Courses of Instruction

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ECE 4930* Selected Topics 1-3(1-3) Classroom study of current and new technical developments in electrical and computer engineering. May be repeated for a maximum of six credits, but only if different topics are covered. Prereq: Consent of instructor.

ECE 4950 Integrated System Design I 2(1) Considers engineering design of systems in a continuous process of project definition, planning, execution, and evaluation. This process includes consideration of both technical and non-technical factors in design. Strong emphasis is placed on the development of effective technical communications skills, particularly oral communications competency. Prereq: Electrical Engineering major and ECE 3200 and ECE 3300 and ECE 3600 and ECE 3800, each with a C or better; or Computer Engineering major and ECE 3200 and ECE 3220 and ECE 3300 and ECE 3520 and ECE 3710, each with a C or better. Prerequisite or concurrent enrollment: ECE 4090 with a C or better. Coreq: ECE 4951.

ECE 4951 Integrated System Design I Laboratory 0(3) Non-credit laboratory to accompany ECE 4950. Coreq: ECE 4950.

ECE 4960 Integrated System Design II 2(6) Project-oriented course which brings together electrical and computer engineering students of dissimilar training in teams or project groups. Group assignments are designed to develop an appreciation for individual and creative thinking, as well as team effort. Prereq: Electrical Engineering major and ECE 3210 and ECE 3810 and ECE 4090 and ECE 4950, each with a C or better; or Computer Engineering major and ECE 4090 and ECE 4950, each with a C or better.

ECE 4990 Creative Inquiry-Electrical and Computer Engineering 1(4) In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits. Includes Honors sections. Prereq: Consent of faculty member/mentor.

ECON 2110 Principles of Microeconomics 3(3) The study of the behavior of consumers and producers. May not be used to satisfy requirements for a degree in Economics. Credit will not be given to students who have completed ECON 4260. Preq: ECON 2110.

ECON 3010 Economics of Labor 3(3) Analyzes the theories of wages and employment, determination of minimum wage levels, investment in human capital, discrimination, and public policy toward the labor market. Also considers the role of labor unions. May not be used to satisfy requirements for a degree in Economics. Preq: ECON 2110.

ECON 3200 Money and Banking 3(3) In 2016-2017 Undergraduate Announcements.

ECON 3030 Economics and Sports 3(3) Considers the theories of wages and employment, determination of minimum wage levels, investment in human capital, discrimination, and public policy toward the labor market. Also considers the role of labor unions. May not be used to satisfy requirements for a degree in Economics. Credit will not be given to students who have completed ECON 4260. Preq: ECON 2110.

ECON (MGT) 3060 Managerial Economics 3(3) Economic analysis of sports teams, leagues, and institutions. May not be used to satisfy requirements for a degree in Economics. Credit will not be given to students who have completed ECON 4260. Preq: ECON 2110.

ECON 3070 Arbitration 3(3) Analyzes dispute settlement procedures emphasizing mediation, fact-finding, and arbitration as they are used to resolve labor-management disputes in the public and private sectors. Prereq: Consent of instructor.

ECON 3090 Government and Business 3(3) Relationships between government and business, including, among other topics, government efforts to enforce competition; to regulate public utilities; and to protect the special interest of laborers, farmers, and consumers. May not be used to satisfy requirements for a degree in Economics. Credit will not be given to students who have completed ECON 4260. Preq: ECON 2110.

ECON 3100 International Economy 3(3) Studies at the University of Michigan. Analytical study of basic concepts of value and distribution under alternative market conditions. Includes Honors sections. Preq: ECON 2110.
ECON 3150 Intermediate Macroeconomics 3(3)
Macroeconomic problems of inflation and un-employment are focal points. Includes statistics (measures of real output and the price level) and theory (covering the sources of short-run fluctuations and long-run growth). Analyzes appropriate public policies addressing these issues. Includes Honors sections. Preq: ECON 2120.

ECON 3190 Environmental Economics 3(3)
Study of the application of economic logic to issues surrounding environmental management and policy. Examines individual, firm, and collective decision making as well as the evolution of regulatory approaches for controlling environmental use. Preq: ECON 3140.

ECON (ELE) 3210 Economics of Innovation 3(3)
Examines the nature of entrepreneurship and the contribution of innovation to economic growth. Investigates the organizational and institutional sources of innovation in different firms and different countries as well as the work of economic theorists concerning the role entrepreneurs play in bringing new products to market. May also be offered as ELE 3210. Preq: ECON 3060 or ECON 3140.

ECON 3250 Personnel Economics 3(3)
Study of various compensation and personnel practices firms employ. Explains how each of these practices should be followed to elicit the desired employee effort and labor force quality. Topics include piece-rate and time-rate systems, seniority-based incentive schemes, promotion contests, evaluation systems, mandatory retirement, and up-or-out rules. Preq: ECON 2110.

ECON 3400 Behavioral Economics 3(3)
Introduces the economic, sociological, and psychological aspects of decision making under uncertainty. Presents the psychology of prediction, intuitive prediction: biases and corrective procedures. Topics also include framing, choice with costly information, and social influences on individual behavior. Preq: ECON 2110.

ECON 3440 Economics of Innovation 3(3)
Examines the nature of entrepreneurship and the contribution of innovation to economic growth. Investigates the organizational and institutional sources of innovation in different firms and different countries as well as the work of economic theorists concerning the role entrepreneurs play in bringing new products to market. May also be offered as ELE 3210. Preq: ECON 3060 or ECON 3140.

ECON 3970 Creative Inquiry in Economics I 1-4(1-4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of four credits.

ECON 4010 Labor Market Analysis 3(3)
Develops the methods of economic analysis of labor markets. Requires students to apply these methods to problems of the labor market. Topics include labor demand and supply, human capital, occupational choice, compensating wage differentials, organizational wage structures and incentive systems, unemployment, and discrimination. Preq: ECON 3140.

ECON 4020* Law and Economics 3(3)
Application of economics to the law of property, torts, and contracts; regulation of markets, business organizations, and financial transactions; distribution of income and wealth; and criminal law. Preq: ECON 2110.

ECON 4040 Comparative Economic Systems 3(3)
Comparative analytical and historical study of the principal economic systems which have been important in the modern world including, among others, capitalism and socialism. Preq: ECON 3140.

ECON 4050* Introduction to Econometrics 4(3)
Introduction to methods of quantitative analysis of economic data. Reviews basic statistical methods and probability distribution. Topics include data management using professional statistical software applications; multiple regression analysis; hypothesis testing under conditions of multicollinearity, heteroscedasticity, and serial correlation. Preq: ECON 2110 and ECON 2120; and either MATH 1080 or MATH 2070; and MATH 3020 or STAT 3090 or STAT 3300. Coreq: ECON 4051.

ECON 4051* Introduction to Econometrics Laboratory 0(3) Non-credit laboratory to accompany ECON 4050. Coreq: ECON 4050.

ECON 4060* Advanced Econometrics 3(3)
Revises statistical inference using multiple regression (OLS) analysis and model specification. Topics include multicol linearity, heteroscedasticity, and serial correlation; two-stage least squares and instrumental variables models; simultaneous equations models; limited dependent variable models using maximum likelihood estimation and time-series analysis; and presentation of results in technical writing. Preq: ECON 4050.

ECON 4100 Economic Development 3(3)
Consideration and analysis of economic and related problems of underdeveloped countries. Attention is given to national and international programs designed to accelerate solution of these problems. Preq: ECON 3140.

ECON 4110* Economics of Education 3(3)
Analysis of economic issues related to education. The decision to invest in education, elementary and secondary school markets and reform, the market for college education, teacher labor markets, and education's effects on economic growth and income distribution. Preq: ECON 3140.

ECON 4120* International Microeconomics 3(3)
Analysis of the essential aspects of international economic linkages. Discusses gains and redistributive effects of trade and the barriers to trade within the context of a variety of economic models. Also discusses the history of trade policy and the political economy of its determination. Preq: ECON 3140.

ECON 4130* International Macroeconomics 3(3)
Examination of macroeconomic linkages between an individual country and the rest of the world and how these linkages are affected by the choice of exchange rate regimes. Topics include the relation between domestic and foreign interest rates and exchange rates and the ability to pursue independent monetary policies. Preq: ECON 3150.

ECON 4190 Economics of Defense 3(3)
Examines the American defense establishment in terms of resource utilization, alternative uses, and the contribution to the national economy and scientific progress generated by resources in a defense use. Discusses economic problems inherent in shifting resources between defense and nondefense uses and among alternative defense uses. Preq: ECON 3140.

ECON 4200 Public Sector Economics 3(3)
Study of the role of government and its proper functions and limitations in a market. Provision of goods and services by all levels of government and the role of taxation are evaluated according to efficiency and equity criteria. Contemporary public sector issues are emphasized throughout. Preq: ECON 3140.

ECON 4220* Monetary Economics 3(3)
Intensive study of the role of monetary factors in economic change. Modern monetary theories and their empirical relevance for policy are developed against a background of monetary history and institutions. Preq: ECON 3140 and ECON 3150.

ECON 4230 Economics of Health 3(3)
 Applies microeconomic theory to examine the demand for health services and medical care, the market for medical insurance, the behavior of physicians and hospitals, and the role of government in health-care provision and regulation. Preq: ECON 3140.

ECON 4240* Organization of Industries 3(3)
Empirical, historical, and theoretical analyses of market structure and concentration in American industry: the effects of oligopoly, monopoly, and cartelization upon price, output, and other policies of the firm; antitrust and other public policies and problems are studied. Preq: ECON 3140.

ECON 4250* Antitrust Economics 3(3)
Analysis of the economic and legal issues created by the exercise of market power. The motivation and execution of government policy towards mergers, predatory conduct, and various restraints of trade are intensively examined. Preq: ECON 3090 or ECON 3140.
ECON 4260* Seminar in Sports Economics 3(3)
ECON 4280* Cost-Benefit Analysis 3(3)
ECON 4290* Economics of Energy Markets 3(3)
ECON 4300* Topics in Mathematical Economics 3(3)
ECON 4270* Development of the American Economy 3(3)
ECON 4290* Economics of Energy Markets 3(3)

Develop techniques for the appraisal of public expenditure programs with particular emphasis on investment in infrastructure. Topics include choice of an appropriate discount rate and the calculation of social costs and benefits in the presence of market distortions. Preq: ECON 3140.

ECON 4290* Economics of Energy Markets 3(3)
This course examines the economics of energy markets and energy policy. The unique features and characteristics of these important and interrelated markets are explored, and participants gain practical experience in connecting economic concepts to recent energy-related events and energy policy issues. Preq: ECON 3140.

ECON 4300* Topics in Mathematical Economics 3(3)
This course develops the mathematical tools underlying economic analysis and prepares students for doing advanced theoretical work in economics. The topics covered in this course provide excellent preparation for advanced economics courses, and lay the foundation for doing quantitative analysis associated with both career work and graduate study in economics. Preq: ECON 3140; and either MATH 1080 or MATH 2070.

ECON 4350 Family Economics 3(3)
Analysis of economic aspects of the family. Economics of marriage, divorce, fertility, public policies affecting the family, women’s labor force participation, and the gender gap are studied using main economic theories and empirical studies. Preq: ECON 3140.

ECON 4400* Game Theory 3(3)
Introduction to the formal analysis of strategic interaction among rational, self-interested rivals. Basic theoretical aspects of games are discussed and applied to such topics as bargaining, voting, auctions, and oligopoly. Preq: ECON 3140 and either MATH 1060 or MATH 2070; or ECON 4300.

ECON 4550* Applied Microeconomic Research 3(3)
Students conduct research in applied microeconomics. Topics vary according to student and professor interests. Students read papers in the literature, formulate their own economic hypotheses, and collect and analyze data to test those hypotheses. May be repeated for a maximum of nine credits, but only if different topics are covered. Preq: ECON 3140.

ECON (AGRB) 4570* Natural Resource Use, Technology, and Policy 3(3)
Focuses on economic analyses of actual, efficient, and sustainable uses of natural resources, impacts of technologies that affect these uses, and policies that affect development and use of such technologies. Resource technology-policy combinations may vary, but an example is crude oil, hybrid automotive engines, and fuel economy standards. May also be offered as AGRB 4570. Preq: MATH 1020 or MATH 1060; and AGRB 3570 or ECON 3410.

ECON 4910 Senior Honors Thesis Research 3(3)
Reading and research for the Senior Honors Thesis. Preq: ECON 3140 and ECON 3150 and senior honors standing.

ECON 4920 Senior Honors Thesis Writing 3(3)
Writing and oral presentation of the Senior Honors Thesis. Preq: ECON 4910.

ECON 4960 Independent Study 1-3(1-3)
Research and writing on a selected economics topic chosen by the student. A written proposal must be approved by the instructor prior to the start of the semester. May be repeated for a maximum of six credits. Preq: ECON 3140.

ECON 4970 Creative Inquiry in Economics II 1-3(1-3)
Engages students in research projects selected by the Economics Department faculty. Research projects vary depending on faculty and student interest. May be repeated for a maximum of six credits. Preq: ECON 3140.

ECON 4980 Selected Topics in Economics 3(3)
In-depth treatment of topics not covered fully in regular courses. Topics vary from year to year. May be repeated for a maximum of nine credits, but only if different topics are covered. Includes Honors sections. Preq: ECON 3140 and ECON 3150.

ECON 4990 Senior Seminar in Economics 1-3(1-3)
Discussion of topics of current interest in economics. Students conduct directed research on a particular topic. Preq: Consent of instructor.

ED 1050 Orientation to Education 2(2)
Introduction to teaching addresses basic program requirements, SoE Conceptual Framework, state evaluation system, the nature of the diverse and multicultural classroom, standards and practices of professional conduct and requirements in teaching. A field experience involving tutoring in a P-12 classroom is required. Coreq: ED 1051.

ED 1051 Orientation to Education Laboratory 0(1)
Non-credit laboratory to accompany ED 1050. Coreq: ED 1050.

ED 1900 Leadership, Citizenship, and Community Service 3(3)
Provides active learning opportunities for students to understand better the system of government, learn the mechanics of how leadership can influence education and other initiatives, and develop interpersonal skills that will assist them throughout their professional lives. Culminates with a service learning plan for the students’ local community.

ED 1970 Creative Inquiry-Education 1-4(1-4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

ED 2970 Creative Inquiry-Education 1-4(1-4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

ED 3220 Responding to Emergencies 3(2)
Provides the citizen responder with the knowledge and skills necessary in a variety of emergencies to help sustain life and to minimize pain and the consequences of injury until professional help arrives. Includes first aid, CPR, and automated external defibrillation (AED). Coreq: ED 3221.

ED 3221 Responding to Emergencies Laboratory 0(1) Non-credit laboratory to accompany ED 3220. Coreq: ED 3220.

ED 3970 Creative Inquiry-Education 1-4(1-4)
In consultation with and under the direction of a faculty member, students pursue scholarly activities individually or in teams. These creative inquiry projects may be interdisciplinary. Arrangements with mentors must be established prior to registration. May be repeated for a maximum of eight credits.

ED 4050 Multiculturalism 3(3)
Introduces prospective teachers to the influence of culture on learning from an anthropological and historical perspective. Preq: HIST 1720 or HIST 1730.

ED 4380 Selected Topics in Education 1-3(1-3)
Specific education topics not found in other courses are selected for in-depth study. May be repeated for a maximum of 12 credits, but only if different topics are covered.