College of Science
Proposed Catalog Changes

Effective Term (unless otherwise noted) = Summer 2016

BIOINFORMATICS AND COMPUTATIONAL BIOLOGY

1. Change the curricular requirement of Bioinformatics and Computational Biology (M.S.)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>As determined on admission</td>
</tr>
<tr>
<td>Core courses</td>
<td>9 credits</td>
</tr>
<tr>
<td>Depth courses</td>
<td>9 credits: 6 in one area and 3 in the other area</td>
</tr>
<tr>
<td>Seminar</td>
<td>2 credits</td>
</tr>
<tr>
<td>Lab rotation</td>
<td>None</td>
</tr>
<tr>
<td>Supplemental</td>
<td>As determined by thesis committee</td>
</tr>
<tr>
<td>Thesis</td>
<td>910 credits, minimum</td>
</tr>
<tr>
<td>Other</td>
<td>As determined by thesis committee</td>
</tr>
<tr>
<td>Total (min)</td>
<td>330 Credits</td>
</tr>
</tbody>
</table>

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

**Geographical Area Availability:** Moscow

**Rationale:** The BCB program wishes to align with the minimum University of Idaho requirements of 30 total credits for a M.S. degree. Since our students can still meet the program course requirements within the 30-credit limit, having a 32-credit requirement is unnecessary.

BIOLOGICAL SCIENCES

1. Discontinue the following subject prefixes

**MMBB** – Microbiology, Molecular Biology, and Biochemistry

**Rationale:** Over recent years, MMBB courses have been moved to numbers within the departments of the faculty who teach them. The MMBB courses that remain in the catalog are either no longer needed or are cross-listed with active BIOL, PLSC, or SOIL courses.

The Department of Biological Sciences has passed a curriculum motion, approved by the College of Science, to drop all remaining MMBB courses and remove the MMBB prefix from the course catalog. The College of Agriculture and Life Sciences has been consulted in this, and have planned for this through preparing the necessary cross-listings with their own courses.

**NEUR** – Neuroscience

**Rationale:** One of the outcomes of the “Focus For the Future” process last year was the relocation of the Neurology graduate programs to the Department of Biological Sciences. Custody of the NEUR course prefix has since also been moved to Biological Sciences.

The Department of Biological Sciences has passed a curriculum motion, approved by the College of Science, to drop all remaining NEUR courses and remove the NEUR prefix from the course...
catalog. With the Neurology degree programs now within that department, there is no longer a need for the separate prefix, and all currently-used NEUR courses are already cross-listed with BIOL, ECE, PSYC, or EDCI courses. Department chair Jim Nagler met last spring with participating faculty to discuss this, and has their support.

2. Add the following courses

**Gene 207 Introduction to Biotechnology (3 cr)**
See PISc 207.

- **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:** Creation of a course listing in GENE will expand on the offerings listed where students interested in Genetics will see available courses.

**Gene 440 Advanced Laboratory Techniques (4 cr)**
See PISc 440.

- **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:** Creation of a course listing in GENE will expand on the offerings listed where students interested in Genetics will see available courses.

**Gene J488/J588 Genetic Engineering (3 cr)**
See PISc J488/J588.

- **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 students from the college of science and non-agricultural departments.
- **Rationale:** Creation of a course listing in GENE will expand on the offerings listed where students interested in Genetics will see available courses.

3. Change the following courses

**Biol 314 Ecology and Population Biology (4 cr)**
Nutrient cycling and energy flow, populations, population genetics, use and construction of phylogenies, communities and biodiversity. Population genetics, population ecology, species interactions, community ecology, biodiversity, and data analysis. Three lec and one 3-hr labaper wk. (Spring only)

- **Prereq:** Biol 114 and Biol 115; Stat 251 or Stat 301; and Math 143 or Math 160 or Math 170.
- **Available via distance:** No
- **Geographic Area Availability:** Moscow
- **Assessment:** Course assignments and exams.
- **Rationale:** No change to workload. New description and prerequisites merely reflect evolving emphasis of the course material.
Biol J447/J547 Virology (3 cr)
Same as MMBB J432/J532. A survey of virology, with special emphasis on the molecular basis of replication, host-pathogen interactions and diseases associated with animal viruses. Extra oral and/or written assignments required for grad credit. Recommended preparation: Biol 250. (Fall, alt/yr)
Prereq: Biol 312380; and Biol 310 or Gene 314; or Permission

Available via distance: No
Geographic Area Availability: Moscow
Assessment: The exams will be primarily short answer/essay type exams that will be designed to test your comprehension/understanding of the basics that we cover in class. I will provide practice exam questions and answers so that you will be able to prepare for this style of exam. 10% of your grade will be determined by attendance and in your participation in discussions during grad student presentations. For grad students in the class, the final 10% of your grade will be determined by your co-leading of one discussion section during class time. This will be a discussion of a paper in the current virology literature (last 6 months). You will be graded on your grasp and presentation of the material, your ability to lead a discussion of the topic and your production of a set of handouts for the class. In addition, you must come up with discussion questions for the breakout groups.
Rationale: The change in prerequisites better reflects the content/information that the students should be familiar with prior to taking this class. Cell and Molecular Biology will give them an introduction to the basic cellular biology that is necessary to understand the host/pathogen interactions that are a main part of this course.

GEOGRAPHY

1. Add the following course
Geog 453 Water and Energy Systems (3 cr)
See EnvS J483/J583.

Available via distance: Yes
Geographic Area Availability: Moscow
Assessment: Student achievement of learning outcomes will be assessed through class assignments and projects.
Rationale: This is an existing course in Environmental Science. We will occasionally split the duties in offering this course with Environmental Science. When taught by a Geography faculty member, we will list in COWS as GEOG 453.

2. Change the following courses
Geog J407/J507 Spatial Analysis Statistics and Modeling (3 cr)
Short Title: SPATIAL STATS AND MODELING
Point Pattern Analysis, Nearest Neighbor, K-Functions, Quadrat Analysis, Spatial Autocorrelation (Moran’s I, Geary’s ratio, General G-statistics), Order Neighbor Analysis, Spatial Regression (creating prediction models, improving accuracy, validating and working with spatial weighted lags), Spatial Sampling Techniques/Methods, Spatial Dispersion, Spatial Diffusion, Gravity Models. Additional assignments and exams required for graduate credit. (Spring only) 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. Graduate students should enroll in GEOG 507 and additional work incorporating more difficult exams, readings and assignments will be required for graduate credit.
Prereq: Geog 385 and Stat 431 or permission
Available via distance: No
Geographic Area Availability: Moscow
Assessment: midterm exam, final exam, weekly assignments, and research project and paper
Rationale: In response to student feedback, we have redesigned the sequence of spatial analysis courses in our department.

**Geog 410 Biogeography (3 cr)**
Geographic distributions of plant and animal species, and causes of patterns, including climate, geology, speciation, extinction, and migration. Additional assignments and exam are required for 3 credits.
Prereq: Geog 100/Geog 100L or For/REM 221 or Permission

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Via tests, homework assignments, and class project
Rationale: We are correcting a clerical error. FOR/REM 221 was previously listed as a prereq for this course but was inadvertently dropped during another change two years ago.

**Geog 475 Intermediate GIS (3 cr)**
Course covers in-depth geographic information systems models and applications. Topics include network analysis, watershed analysis, spatial interpolation, terrain mapping and analysis, 3D visualization, and GIS modeling. Students develop spatial analysis and modeling skills to solve real-world problems.
Prereq: Geog 385 and Stat 251
Coreq: Stat 251

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Students are expected to understand the theories, concepts and principles underpinning geographic information analysis.

They should be able to implement geographic information analysis functions using geographic information systems (e.g., ArcGIS), and apply geographic information analysis in a specific topical area (e.g., land use, natural resource management, transportation, etc.).

The learning outcomes are evaluated based on in-class quizzes or tasks, lab exercises, mid-term exams, and a final project.
Rationale: Changing STAT 251 from prereq only to prereq or co-req.

**Geog 507 Spatial Analysis Statistics and Modeling (3 cr)**
Short Title: SPATIAL STATS AND MODELING
See Geog J407/J507.

Available via distance: No
Geographic Area Availability: Moscow
Assessment: midterm exam, final exam, weekly assignments, and research project and paper
Rationale: In response to student feedback, we have redesigned the sequence of spatial analysis courses in our department.

3. Reactivate and change the following course

**Geog 542 Spatial Statistics (3 cr)**
Same as Stat 546. The course focuses on the basic theory and methods of spatial statistics including spatial dependence assessment and modeling. The course will cover basic spatial data analysis, point pattern analysis, spatial autocorrelation methods as well as the analysis of lattice structures. Geographically weighted regression, spatial auto regression and the analysis of geographically continuous data using kriging methods will also be covered. (Alt/yr) The course extends the range of spatial analysis from GEOG 507. Topics include spatial covariance structures, methods of spatial model estimation, (e.g., iterated LS, GLS, MLE, penalized estimation), spatial interpolation and surface estimation, geostatistics/kriging and gravity model estimation and local parametric estimation procedures. Categorical spatial data analysis, Poisson and logistic regression, mixed models, contingency tables, models of discrete temporal and landscape change and graph-theoretic analogues, log-linear models. Additional topics, time permitting: introduction to hierarchical modeling and Bayesian spatial techniques and MCMC estimation, Markov random fields, stochastic space-time analysis and diffusion, time series of stationary series and vector autoregression with Granger causality, space-time covariance heterogeneity issues. Recommended: An additional course in multivariate statistics, probability theory or mathematical statistics.

Prereq: Geog 475, Math 170, Math 330, and Geog 507, Stat 431 or permission

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Midterm Exam, Final Exam, Weekly Assignments/Problem Sets, Research Project and Paper.
Rationale: In response to student feedback, we have redesigned the sequence of spatial analysis courses in our department. Recommended: an additional course in multivariate statistics, probability theory or mathematical statistics.

Department teaching capacity is increasing as faculty whose initial EPSCOR grant-funded years were limited to one course per semester begin to take on standard teaching loads.

GEOLOGICAL SCIENCES

1. Change the following courses

Geol 324 Principles of Stratigraphy and Sedimentation (4 cr)
Description and identification of sedimentary rocks; organization and correlation of layered rocks in all scales, including factors controlling their distribution; cycles in sedimentation and stratigraphy; sequence stratigraphy and basin dynamics. Interrelationship of sedimentation and stratigraphy and processes and factors influencing genesis of sedimentary rocks. Topics include weathering, fluid flows, sediment mechanics, depositional environments, stratigraphic logging and field data collection, sedimentary lithofacies, provenance, and application of principles of interpretation of stratigraphic record. Two lec and two 2-hr one 4-hr labs a per wk; two 1-day field trips; optional 7-required 5-day field trip.
Prereq: Geol 102/102L and Math 143 with a grade of ‘C’ or better
Rationale: A change to the description is requested to reflect modern usage of technical terms. A 4 hr lab per week will meet consecutively in order to have a block of time to focus on field and lab projects. A 5-day field trip will be incorporated and conducted over a weekend to minimize students missing other classes.

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. Lithofacies distributions and structural styles in a variety of basin types with specific examples from around the world, and methods for studying them. For 500-level credit an additional research project is required. One 2-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
**Rationale:** A change is requested to provide a more detailed description of the course topics and add a 5-day field trip to the Challis ID area that will be conducted over a weekend to minimize students missing other classes.

**Geol 548 Tectonics (3 cr)**

**Synopsis of observations from diverse disciplines of geology leading to the development of modern plate tectonic theory. Applications of plate tectonic principles to fundamental problems of continental and marine geology. Nature and origin of the Earth's major tectonic features.** Two lec and 2 hrs of lab a wk; one or two 1- to 25-day field trips. Cooperative: open to WSU degree-seeking students.

**Prereq:** Geol 345 or Permission

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

**Hydr J412/J512 Environmental Hydrogeology (3 cr)**

Methods of hydrogeologic site characterization for the delineation of environmental problems such as contaminated ground water plumes, and ground water dewatering for landslide remediation. For grad credit, students are required to complete an additional independent research paper/project.

**Prereq:** Geol 309

**Rationale:** A change in the course description is requested to better fit the course topics.

2. Reactivate and change the following courses

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

**Geol 564 same as Hydr 564.**--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, prepare two in-depth term papers and demonstrate through exam work and papers a more in-depth understanding of the material. One compressed video and one web-based lecture a wk. Suggested/Recommended preparation: Geol 423.

**Prereq:** Chem 111-112 and Math 143 with a grade of 'C' or better

**Rationale:** A change in the description is requested to reflect modern usage of technical terms. Graduate students taking Geol/Hydr 564 will be required to complete an additional research paper and not the previous requirements.

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

See Geol J464/J564.

**Rationale:** A change in the description is requested to reflect modern usage of technical terms. Graduate students taking Geol/Hydr 564 will be required to complete an additional research paper and not the previous requirements.

**MATHEMATICS**

1. Add the following course

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

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

**Prereq:** Math 310 and Math 330
Available via distance: No
Geographic Area Availability: Moscow
Assessment: Course assignments and exam questions will be included that are designed specifically to address learning outcomes
Rationale: A course is needed as an elective for the Scientific Modeling option that addresses modeling phenomena from science, business, economics, and engineering. This will help to better prepare students in this degree option for employment. Initiating this course is being done in conjunction with discontinuing on-campus teaching for two other courses. We’re re-organizing all of our on-campus course offerings and the net effect is an anticipated “decrease” of one section each two semesters.

2. Change the following courses

Math 130 Finite Mathematics (3 cr)
Gen Ed: Mathematics
Systems of linear equations and inequalities, matrices, linear programming, and probability.
Prereq: Sufficient score on SAT, ACT, or COMPASS Math Test math placement test; or Math 108 with a C or better. Required test scores can be found here: www.uidaho.edu/registrar/registration/placement/math.

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Assessment of the course will continue as at present.
Rationale: This edit to the prerequisites is necessitated by the discontinuance of the COMPASS test. We do not yet know which test we will find to replace COMPASS but will place that information on the placement webpage when it is decided.

Math 137 Algebra with Applications (3 cr)
Carries no credit after Math 143. Algebraic, exponential, logarithmic functions, systems of equations, applications.
Prereq: A grade of C or better in Math 108 or sufficiently high score on SAT, ACT, or COMPASS Math Test math placement test. It is recommended that Math 137 be taken within two years of passing Math 108 or its equivalent. Math 137 is not sufficient preparation for Math 170. Students intending to take Math 170 should enroll in Math 143 instead.

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Assessment of the course will continue as at present.
Rationale: This edit to the prerequisites is necessitated by the discontinuance of the COMPASS test. We do not yet know which test we will find to replace COMPASS but will place that information on the placement webpage when it is decided.

Math 143 Pre-calculus Algebra and Analytic Geometry (3 cr)
Gen Ed: Mathematics
Carries no credit after Math 160 or Math 170; carries 2 credits after Math 137. Algebraic, exponential, logarithmic functions; graphs of conics; zeros of polynomials; systems of equations, induction. Taught using the Polya Math Center, a studio environment featuring group study, one-to-one interaction with instructors, computer-mediated modules, and lectures.
Prereq: Sufficient score on SAT, ACT, or COMPASS Math Test math placement test; or Math 108 with grade of C or better. It is recommended that Math 143 be taken within two years of passing Math 108 or its equivalent. Required test scores can be found here: www.uidaho.edu/registrar/registration/placement/math.

Available via distance: Yes
Geographic Area Availability: Moscow; Offered as dual-credit to high school students.
Assessment: Assessment of the course will continue as at present.
Rationale: This edit to the prerequisites is necessitated by the discontinuance of the COMPASS test. We do not yet know which test we will find to replace COMPASS but will place that information on the placement webpage when it is decided.

Math 144 Analytic Trigonometry (1 cr)
Not open for cr to students who have previous high school or college cr in trigonometry.
Trigonometric functions, inverse functions, applications. Taught using the Polya Math Center, a studio environment featuring group study, one-to-one interaction with instructors, computer-mediated modules, and lectures.
Prereq: Sufficient score on SAT, ACT, or COMPASS Math Test. Students may qualify by enrolling concurrently in Math 143 or Math 170. Required test scores can be found here: www.uidaho.edu/registrar/registration/placement/math.

Available via distance: Yes
Geographic Area Availability: Moscow; Offered as dual-credit to high school students.
Assessment: Assessment of the course will continue as at present.
Rationale: This edit to the prerequisites is necessitated by the discontinuance of the COMPASS test. We do not yet know which test we will find to replace COMPASS but will place that information on the placement webpage when it is decided.

Math 160 Survey of Calculus (4 cr)
Gen Ed: Mathematics
Carries no credit after Math 170. Functions, graphing, derivative, integral. Overview of functions, and graphs, derivatives, integrals, exponential and logarithmic functions, functions of several variables, and differential equations. Primarily for students who need only one semester of calculus, such as students in business, life sciences, or architecture who need only one semester of calculus.
Prereq: Sufficient score on SAT, ACT, or COMPASS Math Test. Students may qualify by enrolling concurrently in Math 143 or Math 170, or Math 137 with a C or better, or Math 143 with a C or better. Required test scores can be found here: www.uidaho.edu/registrar/registration/placement/math.

Available via distance: Yes
Geographic Area Availability: Moscow; Available as a video course through Engineering Outreach
Rationale: The College of Business requested that some of the course be devoted to differential equations to prepare their students for the business curriculum.

Math 170 Analytic Geometry and Calculus I (4 cr)
Gen Ed: Mathematics
Carries 2 credits after Math 160. Functions, limits, continuity, differentiation, integration, applications, differentiation and integration of transcendental functions. Primarily for students in engineering, mathematics, science or computer science.
Prereq: Math 143 (with a grade of C or better) and Math 144 (concurrent enrollment in Math 144 is allowed although it is recommended that students complete Math 144 before enrolling in Math 170); or demonstrated proficiency through a sufficiently high score on the ACT, SAT, or COMPASS test. Required test scores can be found here: www.uidaho.edu/registrar/registration/placement/math.

Available via distance: Yes
Geographic Area Availability: Moscow; Offered as a video course through Engineering Outreach and as dual-credit to high school students.
Assessment: Assessment of the course will continue as at present.
Rationale: This edit to the prerequisites is necessitated by the discontinuance of the COMPASS test. We do not yet know which test we will find to replace COMPASS but will place that information on the placement webpage when it is decided.
Math 176 Discrete Mathematics (3 cr)
Induction, set theory, graph theory, number systems, Boolean algebra, and elementary counting.
Prereq: Math 143 or sufficiently high score on SAT, ACT, or COMPASS Math Test math placement test.

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Assessment of the course will continue as at present.
Rationale: This edit to the prerequisites is necessitated by the discontinuance of the COMPASS test. We do not yet know which test we will find to replace COMPASS but will place that information on the placement webpage when it is decided.

Math 215 Introduction to Higher Mathematics Proof via Number Theory (3 cr)
Carries no credit after Math 461 or Math 471. The primary goal of this course is to teach students how to read and write mathematical proofs. Topics include logic and proof techniques, as well as fundamental mathematical structures such as sets, relations, functions, and number systems. An introduction to mathematical thinking and proof through the development of the basic results of elementary number theory. Emphasis on techniques of mathematical proofs, reading and writing proofs, and fundamental mathematical structures.
Prereq: Math 175 and Math 176 permission

Available via distance: Yes
Geographic Area Availability: Moscow; Any location via distance education (Engineering Outreach)
Assessment: Course assignments and exam questions will be included that are designed specifically to address learning outcomes
Rationale: The current Math 215 will be changed substantially. Instead of a one-course introduction to proofs, students will now take a sequence consisting of 176 and 215. This will allow two separate exposures to some of the difficult topics. Also, the concepts in Math 215 will now be motivated by being taught in the context of a body of mathematics – elementary number theory. The objectives for Math 215 (or more properly, for 176-215) would be much the same as our current 215 objectives: students would leave this new sequence with skills in understanding mathematical thought and the basic structures and techniques for proofs, and with experience in mathematical abstraction. We believe this will better prepare students to get more out of their upper-division mathematics coursework.

Math 528 Differentiable Manifolds (3 cr)
Fundamentals of smooth manifolds, tangent spaces, vector fields, Lie groups, integration on manifolds, and applications. Cooperative: open to WSU degree-seeking students.
Prereq: Math 521, and Math 474 472

Available via distance: No
Geographic Area Availability:
Rationale: This course requires knowledge of the theory of multivariable calculus and the correct prerequisite has always been Math 472 – listing Math 471 was an error.

3. Change the curricular requirement of Mathematics (B.S.)

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

Basic Courses:

- Math 170 Analytic Geometry and Calculus I (4 cr)
- Math 175 Analytic Geometry and Calculus II (4 cr)
- Math 275 Analytic Geometry and Calculus III (3 cr)

One of the following (3 cr):
- Math 330 Linear Algebra (3 cr)
- Math 430 Advanced Linear Algebra (3 cr)

And one of the following options:

A. General Option

This is the traditional curriculum in Mathematics. It is more mathematically rigorous than the other options. It is especially good for secondary education majors and students intending to go to graduate school in Mathematics or other sciences.

Math Courses:

- Math 176 Discrete Mathematics (3 cr)
- Math 215 Introduction to Higher Mathematics Proof via Number Theory (3 cr)
- Math 310 Ordinary Differential Equations (3 cr)
- Math 461 Abstract Algebra I (3 cr)
- Math 471 Introduction to Analysis I (3 cr)

One of the following (3 cr):
- Math 430 Advanced Linear Algebra (3 cr)
- Math 452 Mathematical Statistics (3 cr)
- Math 453 Stochastic Models (3 cr)
- Math 462 Abstract Algebra II (3 cr)
- Math 472 Introduction to Analysis II (3 cr)
- Math 476 Combinatorics (3 cr)

One of the following (9-10):
- Three credits in Math electives numbered above 310 and six additional credits chosen from Math 385, ECE 455, Stat 431, or any Math course numbered above 400,
- EDCI 401 plus an additional nine credits chosen from ECE 455, Stat 301, Stat 431, or any Math elective numbered above 310.
- Four Math courses numbered above 310 (12 cr)

Supporting Courses:

- Phys 211 Engineering Physics I (3 cr)
- Phys 212 Engineering Physics II (3 cr)

One of the following (3 cr):
- Stat 251 Statistical Methods (3 cr)
- Stat 301 Probability and Statistics (3 cr)
One of the following (3-4 cr):
CS 112  Computational Thinking and Problem Solving (3 cr)
CS 120  Computer Science I (4 cr)

Courses to total 120 credits for this degree

B. Applied - Statistics Option

The emphasis is on the design and analysis of experiments. With a major or minor in another department this is an excellent preparation for work in industry or for graduate school in Statistics.

Math Courses:
Math 451  Probability Theory (3 cr)
Math 452  Mathematical Statistics (3 cr)

At least two courses from the following (6 cr):
Math 395  Analysis of Algorithms (3 cr)
Math 426  Discrete Optimization (3 cr)
Math 428  Numerical Methods (3 cr)
Math 430  Advanced Linear Algebra (3 cr)
Math 432  Numerical Linear Algebra (3 cr)
Math 471  Introduction to Analysis I (3 cr)
Math 472  Introduction to Analysis II (3 cr)

Supporting Courses:
Stat 426  SAS Programming (3 cr)
Stat 431  Statistical Analysis (3 cr)

One course selected from the following (3 cr):
CS 112  Computational Thinking and Problem Solving (3 cr)
CS 120  Computer Science I (4 cr)

One course selected from the following (3 cr):
Stat 251  Statistical Methods (3 cr)
Stat 301  Probability and Statistics (recommended) (3 cr)

At least two courses from the following (6 cr):
Econ 453  Econometrics (3 cr)
Math 453  Stochastic Models (3 cr)
Stat 422  Survey Sampling Methods (3 cr)
Stat 507  Experimental Design (3 cr)
Stat 550  Regression (3 cr)
Stat 514  Nonparametric Statistics (3 cr)
Stat 519  Multivariate Analysis (3 cr)
Stat 555  Statistical Ecology (3 cr)

Approved electives in fields where statistics is applied (not to be in Statistics (Stat) courses) (6 cr)

Courses to total 120 credits for this degree

C. Applied - Computation Option

The emphasis is on the mathematics related to computer science and technology. With a major or minor in computer sciences this is a good preparation for work in the computer industry.

Math courses:
Math 176  Discrete Mathematics (3 cr)
Math 215  Proof via Number Theory (3 cr)
Math 310  Ordinary Differential Equations (3 cr)
Math 385  Theory of Computation (3 cr)
Math 395  Analysis of Algorithms (3 cr)
Math 415  Cryptography (3 cr)

One of the following (3 cr):
Math 428  Numerical Methods (3 cr)
Math 432  Numerical Linear Algebra (3 cr)

One of the following (3 cr):
ECE 455  Information and Coding Theory (3 cr)
Math 326  Linear Optimization (3 cr)
Math 376  Discrete Mathematics II (3 cr)
Math 452  Mathematical Statistics (3 cr)
Stat 301  Probability and Statistics (3 cr)
Stat 431  Statistical Analysis (3 cr)
Any 400-level Math course

Three Two additional courses from the following (96 cr):
Math 415  Cryptography (3 cr)
Math 376  Discrete Mathematics II (3 cr)
Math 426  Discrete Optimization (3 cr)
Math 428  Numerical Methods (3 cr)
Math 430  Advanced Linear Algebra (3 cr)
Math 432  Numerical Linear Algebra (3 cr)
Math 451  Probability Theory (3 cr)
Math 452  Mathematical Statistics (3 cr)
Math 461  Abstract Algebra I (3 cr)
Math 462  Abstract Algebra II (3 cr)
Math 476  Combinatorics (3 cr)
Math 480  Partial Differential Equations (3 cr)

Supporting courses:
CS 120  Computer Science I (4 cr)
CS 121  Computer Science II (3 cr)

Courses to total 120 credits for this degree

D. Applied – Scientific Modeling Option

The emphasis is on the mathematics used to model phenomena in the sciences, engineering, science, business, and economics. With a second major in a science of these disciplines, this provides ideal preparation for graduate school.

Math courses:
Math 176  Discrete Mathematics (3 cr)
Math 215  Proof via Number Theory (3 cr)
Math 310  Ordinary Differential Equations (3 cr)
Math 428  Numerical Methods (3 cr)
Math 451  Probability Theory (3 cr)

One of the following (3 cr):
ECE 455  Information and Coding Theory (3 cr)
Math 437  Mathematical Biology (3 cr)
Math 438  Mathematical Modeling (3 cr)
WLF 552  Ecological Modeling (3 cr)

Five Three additional courses from the following (159 cr):
ECE 350  Signals and Systems I (3 cr)
ECE 450  Signals and Systems II (3 cr)
ECE 455  Information and Coding Theory (3 cr)
Math 326  Linear Optimization (3 cr)
Math 371  Mathematical Physics (3 cr)
Math 376  Discrete Mathematics II (3 cr)
Math 415  Cryptography (3 cr)
Math 420  Complex Variables (3 cr)
Math 426  Discrete Optimization (3 cr)
Math 428  Numerical Methods (3 cr)
Math 432  Numerical Linear Algebra (3 cr)
Math 437  Mathematical Biology (3 cr)
Math 438  Mathematical Modeling (3 cr)
Math 452  Mathematical Statistics (3 cr)
Math 453  Stochastic Models (3 cr)
Math 471  Introduction to Analysis I (3 cr)
Math 472  Introduction to Analysis II (3 cr)
Math 476  Combinatorics (3 cr)
Math 480  Partial Differential Equations (3 cr)
Stat 301  Probability and Statistics (3 cr)
WLF 552  Ecological Modeling (3 cr)

Supporting courses:
Two courses at the 300 level or above in one area of science, engineering, or other quantitative area.

One of the following (3-4 cr):
CS 112  Computational Thinking and Problem Solving (3 cr)
CS 120  Computer Science I (4 cr)

One of the following (3 cr):
Stat 301  Probability and Statistics (3 cr)
Math 452  Mathematical Statistics (3 cr)

Six credits of advisor-approved quantitative electives (from courses in science, engineering, business, economics, etc.)

Courses to total 120 credits for this degree

E. Applied - Actuarial Science and Finance Option

This curriculum provides the background to become an actuary and work in the insurance industry, or to work in finance.

Math courses:
Math 310  Ordinary Differential Equations (3 cr)
Math 451  Probability Theory (3 cr)
Math 452  Mathematical Statistics (3 cr)
Three additional courses chosen from Math courses numbered above 400 or Stat 422 (9 cr)

Supporting courses:
Acct 201  Introduction to Financial Accounting (3 cr)
Acct 202  Introduction to Managerial Accounting (3 cr)
Bus 301  Financial Management (3 cr)
Stat 431  Statistical Analysis (3 cr)

One of the following choices (4-6 cr):
Econ 201  Principles of Macroeconomics (3 cr)
Econ 202  Principles of Microeconomics (3 cr)
OR
Econ 272  Foundations of Economic Analysis (4 cr)

One of the following (3-4 cr):
CS 112  Computational Thinking and Problem Solving (3 cr)
CS 120  Computer Science I (4 cr)

One of the following (3 cr):
Stat 251  Statistical Methods (3 cr)
Stat 301  Probability and Statistics (preferred) (3 cr)

One of the following (1-3 cr):
Bus 339  Spreadsheet Modeling (1 cr)
Stat 426  SAS Programming (3 cr)

At least three courses selected from the following (7-9 cr):
Bus 302  Intermediate Financial Management (3 cr)
Bus 381  International Finance (3 cr)
Bus 408  Security Analysis (3 cr)
Bus 463  Portfolio Management (3 cr)
Bus 464  Derivatives and Risk Management (3 cr)
Bus 465  Introduction to Market Trading (3 cr)
Bus 469  Risk and Insurance (3 cr)
Econ 351  Intermediate Macroeconomic Analysis (3 cr)
Econ 352  Intermediate Microeconomic Analysis (3 cr)
Math 455  Applied Actuarial Science (1 cr)

One of the following (3 cr):
Stat 433  Econometrics (3 cr)
Stat 550  Regression (3 cr)

Courses to total 120 credits for this degree

F. Applied - Mathematical Biology Option

This option offers training across Mathematics and Biology and provides the background to pursue a career in technical industries and to obtain graduate degrees in Biomathematics, Biostatistics, and Bioinformatics

Math and Statistics courses:
Math 437  Mathematical Biology (3 cr)
Math 451 or Stat 451  Probability Theory (3 cr)
Math 452 or Stat 452  Mathematical Statistics (3 cr)

One course from the following (3 cr):
Stat 251  Statistical Methods (3 cr)
Stat 301  Probability and Statistics (3 cr)

Two courses from the following (6 cr):
Math 310  Ordinary Differential Equations (3 cr)
Math 453  Stochastic Models (3 cr)
Stat 431  Statistical Analysis (3 cr)

Two courses from the following (6 cr):
Math 428  Numerical Methods (3 cr)
Math 430  Advanced Linear Algebra (3 cr)
Math 480  Partial Differential Equations (3 cr)

Biology courses:
Biol 114  Organisms and Environments (4 cr)
Biol 115  Cells and the Evolution of Life (4 cr)
Biol 310  Genetics (3 cr)
Biol 456  Computer Skills for Biologists (3 cr)

12 credits of Biology courses at the 300-level or above (12 cr)

Supporting courses:
Chem 111  Principles of Chemistry I (4 cr)

Courses to total 120 credits for this degree

**Distance Education Availability:** More than 50% but less than 100% of the curricular requirements can be completed via distance.

**Geographical Area Availability:** Moscow

**Rationale:**

**General Option:** These modifications are aimed at improving student learning (particularly in the “proofs and abstraction” preparation for theoretical courses), streamlining and simplifying the structure of the requirements (thus making advising for the math major much easier), and improving efficiency in how we cover some topics. Instead of a one-course introduction to proofs, students will now take a sequence consisting of 176 and 215. The learning outcome objectives for Math 176/215 will be much the same as our current 215 objectives: students would leave this new sequence with skills in understanding mathematical thought and the basic structures and techniques for proofs, and with experience in mathematical abstraction. We believe this will better prepare students to get more out of their upper-division mathematics coursework. The new General Option requirements would eliminate the current mess regarding students seeking secondary education certification. All students could choose appropriate electives without recourse to a complicated set of alternate variations in elective requirements. The current General Option requirement for either 462 or 472 is replaced in the proposal by a “depth requirement” – one course that provides a second, more in-depth, treatment of some mathematics field. The principal advantage here is that it will allow a natural segregation, with our strongest students (those who are thinking about graduate school) gravitating towards 462 and 472. The level at which 462 and 472 are taught could thus be raised somewhat.

**Applied Statistics Option:** We are eliminating Math 430 from the Basic Requirements for all math degree options as a student would have to take Math 330 to be able to take Math 430. We are adding Math 430 to the elective choices as it really should have been there all along.

**Applied Computation Option:** These modifications are aimed at improving student learning (particularly in the “proofs and abstraction” preparation for theoretical courses), streamlining and simplifying the structure of the requirements (thus making advising for the math major much easier), and improving efficiency in how we cover some topics. This option remains a good double-major with Computer Science.

**Scientific Modeling Option:** These modifications are aimed at improving student learning (particularly in the “proofs and abstraction” preparation for theoretical courses), streamlining and simplifying the structure of the requirements (thus making advising for the math major much easier), and improving efficiency in how we cover some topics. Instead of a one-course introduction to proofs, students will now take a sequence consisting of 176 and 215.
PHYSICS

2. Change the following courses

Phys 211L Engineering Laboratory Physics I Lab (1 cr)
Gen Ed: Natural and Applied Sciences
Kinematics and dynamics, Newton’s laws, work and energy, rotational dynamics, linear and angular
momentum, collisions, static equilibrium, oscillations, gravity, and central forces, and
thermodynamics. One 2-hr lab a per wk.
Coreq: Phys 211

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Lab reports.
Rationale: Phys 213L is not taught anymore. A thermodynamics lab is moved from Phys 213L to
Phys 211L.

Phys 212L Engineering Laboratory Physics II Lab (1 cr)
Gen Ed: Natural and Applied Sciences
Electric fields and potentials, magnetic fields, capacitance and inductance, DC and AC circuits,
electromagnetic waves, mechanical waves, and geometric optics. One 2-hr lab a per wk.
Coreq: Phys 212

Available via distance: No
Geographic Area Availability: Moscow
Assessment: Lab reports.
Rationale: Phys 213L is not taught anymore. A few labs that deal with mechanical waves and
geometric optics are moved from Phys 213L to Phys 212L.

Phys 321 Analytical Mechanics (3 cr)
Review of single-particle kinematics and dynamics; linear oscillations; Lagrangian dynamics; orbital
dynamics; motion in non-inertial systems; space rotation of rigid bodies.
Prereq: Phys 212 and Phys 212L and Math 275
Coreq: Math 310

Available via distance: No
Geographic Area Availability: Moscow
Assessment:
Rationale: Math 310 (Ordinary Differential Equations) is a crucial math tool for analytical
mechanics.

Phys 351 Introductory Quantum Mechanics I (3 cr)
One-dimensional theory; free particle, bound states, potential barriers, harmonic oscillator, matrix
methods, and Dirac notation; interpretations of quantum theory.
Prereq: Phys 305, 371 Coreq: Math 330

Available via distance: No
Geographic Area Availability: Moscow
Assessment:
Rationale: Math 330 (Linear Algebra) is a crucial math tool for quantum mechanics.

3. Drop the following course

Phys 213L Engineering Physics III Lab (1 cr)
Fluid dynamics, waves in elastic media, sound waves, temperature, heat and thermodynamics,
kinetic theory, geometric and physical optics. One 2-hr lab a wk. (Spring only)
Coreq: Phys 213
Available via distance: No
Geographic Area Availability: Moscow
Assessment:
Rationale: Phys 213L is required only for physics majors. Thus, enrollment is low (about 15 students per year). The low enrollment does not generate sufficient funds from lab fees to maintain the lab, unless one would raise the lab fee to a prohibitive level. Due to the split budget requirement for lab budgets, the income from other lab courses with high enrollment (like, Phys 211L and Phys 212L) cannot be used to maintain Phys 213L. A few Phys 213L labs are moved into Phys 211L and Phys 212L.

4. Change the curricular requirement of Physics (B.A.)

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

Chem 111 Principles of Chemistry I (4 cr)
Chem 112 Principles of Chemistry II (5 cr)
CS 120 Computer Science I (4 cr)
Math 170 Analytic Geometry and Calculus I (4 cr)
Math 175 Analytic Geometry and Calculus II (4 cr)
Math 275 Analytic Geometry and Calculus III (3 cr)
Phys 200 Physics Seminar (1 cr)
Phys 211, Phys 211L Engineering Physics I and Lab (4 cr)
Phys 211L Laboratory Physics I (1 cr)
Phys 212, Phys 212L Engineering Physics II and Lab (4 cr)
Phys 212L Laboratory Physics II (1 cr)
Phys 213, Phys 213L Engineering Physics III and Lab (4 cr)
Phys 305 Modern Physics (3 cr)
Phys 321 Analytical Mechanics (3 cr)
Phys 341 Electromagnetic Fields I (3 cr)

Physics elective courses numbered 300 or above (11 cr)

Mathematics upper-division elective courses (6 cr)

3 credits in the humanities, in a course numbered 300 or above in addition to the minimum university-wide general education requirements.*

3 credits in the social sciences, in a course numbered 300 or above in addition to the minimum university-wide general education requirements.*

4 credits in any course(s) numbered 300 or above approved by student’s advisor

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
Rationale: Titles for Phys 211L and Phys 212L have been updated; Phys 213L eliminated. CS 120 is introduced as a new requirement to ensure that physics majors acquire skills in computer programming. Assessment of the program is ongoing according to the department's existing assessment plan.

5. Change the curricular requirement of Physics (B.S.)

Required course work includes the university requirements (see regulation J-3) and:
Chem 111  Principles of Chemistry I (4 cr)
Chem 112  Principles of Chemistry II (5 cr)

CS 120  Computer Science I (4 cr)
Math 170  Analytic Geometry and Calculus I (4 cr)
Math 175  Analytic Geometry and Calculus II (4 cr)
Math 275  Analytic Geometry and Calculus III (3 cr)
Math 310  Ordinary Differential Equations (3 cr)
Math 330  Linear Algebra (3 cr)
Phys 200  Physics Seminar (1 cr)
Phys 211, Phys 211L  Engineering Physics I and Lab (43 cr)
Phys 211L  Laboratory Physics I (1 cr)
Phys 212, Phys 212L  Engineering Physics II and Lab (43 cr)
Phys 212L  Laboratory Physics II (1 cr)
Phys 213, Phys 213L  Engineering Physics III and Lab (43 cr)
Phys 305  Modern Physics (3 cr)
Phys 321  Analytical Mechanics (3 cr)
Phys 341  Electromagnetic Fields I (3 cr)
Phys 351  Introductory Quantum Mechanics I (3 cr)

And one of the following emphases:

**A. General Physics Emphasis**

Phys 333  Statistical Thermodynamics (3 cr)
Phys 342  Electromagnetic Fields II (3 cr)
Phys 371  Mathematical Physics (3 cr)

*Upper-division mathematics electives (6 cr)*

Physics elective courses numbered 400 or above (15 cr including at least 4 cr of lab and 9 cr of non-lab courses)

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

**B. Applied Physics Emphasis**

Math 310  Ordinary Differential Equations (3 cr)
Math 330  Linear Algebra (3 cr)
Phys 411  Advanced Physics Lab (4 cr)

Four credits from the following of upper-division lab work in physics and engineering:

Phys 490  Research (1-6 cr, max 6)
Phys 492  Senior Research (1 cr)

Physics and engineering electives (27 credit, of which at least 21 credits must be upper-division and at least 9 credits must be 400-level and 21 credits must come from the following: ECE 350 + ECE 351, ECE 460, ECE 462, Engr 210, Engr 240, Engr 335, Engr 350, ME 301, ME 412, ME 413, ME 420, MSE 201, MSE 313, MSE 427, MSE 464, Phys 333, Phys 407, Phys 428, Phys 438, Phys 443, Phys 444, Phys 464, Phys 490, Phys 492.)

**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
Rationale: Titles for Phys 211L and Phys 212L have been updated; Phys 213L eliminated. Math 310 and 330 were previously required for the Applied Physics emphasis, while the General Physics emphasis allowed any upper-division math classes – this changes the requirement to Math 330 and 310 for both. CS 120 is introduced as a new requirement to ensure that physics majors acquire skills in computer programming. Lab work and electives for the Applied Physics Emphasis have been updated. Assessment of this program continues according to the department's existing assessment plan.

6. Change the curricular requirement of Physics (M.S.)

Master of Science. Major in Physics. (Non-thesis Option) General M.S. non-thesis requirements apply. The requirement is a minimum of 30 credits in coursework and the credits must be distributed as follows: (1) 20 cr in physics courses numbered 500 and higher (including 2 cr for Phys 501 and no more than three credits from Phys 599); (2) 10 cr in courses numbered 400 and higher (these may be non-physics courses upon the approval of the physics department Academic Standards Committee). Phys 521, Phys 533, Phys 541, Phys 542, and Phys 550 are required.

Students must pass a comprehensive examination, which must be taken at the first offering after the student has completed the core courses required for the M.S. degree. Full-time students may not delay the completion of their core course requirements by avoiding the taking of a core course when offered except with the prior written consent of the Academic Standards Committee and the student's major professor. The examination is written and covers all of general graduate-level physics as defined by the required courses for the M.S. degree. Typically, it will be administered on two different days, with a time limit of approximately three hours for each day. The results of the examination will be evaluated by the physics faculty. If the comprehensive examination is failed, it may be repeated only once; the repeat examination must be taken within a period of not less than three nor more than 14 months following the first attempt.

Master of Science. Major in Physics. (Thesis Option) General M.S. requirements for a degree with thesis apply. The student must complete a total of at least 30 credits at 400 level or higher, 20 of which must be at the graduate level, including a maximum of 10 credits in research and thesis, with no more than three credits from Phys 599. Specific departmental graduate course requirements are 2 credits in Phys 501 and Phys 521, Phys 541, Phys 542, and Phys 550. If a student's undergraduate preparation is considered deficient (e.g., if it lacks laboratory experience at the upper-division level), then certain undergraduate courses will be required in the study plan. Such remedial credits are not to be counted towards the total required for the degree. No departmental comprehensive exam is required.

A final defense of the M.S. thesis is scheduled upon completion of the thesis. The candidate is required to defend his or her work and show a satisfactory knowledge of the field in which the thesis research has been performed. The defense is oral and would typically last for one hour. The exam has to be announced to the physics faculty at least one week in advance. All members of the physics faculty are permitted to attend and ask questions. A recommendation of a majority of the student's graduate committee is necessary to pass the defense. If the defense is failed, it may be repeated only once; the repeat defense must be taken within a period of not less than three months nor more than one year following the first attempt.

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

Geographical Area Availability: Moscow

Rationale: Prevent excessive use of Phys 599, non-thesis research.

7. Change the curricular requirement of Physics (Ph.D.)
**Doctor of Philosophy. Major in Physics.** General Ph.D. requirements apply. Correspondence concerning the student's specific goals is encouraged in the preliminary planning of the Ph.D. program.

Specific departmental course requirements are: Phys 501 (2 cr), Phys 521, Phys 533, Phys 541, Phys 542, Phys 550, Phys 551, Phys 571, and at least nine additional semester-hours of physics courses at the 500 level (including at most three credits of Phys 599). A typical study plan would include 40 to 50 credits of course work at the 500 level in physics and about 30 credits in research and thesis. The study plan also would include at least six units of upper-division or graduate course work outside of physics. The nature and number of these additional units will depend upon the professional goals of the individual student. In planning a program, the student should consult with the departmental Academic Standards Committee for approval of any particular choice of nonphysics course work. The Ph.D. degree in physics is primarily a recognition of ability and accomplishment in research. The purpose of the course work is to provide the factual and theoretical background for research. Successful completion of course work is not in itself considered as completion of the major requirement for the degree.

All Ph.D. graduate students are required to enroll in Phys 501 (Physics Seminar) each semester while in residence.

No formal foreign language requirement exists for Ph.D. candidates; however, in individual cases, depending on the research topic, a reading knowledge in one foreign language may be required by the thesis advisor.

A two-Part preliminary examination is required. Part I is taken after the student has completed the courses required for the Ph.D. degree. Full-time students must take this exam no later than 2 years after entering the Ph.D. program. Students who have earned a masters degree in physics or wish to transfer credits to satisfy any of the departmental requirements (Phys 521, Phys 533, Phys 541, Phys 542, Phys 550, Phys 551, or Phys 571) may be required by the Academic Standards Committee to take the exam earlier. The examination is written and covers all of general graduate-level physics as defined by the required courses for a Ph.D. degree. Typically, it will be administered on two different days, with a time limit of approximately five hours for each day. The results of the examination will be evaluated by the physics faculty. If the preliminary examination, Part I, is failed, it may be repeated only once; the repeat examination must be taken within a period of not less than three months nor more than 14 months following the first attempt.

Part II of the preliminary examination is set by the major professor of the Ph.D. student for a date within the second semester after Part I has been passed. The student is required to explain the goals of his or her planned Ph.D. research to the thesis committee and show general familiarity with the fields relevant for the research. Part II is oral and would typically last for one hour. The exam is to be announced to the physics faculty at least one week in advance. All members of the physics faculty are permitted to attend and ask questions. The student's committee certifies to the Graduate College the results of the preliminary examinations. Upon passing, the student is advanced to candidacy for the Ph.D. degree. If Part II is failed, it may be repeated only once; the repeat examination must be taken within a period of not less than three months nor more than one year following the first attempt.

A final defense of the Ph.D. thesis is scheduled upon completion of the dissertation. The candidate is required to defend his or her work and show a superior knowledge of the field in which the thesis research has been performed. The defense is oral and would typically last for one hour. The exam is to be announced to the physics faculty at least one week in advance. All members of the physics faculty are permitted to attend and ask questions. A recommendation of a majority of the student's graduate committee is necessary to pass the defense. If the defense is failed, it may be repeated only once; the repeat defense must be taken within a period of not less than three months nor more than one year following the first attempt.
Distance Education Availability: More than 50% of the curricular requirements cannot be completed via distance.

Geographical Area Availability: Moscow

Rationale: Prevent excessive use of Phys 599, non-thesis research.

STATISTICS

1. Change the following courses

Stat 251 Statistical Methods (3 cr)

*Gen Ed: Mathematics*

Credit not awarded for Stat 251 after Stat 301 or Stat 416, or for Stat 416 after Stat 251 or Stat 301. Intro to statistical methods including design of statistical studies, basic sampling methods, descriptive statistics, probability and sampling distributions; inference in surveys and experiments, regression, and analysis of variance.

**Prereq:** One of the following: Math 108, Math 137, Math 143, Math 160, Math 170, or Sufficient score on SAT, ACT, or COMPASS Math Test [placement test](http://www.uidaho.edu/registrar/registration/placement) to qualify for registration in Math 130

- Available via distance: Yes
- Geographic Area Availability: Moscow; Available as a video course through Engineering Outreach
- Assessment: No change to assessment – only a prerequisite change.
- Rationale: Removing “to qualify for registration in Math 130” gives us flexibility to change the sufficient score, and to not have to make catalog changes should the Department of Mathematics change the requirements for Math 130. Also this has confused advisors. The language used here concerning test scores is the same as that used for some mathematics courses.

Stat 416 Statistical Methods for Research (3 cr)

Credit not awarded for Stat 251 after Stat 301 or Stat 416, or for Stat 416 after Stat 251 or Stat 301. Concepts and methods in quantitative research including observational and experimental study design, point estimation, hypothesis testing, effect size, sample size, causation, one and two-way ANOVA, simple linear regression, interpreting and reporting results.

**Prereq:** One of the following: Math 108, Math 137, Math 143, Math 160, Math 170, or Sufficient score on SAT, ACT, or COMPASS Math Test [placement test](http://www.uidaho.edu/registrar/registration/placement) to qualify for registration in Math 130

- Available via distance: No
- Geographic Area Availability: Available as a video course through Engineering Outreach
- Assessment: No change to assessment – only a prerequisite change.
- Rationale: Removing “to qualify for registration in Math 130” gives us flexibility to change the sufficient score, and to not have to make catalog changes should the Department of Mathematics change the requirements for Math 130.