951. Cytogenetics in Plant Breeding Winter. of odd-numbered years. 3(3-0) BOT 427, 428, or approval of department. Interdepartmental with the Department of Horticulture.

Application of cytogenetic principles to plant breeding. Significance of recombination, role of induced mutations, polyploidy, chromosome substitution, and aneuploid analyses as they apply to the field of plant breeding.

952. Plant Breeding Biometrics Winter of even-numbered years. 4(3-2) Approval of department.

Biometrical genetics as it applies to plant breeding. Includes studies of path coefficients, partitioning of variance, and the principles of selection in a changing environment.

999. Research

Fall, Winter, Spring, Summer. Variable credit.

DAIRY SCIENCE DRY

College of Agriculture and Natural Resources

214. Dairy Production Fall, Spring. 4(3-2)


314. Dairy Herdsman Techniques Winter. 2(0-4) 214, majors only.

Herd health and management procedures, disease prevention and detection, equipment maintenance and record systems for dairy herds.

323. Dairy Cattle Judging Spring. 3(3-0)

Desired type in dairy cattle. Judging and show ring procedures. Competitive judging. Teams selected to represent Michigan State University in national competition.


Major issues pertinent to the dairy industry are described by authors from MSU and the dairy industry of Michigan. Students are provided an opportunity for an exchange ideas.

413. Dairy Farm Management Spring. 3(3-2)

Analysis of dairy farm organization and operations. Dairy herd management practices. Dairy cattle housing with emphasis on economical and efficient usage. Use of dairy records in the farm operation.

424. Dairy Cattle Breeding Spring. 4(2-4) ANS 461.

Applications of population genetics to improving dairy cattle. Use of selection, aids to selection, and systems of mating to formulate breeding plans. Inheritance of economic traits. Breed improvement programs.


Principles of ruminant nutrition and application to actual feeding practices in commercial dairy and beef operations. Rumen fermentation as related to feed utilization, growth, milk production and milk composition.

444. Mammary Physiology Winter. 4(3-2) PSL 240, BCH 200. Interdepartmental and administered jointly with the Department of Physiology.


445. Endocrinology and Reproduction of Farm Animals Fall. 4(5-0) PSL 240. Interdepartmental and administered jointly with the Department of Physiology.

Endocrine and reproductive systems are presented with emphasis upon characteristics which can be altered for economic benefit and upon causes, prevention, and treatment of endocrine abnormalities.

460. Special Problems Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 10 credits. Approval of department.

1DC. The Impact of Animal Resource Management Upon the World’s Developing Nations

For course description, see Interdisciplinary Courses.

850. Topics in Dairy Science Fall, Winter, Spring. Variable credit. May re-enroll for credit. Approval of department.

Topics from breeding, management, nutrition, or physiology, changing from term to term to include recent technical advances.

899. Research Fall, Winter, Spring, Summer. Variable credit. Approval of department.

925. Advanced Ruminant Nutrition Fall of even-numbered years. 4(4-0) BCH 459, FSL 801 or approval of department.

Microbiology, physiology and biochemistry of ruminant digestion and the absorption and metabolism of rumen fermentation products.

945. Physiology of Mammalian Reproduction Winter. 4(5-0) DRY or FSL 445 or approval of department. Interdepartmental with the Department of Physiology.

Chemistry and biosynthesis of reproductive hormones. Gonadal, hypothalamic and pituitary development of reproductive potential. Ovulation, fertilization, implantation and placentaion will be studied. Relationships of conceptus, uterus and corpus luteum. Parturition.

999. Research Fall, Winter, Spring, Summer. Variable credit. Approval of department.

EARTH SCIENCE

See Geology.

ECONOMICS

College of Business

Courses are classified as follows:

Labor Economics and Industrial Relations—385, 455, 458, 457.

Money and Banking—318, 320, 470.
International Economics—427.
Public Finance—406, 407, 408.
Price and Value Theory—324, 325, 428.
History of Economic Thought—421, 423.

200. Introduction to Economics Fall, Winter, Spring, Summer. 4(4-0)

Open to Freshmen. Students may begin sequence with either 200 or 201.

Problem of unemployment; meaning and determination of national income; the multiplier; the accelerator; fiscal policy; deficit spending; monetary policy; banks creation of money; international aspects of the employment problems.

201. Introduction to Economics Fall, Winter, Spring, Summer. 4(4-0)

Open to Freshmen. Students may begin sequence with either 200 or 201.

Problem of resource allocation; price determination (demand, supply), applications to agricultural policy; diminishing returns; behavior of the firm (determination of quantity of output, hiring of factors); aspects of international trade.

210. Fundamentals of Economics Fall, Winter, Spring, 4(4-0) MTH 215 or 223; or concurrently. Students may not earn credit in 210 if they have credit in either 200 or 201.

Introductory course in economic theory, applying mathematics, when useful, as a tool analysis. Covers consumer and business behavior, markets and the price system, income distribution, and elements of employment theory.

1DC. Introduction to Latin America III

For course description, see Interdisciplinary Courses.

251H. Households, Firms and Markets Fall. 5(5-0) Honors College students.

Microeconomic theory and its applications to analysis and policy. Substitutes for 261, 324 and 395.

253H. Aggregative Economics and Public Policy Winter. 5(5-0) Honors College students.

Theory of national income and its application to analysis and policy. Substitutes for 200, 320, and 331.

305. Industrial Relations and Trade Unionism

Fall, Winter, Spring. 5(5-0)

Development, aims, structure, and functions of labor and employer organizations. Their relation to economic, political, and legal institutions and their impact on society. Primary issues in collective bargaining.

318. Money, Credit and Banking Fall, Winter, Spring, Summer. 4(4-0)

200 or 210.

Commercial banking and the money supply. The Federal Reserve System, the Treasury, and other financial institutions. Sources and uses of funds in the financial market.
320. Macroeconomics I
Fall, Winter, Spring. 3(3-0)
200 and 322 or 210.
Measurement of economic activity. Determina-
tion of equilibrium aggregate output and the
theory of underemployment equilibrium. Role of
consumption, investment, government and
foreign sectors in determining national income.

321. Macroeconomics II
Fall, Winter, Spring. 3(3-0)
320.
Expansion of role of monetary factors in
macroeconomic theory. Theories of economic
growth and cycles. Study of macroeconomic
problems of inflation, unemployment, and other
current policy problems.

324. Microeconomics I
Fall, Winter, Spring. 3(3-0)
200 and 201, or 210.
Theory of production and cost. Theory of the firm
under varying market structures.

325. Microeconomics II
Fall, Winter, Spring. 3(3-0)
200 and 201, or 324.
Consumer choice and theory of demand. Theory of
distribution and factor rewards. Welfare
economics and general equilibrium theory.

330. Investments and Security
Markets
Fall, Spring. 3(3-0) 200 or 210.
The stock market; principles of investment;
analysis of selected industries and corporations;
regulation by the Securities and Exchange Com-
mission.

337. American Social and Economic
History: Foundations
Winter. 4(4-0) Interdepartmental with
and administered by the Department of History.
Multiple sources of economic growth in econo-
mic, social and political change, education,
science and technology, political action, and
other factors, mid-19th century.

338. American Social and Economic
History: Modern Trends
Spring. 4(4-0) Interdepartmental with
and administered by the Department of History.
Urbanization, origins and implications of large-
above organizations in business and other sectors
of society, sources of economic growth since
mid-19th century.

361. Economic Development of Asia
Fall. 3(3-0) 200 and 201 or 210.
Population and resources; comparison of three
economic systems: Communism in China, free
enterprise in Japan and socialism in India; the role
of Japan in regional trade and de-
velopment.

362. Economic Development of Latin
America
Winter. 3(3-0) 200 and 201 or 210.
Concentration of political and economic power
as related to income distribution, tax structures,
agrarian reform; inflation; trade, exchange
dates, integration; population and employment
policy.

363. Economic Development of Tropical
Africa
Spring. 3(3-0) 200 and 201 or 210.
Interdepartmental with Public Affairs Manage-
ment.
African economic development in historical
perspective. Analysis of contemporary economic
development problems faced by tropical African
countries. Alternative strategies for African eco-

demic development.

371A. European Economic History
Fall. (4-0) Interdepartmental with
and administered by the Department of History.
Economic history of medieval and early modern
Europe stressing the nature of agrarian societies,
the growth of cities, the divergence of the Euro-
pean economies, and the Industrial Revolution
in England.

371B. European Economic History
After 1800
Winter. 4(4-0) Interdepartmental with
and administered by the Department of History.
The industrialization of Europe stressing urbani-
sation, national rivalry, problems of the matu-
ration of capitalist institutions, and the social
and ecological impact of economic growth in the
twentieth century.

400. Independent Study
Fall, Winter, Spring. 1 to 4 credits.
Seniors or approval of department.
Research and reading course for students inter-
rested in doing independent work in economics.

406. Public Expenditure: Theory and
Policy
Fall, Spring. 4(4-0) 201 or 210. Inter-
departmental with Public Affairs Management.
Expenditure theory; objectives and rationale of
government activity in the market system;
efficiency criteria in government decision-
now; planning-programming-budgeting systems
and cost-benefit analysis.

407. Public Revenues
Winter. 4(4-0) 201 or 210.
Principles and theory of the distribution of tax
burdens and the incidence of taxation. Income,
sales, property, and other major revenue sources.

408. State and Local Finance
Spring. 4(4-0) Juniors.
Fiscal problems at the state and local levels of
government, including revenues, expenditures,
borrowing, and intergovernmental fiscal rela-
tions.

410. Medical Economics
Spring. 3(3-0) 200, 201, or approval of
department. Interdepartmental with the De-
partment of Urban and Metropolitan Studies.
Demand, supply and economic efficiency in the
markets for health services. Demand for med-
ical care, organization systems, methods of pay-
ment, utilization and cost, and public policy for
health care.

412. The Economics of Poverty
(360.) Winter. 3(3-0) 200, 201. In-
terdepartmental with the Department of Urban
and Metropolitan Studies.
Theory of the distribution of income and
wealth. Concepts and measurement of welfare.
Definitions of poverty. Effects of public and
private programs on the poor.

413. Urban Economics
(360.) Fall. (4-0) 200, 201. Inter-
departmental with the Department of Urban
and Metropolitan Studies.
Location theory and urban development. Eco-
nomics of city size and urban-suburban conflict.
Economic aspects of certain community problems
like housing, transportation, welfare and poverty.
Strategies for urban development.

417. Land Economics
Fall, Spring. 4(4-0) Interdepartmental
with the Department of Resource Development,
Public Affairs Management and Food Systems
Economics and Management and administered
by the Department of Resource Development.
Factors affecting man's economic use of land
and space resources, input-output relationships;
development, investment, and enterprise location
decisions; land markets; property rights, area
planning; zoning and land use controls.

421. Economic Thought I
Fall. Summer. 4(4-0) 200 and 201,
or 210.
Foroumenors of classical economics. Develop-
ment of classical economic thought from Adam
Smith to J. S. Mill. The Socialist reaction.

422. Economic Thought II
Winter, Spring. 4(4-0) 200 and 201,
or 210.
The decline of classical economics and the rise of
marginalist value and distribution theory.
Marxism and institutionalism.

426. Introductory Mathematical
Economics
Spring. 3(3-0) 320, 324; MTH 214.
Mathematical analysis of production, cost, and
consumer choice. Mathematical models of ag-
gregate and general-equilibrium economic sys-
tem.

427. International Trade and Finance
Fall, Winter, Spring. 5(5-0) 200 and 201,
or 210.
Theory of comparative advantage. Tariffs, qua-
tas, and customs unions. Mechanism of balance
of payments adjustments. Exchange rate deter-
mination and international financial relations-
hips.

431. Principal Issues in Promoting
Economic Development
Spring. 4(4-0) 430.
Structural change and growth, capital forma-
tion and investment criteria; financing develop-
ment; foreign trade and finance in development;
government and planning.

434. Comparative Economic Systems
Fall, Winter, Summer. 4(4-0) 200
and 201, or 210.
Characteristics and functions of an economic
system. Analysis of alternative patterns of eco-

domic control, planning and market structure.
Experiences under capitalism, socialism and
mixed economies. Consideration of their theories
and philosophies.

440. Radical Political Economy
Spring. 3(3-0) 260 and 210, or 251H
and 252H.
Development and contemporary characteristics of
capitalism from Marxian-radical perspective.
His-
torical materialism and class analysis. Radical
critique of modern economics. Relationship of
inequality, racism, alienation and other problems
to the structure of capitali,
444. Private Enterprise and Public Policy
Fall, Winter, Spring, Summer. 3(3-0)
Competition and monopoly in the American economy. Problems of antitrust.

445. Economics of Regulated Industries
Winter. 4(4-0) 444.
Government policy and role of competition in the public utility and transportation industries.

451. Methods of Economic Research and Forecasting
Spring. (4-0) 320 and 324; STT 422 or 317.
Quantitative analysis, testing of economic hypotheses, elementary methods of projection, forecasting, estimation, and introduction to econometrics.

453. Women and Work: Issues and Policy Analysis
Winter. 3(3-0) PAM 201 or EC 290 or 261 or approval of department. Interdepartmental with and administered by Public Affairs Management. Causes and effects of labor-management disputes; public and private methods and agencies for dispute settlement.

455. Public Policy and Labor Relations
Fall, Winter, Spring, Summer. 5(5-0)
Evolution of public policy concerning trade unions and collective bargaining. Causes and effects of labor-management disputes; public and private methods and agencies for dispute settlement.

462. Economics of Urban Education
Spring. 3(3-0) EC 201 or 210. Interdepartmental with and administered by the Department of Urban and Metropolitan Studies. Political economy of urban schools. Education as a commodity: efficient production and distribution, supply and demand for education, financing education, planning education to meet job needs and social mobility.

470. Monetary Theory
Fall. 3(3-0) 321.
Relationship between money and interest rates, prices and output.

490. Mathematics for Economics
Fall. 5(5-0) MTH 113, graduate status in either economics, agricultural economics or College of Business, or approval of department. Interdepartmental with and administered by the Department of Mathematics. Matrices, determinants, quadratic forms, characteristic values. Partial derivatives, chain rule, Jacobian matrix, Taylor series, constrained optimization, linear differential equations. Mathematics introduced and developed using student's background in economics.

800. Economic Analysis I
Fall, Winter. 4(4-0) 324.
Consumption, exchange and production.

801. Economic Analysis II
Winter, Spring. 4(4-0) 324.
The Firm. Market behavior and price formation (competition, monopoly and mixed cases). Distribution.

802. Economic Analysis III
Spring, Summer. 4(4-0)
Comparative statics analysis of macroeconomic problems.

IDC. Seminar in Industrial Relations
Fall, Winter, Spring, Summer. 3(3-0)
For course description, see Interdisciplinary Courses.

806A. Public Expenditures
Fall. 3(3-0) Approval of department.

806B. Public Revenues
Winter. 3(3-0) Approval of department.
Theory of taxation. Incidence and economic effects, especially on income and wealth redistribution. Institutional and policy analysis of the U.S. federal tax system.

806C. State and Local Public Finance
Spring. 3(3-0) Approval of department.
State and local expenditure systems in theory and practice; tax and non-tax revenues; intergovernmental fiscal relationships; the fiscal problems of metropolitan governments.

810. Economics of Public Choice
Winter. 3(3-0) Approval of department. Interdepartmental with the departments of Agricultural Economics and Resource Development and administered by the Department of Agricultural Economics. Economics of alternative institutions for collective action. Emphasis on property rights and natural resources. Public goods, externalities non-marginal change, commonwealth, income and power distribution, grants, welfare criteria and market failure.

811. Public Program Analysis
Spring. Summer of odd-numbered years. 3(3-0) FSM 401 or EC 324 or approval of department. Interdepartmental with the departments of Resource Development and Agricultural Economics and administered by the Department of Agricultural Economics. Application of benefit-cost analysis to public programs of resource development. Issues and case studies in budgeting, investment criteria, pricing, externalities, and coordination.

812A. Microeconomics I: Choice and Exchange
Fall. 3(3-0) 324, 325; 480 or MTH 215 or concurrently.
Consumption exchange the axioms of choices, involving time, introduction to welfare.

812B. Microeconomics II: Production and Distribution
Winter. 3(3-0) 513A.
Production—variable properties, the multiple-product firm, programming analysis. Distribution—the micro theory.

812C. Microeconomics III: The Firm and Market
Spring. 3(3-0) 513B.
Theories of the firm. Market behavior—perfect and imperfect markets. Game theory.

813A. Macroeconomics I: Comparative Statics
Fall. 3(3-0) 320, 321; 480 or MTH 215 or concurrently.
Macro models and macro function; the interaction of macro markets.

813B. Macroeconomics II: Dynamics
Winter. 3(3-0) 513A.
Stochastic and dynamic models. Growth and technical change. The macro theory of distribution.

813C. General Equilibrium and Welfare
Spring. 3(3-0) 513B; 513C or concurrently.

815. Labor Force Behavior
Fall, Winter. 4(4-0) LIR 209, EC 457 or approval of department. Interdepartmental with and administered by the School of Labor and Industrial Relations. Theoretical and empirical analysis of factors affecting labor force participation rates, unemployment levels, employment distribution, hours of work, and labor mobility. Concepts and measurement methods.

818A. Monetary Theory
Fall. 3(3-0) 812C, 813C, and 835 and approval of department.
Monetary and interest theories.

818B. The Theory of Monetary Policy
Winter. 3(3-0) or approval of department.
Theories of the transmission of monetary policy to output, employment and prices.

818C. Problems in Monetary Policy
Spring. 3(3-0) 812B.
Goals and techniques of monetary policy.
821A. Competition and Monopoly in American Industry
3(3-0). Approval of department.
Examination of structure, behavior, and performance in industries.

821B. Government Policy Toward Private Enterprise
Winter. 3(3-0). Approval of department.
Evolution of government policy with respect to such problems as conspiracy, monopoly, mergers, unfair practices, and their impact on economic and legal appraisal of policy alternatives.

821C. Problems Related to Regulated Industries
Spring. 3(3-0). Approval of department.
Departures from market competition as a policy norm, as in public utilities and transportation.

826A. Theory of International Trade
Fall. 3(3-0) 427 or approval of department.
Classical and modern theories of international trade. Application of modern techniques of economic analysis to international trade theory.

826B. Theory of International Trade Policy
Winter of even-numbered years. 3(3-0) 826A.
Various means by which a government may influence the volume, character, and direction of its foreign commerce. In this connection an analysis is made of the theory of the tariff, the subsidy, exchange control, and quotas. Emphasis on the economic impact of trade controls upon a nation and the world.

826C. International Exchanges and Capital Flows
Spring of even-numbered years. 3(3-0) 826B.
Theory of exchange rates and international money markets especially with reference to other than current account items in balances of payments. Analysis of sources, causes, effects of capital flows with developing economies considered as a special case.

831. Mathematical Economics I
Fall of even-numbered years. 3(3-0) 812; MTH 214, 334.

832. Mathematical Economics II
Winter of odd-numbered years. 3(3-0) 813; MTH 215, 334.
Mathematical models of growth and fluctuations dealing with macroeconomics, monetary theory, fiscal policy. The cobweb, stock and dynamic multiplexes, multiplier-accelerator models, trade cycle models. Relations among stocks, flows and time lags.

833. Mathematical Programming
Spring. 3(3-0) 800; or 812A; MTH 334. Interdepartmental with the departments of Agricultural Economics and Statistics and Probability and administered by the Department of Agricultural Economics.
Linear programming. Theory of linear economic models. Topics in nonlinear programming.

835. Introduction to Econometrics
(AEC 531) Fall, Spring, Summer. 3(3-0) 385; STT 422. Interdepartmental with the Department of Agricultural Economics.

1DC. Interdisciplinary Seminar on Africa
For course description, see Interdisciplinary Courses.

541A. History of Economic Thought: Classical
Fall. 3(3-0)
Early thought: mercantilism, physiocracy, and classical economics.

541B. History of Economic Thought: Heterodox
Winter. 3(3-0)
Historicism, socialism, and institutionalism.

541C. History of Economic Thought: Modern
Spring. 3(3-0)
Development of marginalism, general equilibrium theory, employment theory, and mathematical economics.

550. The Development of Economic Institutions
Fall. 3(3-0) 430 or approval of department.

551. The Economics of Secular Change
Winter. 3(3-0) 320, 324, or approval of department.
Empirical study of long-run economic trends and the consideration of alternative hypotheses explaining these trends including classical, Marxist, and other general theories of economic development. Population growth, technological change, capital formation, occupational distribution, urbanization, and international trade.

582. Economic Problems of Underdeveloped Areas
Spring. 3(3-0) 320, 324, or approval of department.
Overcoming problem relating to early stages of economic development; investment priorities, mobilizing savings, balance of payment considerations, and policies and programs of various types.

584. The Emergence of Commercial Capitalism
Winter of odd-numbered years. 3(3-0) 315, 324. Interdepartmental with the Department of History.
The rise of the mercantilist economies of Europe with stress on the growth of internal and international trade and finance during the 16th and 17th centuries.

585. The Industrial Revolution in Europe
Winter of even-numbered years. 3(3-0) 318, 324. Interdepartmental with the Department of History.
The preconditions that led to the momentous changes in agriculture and industry in Europe from 1700-1914.

857. Wage Theory
Fall. 3(3-0) 320, 324, or approval of department. Interdepartmental with the School of Labor and Industrial Relations.
Advanced analysis of theories of wage determination; labor market research, optimal effects of collective bargaining upon the national wage structure, output, employment, distribution of national income, the price level, nature and effects of government wage policies.

858. Industrial Relations
Winter. 3(3-0) 305 or approval of department. Open to graduate students in economics and related fields such as labor and industrial relations, psychology, sociology, anthropology, political science, business, and history. Interdepartmental with and administered by the School of Labor and Industrial Relations.
Problems and issues in the administration and negotiation of collective bargaining agreements; includes both economic and noneconomic aspects of industrial relations policies and practices.

860. Economics of the Firm
Fall, Winter, Summer. 4(4-0) Graduate students in Business Administration. Not open to Economics majors.
Analysis of the firm. Problems facing management; economizing in use of resources, optimal combinations of products, pricing, competitive forces in markets affecting the firm.

861. American Economy
Fall, Winter, Spring, Summer. 4(4-0) Thirty credits in MBA core program. Not open to Economics and Agricultural Economics majors.

862. Business and Public Policy
Winter. 4(4-0) 360 or approval of department.

876. Statistical Inference in Economics I
Fall. 3(3-0) 812A or 812; STT 442 or 863; or approval of department. Interdepartmental with the departments of Agricultural Economics, and Statistics and Probability. Review and extension of single-equation regression models. Properties of least-squares estimators under alternative specifications. Problems of analyzing nonexperimental data. Errors in variables, autoregressive and heteroscedastic models.

877. Statistical Inference in Economics II

878. Statistical Inference in Economics III
Spring. 3(3-0) 877 or approval of department. Interdepartmental with the departments of Agricultural Economics, and Statistics and Probability. Validation and application of dynamic econometric models. Bayesian approach to estimation problems. Recent developments in econometric methods and in applied econometric research.
880. Organization and Control in the Political Economy: Institutions and Theory
Winter of even-numbered years. 4(4-0)
Interdepartmental with the Department of Management.
Organization and technique in choice and implementation of economic (especially planning, programming) functions of political authority.

881. Organization and Control in the Political Economy: Selected Problems
Winter of odd-numbered years. 4(4-0)
 Approval of instructor. Interdepartmental with the Department of Management.
Analysis of role and tasks, appropriate techniques and organizational structures of political agencies in planning and management of complex programs.

895. Graduate Reading in Economics
Fall, Winter, Spring, Summer. Variable credit.

899. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

900. Selected Problems in Advanced Microeconomic Theory
Fall, Winter, Spring, Summer. 3(3-0)
May re-enroll for a maximum of 12 credits. 812A, 812B, 812C, 813C.
Advanced applications of economic methodology to the analysis of household and firm behavior; risk, uncertainty, and transactions costs.

901. Selected Problems in Advanced Macroeconomic Theory
Fall, Winter, Spring, Summer. 3(3-0)
May re-enroll for a maximum of 12 credits. 813A, 813B.
Analysis of the behavior and interaction of multimarket systems.

972. Methodological Approaches to Research
Fall, Winter, Spring. 3(0-6)
Approved by the Department of Agricultural Economics.

990A. Monetary Theory and Policy Workshop
Winter, Spring. 3 to 18 credits.
Approval of department.
Critical evaluation of research reports by staff and other students. Students writing doctoral dissertations in the appropriate areas are encouraged to participate in workshop and may do so while registered for 999.

990B. Industrial Organisation and Public Policy Workshop
Fall, Winter, Spring. 3 to 18 credits.
Approval of department.
Critical evaluation of research reports by staff and other students. Students writing doctoral dissertations in the appropriate areas are encouraged to participate in workshop and may do so while registered for 999.

990C. Mathematical Economics and Econometrics Workshop
Fall, Winter, Spring. 3 to 18 credits.
812A, 812B, or approval of department. Interdepartmental with the Department of Agricultural Economics.
Critical evaluation of research reports by staff and other students. Students writing doctoral dissertations in the appropriate areas are encouraged to participate in workshop and may do so while registered for 999.

990D. Economic Development Workshop
Fall, Winter, Spring, Summer. 3 to 16 credits.
850, 851, 852 or approval of department.
Critical evaluation of research reports by staff and students. Students writing doctoral dissertations in Development are encouraged to participate in the workshop and may do so while registered for 999.

999. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

Education — Descriptions of Courses

101A. Exploring Elementary Teaching
Fall, Winter, Spring. 3(1-4) Field credit.
Emphasis on the nature of teaching in the elementary school achieved through field experience while serving as a teacher aide in an elementary classroom. Concurrent lecture sessions focus on techniques of classroom management and operation.

124. Introduction to Careers in Vocational and Practical Arts Education
Opportunities in teaching agriculture, business, home economics or industrial education and in closely related fields; analysis of student's potentialities for these fields.
A. Agriculture.
Fall. 2(1-2) Interdepartmental with Agriculture.
D. Industrial Arts
Winter and Fall of even-numbered years, Spring of odd-numbered years. 3(3-0)

141A. General Industrial Arts
Winter and Fall of odd-numbered years, Spring of even-numbered years. 3(0-6)
Approval of department.
Introductory experiences in all major areas of industrial arts. Organized under a comprehensive general shop organization similar to that utilized in the modern secondary school.

141B. General Woodwork
Winter and Fall of odd-numbered years, Spring of even-numbered years. 3(0-6)
Approval of department.
Handwork, patternwork, carpentry, introductory machine work, finishing. Designed to exemplify in both organization and equipment, desirable practices in today's secondary schools.

300. Individual and the School
Fall, Winter, Spring, Summer. 5(3-2)
Sophomores. Must be admitted to a teacher education program. Major psychological factors in the school learning-teaching situation; concepts in human development related to problems in the school situation; teacher's role in motivation, perceptual learning, problem solving, and the development of emotional behavior, attitudes and values; learning of skills, retention and transfer, and measurement of student abilities and achievement.

200A. Educational Psychology
Spring of odd-numbered years. 3(3-0)
Approval of department.
Same goals as Education 200, but assumes a background in general psychology.

202B. Workshops in Secondary Education
Winter. 2(0-6) May not receive credit for 402B and 450. 202B.
Students select from a variety of single session workshops focusing on psychological and sociological aspects of teaching in secondary schools. Approved through Winter term 1978.

202C. Alternative Secondary School Structures
Spring. 1 credit.
May not receive credit for 240B and 450, 240B.
On-site examination of a variety of secondary school organizational patterns, together with on-campus analysis of underlying theories of social organization and curricular construction. Approved through Spring term 1978.

241A. Advanced Woodwork
Winter and Fall of even-numbered years. Spring of odd-numbered years. 3(0-6)
141B or approval of department.
Safe operation of woodworking machines in home and school shop. Care and maintenance of shop tools and equipment.

241B. General Metalwork
Winter and Fall of even-numbered years. Spring of odd-numbered years. 3(0-6)
Approval of department.
Typical crafts in outstanding public school programs of industrial arts. Work in plastics, leather, silver, aluminum, copper, metal enameling, lapidary, ceramics, and model making.

241D. Printing and Graphics
Winter and Fall of even-numbered years. Spring of odd-numbered years. 3(0-6)
Approval of department.
Manual composition, press work, printing, bookbinding, block printing, plate making, silk screen work, and photography. Designed to exemplify a desirable approach to the work of this area in the modern secondary school.

302A. Teaching Skills Laboratory
Fall. 2(1-3) May not receive credit for 302A and 430. 302A.
Competency based instruction and field experience in selected generic teaching skills, including classroom management, secondary reading, data analysis, graphics, and sociometric techniques, instructional planning, assessment and evaluation. Approved through Fall term 1978.

A-51