890. Independent Study  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.  
Individual study on field, laboratory, or library research.

891. Current Topics in Ecology and Evolution  
Summer. 1 credit. Given only at W.K. Kellogg Biological Station. A student may earn a maximum of 8 credits in all enrollments for this course. Interdepartmental with Zoology, and Botany and Plant Pathology. Administered by Zoology.  
Presentation and critical evaluation of theoretical and empirical developments by visiting scientists.

891B. Selected Topics in Plant Breeding and Genetics  
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 8 credits in all enrollments for this course. Interdepartmental with Horticulture and Forestry. Administered by Horticulture. R: Open only to graduate students in Plant Breeding and Genetics or Genetics. Approval of department.  
Selected topics in plant breeding.

892. Plant Breeding and Genetics Seminar  
Fall, Spring, Summer. 11-0. A student may earn a maximum of 8 credits in all enrollments for this course. Interdepartmental with Horticulture and Forestry. Administered by Horticulture.  
Experience in review, organization, oral presentation, and analysis of research.

893. Selected Topics  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.  
Selected topics in crop and soil sciences of current interest and importance.

899. Master's Thesis Research  
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open to graduate students in Crop and Soil Science.

900. Advanced Forest Genetics  
Fall of odd-numbered years. 2(1-2) Interdepartmental with Forestry and Horticulture. Administered by Forestry. P: HRT 815 or HRT 836.  
Applications of genetics, plant breeding, and biotechnology to the improvement, and preservation of diversity, of tree species.

940. Advanced Soil Physics  
Fall of odd-numbered years. 3(2-0) P: CSS 840. R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.  
Modelling major physical transport mechanisms in the soil profile.  
Aeration, temperature, and solute movement. Water movement and evaporation.

941. Quantitative Genetics in Plant Breeding  
Spring of even-numbered years. 3(3-0) Interdepartmental with Forestry and Horticulture. P: CSS 450, SFT 422. Theoretical genetic basis of plant breeding with emphasis on traits exhibiting continuous variation. Classical and contemporary approaches to the study and manipulation of quantitative trait loci.

943. Techniques of Analyzing Unbalanced Research Data  
Spring. 4(4-0) Interdepartmental with Animal Science. Forestry, Horticulture, and Fisheries and Wildlife. Administered by Animal Science. P: SFT 494. R: Open only to graduate students in the College of Agriculture and Natural Resources.  
Linear model techniques to analyze research data characterized by missing and unequal numbers of observations in classes. Simultaneous consideration of multiple factors. Estimable comparisons. Hypothesis testing. Computational strategies. Variance and covariance components. Breeding values.

999. Doctoral Dissertation Research  
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to doctoral students in Crop and Soil Sciences.

**EARTH SCIENCE**  
Department of Geological Sciences  
College of Natural Science

445. Field Studies in Earth Science  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.  
Field experience and techniques in geological sciences, meteorology, soil science, or oceanology.

446. Laboratory Investigations in Earth Science  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: ES 445 or concurrently. R: Approval of department.  
Laboratory techniques and investigations in geological sciences, meteorology, soil science, or oceanology.

800. Special Problems in Earth Science  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.  
Individual faculty directed study on topics in earth science.

**ECONOMICS**  
Department of Economics  
The Eli Broad College of Business  
and The Eli Broad Graduate School of Management

201. Introduction to Microeconomics  
Fall, Spring, Summer. 3(3-0) R: Not open to students with credit in EC 251H.  
Theories of consumer behavior, production and cost. Output and price determination in competition and monopoly. Welfare economics, general equilibrium, externalities, and public goods.

251H. Microeconomics and Public Policy  
Fall, Spring. 4(4-0) R: Not open to students with credit in EC 251.  
Theories of consumer behavior, production and cost. Output and price determination in competition and monopoly. Welfare economics, general equilibrium, externalities, and public goods.

252H. Macroeconomics and Public Policy  
Fall, Spring. 3(3-0) P: EC 251H; or EC 201, EC 301. R: Not open to students with credit in EC 202.  
Theories of national income, unemployment, inflation and economic growth and its application to economic analysis and policy.

301. Intermediate Microeconomics  
Fall, Spring. 3(3-0) P: EC 201, EC 202. R: Not open to students with credit in EC 251H.  
Theories of consumer choice, production, cost, perfect competition, and monopoly. Welfare economics, general equilibrium, externalities and public goods.

302. Intermediate Macroeconomics  
Fall, Spring. 3(3-0) P: EC 201, EC 202. R: Not open to students with credit in EC 252H.  

306. Comparative Economic Systems  
Fall, Spring. 3(3-0) P: EC 201 or EC 251H; EC 202 or EC 252H.  
Characteristics and functions of economic systems. Alternative patterns of economic control, planning, and market structure. Theories, philosophies, and experiences associated with capitalism, socialism, and mixed economies.

330. Money, Banking, and Financial Markets  
Fall, Spring. 3(3-0) P: EC 201 or EC 251H; EC 202 or EC 252H.  
Money markets and financial intermediation. Money, the Federal Reserve System, and monetary policy. Regulation of money markets.

335. Survey of Public Economics  
Fall, Spring. 3(3-0) Interdepartmental with Public Resource Management. P: EC 201 or EC 251H. R: Not open to students with credit in EC 435 or EC 436.  
Economics of the public sector. Public goods, externalities, design and incidence of the tax system. Equity and efficiency effects of government programs.

340. Survey of International Economics  
Fall, Spring. 3(3-0) P: EC 201 or EC 251H; EC 202 or EC 252H. R: Not open to students with credit in EC 440 or EC 441.  

360. Private Enterprise and Public Policy  
Fall, Spring. 3(3-0) P: EC 201 or EC 251H. R: Not open to students with credit in EC 251H.  
effects of antitrust, economic regulation, and other public policies on competition, monopoly, and other market problems in the United States economy.