

**College of Science  
Proposed Catalog Changes  
Effective Summer 2018**

**BIOLOGICAL SCIENCES**

1. Change the following course:

**Biol 250 General Microbiology (3 cr)**

Gen Ed: Natural and Applied Sciences

Introduction to nature and activity of bacteria and other microorganisms; their importance in all life systems. Three hrs of lec per wk. (Fall only)

**Prereq:** [Biol 115](#) and either Chem 101 or Chem 111

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Proper preparation for this course requires the knowledge provided by the content of Biol 115 (eg macromolecules, basics of glycolysis and respiration, structure of ATP, DNA replication, protein synthesis, mutations, and regulating gene expression). Because these topics are taught in relation to prokaryotes in microbiology, this basic knowledge is important for successful students. Instead of teaching the foundation of biological principles that they can receive from another class, this focuses the General Microbiology course on actual microbiology. The impact of this change is minimal and requires advising adjustments in most of the majors taking this course (eg AVS, Crop Science, Food Science) as these already require Biol 115. The only major that requires a microbiology course but does not require Biol 115 is Food and Nutrition, which impact 4-7 students per year. Assuming that the Food and Nutrition major requires Biol 115, this would result in a very slight increase in Biol 115 enrollment.

2. Drop the following courses:

**Biol 495 Research in Molec/Cell/Dev Biology (cr arr)**

*Gen Ed: Senior Experience*

Directed research in faculty laboratory.

**Prereq:** Permission

**Biol 496 Research in Ecology and Evolution (cr arr)**

*Gen Ed: Senior Experience*

Directed research in faculty laboratory.

**Prereq:** Permission

**Biol 497 Research in Anatomy and Physiology (cr arr)**

*Gen Ed: Senior Experience*

Directed research in faculty laboratory.

**Prereq:** Permission

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Replacing all of the research courses below with BIOL 401: Undergraduate Research in order encompass all disciplines of our faculty.

BIOL 495: Research in Molec/Cell/Dev Biology  
 BIOL 496: Research in Ecology and Evolution  
 BIOL 497: Research in Anatomy and Physiology

3. Make the following curricular changes to the **Major in Medical Sciences (B.S.)**:

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**Leadership and Professional (5-3 cr):**

BIOL 398	Internship	1-3 cr - Max 3 cr
MHR 311	Introduction to Management	3 cr
INTR 492	College of Science Ambassadors	1 cr - Max 8 cr
INTR 496	Pre-Health Peer Mentors	1-4 cr - Max 4 cr
PHIL 361	Professional Ethics	3 cr - Max 6 cr
PSYC 414	Traumatic Events: Preparation, Intervention, Evaluation	3 cr

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**Courses to total 120 credits for this degree**

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The original intent of the required 5 credits in Leadership and Professionalism was to include Phil 103 (3 cr) and a choice from the list to equal 2 credits. Phil 103 was moved under required courses, but the number of credits for that section was not decreased accordingly. We would like it to read as 2-3 credits to encompass those class choices that are set at three credits.

**BIOINFORMATICS AND COMPUTATIONAL BIOLOGY**

1. Change the following course:

**BCB 501 (s) Seminar (cr arr)**

[Students are required to attend all of the invited speaker presentations in the IBEST/CMCI/BCB seminar series for the semester they are enrolled. Students who miss one or more presentations are expected to attend an alternative seminar approved by the instructor. Additional meetings may be required by the instructor.](#)

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Added description to course listing to clarify requirements for BCB instructors and students of the course. This addition will not add workload.

**CHEMISTRY**

1. Add the following courses:

**CHEM 110L Introduction to Chemistry Laboratory (1 cr)**

*Gen Ed: Natural and Applied Sciences*

This is the companion laboratory course to Chem 101 and provides an introduction to Chemistry lab practices. It does not satisfy the lab requirement for Chem 111 or 112. One 3-hr lab a wk.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** As noted in the course change request for Chem 101, it is proposed to separate the lecture and laboratory sections of Chem 101, thereby reducing Chem 101 to 3 credits and creating a new (lab) course, Chem 101L, which carries 1 credit. The primary motivation for doing this is that it gives the students more scheduling flexibility with the labs and alleviates the bottlenecks (i.e. wait lists) that are often experienced with laboratories in the fall. In addition, offering the lab as a separate course is in line with our ongoing efforts to integrate the lower level laboratories across disciplines. In collaboration with Biological Sciences, and supported by the HHMI grant, we have made important content adjustments to make the labs relevant to both Chemistry and Biology students.

The proposed course creation is a redistribution and does not add to the departmental workload.

**CHEM 111L Principles of Chemistry I Laboratory (1 cr)**

*Gen Ed: Natural and Applied Sciences*

This is the companion laboratory course to Chem 111 and provides an intensive treatment of Chemistry lab practices. One 3-hr lab a wk.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** As noted in the course change request for Chem 111, it is proposed to separate the lecture and laboratory sections of Chem 111, thereby reducing it to 3 credits and creating a new (lab) course, Chem 111L, which carries 1 credit. The primary motivation for doing this is that it gives the students more scheduling flexibility with the labs and alleviates the bottlenecks (i.e. wait lists) that are often experienced with laboratories in the fall. In addition, offering the lab as a separate course is in line with our ongoing efforts to integrate the lower level laboratories across disciplines. In collaboration with Biological Sciences, and supported by the HHMI grant, we have made important content adjustments to make the labs relevant to both Chemistry and Biology students.

Lecture-lab separation also facilitates accommodating students who come in with AP Chemistry. These students get credit for the Chem 111 lecture, but do not have the lab component. Remediating this is difficult in the present system, but with a self contained lab course in place, it becomes simply a matter of taking that.

The proposed course creation is a redistribution and does not add to the departmental workload.

**CHEM 112L Principles of Chemistry Laboratory (1 cr)***Gen Ed: Natural and Applied Sciences*

This is the companion laboratory course to Chem 112 and teaches Chemistry lab practices in inorganic chemistry, kinetics, equilibrium, acid-base, electrochemistry, thermodynamics, and qualitative analysis. One 3-hr lab a wk.

**Available via distance:** No**Geographical Area:** Moscow

**Rationale:** As noted in the course change request for Chem 112, it is proposed to separate the lecture and laboratory sections of Chem 112, thereby reducing it to 4 credits and creating a new (lab) course, Chem 112L, which carries 1 credit. The primary motivation for doing this is that it gives the students more scheduling flexibility with the labs and alleviates the bottlenecks (i.e. wait lists) that are often experienced with laboratories in the spring. In addition, offering the lab as a separate course is in line with our ongoing efforts to integrate the lower level laboratories across disciplines. In collaboration with Biological Sciences, and supported by the HHMI grant, we have made important content adjustments to make the labs relevant to both Chemistry and Biology students.

The proposed course creation is a redistribution and does not add to the departmental workload.

## 2. Change the following courses:

**Chem 101 Introduction to Chemistry † (4~~3~~ cr)***Gen Ed: Natural and Applied Sciences*

Full credit may be earned in only one of the following: Chem 101 or Chem 111. General treatment of the fundamentals of chemistry. ~~Three lec and one 3-hr lab a wk.~~ Does not satisfy the prereq for Chem 112.

**Available via distance:** No**Geographical Area:** Moscow

**Rationale:** The requested change is part of a proposal to separate the lecture and laboratory sections of all freshman Chemistry courses. For Chem 101, this means a reduction from 4 to 3 credits and the creation of a new lab course, Chem 101L (1 cr). The primary motivation for doing this is that it gives the students more scheduling flexibility with the labs and alleviates the bottlenecks (i.e. wait lists) that are often experienced with laboratories in the fall. In addition, offering the lab as a separate course is in line with our ongoing efforts to integrate the lower level laboratories across disciplines. In collaboration with Biological Sciences, and supported by the HHMI grant, We have made important content adjustments to make the labs relevant to both Chemistry and Biology students.

The title change ('Introduction to Chemistry I' becomes 'Introduction to Chemistry') is based on the fact that the number 'I' is superfluous and misleading, since there is no number 'II'.

The proposed change is a redistribution and does not add to the departmental workload.

**Chem 111 Principles of Chemistry I (43 cr)***Gen Ed: Natural and Applied Sciences*

Full credit may be earned in only one of the following: Chem 101, or 111. Note that grades in Chem 111 will supersede any grades earned in Chem 101. Intensive treatment of principles and applications of chemistry. ~~Three lec and one 3-hr lab a week.~~ Recommended Preparation: A grade of 'B' or better in a high school chemistry course.

**Prereq:** ~~Chem 050~~ or min 580 SAT math or min 25 ACT math ~~or min 49 COMPASS College Algebra,~~ [or min 46 ALEKS math](#); or a grade of 'C' or better in Chem 101, Math 143, Math 160, or Math 170; or Permission

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The requested change is part of a proposal to separate the lecture and laboratory sections of all freshman Chemistry courses. For Chem 111, this means a reduction from 4 to 3 credits and the creation of a new lab course, Chem 111L (1 cr). The primary motivation for doing this is that it gives the students more scheduling flexibility with the labs and alleviates the bottlenecks (i.e. wait lists) that are often experienced with laboratories in the fall. In addition, offering the lab as a separate course is in line with our ongoing efforts to integrate the lower level laboratory courses across disciplines. In collaboration with Biological Sciences, and supported by the HHMI grant, We have made important content adjustments to make the labs relevant to both Chemistry and Biology students.

Lecture-lab separation also facilitates accommodating students who come in with AP Chemistry. These students get credit for the Chem 111 lecture, but do not have the lab component. Remediating this is difficult in the present system, but with a self contained lab course in place, it becomes simply a matter of taking that.

Changes in prerequisites: (i) eliminate Chem 050: we no longer offer this course; (ii) SAT 580 not 560: this is necessary because of a change in the SAT grading system: what used to be 560 is now 580; (iii) eliminate COMPASS Test: this exam no longer exists.

The proposed change is a redistribution and does not add to the departmental workload.

**Chem 112 Principles of Chemistry II (54 cr)***Gen Ed: Natural and Applied Sciences*

Continuation of Chem 111. Some work in inorganic chemistry, kinetics, equilibrium, liquids, solids, acid-base, electrochemistry, nuclear chemistry, thermodynamics, and qualitative inorganic analysis. Three [lec](#), [and one recitation](#), ~~and one 3-hr lab a wk.~~

**Prereq:** Chem 111 [and Chem 111L](#) or Permission

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The requested change is part of a proposal to separate the lecture and laboratory sections of all freshman Chemistry courses. For Chem 112, this means a reduction from 5 to 4 credits and the creation of a new lab course, Chem 112L (1 cr). The primary motivation for doing this is that it gives the

students more scheduling flexibility with the labs and alleviates the bottlenecks (i.e. wait lists) that are often experienced with laboratories in the spring. In addition, offering the lab as a separate course is in line with our ongoing efforts to integrate the lower level laboratory courses across disciplines. In collaboration with Biological Sciences, and supported by the HHMI grant, We have made important content adjustments to make the labs relevant to both Chemistry and Biology students. Since Chem 111 is being split into Chem 111 and Chem 111L, the prereq for Chem 112 now also includes Chem 111L. The proposed change is a redistribution and does not add to the departmental workload.

### Chem 305 Physical Chemistry I (3 cr)

Kinetic theory, thermodynamics, ~~quantum mechanics, and spectroscopy.~~ [Work, heat and energy; state functions, thermochemistry, the second law of thermodynamics; free energy and mixtures; electrolyte solutions and phase equilibrium; chemical and electrochemical equilibrium.](#) (Fall only)

**Prereq:** Chem 112, [Chem 112L](#), and Math 275

~~Prereq or Coreq:~~ Phys 212 or Phys 213

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The title of Chem 305, which is presently 'Physical Chemistry' should be changed to 'Physical Chemistry I' to clearly distinguish it from Chem 306, which is to become 'Physical Chemistry II'. Having these courses, of which one is the prereq for the other, both called 'Physical Chemistry' (as they presently are) is confusing to students.

The new description of Chem 305 provides more complete coverage of the material presented, as well as reflecting a change of emphasis in course content.

The proposed changes do not add to the department workload.

### Chem 306 Physical Chemistry II (3 cr)

Kinetic theory, ~~thermodynamics,~~ [atomic and molecular structure](#), quantum mechanics, [statistical mechanics.](#) ~~and spectroscopy.~~ (Spring only)

**Prereq:** ~~Chem 112 and Math 275~~ [Chem 305](#)

~~Prereq or Coreq:~~ Phys 212 or Phys 213

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** CHEM 305 and CHEM 306 have evolved into a hierarchical structure in which a good knowledge of the first course is necessary for successful completion of the second. We therefore wish to make Chem 305 a prerequisite for Chem 306. The previous prereqs. for Chem 306 (Chem 112, Math 275, Phys 212 or 213) are already prereqs. for Chem 305, so they no longer need to be stated as prereqs. for Chem 306.

In addition, the title of Chem 306, which is presently 'Physical Chemistry' should be changed to 'Physical Chemistry II' to clearly distinguish it from Chem 305, which is to become 'Physical Chemistry I'. Having these courses, of which one is

the prereq for the other, both called 'Physical Chemistry' (as they presently are) is confusing to students.

The new description of Chem 306 reflects a moderate change of emphasis in the course content.

The proposed changes do not add to the department workload.

## **GEOGRAPHY**

1. Add and joint-list the following courses:

### **GEOG 565 Political Geography (3 cr)**

See GEOG J365/J565.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Political Geography is a primary subfield in Human Geography and considers the spatial dimensions of political activity at a variety of scales, including international, national, and local. The Department of Geography has three faculty members with expertise in Political Geography and several graduate students working on topics in the subfield but does not offer a graduate level course in Political Geography. Adding a graduate course in Political Geography will fill an obvious curriculum need for Geography graduate students and can serve graduate students in other programs (e.g., Political Science). Joint-listing the course with the existing undergraduate course in Political Geography (GEOG 365) eliminates the need to add an additional course to the department's teaching workload and rotations

The course will enhance graduate education in the subfield as students will be required to complete an additional semester-long research project that culminates into a journal-quality paper that informs a graduate student's dissertation or thesis proposal/project. The department has provided this content for the past four years through a directed study which has been offered in addition the regular course workload for faculty. Adding the joint-listed GEOG 565 course will reduce the strain on faculty teaching rotations while also eliminating the need for graduate students that enter the program from other disciplines (a common occurrence) to take an undergraduate course to remove a deficiency in their study plan.

### **GEOG 531 Urban Geography (3 cr)**

See GEOG J330/J531.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Urban Geography is considered one of the six most important subfields in Human Geography and is the sub-discipline of geography which concentrates on the processes that have shaped and continue to shape cities around the world. Currently, the Department of Geography, or other departments at UI, does not offer a graduate level course in Urban Geography, yet this is a critical need for graduate students in the department and other programs (e.g., bioregional planning and environmental science). The request to add a more intensive, jointly listed 500 level Urban Geography course will fill this gap while making Urban Geography still available as an important 300 level elective for Geography undergraduates.

Furthermore, graduate students are required to complete an additional semester-long research project, which cumulates into a research paper that helps inform a graduate student's dissertation or thesis proposal/project. Graduate students previously either took GEOG 330 or a directed study to satisfy this need. If this course is available at the 500 level, more room is available on the 30-credit graduate study plan for supporting other courses on more advanced topics or methods in Urban Geography. In addition, graduate students who enter the program from disciplines other than Geography need to take undergraduate courses to remove the deficiencies. If this 500 level course is offered, additional room will be available for supporting other undergraduate level deficiency courses, which are important courses for students in the Geography program and should be taken as early in the program as possible.

Because 330 is already taught and 530 is proposed as a jointly listed course, no impact to workload will occur. [Editor's note: 530 is not available.]

2. Change the following courses and revise the joint-listing:

**Geog ~~J412401~~/J512 Applied Meteorology and Climatology (3 cr)**

Physical basis for climatic processes and patterns; mechanics of global atmospheric circulation; radiation balance and heat budget of the earth; models of weather patterns and climate. Additional assignments and quantitative exercises required for graduate credit. (Spring, alt/yrs)

**Prereq:** ~~Geog 301 or Geog 401; or Permission~~

**Available via distance:** Yes

**Geographical Area:** Moscow, Offered via the web

**Rationale:** We propose adding a joint-listed graduate level offering of Climatology (currently GEOG 401). This course will be offered at the graduate level every other spring and not require any additional workload.

We acknowledge that having 401 and 512 offers the possibility of confusion. However, our department already has an existing 501 course, and other departments know and include GEOG 401. For graduate level credit, students will be required to solve additional quantitative problem sets and read scientific journal articles. in their curricula.

[Editor's note, from email with Leslie Baker:]

The 401 class is offered regularly, and there is interest in a graduate-level section of it. There is already a different class numbered GEOG 501, so the graduate section of 401 needs a different number. It was decided to revise the existing 512 course to be that graduate section.

If the committee would really prefer it, they could create a new course number to be the graduate equivalent of 401. It would have the same description with the added sentence: "Additional projects/assignments required for graduate credit." However, since it can't be numbered 501, the numbering isn't going to match no matter what.

If the committee is wondering why 412 is not being taught instead of 401: they are substantially different courses, with 401 being more theoretical and 412 being applied with a strong meteorology content. So the 412 course description would have to be

completely revised. I suppose the department could have done that; I can't explain why they did not because I was not involved.

[With regard to dropping 412] That was not specifically decided, but if it would decrease confusion, we can put that change forward. However, I would have to discuss it with the faculty curriculum committee first.

### Geog 512 ~~Applied Meteorology and Climatology~~ (3 cr)

See Geog ~~J412~~J401/J512.

3. Change the following courses:

### Geog ~~J330~~J531 Urban Geography (3 cr)

Theory and models of the functions, origin, development, structure, and distribution of cities; land-use ~~classification and housing~~; ~~globalization and cities~~, ~~neighborhood transition~~, ~~urban economic development~~, and geographic aspects of city planning. ~~One hour additional meeting per week or project for fourth credit. One 1-day field trip. (Fall only)~~ Also considers urban social differences, inequality, and conflicts over the uses and meanings of city space. Graduate students are required to synthesize journal articles and complete an additional independent research paper.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The new course description reflects minor topical and organizational changes. These revisions also better reflect new instructors' area of expertise in Urban Geography and pedagogic strategies. We are also proposing to joint-list the course with GEOG 530 (a new course we are proposing). Because 330 is already taught and 530 is proposed as a jointly listed course, no impact to workload will occur.

### Geog ~~J365~~J565 Political Geography (3 cr)

*Gen Ed: Social Science, International*

~~A survey of the geographical framework of the State and its development over the last 400 years. An examination of the ideas of geopolitics and the role of hegemony in interstate relations as well as the geographical implications of globalization are emphasized. The creation of diverse political landscapes of actual and imagined communities and their impact on ideas of nationalism and electoral behavior are also discussed. (Alt/yrs)~~ Surveys the geographic distribution of political processes, actions, and outcomes at variety of spatial scales - international, national, and local. Topics include origins of the modern territorial state, conflicts over access to and use of space, access to natural resources, nationalism, elections, democratization, globalization, terrorism, and the politics of identity. Graduate students are required to complete an additional independent research paper.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The new course description reflects minor topical and organizational changes. These revisions also better reflect a new instructor's areas of expertise and pedagogic techniques in Political Geography. We are also proposing to joint-list the course with GEOG 565 (a new course we are proposing). Because GEOG 365 is already taught and GEOG 565 is proposed as a joint-listed course, no impact to faculty workload and teaching rotations are expected.

**Geog J407/J507 Spatial Statistics and Modeling (3 cr)**

Introduces the basic theories and methods of spatial analysis used for statistical modeling and problem solving in human and physical geography. The special nature of spatial data (point, continuous, and lattice) in the social and physical sciences is emphasized. Topics include point pattern analysis, spatial autocorrelation analysis, spatial multivariate regression, local indicators of spatial association, and geographically weighted regression. Extra oral and/or written assignments required for grad credit.

[Cooperative: open to WSU degree-seeking students.](#)

Prereq: Stat 431 or permission

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Spatial analysis is now widely used in the environmental, physical, and social sciences which places the course in high demand among graduate students across a variety of fields. Concurrent with the growing enrollments in the course by UI graduate students, there is also a demand for this class by WSU graduate students, particularly in sociology and criminology. However, there is no Geography department or program at WSU and no comparable course to this one is offered at WSU. Steven Radil and WSU sociology professor Jennifer Schwartz have partnered to allow one WSU graduate student to audit the course each semester while still receiving independent study credit at WSU but the WSU demand for the course exceeds this arrangement. Making this course available to WSU students would strengthen an emerging inter-campus collaboration by leveraging a clear unique strength at UI (the presence of a Geography program at UI) and provide for greater interactions between UI and WSU students and faculty. The addition of cooperative status is not expected to change the department workload.

**Geog J435/J535 Climate Change Mitigation (3 cr)**

~~Overview of methodologies for calculating greenhouse gas (GHG) emissions at the national, state and local level. Cost/benefit analysis of emission reduction strategies. Students utilize the UI campus operations as a learning laboratory for evaluating emission reduction strategies at the local level. Idaho is used as a case study for emission reduction strategies at the state level. For graduate credit, additional literature review and evaluation of new, advanced technologies are required. Overview of the sources and magnitude of greenhouse gas (GHG) emissions at various scales from international to local; barriers to and options for reducing GHG emissions via new energy sources, increased efficiency, capture of wasted energy and land management practices. For graduate credit, a major independent project is required as well as additional assignments.~~

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** This course is not new, we seek only to make it active again after becoming dormant. It was offered in 2007 and 2010, then instructor's teaching percentage was reduced when she served as Dept Chair from 2011 to 2016. It was offered in Fall 2016 and is now again on the instructor's course rotation to be offered at least every 2 years, possibly annually. The description is requested to be updated to reflect that many changes in this topic in recent years. This course is currently an important menu option for students in the Climate Change Certificate, as well the Climate Change depth area in the BS Envs program.

**Geog J483/J583 Remote Sensing/GIS Integration (3 cr)**

Concepts and tools for the processing, analysis, and interpretation of digital images from satellite and aircraft-based sensors. The integration of remotely sensed data and the other spatial data types within Geographic Information Systems. Additional assignments and exams reqd for grad cr. Two lec and 2 hr of lab a wk.

**Prereq:** ~~For 472 or equiv, and Stat 251~~

**Coreq:** Geog 385 or Equivalent

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** a) Dropping the For 472 pre-req: This catalog change request reflects the de facto practice for 5-6 years now, as the For 472 pre-req has been very frequently waived in recent years due to changes in the focus and scope of that course, including one year in which it was not offered at all, which required some re-design of Geog 483/583. The instructor of Geog 483/583 still encourages students to take For 472 if they would like more depth in the concepts of remote sensing, but it is no longer important that this course and that one be taken in a specific sequence.

b) Dropping the Stat 251 pre-req: This course does not require the completion of Stat 251. It was originally placed on this course as a pre-request because we utilize histograms frequently in Geog 483/583, but those simple concepts are reviewed early in this course.

**Geog 493 Senior Capstone in Geography (3 cr)**

Gen Ed: Senior Experience

A capstone course in which students integrate their knowledge of human and physical geography, as well as geographic techniques, to propose solutions to real-world problems. Students gain experience in working in small groups and in written and oral presentation of project results, and will be evaluated with respect to the skills acquired in their degree program. Topics may include, but are not limited to, issues such as sustainable development in rural communities, global and regional food and energy distribution, quantifying and analyzing global or regional indicators of environmental and/or societal trends. Open to senior geography majors or to non-majors with instructor's permission.

**Prereq:** [Geog 489](#), Department of Geography Majors or Permission

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The proposed change adds GEOG 498, Capstone Preparation, as a prerequisite for this course. GEOG 498 is a 1-credit course offered in the previous semester (fall) to help students better prepare for their capstone project by, among other items, developing a project proposal. As such, requiring students to complete 489 before taking 493 will result in a better student capstone experience.

4. Make the following curricular changes to the **Major in Geography (B.S.)**

This program is offered through the College of Science. Required course work includes the university requirements (see regulation J-3) and:

*Note: Students must earn a grade of "C" or better in all Geography courses.*

GEOG 100	Physical Geography	3 cr
GEOG 100L	Physical Geography Lab	1 cr
GEOG 165	Human Geography	3 cr
GEOG 200	World Regional Geography	3 cr
GEOG 313	Global Climate Change	3 cr
GEOG 385	GIS Primer	3 cr
GEOG 390	Cartographic Design & Geovisualization	3 cr
<a href="#">GEOG 489</a>	<a href="#">Capstone Preparation</a>	<a href="#">1 cr</a>
GEOG 493	Senior Capstone in Geography	3 cr
STAT 251	Statistical Methods	3 cr

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**Distance Education:** 50% or more of curricular requirements cannot be completed via distance

**Geographical Area:** Moscow:

**Rationale:** Change: Add GEOG 489, Capstone Preparation (1 credit), to requirements of major.

This 1-credit course is designed to assist students taking GEOG 493, Capstone, in the following semester by preparing them to complete a capstone project. The main objectives of the Capstone Preparation course are for students to identify mentors, select projects, and write project proposals. We have found that students who take the Capstone Preparation course have a better senior capstone experience because they get to focus on completing their projects and write-ups instead of also having to identify mentors and select projects in the same semester. In semesters when the Capstone Preparation and Capstone courses are both offered (because of student need), the course is taught together with the Capstone course, so no additional course instructors are needed.

This course has been, and currently is, taught by the department. No additional workload will result from this change. The change proposed here will require Geography majors to take the Capstone Preparation (which is currently not required).

## GEOLOGICAL SCIENCES

1. Add and joint-list the following courses:

### **Geol J431/J531 Chemical Hydrology (3 cr)**

An exploration of low temperature, aqueous geochemistry principles through examination of atmospheric, geologic, and biologic influences on water chemistry in surface and near-surface hydrologic environments. For graduate credit, students are required to complete an additional independent research paper or presentation. Recommended preparation: Geol 423.

**Prereq:** Chem 111

**Geol 531 Chemical Hydrology (3 cr)**

See Geol J431/J531.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The new course identifier aligns it with an existing block of hydrogeology (GEOL/HYDR) courses offered in the Geological Sciences Department. Currently, such courses are offered as 409/509 (Quantitative Hydrogeology), 410 (Techniques of Groundwater Study), and 412/512 (Environmental Hydrogeology). A GEOL 411/511 identifier will align this course (Chemical Hydrogeology) with these existing courses and better indicate its utility of knowledge and sub-discipline in the hydrogeologic field. Historically, GEOL 464/564 was offered on a multi-year schedule, but GEOL 411/511 will be offered on a biennial schedule through rotation with HYDR 412/512. [Editor's Note: 511 is not available.]

**Geol J424/J520 Advanced Topics in Sedimentary Rocks (3 cr)**

Modern concepts of tectonic sedimentology, depositional environments, facies models, and application of analytical techniques to stratigraphic sequences. 520 students will have an additional research project. One 5-day field trip. Prerequisite: GEOL 324.

**Prereq:** Geol 324

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** No additional workload – Prof. Cassel will alternate between 420/520 and 407/507 in Spring terms, and this course will be similar in structure but cover topics not dealt with in Basin Analysis (407/507) to provide graduate students with more course options. Proposed change allows for expansion of the course to include hands-on experiential learning and to include an undergraduate option, which is needed for GEOL majors who need to fill elective requirements. [Editor's note: 420 is not available]

2. Reactivate, change, and and joint-list the following course:

**Geol 520 (s) Advanced Topics in Sedimentary Rocks (2-3 cr, max-6)**

~~Modern aspects of sedimentary rocks.~~ See [Geol J424/J520](#).

**Prereq:** Geol 324

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** No additional workload – Prof. Cassel will alternate between 420/520 and 407/507 in Spring terms, and this course will be similar in structure but cover topics not dealt with in Basin Analysis (407/507) to provide graduate students with more course options. Proposed change allows for expansion of the course to include hands-on experiential learning and to include an undergraduate option, which is needed for GEOL majors who need to fill elective requirements.

3. Add, joint list, and make cooperative the following courses:

**Geol J435/J535 Glaciology and the Dynamic Frozen Earth (3 cr)**

This course examines the physical processes that govern the frozen components of the Earth system. Idaho's changing snowpack, thinning Arctic sea ice, and accelerating glaciers are all evidence of the Earth's dynamic and rapidly changing frozen surface. These landscapes play critical roles in the climate system. Thinning and retreat of glaciers and ice sheets is on track to raise global sea level by up to a meter within student lifetimes. This course covers the mechanics and energy budgets of the frozen earth. Upon completion of this course, students will be able to describe the ways by which glaciers increase or decrease their flow, the controls on the growth and loss of sea ice, the importance of permafrost environments to the climate and landscape evolution, and how ice preserves a record of past global temperatures. Additional work required for 500-level credit. Cooperative: open to WSU degree-seeking students.

**Prereq:** Math 160 or Math 170

### **Geol 535 Glaciology and the Dynamic Frozen Earth (3 cr)**

See Geol J435/J535.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** This course will be taught by Dr. Bartholomaeus, a new hire in our department, and covers some of the topics that are fundamental to his research program and that of his students. This department upper-division elective and graduate course broadens the geological sciences curriculum and offers students an opportunity to learn about an increasingly important, societally relevant component of the Earth system. This course will be an elective added to Dr. Bartholomaeus' developing teaching rotation. It requires no special space requirements and can be offered in most small to medium-sized classrooms on campus.

4. Change the following courses:

### **Geol J407/J507 Basin Analysis (3 cr)**

Formation mechanisms and characteristics of sedimentary basins. Modern concepts of tectonics and sedimentary basin analysis, including ~~geologic application of provenance, thermal and subsidence histories, and sequence stratigraphy~~ [tectonics of subsidence, detrital mineral provenance, thermal histories, and facies models](#). Lithofacies distributions and structural styles in a variety of basin types with specific examples from around the world. [For 500-level credit an additional paper is required](#). One 2-day [and one 5-day](#) field trip. Cooperative: open to WSU degree-seeking students. (Spring only)

**Prereq:** Geol 324 [and Math 143 with a grade of C or better](#)

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** A previous course change form was filed in 2015 (approved by department on 3/11/2015 and by college on 4/8/2015) but apparently only some of the changes were entered after approval by UCC. Specifically, the addition of a 5-day field trip and of the alternate Math 170 prerequisite were apparently never entered, and this editing error was not caught in time by the department. The changes that actually were made are on General Curriculum Report #282.

The rationale from the previous form was:

A change is requested to provide a more detailed description of the course topics and add a 5-day field trip to a basin in the region area that will be conducted over a weekend to minimize students missing other classes.

**Geol 490 Geology Field Camp ~~Geology II~~ (3 cr)**

*Gen Ed: Senior Experience*

Advanced field problems and methods; interpretation of field data, preparation of reports based on field observations and interpretations. Accident and health insurance required. Three week, off-campus.

Cooperative: open to WSU degree-seeking students. (Summer only)

**Prereq:** Geol 290 and Geol 345; and Math 143 with a grade of 'C' or better

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** The title change to simply " Geology Field Camp" instead of "Field Geology II" is necessary because the course "Field Geology I" no longer exists. That course is now called "Geol 290 Geology Field Methods. The term "field camp" is recognized nationwide as the capstone field experience for geologists.

**Hydr 576 Fundamentals of Modeling Hydrogeologic Systems (3 cr)**

Development and application of models representing physical systems, with particular emphasis on ground water flow. Development and solution of the basic equations of potential flow will be covered, along with their assumptions and limitations. Properties assignment, parameter sensitivity, and dimensional analysis will also be discussed. The course will emphasize when modeling is appropriate, how to design a model, and how properties should be selected to achieve meaningful results.

Cooperative: open to WSU degree-seeking students.

**Prereq:** Math 275 or Permission

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Because there is close cooperation between the UI and WSU geology programs, and because no comparable course to this one is offered at WSU, there is strong demand for this class by WSU graduate students in geology and hydrogeology. In particular, UI course instructor Fairley has a research partnership (NSF funded 2013—2017; current NSF funding pending) with WSU professor Peter Larson. While Larson's courses are available to Fairley's graduate students, the reverse is not true. Making this course available to WSU students strengthens our inter-campus collaboration at the PI and department levels, and provides for greater interactions between UI and WSU students and faculty. The addition of cooperative status is not expected to change the department workload.

5. Drop the following courses:

**Geol J464/J564 The Geochemistry of Natural Waters (3 cr)**

Basic principles of aqueous geochemistry applied to natural waters (groundwaters, lake and river waters, seawater), presented at an intermediate level; carbonate equilibria and alkalinity, solubility of minerals, sorption processes and surface reactions, redox reactions and Eh-pH diagrams, organic geochemistry, etc. For graduate credit, students are required to complete an additional independent research paper Recommended preparation: Geol 423.

Prereq: Chem 111

**Geol 564 The Geochemistry of Natural Waters (3 cr)**

See Geol J464/J564.

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** This course is being replaced by Geol J411/J511. [Editor's note: J431/J531]

**MATHEMATICS**

1. Change the following courses:

**Math 390 Axiomatic Geometry (3 cr)**

May be used as core credit in J-3-d. Development of Euclidean and hyperbolic geometry using the axiomatic approach. Recommended Preparation: Math 215.

**Prereq:** High school geometry and Math [176](#)~~330~~, or Permission

**Available via distance:** Yes

**Geographical Area:** Moscow, Distance

**Rationale:** Taking Math 176 provides the students with the minimum familiarity with proofs and assures us of mathematical maturity. Math 330 was a prerequisite for Math 390 mainly because it assured us of some level of mathematical maturity. However, there is nothing in Math 390 that requires linear algebra.

**Math 391 Modern Geometry (3 cr)**

Euclidean and non-Euclidean geometries, plus topics chosen from projective, transformational, and computational geometry. Recommended Preparation: Math 215.

**Prereq:** High School Geometry and Math [176](#)~~330~~, or Permission

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Taking Math 176 provides the students with the minimum familiarity with proofs and assures us of mathematical maturity. Math 330 was a prerequisite for Math 391 mainly because it assured us of some level of mathematical maturity. However, there is nothing in Math 391 that requires linear algebra.

**Math 430 Advanced Linear Algebra (3 cr)**

Vector spaces, linear transformations, characteristic polynomial, eigenvectors, Hermitian and unitary operators, inner products, quadratic forms, Jordan canonical form, applications. **Recommended Preparation: Math 215.**

**Prereq:** [Math 215 and](#) Math 330 or Permission

**Available via distance:** Yes

**Geographical Area:** Moscow, Distance

**Rationale:** Requiring Math 215 gives the students the right preparation for Math 430.

**Math 438 Mathematical Modeling (3 cr)**

Topics in the use of mathematics to model phenomena from science, business, economics, and engineering.

**Prereq:** [CS 120](#), Math 310 and Math 330

**Available via distance:** No

**Geographical Area:** Moscow

**Rationale:** Taking CS 120 provides the students with necessary programming skills/experience for Math 438.

**STATISTICAL SCIENCE**

1. Add the following courses:

**STAT 427 R Programming (3 cr)**

Credit not awarded for Stat 424 after Stat 419.

Introduction to the R computing language for scientific graphics, statistical analysis, simulation, and mathematical modeling. Topics include functions, data management and manipulation, loops and logical structures, vector and matrix calculations, contemporary graphical displays, probability and simulation, dynamic models, numerical optimization, standard methods of statistical analysis.

**Prereq:** Stat 251 or Stat 301 or Stat 416

**Distance Education:** No

**Geographical Area:** Moscow

**Rationale:** The new course is proposed in response to numerous requests from faculty and students in other departments. The free, open source R package is becoming a cornerstone of data analysis worldwide, and the new course is likely to be popular on campus. The added workload has been managed successfully by the Department of Statistical Science for the past two years while the course was being developed under the special topics (404) classification. At a later date, an online version will be offered.

**Stat 535 Introduction to Bayesian Statistics (3 cr)**

Exploring the basics of Bayesian thinking with a comparative approach to interpretations of probability. Statistical methods, Bayesian approach to statistical inference. Methods include point and interval estimation under the Normal model, and inference under hierarchical models with emphasis on statistical model building. Computational methods, applications of methods useful for sampling posterior distributions such as rejection sampling, importance sampling and Markov Chain Monte Carlo.

**Prereq:** Stat 431 or equivalent paperwork

**Distance Education:** No

**Geographical Area:** Mosc0w

**Rationale:** The addition of an applied Bayesian Statistics course is important for the UI campus. At one time the Bayesian approach to statistical inference was rarely used and difficult to implement, but computational advances over the past 25 years have made the Bayesian approach common in many scientific fields. Some topics in Bayesian Statistics are covered in advanced statistics courses, but having this course will enable a wider audience to learn about the distinctions between Bayesian Statistics and the Frequentist approach, and how they can apply these methods to their data.

There is no added workload, because this course will be offered in alternate years while the Stat 514 Nonparametric Statistics course will move from being offered each year to every other year.

2. Add and joint-list the following courses:

**STAT J436/J516 Applied Regression Modeling**

Statistical modeling and analysis of scientific data using regression model including linear, nonlinear, and generalized linear regression models. Topics also include analysis of survival data, censored and truncated response variables, categorical response variables, and mixed models. Emphasis is on application of these methods through the analysis of real data sets with statistical packages. Additional coursework/projects will be assigned at the 500-level.

**Distance Education:** No

**Geographical Area:** Moscow

**Rationale:** A 400-level course in Applied Regression Modeling will be required for the new Statistics BS degree being requested. Additional coursework/projects will be assigned at the 500-level.

**Stat J437/507 Experimental Design (3 cr)**

Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology. Additional work required for 500-level credit. Cooperative: Available to WSU degree-seeking students for credit.

**Distance Education:** No

**Geographical Area:** Moscow

**Rationale:** A 400-level course in Experimental Design will a required for the new Statistics BS degree being requested. Additional coursework/projects will be assigned at the 500-level.

3. Joint-list and change the following courses:

**Stat 516 Applied Regression Modeling (3 cr)**

~~See Stat J436/J516. Statistical modeling and analysis of scientific data using regression model including linear, nonlinear, and generalized linear regression models. Topics also include analysis of survival data, censored and truncated response variables, categorical response variables, and mixed models. Emphasis is on application of these methods through the analysis of real data sets with statistical packages.~~

**Prereq:** Stat 431

**Distance Education:** No

**Geographical Area:** Moscow

**Rationale:** A 400-level course in Applied Regression Modeling will be required for the new Statistics BS degree being requested. Additional coursework/projects will be assigned at the 500-level.

**Stat 507 Experimental Design (3 cr)**

~~See Stat J437/507. Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology. Cooperative: open to WSU degree-seeking students.~~

**Prereq:** Stat 431

**Distance Education:** Yes

**Geographical Area:** Moscow, Engineering Outreach

**Rationale:** A 400-level course in Experimental Design will a required for the new Statistics BS degree being requested. Additional coursework/projects will be assigned at the 500-level.

4. Make the following curricular changes to the Statistics Academic Graduate Certificate:

STAT 431 Statistical Analysis or similar course preparation must be completed prior to pursuing this academic certificate. At least half of the credits used for this certificate must be at the 500-level.

~~STAT 431      Statistical Analysis      3 cr~~

**One of the following (3 cr)**

STAT 422	Survey Sampling Methods	3 cr
STAT 507	Experimental Design	3 cr

~~Two or more of~~ Courses from the following (6-9 cr):

STAT 428	Geostatistics	3 cr
STAT 451	Probability Theory	3 cr
STAT 452	Mathematical Statistics	3 cr
STAT 514	Nonparametric Statistics	3 cr
STAT 519	Multivariate Analysis	3 cr
STAT 555	Statistical Ecology	3 cr
STAT 565	Computer Intensive Statistics	3 cr

**Courses to total ~~15~~12 credits for this certificate**

**Distance Education:** 100% of requirements can be completed via distance

**Geographical Area:** Moscow, Engineering Outreach

**Rationale:** The requirement for a graduate certificate to have a majority of credits at the 500 level made this change necessary. Also, students should really begin the program with the preparation of STAT 431.