Fall 2014 Effective Fall 2017

GLG 801  Seminar in Geochemistry
Fall of every year. Spring of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to graduate students in the Department of Geological Sciences. R: Open to graduate students in the Department of Earth and Environmental Sciences.
Recent developments in geochemistry, including aqueous, biologic and mineralogic aspects.
Effective Spring 2004 Effective Fall 2017

GLG 802  Seminar in Geophysics and Geodynamics
Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. RB: GLG 401 or GLG 470 or GLG 471 R: Open only to graduate students in the Department of Geological Sciences. R: Open to graduate students in the Department of Earth and Environmental Sciences.
Applied, solid-earth, and theoretical geophysics, global and regional geodynamics. Plate tectonics, marine geophysics, and polar earth sciences.
Effective Fall 2003 Effective Fall 2017
GLG 803  Seminar in Hydrogeology  
Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. RB: GLG 411 or GLG 421  
R: Open only to graduate students in the Department of Geological Sciences. 
R: Open to graduate students in the Department of Earth and Environmental Sciences. 
Occurrence, movement and composition of groundwater in geologic settings.  
Effective Fall 1999 Effective Fall 2017

GLG 804  Seminar in Paleobiology  
Fall of every year. Spring of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
R: Open only to graduate students in the Department of Geological Sciences. 
R: Open to graduate students in the Department of Earth and Environmental Sciences. 
Invertebrate, vertebrate and plant paleobiology.  
Effective Fall 2000 Effective Fall 2017

GLG 805  Seminar in Petrology  
Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. RB: GLG 361  
R: Open only to graduate students in the Department of Geological Sciences. 
R: Open to graduate students in the Department of Earth and Environmental Sciences. 
Current topics in igneous petrology.  
Effective Fall 2001 Effective Fall 2017

GLG 806  Seminar in Sedimentology and Stratigraphy  
Fall of every year. Spring of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
R: Open only to graduate students in the Department of Geological Sciences. 
R: Open to graduate students in the Department of Earth and Environmental Sciences. 
Recent developments in stratigraphy and deposition, and diagenesis of sedimentary rocks.  
Effective Summer 1994 Effective Fall 2017

GLG 807  Seminar in Structural Geology and Tectonics  
Fall of every year. Spring of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
R: Open only to graduate students in the Department of Geological Sciences. 
R: Open to graduate students in the Department of Earth and Environmental Sciences. 
Rock deformation and major lithospheric structure.  
Effective Fall 1993 Effective Fall 2017

GLG 808  Seminar in Planetary Geology and Astromaterials  
Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. RB: Upper university-level coursework in GLG or AST.  
R: Open to graduate students in the Department of Geological Sciences. Approval of department. 
R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department. 
Current topics in planetary geology and astromaterials, including meteorites and returned samples.  
Effective Spring 2008 Effective Fall 2017

GLG 813  Hillslope Hydrology  
Spring of every year. 4(3-1)  
Advanced course on Hillslope Hydrology covering the physical, chemical, and isotopic characteristics of river runoff generation from the pore to the catchment scale.  
Effective Spring 2015 Effective Fall 2017
GLG 821  Aqueous Geochemistry  
Fall of odd years. 3(2-2) RB: CE 481 or CEM 383 or CSS 455 or FW 472 or GLG 421 or GLG 422  
RB: CEM 383 or CSS 455 or FW 472 or GLG 421  
R: Open only to graduate students.  R: Open to graduate students.  
Controls on the chemical and isotopic nature of water (fresh, marine, brine) and its solutes. Data acquisition and synthesis. Chemical modeling and evolution of water masses.  
Effective Fall 1996 Effective Fall 2017

GLG 862  Igneous Petrology  
Fall of even years. 4(3-2) RB: GLG 361  
R: Open to graduate students.  
Origin and evolution of magmatic systems. Relationship of igneous activity to tectonic setting.  
Effective Fall 2009 Effective Fall 2017

GLG 889  Special Problems in Geocognition  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
Individual study on current problems in geocognition and geoscience education research  
Effective Summer 2016 Effective Fall 2017

GLG 890  Special Problems in Planetary Geology and Astromaterials  
Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Upper university-level coursework in GLG or AST  
R: Open only to graduate students in the Department of Geological Sciences. Approval of department.  R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.  
Individual study on current topics in planetary geology and astromaterials, including meteorites and returned samples.  
Effective Spring 2008 Effective Fall 2017

GLG 891  Special Problems in Geochemistry  
Fall of every year. Spring of every year. Summer of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.  
R: Open only to graduate students in the Department of Geological Sciences. Approval of department.  R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.  
Individual study on problems in geochemistry, including aqueous, biologic, and mineralogic aspects.  
Effective Fall 1993 Effective Fall 2017

GLG 892  Special Problems in Geophysics and Geodynamics  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: GLG 401 or GLG 470 or GLG 471  
R: Open only to graduate students in the Department of Geological Sciences. Approval of department.  R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.  
Individual study on problems in applied and solid-earth geophysics, global and regional geodynamics, and polar earth sciences.  
Effective Fall 2001 Effective Fall 2017

GLG 893  Special Problems in Hydrogeology  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: GLG 411 or GLG 421  
R: Open only to graduate students in the Department of Geological Sciences. Approval of department.  R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.  
Individual study on the movement, occurrence and composition of groundwater in geologic environments.  
Effective Fall 1995 Effective Fall 2017
GLG 894 Special Problems in Paleobiology
Fall of every year. Spring of every year. Summer of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate students in the Department of Geological Sciences. Approval of department. R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.
Individual study on invertebrate, vertebrate and plant paleobiology.
Effective Summer 1994 Effective Fall 2017

GLG 895 Special Problems in Petrology
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: GLG 361 R: Open only to graduate students in the Department of Geological Sciences. Approval of department. R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.
Individual study on current problems in petrology.
Effective Fall 2001 Effective Fall 2017

GLG 896 Special Problems in Sedimentology and Stratigraphy
Fall of every year. Spring of every year. Summer of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate students in the Department of Geological Sciences. Approval of department. R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.
Individual study on problems in sedimentology and stratigraphy.
Effective Fall 2000 Effective Fall 2017

GLG 897 Special Problems in Structural Geology and Tectonics
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: GLG 351 R: Open only to graduate students in the Department of Geological Sciences. Approval of department. R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.
Individual study on rock deformation or major expressions of deformation. From two to seven weeks of field study during semester breaks may be required for certain research projects.
Effective Fall 1996 Effective Fall 2017

GLG 898 Special Problems in Environmental Geosciences
Fall of every year. Spring of every year. Summer of every year. On Demand. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate students in the Department of Geological Sciences. Approval of department. R: Open to graduate students in the Department of Earth and Environmental Sciences. Approval of department.
Individual study on problems in environmental geosciences.
Effective Fall 1994 Effective Fall 2017

GLG 899 Master's Thesis Research
Fall of every year. Spring of every year. Summer of every year. On Demand. 1 to 10 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open only to master's students in the Department of Geological Sciences. Approval of department. R: Open to master's students in the Department of Earth and Environmental Sciences. Approval of department.
Master's thesis research.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Summer 2003 Effective Fall 2017

GLG 901 Research Strategies and Methods
Fall of every year. Spring of every year. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course. RB: Undergraduate degree in Engineering or Sciences
Selected topics in the earth and environmental sciences.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2011 Effective Fall 2017
GLG 999  Doctoral Dissertation Research  
Fall of every year. Spring of every year. Summer of every year. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open to doctoral students in the Department of Geological Sciences. Approval of department. R: Open to doctoral students in the Department of Earth and Environmental Sciences. Approval of department.  
Doctoral dissertation research.  
Request the use of the Pass-No Grade (P-N) system.  
Effective Summer 2014 Effective Fall 2017

COLLEGE OF EDUCATION

ED 928  Proseminar in Educational Policy  
Spring of every year. 1(2-0) R: Open to graduate students in the Educational Policy major.  
Disciplinary perspectives on policy issues. Influence of research on policy process and outcomes. Workshops in educational policy.  
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.  
DELETE COURSE  
Effective Fall 2017

ED 976  Capstone in Educational Policy Analysis and Evaluation  
Spring of every year. 3(3-0) RB: TE 901 and EAD 942 and EAD 943 and EAD 925 and ED 928 R: Open to graduate students in the Educational Policy major.  
Essential issues in policy analysis and evaluation. Prominent evaluations of educational policy initiatives at national, state, and local levels. Policy evaluation methods. Policy analysis and group evaluation project.  
DELETE COURSE  
Effective Spring 2017

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

EAD 942  Economic Analysis in Educational Policy Making  
Economics of Education  
Spring of every year, Spring of every year, 3(3-0) Interdepartmental with Teacher Education. R: Open to graduate students.  
Alternative theoretical perspectives. Applications to the United States and other countries.  
Effective Fall 1992 Effective Spring 2017

EAD 943  Politics of Education  
Fall of odd years. Spring of every year, 3(3-0) R: Open to graduate students.  
Education as a political enterprise. Interplay of federal relations, democratic principles, and contending sources of authority in shaping educational policy and practice. Politics of education in the United States. Interplay of key institutions (e.g., school boards, state governments, Congress, mayors) and actors (e.g., elected officials, parents, teachers unions, and the general public) shaping the public education system.  
Effective Fall 1992 Effective Spring 2017

DEPARTMENT OF EPIDEMIOLOGY AND BIOSTATISTICS

EPI 240  Epidemiological Investigations in Nutrition and Health  
Summer of every year. 3(3-0) Interdepartmental with Human Nutrition and Foods. R: (HNF 150 or concurrently) or (HNF 260 or concurrently) or approval of department P: HNF 150 or concurrently or approval of department  
Integration of epidemiology with human nutrition concepts to understand the role of dietary intake and nutritional status as determinants of health-related issues in populations.  
Effective Summer 2014 Effective Fall 2016
EPI 880  Select Topics in Biostatistics
Summar of every year. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P: (EPI 808B or (EPI 808 and EPI 809) or (PHM 830 or STT 464) P: EPI 808 and EPI 809 for graduate students in the Department of Epidemiology and Biostatistics. PHM 830 or STT 464 or equivalent. R: Approval of department. R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
Select topics in biostatistics including global disease distribution and estimation, causal inference, Bayesian methods in health services research. Effective Summer 2012 Effective Summer 2017

DEPARTMENT OF FOOD SCIENCE AND HUMAN NUTRITION

FSC 211  Principles of Food Science
Fall of every year. Spring of every year. Summer of every year. 3(3-0)
Scientific principles, historical perspective, and current status of technology related to food composition, safety, toxicology, processing, preservation, and distribution. Effective Fall 2014 Effective Fall 2016

FSC 401  Food Chemistry
Fall of every year. Spring of every year. 3(3-0) P: BMB 200 or CEM 352 or (BMB 401 or concurrently) R: Not open to freshmen or sophomores.
Organic and biological reactions of food constituents. Chemical changes in foods during processing and storage affecting texture, color, flavor, stability, and nutritive qualities. Effective Fall 2014 Effective Fall 2016

FSC 402  Food Chemistry Laboratory
Fall of every year. Spring of every year. 1(0-3) P: (FSC 401 or concurrently) and completion of Tier I writing requirement
Chemical changes in food constituents which affect stability of food products and properties such as color, flavor and texture. Effective Fall 2014 Effective Fall 2016

DEPARTMENT OF FORESTRY

FOR 406  Applied Forest Ecology: Silviculture
Fall of every year. 3(3-0) P: (FOR 404 or concurrently) or (ZOL 355 or concurrently) and completion of Tier I writing requirement P: (FOR 404 or concurrently) or (IBIO 355 or concurrently) and completion of Tier I writing requirement R: Not open to freshmen or sophomores.

DEPARTMENT OF GEOGRAPHY, ENVIRONMENT, AND SPATIAL SCIENCES

GEO 113  Introduction to Economic Geography
Fall of every year. Spring of every year. 3(3-0)
Spatial distribution of resources, population, enterprise, trade, consumption, and production. Interaction of those distributions at local to global scales. Effective Fall 2014 Effective Fall 2017

GEO 151  Introduction to Human Geography
Fall of every year. Spring of every year. 3(3-0)
Systematic study of spatial patterns and processes that have shaped human use and alteration of the world. Effective Fall 2014 Effective Fall 2017

GEO 201  Introduction to Plant Geography
Fall of even years. 3(3-0) R: Not open to graduate 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. Effective Spring 2016 Effective Fall 2017
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Offered</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 203</td>
<td>Introduction to Meteorology</td>
<td>Fall of every year</td>
<td>3(3-0)</td>
<td>Fundamentals of meteorology. Energy balance, adiabatic processes, horizontal motion, cyclogenesis, and severe weather.</td>
</tr>
<tr>
<td>GEO 204</td>
<td>World Regional Geography</td>
<td>Fall of every year</td>
<td>3(3-0)</td>
<td>Economic, political, cultural, environmental, and technological processes and conditions that explain the diversity of world regions.</td>
</tr>
<tr>
<td>GEO 206</td>
<td>Physical Geography</td>
<td>Fall of every year</td>
<td>3(3-0)</td>
<td>Geographic and functional interrelationships within the physical environment: Earth-sun relationships, weather, climate, soils, vegetation and landforms (terrain characteristics).</td>
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<tr>
<td>GEO 206L</td>
<td>Physical Geography Laboratory</td>
<td>Fall of every year</td>
<td>1(0-2)</td>
<td>Geographic aspects of weather, climate, soil, vegetation, and terrain. Interpretation and application of maps and remotely sensed imagery.</td>
</tr>
<tr>
<td>GEO 208</td>
<td>Physical Geography of the National Parks</td>
<td>Fall of odd years</td>
<td>2(2-0)</td>
<td>Physical features such as geology, landforms, biota, and waters of United States and Canadian national parks, forests, seashores and lakeshores. Emphasis on formation and distribution.</td>
</tr>
<tr>
<td>GEO 211</td>
<td>Environmental Policy and Practice</td>
<td>Fall of every year</td>
<td>3(3-0)</td>
<td>Systematic study of environmental policy and resource management practices in the United States and the broader global context, emphasizing geographical and other social sciences perspectives.</td>
</tr>
<tr>
<td>GEO 214</td>
<td>Geography of Drugs</td>
<td>Fall of even years</td>
<td>3(3-0)</td>
<td>Physical, ecological, and human geographies of drugs, drug crops, pharmaceuticals, alcohol, and their diffusions. Cultural geographies and geopolitical implications of drugs' consumption, trade, and regulation and prohibition.</td>
</tr>
<tr>
<td>GEO 215</td>
<td>Sports Geography</td>
<td>Fall of odd years</td>
<td>3(3-0)</td>
<td>Geographical variables that influence the location, character, and spread of sports at the national and global scale. Human cultures and diffusion. Themes associated with the geography of sports. Origin and spread of collegiate, professional, international, and Olympic sports</td>
</tr>
<tr>
<td>GEO 221</td>
<td>Introduction to Geographic Information</td>
<td>Fall of every year</td>
<td>3(3-0)</td>
<td>Principles and methods of spatial data collection, handling, analysis, and display. Introduction to remote sensing, geographic information systems, and cartography.</td>
</tr>
</tbody>
</table>
GEO 221L  Introduction to Geographic Information Laboratory
Fall of every year. Spring of every year. Summer of every year. 1(0-2) P: GEO 221 or concurrently
RB: Basic computer and math skills
Basic skills for working with Geographic Information Systems, remotely sensed imagery,
design of maps, geospatial tools and technologies for data analysis and problem-solving.
Effective Fall 2014 Effective Fall 2017

GEO 235  Geography of Environment and Health
Spring of every year. 3(3-0)
Geographic patterns of global health and environmental inequalities; the built, physical
and social environment; urban design; infectious and chronic diseases.
Effective Spring 2016 Effective Fall 2017

GEO 259  Geography of Recreation and Tourism
Fall of every year. 3(3-0)
Cultural, physical, and biotic factors affecting the distribution of recreation and tourism
resources and participation. U.S. and international examples and case studies.
Effective Fall 2014 Effective Fall 2017

GEO 286  Undergraduate Research in Geography
Fall of even years. 3(3-0)
Supervised research on a topic or topics determined by the instructor. Applications of
geographic tools and theory.
Effective Fall 2016 Effective Fall 2017

GEO 306  Environmental Geomorphology
Fall of even years. 3(3-0) Interdepartmental with Geological Sciences. P: CSS 210 or GEO 206 or
GEO 333 or GLG 201 or GLG 304 or ISP 203A
Relationships of running water, weathering, gravity, ice, waves, wind, and biota (including
humans) to terrain and soils. Evolution of landscapes. Classical and modern
interpretations.
Effective Fall 2014 Effective Fall 2017

GEO 324  Remote Sensing of the Environment
Fall of every year. 4(2-4) P: GEO 221
Features and interpretation methods of remotely-sensed imagery, especially black-and-
white and color infrared airphotos. Basic features of radar, thermal, and multispectral
imagery. Interpretation for agriculture, archaeology, fisheries, forestry, geography,
landscape architecture, planning, and wildlife management.
SA: GEO 224
Effective Fall 2014 Effective Fall 2017

GEO 325  Geographic Information Systems
Fall of every year. 3(2-2) P: GEO 221 and GEO 221L
Technical and theoretical issues in the design, implementation, and use of geographic
information systems for research and applications.
Effective Fall 2014 Effective Fall 2017

GEO 326  Cartographic Design and Production
Fall of every year. 4(2-4) P: GEO 221 and GEO 221L
Map design, layout, and usability. Typography and color theory. Techniques of map
production, print and digital display.
SA: GEO 423
Effective Spring 2016 Effective Fall 2017

GEO 330  Geography of the United States and Canada
Spring of every year. Summer of every year. 3(3-0)
Regional analysis. Evolution and status of environmental, demographic, economic, and
sociocultural patterns and processes.
SA: GEO 230
Effective Fall 2014 Effective Fall 2017
GEO 333  Geography of Michigan and the Great Lakes Region
Spring of every year. 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
Effective Fall 2014 Effective Fall 2017

GEO 335  Geography of Latin America
Fall of odd years. 3(3-0)
Physical and human geography of Latin America. Current development issues, especially people-environment interaction in urban and rural areas. Topics include migration, urbanization, and industrialization.
Effective Fall 2014 Effective Fall 2017

GEO 336  Geography of Europe
Fall of even years. 3(3-0)
Major regions and nations, including their physical resources, peoples, political structures, and economies.
Effective Fall 2014 Effective Fall 2017

GEO 337  Geography of Asia-Pacific
Spring of odd years. 3(3-0)
Spatial patterns and processes of economic, urban, human and physical geography in eastern Asia, including China, Korea, Japan, Australia, New Zealand, the Indian subcontinent and other Asian countries. Contemporary regional development.
Effective Fall 2014 Effective Fall 2017

GEO 338  Geography of Africa
Fall of every year. 3(3-0)
Physical and human geography of Africa. Current development issues, especially people-environment interaction in urban and rural areas. Topics include drought, agricultural patterns, hunger, rural development, migration, and urbanization.
Effective Fall 2014 Effective Fall 2017

GEO 339  Geography of the Middle East and North Africa
Spring of odd years. 3(3-0)
Effective Fall 2015 Effective Fall 2017

GEO 340  Geography of Eurasia
Spring of even years. 3(3-0)
Physical, ecological, and human geographies of the lands and peoples of the former Russian and Soviet empires and of neighboring regions.
Effective Fall 2016 Effective Fall 2017

GEO 363  Introduction to Quantitative Methods for Geographers
Fall of every year. 3(3-0) RB: Completion of University mathematics requirement.
Quantitative techniques in the analysis and classification of spatial data.
SA: GEO 463
Effective Fall 2014 Effective Fall 2017

GEO 402  Agricultural Climatology
Fall of every year. 3(3-0) Interdepartmental with Biosystems Engineering. P: MTH 110 or MTH 116 R: Not open to freshmen or sophomores.
Relationships between climate and agriculture in resource assessment, water budget analysis, meteorological hazards, pests, crop-yield modeling, and impacts of global climate change.
Effective Fall 2014 Effective Fall 2017
GEO 403  Dynamic Meteorology (W)
Spring of every year. 3(3-0) P: (MTH 234 and GEO 203) and completion of Tier I writing
requirement RB: GEO 405 R: Open to juniors or seniors or master's students or doctoral students.
Principles of fluid dynamics and their application to the atmosphere.
Effective Fall 2014 Effective Fall 2017

GEO 405  Weather Analysis and Forecasting
Spring of every year. 4(3-2) P: GEO 203 and (MTH 110 or MTH 116)
Dynamic and thermodynamic principles of atmospheric science applied to the
development and evolution of extratropical cyclones. Laboratory sessions include analysis
of current observations and satellite imagery.
Effective Fall 2014 Effective Fall 2017

GEO 407  Regional Geomorphology of the United States
Spring of odd years. 3(3-0) RB: GEO 306 or GLG 201 or GLG 412 or ISP 203A or ISP 203B
Geomorphic characteristics of physiographic regions of the United States.
Effective Fall 2014 Effective Fall 2017

GEO 408  Soil Geomorphology Field Study
Fall of odd years. 4(2-4) P: CSS 210 or GEO 306 or GLG 201 or GLG 412 or GEO 206 R: Not open
to freshmen or sophomores.
Common geographic relationships among soils, landforms, and vegetation in lower
Michigan. Description, analysis, and genesis of soils and landscapes. Surficial processes.
Effective Fall 2014 Effective Fall 2017

GEO 409  Global Climate Change and Variability
Fall of odd years. 3(3-0) P: GEO 203 or GEO 206
Analysis of climate change and variability at various time and space scales. Climate
systems, paleoclimatology, global warming, climate models, and climate impact
assessment.
Effective Fall 2014 Effective Fall 2017

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: Not open to
freshmen or 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.
Effective Fall 2014 Effective Fall 2017

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: Not open to
freshmen or 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.
Effective Fall 2014 Effective Fall 2017

GEO 413  Urban Geography
Spring of every year. 3(3-0) Interdepartmental with Urban Planning. R: Not open to freshmen 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.
Effective Fall 2014 Effective Fall 2017

GEO 414  Geography of Transportation
Fall of odd years. 3(3-0) Interdepartmental with Urban Planning. P: GEO 113 R: Not open to
freshmen.
Spatial principles of transportation. Theories of interaction, network structures, and
location-allocation models. Role of transport and transport planning.
Effective Fall 2014 Effective Fall 2017
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: Not open to freshmen or 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.  
Effective Fall 2016 Effective Fall 2017

GEO 418  The Ghetto  
Fall of odd years. 3(3-0) Interdepartmental with Urban Planning. R: Not open to freshmen or sophomores.  
Analysis of the ghetto including its spatial organization and structure. Distribution of racial and ethnic populations. Emphasis on U.S. cities.  
Effective Fall 2014 Effective Fall 2017

GEO 424  Advanced Remote Sensing  
Spring of every year. 4(3-2) P: GEO 324  
Interaction of solar radiation with the atmosphere, lithosphere, hydrosphere, and biosphere. Introductory digital image processing. Earth-resources satellite sensors, data products, and applications. Radar and thermal remote sensing.  
Effective Fall 2014 Effective Fall 2017

GEO 425  Problems in Geographic Information Science (W)  
Spring of every year. 3(2-2) Interdepartmental with Urban Planning. P: (GEO 325 or GEO 802) and completion of Tier I writing requirement  
Advanced theoretical and technical issues in geographic information science utilizing a problems oriented approach. Development and implementation of geographic information science solutions and formal documentation of work.  
Effective Fall 2014 Effective Fall 2017

GEO 426  Thematic Cartography  
Spring of every year. 4(3-2) P: GEO 221 and GEO 221L and GEO 326 or approval of department  
Principles, theories, decision making, and techniques in thematic map production. Graphic and Geographic Information Systems applications. Print and digital display.  
Effective Spring 2016 Effective Fall 2017

GEO 428  Digital Terrain Analysis  
Fall of even years. 4(3-2) P: GEO 325  
Theoretical and technical issues of collection, management, analysis, and display of terrain data. Application of photogrammetry, geographic information systems, and cartography.  
Effective Fall 2014 Effective Fall 2017

GEO 429  Geoprocessing  
Spring of every year. 3(3-0) P: GEO 325 or GEO 802 or approval of department  
Applications of computer programming to address geographic information problems. Integration of digital spatial data, geographic information systems, spatial analysis, and expert systems.  
Effective Spring 2015 Effective Fall 2017

GEO 432  Environmental Ethics (W)  
Fall of every year. 3(3-0) P: Completion of Tier I writing requirement. R: Not open to freshmen or sophomores.  
Ethical dimensions of environmental and spatial issues and associated public policies  
Effective Fall 2014 Effective Fall 2017

GEO 435  Geography of Health and Disease  
Fall of every year. 3(3-0) R: Not open to freshmen or sophomores.  
Spatio-environmental concepts and techniques applied to health problems. Disease transmission cycles, community nutrition, and health-care planning.  
Effective Fall 2014 Effective Fall 2017
GEO 436  Spatial Analysis of Populations  
Spring of odd years. 3(3-0) R: Not open to freshmen or 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.  
**Effective Fall 2014 Effective Fall 2017**

GEO 440  Critical Geopolitics  
Spring of even years. 3(3-0) R: Not open to freshmen.  
**Effective Fall 2014 Effective Fall 2017**

GEO 441  Cultural Geography  
Spring of odd years. 3(3-0) RB: GEO 151 R: Not open to freshmen.  
Survey of the geographic study of world cultures, cultural ecologies, cultural landscapes, and cultural influences on societies’ patterns of spatial organization.  
**Effective Fall 2014 Effective Fall 2017**

GEO 453  Metropolitan Environments: Urban Forms and Land Uses  
Spring of every year. 3(2-2) P: GEO 221  
Land use change, the physical fabric of the city, and the growth of regional centers in the American urban landscape. Issues associated with urban developments, practices and patterns in the 20th century and the resulting metropolitan form and function. Extensive use of geographic information software in spatial analysis.  
**Effective Fall 2014 Effective Fall 2017**

GEO 454  Geography of Environment and Development  
Spring of odd years. 3(3-0) RB: GEO 113 or GEO 151 or GEO 330 or GEO 333 or GEO 335 or GEO 336 or GEO 337 or GEO 338  
Spatial patterns and processes associated with regional development in selected world areas.  
**Effective Fall 2014 Effective Fall 2017**

GEO 480  Senior Seminar (W)  
Fall of every year. 3(3-0) P: Completion of Tier I Writing Requirement R: Open to seniors in the Geography Major or in the Geography Minor.  
History, philosophy, and methodology of the geographic discipline as it has evolved within academic and social contexts.  
**Effective Fall 2014 Effective Fall 2017**

GEO 490  Independent Study  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.  
Supervised individual study in an area supplementary to regular courses.  
**Effective Fall 2014 Effective Fall 2017**

GEO 492  Geographic Research Problems  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Not open to freshmen or sophomores. Approval of department.  
Supervised original research on selected aspects of geography.  
**Effective Fall 2014 Effective Fall 2017**

GEO 495  Field Study  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
Supervised field study in geography.  
**Effective Fall 2014 Effective Fall 2017**
PART III – COURSE CHANGES

GEO 498  Internship in Geography
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.
- Individual experience in geography in an approved organization.
- Request the use of the Pass-No Grade (P-N) system.
  Effective Fall 2014  Effective Fall 2017

GEO 802  Geospatial Technology
Fall of every year. 3(3-0) RB: Familiarity with coordinate systems.
- Comprehensive introduction to geotechnologies. Concepts and theories of remote sensing to include image interpretation and processing, Global Positioning Systems, spatial data structures, and geographic information systems.
  Effective Fall 2007  Effective Fall 2017

GEO 813  Seminar in Urban and Economic Geography
Spring of every year. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
- RB: Two of GEO 413, GEO 414, GEO 415, GEO 416, GEO 417, GEO 418.
- RB: Two of GEO 413, GEO 414, GEO 415, GEO 418.
- Review of research on selected topics in urban and economic geography.
  Effective Summer 1995  Effective Fall 2017

GEO 816  The World System of Cities
Fall of every year. 3(3-0) Interdepartmental with Global Urban Studies Program. R: Open to graduate students.
- Modern global economic restructuring. Social, economic, and political impacts on world system of cities.
  Effective Fall 2016  Effective Fall 2017

GEO 817  China and Globalization
Fall of even years. 3(3-0) Interdepartmental with Global Urban Studies Program. RB: GEO 113 or GEO 204 or GEO 337 or GEO 413 R: Open to graduate students.
- Theoretical debates and empirical discussions on current social, economic, environmental, and spatial challenges facing contemporary urban China in an era of globalization. Comparative and thematic approach.
  Effective Fall 2010  Effective Fall 2017

GEO 820  GIS and Management
Fall of odd years. 3(3-0) P: GEO 425 or approval of department RB: Students should be familiar with GIS Technology
- Exploration of the professional field of geographic information science (GIS) career management opportunities, organizational structures, and applications within the public, commercial and academic sectors.
  Effective Fall 2014  Effective Fall 2017

GEO 821  GIS Practicum
Spring of even years. 3(3-0) P: (GEO 425 or approval of department) and (GEO 820 or approval of department) RB: Students should be knowledgeable in the application of GIS technology
- Instructor-guided geographic information science (GIS) practicum connecting University faculty and students with local communities. Students are assigned a community GIS project and work collaboratively to develop a proposal, manage the project, and present the output.
  Effective Fall 2014  Effective Fall 2017

GEO 826  Geocomputation
Fall of every year. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course.
- Research on topics in cartography, geographic information systems, and remote sensing.
  Effective Spring 2013  Effective Fall 2017
PART III – COURSE CHANGES

GEO 827 Digital Image Processing and Analysis
Fall of every year. 4(2-4) P: GEO 424
Use of computer to classify and enhance satellite images and to extract information from them. Combining images from different sources. Accuracy assessment of resulting information.
Effective Spring 2002 Effective Fall 2017

GEO 837 Remote Sensing of the Biosphere
Fall of even years. 3(3-0) P: GEO 424 or approval of department
Remote sensing for environmental and global change research. Advanced image interpretation and applications with emphasis on independent research projects.
Effective Fall 2016 Effective Fall 2017

GEO 865 Advanced Quantitative Methods in Geography
Spring of every year. 4(4-0) RB: GEO 363
Effective Spring 2008 Effective Fall 2017

GEO 866 Spatial Data Analysis
Fall of every year. 4(3-2) Interdepartmental with Statistics and Probability. RB: (GEO 363 or STT 421 or STT 430) or equivalent quantitative methods courses.
Theory and techniques for statistical analysis of point patterns, spatially continuous data, and data in spatial zones.
SA: GEO 466
Effective Spring 2009 Effective Fall 2017

GEO 868 Spatial Regression and Modeling
Fall of every year. 3(3-0) P: GEO 865 or approval of department RB: Linear regression and data analysis at graduate level
SA: GEO 867
Effective Fall 2007 Effective Fall 2017

GEO 869 Geosimulation
Spring of every year. 3(3-0) Interdepartmental with Environmental Science and Policy. RB: Basic understanding of data structures and algorithms covered in an introductory course of any programming language. R: Approval of department.
Theoretical concepts related to simulating dynamic geographic phenomena in the intersection between human and natural systems. Innovative agent-based methodology applied to complex social-environmental systems. Hands-on experience of agent-based modeling, with special emphasis on modeling human decision-making and its impact on the natural environment.
Effective Spring 2011 Effective Fall 2017

GEO 871 Seminar in Physical Geography
Fall of every year. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. RB: at least one course in physical geography R: Approval of department.
Research on topics in physical geography.
Effective Summer 2012 Effective Fall 2017

GEO 872 Seminar in Human Geography
Fall of every year. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. RB: at least one course in human geography R: Approval of department.
Research on topics in human geography.
Effective Summer 2012 Effective Fall 2017
GEO 873  Seminar in Human-Environment Geography  
Spring of every year. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. RB: at least one course in human geography and one course in physical geography. R: Approval of department.  
Research on topics in human-environment geography.  
Effective Summer 2012 Effective Fall 2017

GEO 874  Seminar in Geographic Information Science  
Spring of every year. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. RB: at least one course in geographic information science, cartography or remote sensing R: Approval of department.  
Geographic information science (GIS) applications to social and environmental problems.  
Theory and related issues.  
Effective Summer 2012 Effective Fall 2017

GEO 886  Research Design in Geography  
Spring of every year. 3(3-0) R: Approval of department.  
Research and writing in geography. Identification of geographic problems and their relative importance. Structuring and stating hypotheses. Data acquisition and tests for validity.  
Effective Spring 2011 Effective Fall 2017

GEO 890  Advanced Readings in Geography  
Fall of every year. Spring of every year. Summer of every year. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.  
Advanced independent readings.  
Effective Fall 1993 Effective Fall 2017

GEO 892  Advanced Research in Geography  
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.  
Advanced independent research.  
Effective Fall 1992 Effective Fall 2017

GEO 899  Master's Thesis Research  
Fall of every year. Spring of every year. Summer of every year. 1 to 12 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to graduate students in the Geography major.  
R: Open to graduate students.  
Master's thesis research.  
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 6 semesters after the end of the semester of enrollment.  
Effective Spring 2003 Effective Fall 2017

GEO 986  Theories and Philosophies in Geography  
Spring of odd years. 3(3-0) R: Open to doctoral students in the Geography major.  
Historical development of the discipline within social and intellectual contexts.  
Philosophical approaches behind geographic research and theory.  
Effective Fall 2012 Effective Fall 2017

GEO 999  Doctoral Dissertation Research  
Fall of every year. Spring of every year. Summer of every year. 1 to 36 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open to doctoral students in the Department of Geography.  
Doctoral dissertation research.  
Request the use of the Pass-No Grade (P-N) system.  
Effective Fall 2014 Effective Fall 2017
DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY STUDIES

HDFS 270  Introduction to Human Development and Family Studies
Fall of every year. Spring of every year. Summer of every year. 4(3-2) R: Open to students in the Department of Human Development and Family Studies. Introduction of ecological perspective for Human Service delivery. Professional orientation, ethics and factors influencing the field. Participation in service learning required.
SA: FCE 270
Effective Summer 2014 Effective Summer 2017

HDFS 322  Infant Development and Program Planning
Fall of every year. Spring of every year. 3(3-0) P: HDFS 211 RB: HDFS 320 Markers of typical and atypical development in infancy. Indicators of quality childcare. Early intervention and support programs. Issues in curriculum and environments of childcare.
SA: FCE 322
Effective Summer 2014 Effective Summer 2017

HDFS 405  Work and Family
Spring of every year. 3(3-0) R: Open to juniors or seniors or graduate students. Historical perspectives on work and family. Effects of work on family members across the life cycle, and employer and public policy response.
SA: FCE 405
DELETE COURSE
Effective Summer 2017

HDFS 413  Adult Development and the Family
Fall of even years. 4(3-3) R: Open to juniors or seniors or graduate students. Social, psychological, and biological development within the family in middle and later years. Field study required.
SA: FCE 413
DELETE COURSE
Effective Summer 2017

HDFS 454  Family Resource Management
Fall of every year. Spring of every year. 3(3-0) RB: HDFS 238 R: Open to juniors or seniors or graduate students in the Department of Human Development and Family Studies. Resource management strategies of families during the life cycle, including time, money, material assets, energy, social connections, and space.
SA: FCE 454
Effective Summer 2015 Effective Summer 2017

SCHOOL OF HUMAN RESOURCES AND LABOR RELATIONS

HRLR 212  Career Management
Fall of every year. Spring of every year. Summer of every year. 3(3-0) R: Open to undergraduate students in the College of Social Science or approval of school. Career development. Career self-assessment, occupational opportunities, changing global world of work, social networking, written communication, job interviews, the first job, career planning and decision making.
Effective Summer 2015 Effective Summer 2017
PART III – COURSE CHANGES

DEPARTMENT OF KINESIOLOGY

KIN 103V  Boxing Conditioning
Fall of every year. Spring of every year. Summer of every year. 1(0-2) R: A student may earn a maximum of 8 credits in all enrollments for this course if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 8 credits in KIN 101-108 and KIN 111-118.
- Intensive boxing specific conditioning. Fundamentals and techniques
- Introduction to boxing specific conditioning. Fundamentals and techniques.
- Request the use of the Pass-No Grade (P-N) system.
Effective Spring 2014 Effective Summer 2017

KIN 121  The Healthy Lifestyle
Fall of every year. Spring of every year. Summer of every year. 3(2-2) R: Open to undergraduate students in the Athletic Training Major or in the Health Promotion Minor or in the Kinesiology major.
- Cardiovascular risk factors, lifestyle habits, and aerobic capacities and their relationship to optimal health and longevity. Individual physical activity required as part of the course.
- SA: PES 121
Effective Spring 2013 Effective Spring 2017

KIN 173  Foundations of Kinesiology
Fall of every year. Spring of every year. Summer of every year. 3(2-2) R: Open to undergraduate students in the Department of Kinesiology. R: Open to undergraduate students in the Athletic Training Major or in the Coaching Minor or in the Kinesiology major.
- Kinesiology as a disciplinary major. Subdisciplines and professions. Historical, professional and philosophical perspectives.
- SA: KIN 370, KIN 170
Effective Spring 2013 Effective Spring 2017

KIN 216  Applied Human Anatomy
Fall of every year. 3(3-0) R: Open to students in the Athletic Training major or in the Kinesiology major. R: Open to undergraduate students in the Athletic Training Major or in the Kinesiology major or in the Coaching Minor.
- Structural anatomy of the human body. Interrelationships of structure, function, and human movement.
- SA: PES 216
Effective Spring 2013 Effective Spring 2017

KIN 250  Measurement in Kinesiology
Fall of every year. Spring of every year. Summer of every year. 3(3-0) R: Open to undergraduate students in the Department of Kinesiology. R: Open to undergraduate students in the Athletic Training Major or in the Kinesiology major.
- Methods and materials for measurement and evaluation. Motor skills, physical fitness, knowledge, and attitudes associated with physical activity.
- SA: PES 250
Effective Spring 2013 Effective Spring 2017

KIN 251  Principles of Human Movement
Fall of every year. Spring of every year. Summer of every year. 4(3-2) RB: Functional Anatomy R: Open to students in the College of Education. R: Open to students in the Athletic Training Major or in the Kinesiology major.
- Basic principles governing human movement with a focus on mechanics, movement coordination and motor learning aspects.
Effective Fall 2016 Effective Spring 2017

KIN 330  Biomechanics of Physical Activity
Fall of every year. Spring of every year. Summer of every year. 3(2-2) P: (KIN 173 and KIN 251) and (KIN 216 or ANTR 350) R: Open to junior or seniors in the Department of Kinesiology. R: Open to undergraduate students in the Athletic Training Major or in the Kinesiology major.
- Biomechanical analysis of human movement based upon musculoskeletal structure and function. Mechanical principles.
- SA: PES 330
Effective Fall 2016 Effective Spring 2017
KIN 345   Sport and Exercise Psychology (W)
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: (KIN 173) and completion of Tier I writing requirement. R: Open to juniors or seniors in the Athletic Training major or in the Kinesiology major. R: Open to juniors or seniors in the Athletic Training Major or in the Kinesiology major or in the Coaching Minor.
Psychological effects on sport, motor performance, and exercise behavior. Influence of sport and exercise on psychological development.
SA: KIN 340
Effective Spring 2013 Effective Spring 2017

KIN 360   Physical Growth and Motor Behavior
Fall of every year. Spring of every year. 3(3-0) P: (KIN 216 or ANTR 350) and KIN 251 R: Open to undergraduate students in the Athletic Training Major or in the Kinesiology major or in the Coaching Minor.
SA: KIN 260
Effective Fall 2016 Effective Spring 2017

KIN 371   Introduction to Research Methods in Kinesiology
Fall of every year. Spring of every year. 3(3-0) P: (KIN 173 and KIN 250) and (KIN 216 or ANTR 350) R: Open to juniors or seniors in the Department of Kinesiology. R: Open to undergraduate students in the Athletic Training Major or in the Kinesiology major.
Research methods as they apply to Kinesiology, study design, statistics, elements of scientific process, scientific writing.
Effective Spring 2013 Effective Spring 2017

KIN 465   Adapted Physical Activity
Fall of every year. Spring of every year. 3(2-2) P: KIN 173 R: Open to seniors in the Department of Kinesiology. R: Open to undergraduate students in the Athletic Training Major or in the Kinesiology major.
Teaching and coaching physical activities for persons with disabilities.
SA: PES 465
Effective Spring 2013 Effective Spring 2017

DEPARTMENT OF LARGE ANIMAL CLINICAL SCIENCES

LCS 679  Food Animal Production Medicine I
Spring of every year. 6 credits, 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine R: Open to graduate-professional students in the College of Veterinary Medicine.
Enter-level principles of production medicine as applied to food animal practice.
Effective Fall 2013 Effective Spring 2017

DEPARTMENT OF LINGUISTICS AND GERMANIC, SLAVIC, ASIAN AND AFRICAN LANGUAGES

GRM 400  Reading German for Graduate Students
GRM 800  Reading German
Spring of even years. 5(5-0) 3(3-0) R: Open to graduate students or approval of department.
German grammar and syntax, with emphasis on reading and translation in specialized fields.
SA: GRM 400
Effective Spring 2015 Effective Summer 2017
DEPARTMENT OF MATHEMATICS

MTH 101  Quantitative Literacy I
Fall of every year. 3 credits. P: (MTH 1825) or designated score on Mathematics Placement test R: (MTH 1825 or MTH 103) or designated score on Mathematics Placement test
Quantitative literacy including applications to health and risk, science, and the environment.
Effective Fall 2015  Effective Fall 2016

MTH 102  Quantitative Literacy II
Spring of every year. 3 credits. P: (MTH 1825) or designated score on Mathematics Placement test R: (MTH 1825 or MTH 103) or designated score on Mathematics Placement test
Quantitative literacy including applications to finance, economics, and politics.
Effective Spring 2016  Effective Fall 2016

MTH 309  Linear Algebra I
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: ((MTH 133 or MTH 153H or LB 119) and completion of Tier I writing requirement) and (MTH 299 or approval of department)
Not open to students with credit in MTH 317H.
Matrices, systems of linear equations, vector spaces, linear transformations, inner products and orthogonal spaces, eigenvalues and eigenvectors, and applications to geometry. A writing course with emphasis on proofs.
Effective Fall 2013  Effective Fall 2017

MTH 310  Abstract Algebra I and Number Theory
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: ((MTH 299 or MTH 317H) or approval of department) and completion of Tier I writing requirement Not open to students with credit in MTH 418H.
Structure of the integers, congruences, rings, ring homomorphisms, ideals, quotient rings. A writing course with an emphasis on proofs.
Effective Fall 2013  Effective Summer 2017

MTH 317H  Honors Linear Algebra
Fall of every year. Spring of every year. 4(5-0) P: MTH 133 or MTH 153H or LB 119 R: Open to students in the Honors College or approval of department. Not open to students with credit in MTH 309.
Effective Fall 2013  Effective Fall 2017

MTH 411  Abstract Algebra II
Fall of every year. Spring of every year. 3(3-0) P: MTH 310 Not open to students with credit in MTH 418H.
Continuation of MTH 310. Permutation groups, groups of transformations, normal subgroups, homomorphism theorems, modules. Principal ideal rings, unique factorization domains, noncommutative rings, rings of fractions, ideals.
Effective Summer 2015  Effective Summer 2017

COLLEGE OF OSTEOPATHIC MEDICINE

OST 574  Female Reproductive System
Spring of every year. Summer of every year. 3(3-0) R: Open to graduate-professional students in the College of Osteopathic Medicine.
Normal structure and function and pathologies related to the female reproductive system. Integration of basic science and clinical information in obstetrics and gynecology. Request the use of the Pass-No Grade (P-N) system.
Effective Summer 2013  Effective Summer 2017
DEPARTMENT OF PLANT, SOIL AND MICROBIAL SCIENCES

CSS 192  
Professional Development Seminar I  
Fall of every year.  Spring of every year.  1(0-2)  
R: Open to students in the Department of Plant, Soil and Microbial Sciences.  
Career development, critical issues analysis, resume writing, scientific presentations and public speaking in crop and soil sciences.  
Request the use of the Pass-No Grade (P-N) system.  
Effective Spring 2014 Effective Fall 2016

CSS 451  
Biotechnology Applications for Plant Breeding and Genetics  
Spring of every year.  3(2-2)  
Interdepartmental with Forestry and Horticulture.  P: CSS 350 or ZOL 344  
P: CSS 350 or IBIO 341  
R: Open to juniors or seniors or graduate students.  
Principles, concepts, and techniques of agricultural plant biotechnology. Recombinant DNA technology, plant molecular biology and transformation in relation to plant improvement.  
Effective Spring 2014 Effective Fall 2016

SCHOOL OF SOCIAL WORK

SW 310  
Human Behavior and Social Environment  
Fall of every year.  3(3-0)  
P: (SOC 100 and PSY 101 and SW 200) and (HNF 150 or ZOL 141 or PSY 200 or PSL 250) and (PSY 200 or PSY 235 or PSY 236 or PSY 244 or PSY 270 or PSY 280 or PSY 371)  
P: (SOC 100 and PSY 101 and SW 200) and (HNF 150 or PSY 209 or PSL 250) and (PSY 200 or PSY 235 or PSY 236 or PSY 244 or PSY 270 or PSY 280 or PSY 371)  
R: Open to juniors or seniors in the School of Social Work or approval of school.  
General systems and ecological theories within the context of lifespan development as applied to social work.  
Effective Fall 2013 Effective Fall 2016