College of Agricultural and Life Sciences

Proposed Catalog Changes

Effective Term (unless otherwise noted) = Summer 2016

AGRICULTURAL SCIENCE AND TECHNOLOGY

1. Change the following subject prefix

   AG – Agricultural Science and Technology to AGLS – Agricultural and Life Sciences

   **Rationale:** The AG prefix designation was moved from the Department of Agricultural and Extension Education (AEE) in 2014. CALS Academic Programs would like to update the name to be more inclusive of the whole college. CALS Academic Programs is requesting a prefix and name change from AG prefix to AGLS and name change from Agricultural Science and Technology to Agricultural and Life Sciences.

AGRICULTURAL AND EXTENSION EDUCATION

1. Add the following course

   **AgEd 407 Global Agricultural & Life Sciences Systems (3 cr, max 9)**
   Short title: GLOBAL AG & LIFE SCI SYSTEMS
   This course will introduce students to the history, culture, economy and agricultural systems of a selected foreign country emphasized through a planned short-term international field experience. Through study and travel to the select country, students will be exposed to the history of the country, important cultural sites, production agriculture field operations, agricultural business enterprises, and international agricultural markets. Students will participate in educational and pre-trip informational sessions along with post-trip debriefing, class discussions, completing reports and developing presentations for other CALS classes and clubs about their experience.

   **Available via distance:** No
   **Geographic Area Availability:**
   **Rationale:** Dr. Bob Haggerty, CALS Director of International Programs already offers international field experiences to CALS students. In the past he has offered course credit to participants through a Directed Study (DS) course. This formalizes the international agricultural and life sciences systems course and experience as a regular course in the Department of Agricultural and Extension Education. It will be Ag Ed 407 to complement Ag Ed 406 Exploring International Agriculture that Dr. Haggerty offers in the spring semester.

2. Change the curricular requirement of **Agricultural Education (B.S.Ag.Ed.)**

   Required course work includes the university requirements (see regulation J-3) and the following: This major is approved by the State Board of Professional-Technical Education for the preparation of high school agriculture instructors. Graduates who have completed at least 28 credits in agricultural education, and who meet the state certification requirements for a Standard Secondary Teaching Certificate, are eligible to teach secondary agricultural science and technology in Idaho. Students must be admitted to the Teacher Education Program, which requires a grade-point average of at least 2.75, before being allowed to enroll in upper-division teacher education courses and participate in student teaching. The Idaho teaching certificate transfers to most states in the US. In addition, government and business agencies and the Cooperative Extension System that seek persons with education in both agriculture and education provide employment opportunities for graduates of this curriculum.
AgEd 180  Introduction to Agricultural Education (1 cr)
AgEd 258  Experiential Learning and SAE Programs (1 cr)
AgEd 351  Principles and Philosophy of Professional-Technical Education (3 cr)
AgEd 358  Supervising FFA and SAE Programs (3 cr)
AgEd 451  Communicating in Agriculture (3 cr)
AgEd 452  Methods of Teaching Agriculture (4 cr)
AgEd 453  Program Planning in Secondary and Adult Ag Education (3 cr)
AgEd 454  Facilities Organization and Management (2 cr)
AgEd 460  Practicum: Secondary School Teaching in Agriculture (10 cr)
AgEd 461  Student Teaching Portfolio (2 cr)
AgEd 470  Proseminar in Agricultural Education (1 cr)
AgEd 471  Senior Capstone in Agricultural Education (1 cr)
ASM 107  Beginning Welding (2 cr)
ASM 202  Agricultural Shop Practices (2 cr)
ASM 210  Small Engines (2 cr)
ASM 407  Advanced Welding (1 cr)
Biol 115  Cells and the Evolution of Life (4 cr)
Comm 101  Fundamentals of Public Speaking (2 cr)
Econ 202  Principles of Microeconomics (3 cr)
EDCI 201  Contexts of Education (2 cr)
EDCI 301  Learning, Development, and Assessment (3 cr)
EDCI 453  Phonics, Phonological Awareness, Fluency, and Assessment (1 cr)
EDCI 463  Literacy Methods for Content Learning (3 cr)
EDSP 300  Educating for Exceptionalities (2 cr)
Psyc 101  Introduction Psychology (3 cr)

Ag electives, which include a minimum of 6 cr in Ag Econ, 6 cr in Animal Sci, 6 cr in Plant Sci, 3 cr in Horticulture, and 4 cr in Soils (25 cr)

One of the following (4 cr):
Chem 101  Introduction to Chemistry I (4 cr)
Chem 111  Principles of Chemistry I (4 cr)

One of the following (3 cr):
Engl 313  Business Writing (3 cr)
Engl 317  Technical Writing (3 cr)

One course from the following (3-4 cr):
Math 137  Algebra with Applications (3 cr)
Math 143  Pre-calculus Algebra & Analytical Geometry (3 cr)
Math 160  Survey of Calculus (4 cr)
Math 170  Analytical Geometry & Calculus I (4 cr)

One of the following (4 cr):
Phys 100, Phys 100L  Fundamentals of Physics and Lab (4 cr)
Phys 111, Phys 111L  General Physics I and Lab (4 cr)

Courses to total 128 credits for this degree

Distance Education Availability: More than 50% of the curricular requirements cannot be completed via distance.
Geographical Area Availability: Moscow
Rationale: High School Agriculture Teachers are required; as a part of a “Total Agricultural Education Program” to incorporate SAE (Supervised Agricultural Experience Programs) into their high school agriculture programs. Ideally, every student should have an SAE. In Idaho,
we have found that the definition of SAE has not been followed well. As a result, many of our students in Agriculture Education have never had a true SAE program where they kept records and therefore do not have the experience required to teach their students. Additionally, the use of Proficiency Awards in Idaho has been limited due to the lack of knowledge. This course will require all teacher education students to have an agriculturally based experience. Students will keep records utilizing the AET- Agricultural Experience Tracker, a software program widely used in Agricultural Education.

Students will be assessed through a series of AET assignments and the completion of Proficiency Award applications.

This change will reduce the amount of free elective credits from 4 to 3.

PLANT, SOIL AND ENTOMOLOGICAL SCIENCES

1. Change the following courses

**PISc 205 General Botany (4 cr)**
Growth, development and ecology of plants, fungi, and protists in relation to their environments. Recommended Preparation: Chem 101 and PIsc 102. (Spring only)

**Prereq:** Biol 114 or 115

**Available via distance:** No

**Geographic Area Availability:** Moscow

**Rationale:** The General Botany course, PIsc 205, currently requires Biol 115 as a prerequisite. A department in another college (CNR) has requested that Biol 114 also be allowed to serve as a prerequisite for the botany course since their students need to take Biol 114 rather than Biol 115. The Plant Science faculty members discussed this request to determine if both biology courses would provide sufficient preparation for PIsc 205. The faculty members approved having Biol 114 also serve as a prerequisite for PIsc 205. Students in this course will be assessed by written exams and assignments as well as two practical laboratory exams.

**PISc 207 Introduction to Biotechnology (3 cr)**
Same as Gene 207. Offers an overview of modern biotechnology, focusing on basic concepts and applications of biotechnology with regards to plants, animals, environment and microorganisms, and medicine. Recommended preparation: Chem 101 or Chem 111. (Fall, alt even/yr)

**Available via distance:** No

**Geographic Area Availability:** Moscow

**Assessment:** Assessment protocols are unchanged from those approved for the existing PIsc course. Success of cross-listing will be judged by sustained or increased enrollment of student from college of science and non-agricultural departments.

**Rationale:** This course will be cross-listed to a newly created course in GENE. Creation of a course listing in GENE will expand on the offerings listed where students interested in Genetics will see available courses.

**PISc 440 Advanced Laboratory Techniques (4 cr)**
See MMBB 440. Same as Gene 440. Intensive hypothesis-driven laboratory course that will prepare the student for research in molecular biology; emphasis on areas of microbial physiology, microbial genetics, immunology, and pathogenic microbiology. (Spring only)

**Prereq:** BIOL 250.

**Available via distance:** No
Geographic Area Availability: Moscow
Assessment: Assessment protocols are unchanged from those approved for the existing PISc course. This course has been listed under MMBB with cross-listing to PIISC even though the instructor is in PIISC. So, this is an ongoing course with no changes in assessment. Success of cross-listing will be judged by sustained or increased enrollment of student from college of science and non-agricultural departments.

Rationale: The MMBB designation where this course has primarily been listed will be moved into PIISC which is the primary department of the instructor. It is our understanding the MMBB designation will be eliminated. This course will be cross-listed to a newly created course in GENE. Creation of a course listing in GENE will expand on the offerings listed where students interested in Genetics will see available courses.

PISc J476/J576 Cell Biology (3 cr)
See MMBB J475/J575. Introduction to the organization and function of the major components of the eukaryotic cell; emphasis on the composition of cells, the structures and assembly processes of molecules that make up cells, and how common interacting processes are coordinately controlled. Extra written assignments reqd for graduate credit. (Spring, Alt/yrs)
Prereq: Biol 115 and either Biol 300 or Biol 380.

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Assessment protocols are unchanged from those approved for the existing PISc course.
Rationale: The MMBB designation where this course has primarily been listed will be moved into PIISC which is the primary department of the instructor. It is our understanding the MMBB designation will be eliminated.

PISc J486/J586 Plant Biochemistry (3 cr)
See MMBB J486/J586. An in-depth introduction to metabolic processes carried out by plants, some fungi, and some algae with emphasis on cell wall synthesis, hormone synthesis, and photosynthesis. Extra oral and/or written assignments reqd for grad cr. (Spring, alt/years)
Prereq: Biol 300 or 380.

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Assessment protocols are unchanged from those approved for the existing PISc course.
Rationale: The MMBB designation where this course has primarily been listed will be moved into PIISC which is the primary department of the instructor. It is our understanding the MMBB designation will be eliminated.

PISc J488/J588 Genetic Engineering (3 cr)
See MMBB J488/J588. Same as Gene J488/J588. Techniques and theory underlying practical genetic modifications of plants, microbes, and animals. Extra written assignments required for graduate credit. Recommended Preparation: Biol 300 or 380. (Fall only)
Prereq: Gene 314 or Biol 310

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Assessment protocols are unchanged from those approved for the existing PISc course. This course has been listed under MMBB with cross-listing to PIISC even though the instructor is in PIISC. So, this is an ongoing course with no changes in assessment. Success of cross-listing will be judged by sustained or increased enrollment of student from college of science and non-agricultural departments.
Rationale: The MMBB designation where this course has primarily been listed will be moved into PIISC which is the primary department of the instructor. It is our understanding the MMBB
designation will be eliminated. This course will be cross-listed to a newly created course in GENE. Creation of a course listing in GENE will expand on the offerings listed where students interested in Genetics will see available courses.

**PISc 542 Biochemistry (3 cr)**

*See MMBB 541. Intermediate biochemistry; intro to metabolism and the chemical and physical properties of biomolecules. (Fall only)*

**Prereq:** Chem 372 and either Biol 300 or 380

**Available via distance:** No

**Geographic Area Availability:**

**Assessment:** Assessment protocols are unchanged from those approved for the existing PISc course.

**Rationale:** The MMBB designation where this course has primarily been listed will be moved into PI Sc which is the primary department of the instructor. It is our understanding the MMBB designation will be eliminated.

**PISc 576 Cell Biology (3 cr)**

*See MMBB J475/J575 PI Sc 476.*

**Available via distance:** No

**Geographic Area Availability:** Moscow

**Assessment:** Assessment protocols are unchanged from those approved for the existing PI Sc course.

**Rationale:** The MMBB designation where this course has primarily been listed will be moved into PI Sc which is the primary department of the instructor. It is our understanding the MMBB designation will be eliminated.

**PISc 586 Plant Biochemistry (3 cr)**

*See MMBB J486/J586 PI Sc 486.*

**Available via distance:** No

**Geographic Area Availability:** Moscow

**Assessment:** Assessment protocols are unchanged from those approved for the existing PI Sc course.

**Rationale:** The MMBB designation where this course has primarily been listed will be moved into PI Sc which is the primary department of the instructor. It is our understanding the MMBB designation will be eliminated.

**PISc 588 Genetic Engineering (3 cr)**

*See MMBB J488/J588 PI Sc 488.*

**Available via distance:** No

**Geographic Area Availability:** Moscow

**Assessment:** Assessment protocols are unchanged from those approved for the existing PI Sc course. This course has been listed under MMBB with cross-listing to PIS C even though the instructor is in PISC. So, this is an ongoing course with no changes in assessment. Success of cross-listing will be judged by sustained or increased enrollment of student from college of science and non-agricultural departments.

**Rationale:** The MMBB designation where this course has primarily been listed will be moved into PI Sc which is the primary department of the instructor. It is our understanding the MMBB designation will be eliminated. This course will be cross-listed to a newly created course in GENE. Creation of a course listing in GENE will expand on the offerings listed where students interested in Genetics will see available courses.
Soil J425/J525 Microbial Ecology (3 cr)
See MMBB J425/J525. Biogeochemical activities and relationships of microorganisms in soil, water, plants, and animals. Extra oral and/or written assignments reqd for grad cr. Recommended Preparation: Math 137 or 143. (Spring, alt/ yrs).
Prereq: Biol 154 or 250

Available via distance: No
Geographic Area Availability: Moscow
Assessment: No changes are being made to the learning outcomes or assessment procedures for this course.
Rationale: Soil 425/525 was cross listed with MMBB. The MMBB prefix is being deleted as the department no longer exists. In the current catalog, the course description for Soil J425/J525 is: See MMBB J425/J525. This form will add a description of Soil J425/J525 to the new catalog.

Soil 525 Microbial Ecology (4 cr)
See MMBB J425/J525 Soil 425.

Available via distance: No
Geographic Area Availability: Moscow
Assessment: No changes are being made to the learning outcomes or assessment procedures for this course.
Rationale: Soil 425/525 was cross listed with MMBB. The MMBB prefix is being deleted as the department no longer exists. In the current catalog, the course description for Soil J425/J525 is: See MMBB J425/J525. This form will add a description of Soil J425/J525 to the new catalog.

2. Change the curricular requirement of Sustainable Crop and Landscape Systems (B.S.Ag.L.S.)

Required course work includes the university requirements (see regulation J-3) and:

Agricultural and Life Science Core
AgEd 406 Exploring International Agriculture (3 cr)
Soil 205, Soil 206 The Soil Ecosystem and Lab (4 cr)
Stat 251 Statistical Methods (3 cr)

One of the following (2-3cr):
ASM 305 GPS and Precision Agriculture (3 cr)
ASM 412 Agricultural Safety and Health (2 cr)
PlSc 207 Introduction to Biotechnology (3 cr)

One of the following (4cr):
Chem 101 Introduction to Chemistry I (4 cr)
Chem 111 Principles of Chemistry I (4 cr)

One of the following (3-4cr):
Comm 101 Fundamentals of Public Speaking (2 cr)
Engl 207 Persuasive Writing (3 cr)
Engl 313 Business Writing (3cr)
Engl 316 Environmental Writing (3 cr)
Engl 317 Technical Writing (3 cr)

One of the following (3-4cr):
Math 143 Pre-calculus Algebra and Analytic Geometry (3 cr)
Math 160 Survey of Calculus (4 cr)
Math 170 Analytic Geometry and Calculus I (4 cr)
Sustainable Crop and Landscape Systems Courses

Biol 115  Cells and the Evolution of Life (4 cr)
Ent 322  General and Applied Entomology (4 cr)
PlSc 102  The Science of Plants in Agriculture (3 cr)
PlSc 400  (s) Seminar (1 cr)
PlSc 438, Soil 438, or ENT 438  Pesticides in the Environment (3 cr)

One of the following (4 cr):
PlSc 415 Plant Pathology (3 cr)
Soil 425  Microbial Ecology (3 cr)

One of the following (4 cr):
Biol 213  Principles of Biological Structure and Function (4 cr)
PlSc 205  General Botany (4 cr)

One of the following (3 cr):
Chem 275  Carbon Compounds (3 cr)
Chem 277  Organic Chemistry I (3 cr)

One of the following (3-5 cr)
Biol 154, Biol 155  Introductory Microbiology and Lab (4 cr)
Biol 250, Biol 255  General Microbiology and Lab (5 cr)
Biol 300  Survey of Biochemistry (3 cr)
Biol 380  Biochemistry I (4 cr)
Chem 253, Chem 254  Quantitative Analysis and Lab (5 cr)

And one of the following emphases:

A. Insects and Society
Biol 114  Organisms and Environments (4 cr)
Biol 312  Molecular and Cellular Biology (3 cr)
Biol 313  Molecular and Cellular Laboratory (1 cr)
Biol 314  Ecology and Population Biology (4 cr)
Chem 112  Principles of Chemistry II (5 cr)
Ent 440  Insect Identification (4 cr)
Ent 441  Insect Ecology (3 cr)

One of the following (3-4 cr):
Biol 310, Biol 315  Genetics and Lab (4 cr)
Gene 314  General Genetics (3 cr)

Biotechnology Electives (3 cr)
Entomology Electives (5 cr)
Life Science Electives (6 cr)
Mathematics Electives (4 cr)
Physics Electives (4 cr)

Courses to total 128 credits for this degree

B. Soil and Land Use
Chem 112  Principles of Chemistry II (5 cr)
CS 112  Computational Thinking and Problem Solving (3 cr)
Geol 101, Geol 101L  Physical Geology and Lab or
Geol 111, Geol 111L  Physical Geology for Science Majors and Lab (4 cr)
Phys 111, Phys 111L  General Physics I and Lab (4 cr)
Phys 112, Phys 112L  General Physics II and Lab (4 cr)
Soil 415  Soil and Environmental Physics (3 cr)
Soil 422  Environmental Soil Chemistry (3 cr)
Soil 425 or MMBB 425  Microbial Ecology (3 cr)
Soil 446  Soil Fertility (3 cr)
Soil 454  Pedology (3 cr)
Soil 499  Directed Study (1 cr)

Courses to total 128 credits for this degree

C. Sustainable Cropping Systems
Gene 314  General Genetics (3 cr)
PISc 338  Weed Control (4 cr)
PISc 401  Plant Physiology (3 cr)
PISc 407  Field Crop Production (3 cr)
PISc 446  Plant Breeding (3 cr)
PISc 480  Field Trip (1 cr)
Soil 446  Soil Fertility (3 cr)

One of the following (1 cr):
Chem 276  Carbon Compounds Lab (1 cr)
Chem 278  Organic Chemistry I: Lab (1 cr)

One of the following (3 cr):
PISc 398  Internship (3 cr)
PISc 499  Directed Study (3 cr)

Sustainable Cropping Systems Electives (17 cr):
PISc 408  Cereal Science (3 cr)
PISc 410  Invasive Plant Biology (3 cr)
PISc 433  Plant Tissue Culture Techniques (3 cr)
PISc 490  Potato Science (3 cr)
Stat 431  Statistical Analysis (3 cr)

Courses to total 120 credits for this degree

D. Environmental Horticulture
Gene 314  General Genetics (3 cr)
PISc 201  Principles of Horticulture (3 cr)
PISc 300  Plant Propagation (3 cr)
PISc 338  Weed Control (4 cr)
PISc 401  Plant Physiology (3 cr)
Soil 446  Soil Fertility (3 cr)

One of the following (1 cr):
Chem 276  Carbon Compounds Lab (1 cr)
Chem 278  Organic Chemistry I: Lab (1 cr)

One of the following (3 cr):
PISc 398  Internship (3 cr)
PISc 499  Directed Study (3 cr)

Environmental Horticulture Electives (15 cr):
PISc 340  Nursery Management (3 cr)
PISc 341  Nursery Management Laboratory (1 cr)
PISc 433  Plant Tissue Culture Techniques (3 cr)
PlSc 451  Vegetable Crops (3 cr)
PlSc 464  Landscape Maintenance (3 cr)
PlSc 490  Potato Science (3 cr)

Courses to total 120 credits for this degree

E. Plant Biotechnology
Chem 112  Principles of Chemistry II (5 cr)
Chem 278  Organic Chemistry I: Lab (1 cr)
Gene 314  General Genetics (3 cr)

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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MMBB PlSc 486</td>
<td>Plant Biochemistry</td>
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<tr>
<td>MMBB PlSc 488</td>
<td>Genetic Engineering</td>
<td>3 cr</td>
</tr>
<tr>
<td>PlSc 401</td>
<td>Plant Physiology</td>
<td>3 cr</td>
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<td>PlSc 433</td>
<td>Plant Tissue Culture Techniques</td>
<td>3 cr</td>
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<td>PlSc 440</td>
<td>Advanced Laboratory Techniques</td>
<td>4 cr</td>
</tr>
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<td>PlSc 446</td>
<td>Plant Breeding</td>
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One of the following (3 cr):

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<tr>
<td>PlSc 398</td>
<td>Internship</td>
<td>3 cr</td>
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<td>PlSc 402</td>
<td>Undergraduate Research in Plant Science</td>
<td>3 cr</td>
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<td>PlSc 499</td>
<td>Directed Study</td>
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Plant Biotechnology Electives (12 cr):

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<tr>
<td>Biol 250</td>
<td>General Microbiology</td>
<td>3 cr</td>
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<td>Biol 255</td>
<td>General Microbiology Lab</td>
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<tr>
<td>Biol 312</td>
<td>Molecular and Cellular Biology</td>
<td>3 cr</td>
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<tr>
<td>Biol 313</td>
<td>Molecular and Cellular Laboratory</td>
<td>1 cr</td>
</tr>
<tr>
<td>Biol 382</td>
<td>Biochemistry I Laboratory</td>
<td>2 cr</td>
</tr>
<tr>
<td>Biol 444</td>
<td>Genomics</td>
<td>3 cr</td>
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<td>MMBB Biol 485</td>
<td>Prokaryotic Molecular Biology</td>
<td>3 cr</td>
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<tr>
<td>MMBB Biol 487</td>
<td>Eukaryotic Molecular Genetics</td>
<td>3 cr</td>
</tr>
<tr>
<td>PlSc 338</td>
<td>Weed Control</td>
<td>4 cr</td>
</tr>
<tr>
<td>PlSc 407</td>
<td>Field Crop Production</td>
<td>3 cr</td>
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<tr>
<td>PlSc 451</td>
<td>Vegetable Crops</td>
<td>3 cr</td>
</tr>
<tr>
<td>PlSc 476</td>
<td>Cell Biology</td>
<td>3 cr</td>
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<td>PlSc 490</td>
<td>Potato Science</td>
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<td>Soil 446</td>
<td>Soil Fertility</td>
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Courses to total 120 credits for this degree

Distance Education Availability: More than 50% of the curricular requirements cannot be completed via distance.

Geographical Area Availability: Moscow
Assessment: No changes are being made to the program learning outcomes or assessment plan. The changes are just technical changes.
Rationale:

1. Credit value error under Sustainable Crop and Landscape Systems courses:

One of the following
( 3-4 cr):

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>PlSc 415</td>
<td>Plant Pathology</td>
<td>3 cr</td>
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</table>
2. With the removal of the MMBB prefix, our curriculum listing for courses needed to be updated to include PLSC rather than MMBB.

3. Pesticides in the Environment is cross listed as PLSc 438, Soil 438 and Ent 438. Students in each discipline take the course with the corresponding prefix. We would like to change the presentation in the catalog to make this clear to students. Because students in soil and land resources are required to have a certain number of credits of soils course work to qualify for federal jobs, it is important that they take the course as Soil 438 and not PLSc 438. The change in the catalog language, therefore, is to clarify and not change the requirement. Students will continue to be advised of this requirement, but it would make it clearer in all areas.

4. When the Plant Biotechnology emphasis area was changed last year, the section for Plant Biotechnology Electives should have stated “9 credits”, but the change was not made (it was an oversight/mistake) and the requirement remained at 12 credits. This change should have been made in conjunction with the change from 128 credits to 120 credits.