

College of Arts and Sciences – Departments

Economics (ECON)

Langan (chair), Alexander, Blumenthal, Combs, Fairchild, Gray, Hartmann, Kim, Marcott, Papagapitos, Riley, Saavedra, Vincent, Walsh, Wilson

The economics program develops a logical, consistent and rigorous method of thinking about the world and its problems. The economic way of thinking can be applied to a wide variety of topics including inflation, unemployment, international trade, poverty, income inequality, currency depreciation, monopoly power, bank failures, budget deficits and health-care costs.

The Department of Economics offers two majors and a minor in economics. All three programs are designed to provide excellent career-entry skills and those skills providing preparation for possible career shifts.

Whether a major or minor in economics is pursued, students are strongly encouraged to complement their studies with work in other fields. In recent years, for example, graduates have done complementary coursework in such fields as mathematics, foreign languages, business, environmental studies, computer sciences, international studies and English.

The choice of major and of a complementary field depends upon the path the student wishes to pursue. For example, students pursuing a liberal arts major, wishing to double major, or who are interested in continuing studies in professions other than economics would likely find the Bachelor of Arts (B.A.) best suited to their needs. Students wishing to engage the discipline at a much broader and deeper level would find the Bachelor of Science (B.S.) a better alternative.

Students graduating with a major in economics will be able to integrate the tools and concepts of the discipline in the analysis of an economic issue. The background provided by this major should prepare the student for a sound preparation for career advancement.

The core for each degree consists of five economics courses and two allied requirements. The B.A. requires three additional elective of the student's choosing. The B.S. has three possible paths. Each path requires three specified electives, two additional electives of the student's choosing, and additional allied requirements.

Students wishing to pursue graduate study in economics should consider the path in Mathematical Economics. Students interested in international affairs should consider the path in International Economics. Students seeking an economics degree supplemented with additional technical skills and an introduction to the business field or who are looking towards an eventual MBA degree should consider the Business Economics path.

Majors must complete a minimum of twenty credits in economics at St. Thomas. Minors must complete a minimum of twelve credits in economics at St. Thomas.

Economics Honor Society

Omicron Delta Epsilon, the international fraternity in economics, was organized at St. Thomas in 1967. Candidates must have completed at least sixteen credits in economics and have an average of 3.00 or better in both economics and their overall work.

Economics Honors Program

Candidates for honors in economics must complete a research paper and an additional four credits in economics chosen in consultation with the department chair. The research papers of honors candidates are to be read by a committee of three faculty, appointed by the department chair. Each will determine if the paper is suitable for the honors requirement, with a majority rule determining honors designation. Candidates must achieve a grade-point average of 3.25 or higher in the major and 3.0 or higher overall.

Major in Economics (B.A.)

- 251 Principles of Macroeconomics
- 252 Principles of Microeconomics
- 315 Empirical Methods in Economics
- 351 Macroeconomic Theory
- 352 Microeconomic Theory

Plus:

Twelve credits in courses numbered 300 and above.

Note: Students are strongly encouraged to take 315, 351 and 352 by the end of the junior year.

Allied requirements

One of:

- MATH 109 Calculus with Review II
- MATH 111 Calculus for Business and Social Science
- MATH 113 Calculus I

Plus either:

QMCS 220 Statistics I or MATH 303 Statistics for the Applied Sciences

or

MATH 313 Probability and MATH 314 Mathematical Statistics

Major in Economics (B.S.)

- 251 Principles of Macroeconomics
- 252 Principles of Microeconomics
- 315 Empirical Methods in Economics
- 351 Macroeconomic Theory
- 352 Microeconomic Theory

Note: Students are strongly encouraged to take 315, 351 and 352 by the end of the junior year.

Plus:

A set of courses in one of the three paths below.

Allied requirements

One of:

- MATH 109 Calculus with Review II
- MATH 111 Calculus for Business and Social Science
- MATH 113 Calculus I

Plus either:

QMCS 220 Statistics I or MATH 303 Statistics for the Applied Sciences

or

MATH 313 Probability and MATH 314 Mathematical Statistics

Business Economics

A path which emphasizes additional tools for analyzing business situations as well as incorporating a basic foundation in the field of business.

- 311 Forecasting
- 332 Industrial Organization
- 401 Managerial Decision Making

Plus:

Eight credits in elective economics courses numbered 300 or above

Plus:

- ACCT 205 Introduction to Accounting
- BUS 201 Ethics and Practice: Foundations of Business

Plus one of:

- FINC 300 Finance for Non-Business Majors
- FINC 321 Financial Management

International Economics

A path which prepares students for careers in which an understanding of the complexities of cultural differences and international economic relationships is crucial.

- 345 Economics of Development and Growth
- 346 Country and Area Studies in Economics
- 348 International Economics

Plus:

Eight credits in elective economics courses numbered 300 or above (ECON 346 can only be included one time in fulfillment of the path requirement, and not as one of the additional electives)

Plus:

A minor in a foreign language or significant study abroad experience approved by the department chair

Mathematical Economics

A path which prepares students for the core competencies necessary for graduate study in economics.

- 355 Game Theory
- 418 Mathematical Economics

Plus one of:

- 301 History of Economic Thought
- 337 Economics of the Public Sector
- 339 Labor Economics
- 348 International Economics

Plus:

Eight credits in elective economics courses numbered 300 or above

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Plus:

MATH 114 Calculus II
MATH 200 Multi-Variable Calculus
MATH 210 Linear Algebra and Differential Equations

Note: MATH 333 Applied Statistical Methods may be substituted for ECON 315

Teacher Licensure

Elementary Education with a Specialty in Social Studies (5-8)
Co-major in Social Studies (5-12) and a Co-major in Secondary Education

See School of Education Department of Teacher Education

Minor in Economics

251 Principles of Macroeconomics
252 Principles of Microeconomics

Plus one of:

351 Macroeconomic Theory
352 Microeconomic Theory

Plus:

Twelve credits in elective economics courses numbered 300 and above.

101 The American Economy (251)

The organization and functioning of the American economy; the course is designed to provide general education in economics for the average citizen. Each semester, topics of current interest will be analyzed using the tools and viewpoint of economic theory and policies. Designed for non-economics and non-business students.

211 Current Economic Issues

Poverty, health care, tax reform, international trade, crime, income inequality, inflation, and business mergers are some of the contemporary topics that raise interesting questions for public policy and economic analysis. This course will focus on a series of these macroeconomic and microeconomic topics. The goal is to develop economic concepts and analytical tools within a context of direct application to economic issues. Consideration of equity or fairness will be included in discussions of public policy. Student preferences will be considered in selecting many of the issues. Not open to students who have completed 251 or 252. This course fulfills the Social Analysis requirement in the core curriculum.

251 Principles of Macroeconomics (101)

An introduction to macroeconomics: national income analysis, unemployment, price stability, and growth; monetary and fiscal policies; international trade and finance; application of economic theory to current problems. Students who enroll in this course are expected to be able to use high-school algebra. This course fulfills the Social Analysis requirement in the core curriculum.

252 Principles of Microeconomics

An introduction to microeconomics: theory of household (consumer) behavior, theory of the firm, market structures, market failures, economic efficiency, factor markets, and income distribution. Students who enroll in this course are expected to be able to use high-school algebra. This course fulfills the Social Analysis requirement in the core curriculum.

295, 296 Topics

2 credits

297, 298 Topics

The subject matter of these courses, announced in the annual *Class Schedule*, will vary from year to year, but will not duplicate existing courses. See the description of these courses at the beginning of the "Curricula" section of this catalog.

301 History of Economic Thought

A survey of the content and method of economics and an analysis of the theories of the great economists from the ancient Greeks to the present; mercantilism, physiocracy, the classical school and its critics, particularly Marx; the marginalist school; Alfred Marshall and Keynes, recent developments in economic thought.

Prerequisites: 251 and 252

311 Forecasting

An introduction to techniques used in forecasting with emphasis on analyzing economic and business data. The emphasis is on time-series data, although cross-sectional analysis is also covered. Techniques presented include variants of moving averages, variants of exponential smoothing, regression and ARIMA processes. This course fulfills the second-level Computer Competency requirement in the core curriculum.

Prerequisites: 251, 252 and QMCS 220

315 Empirical Methods in Economics

An introduction to the application of statistical models and methods to economic problems; simple and multiple linear regression models; generalized least-squares; model building and related topics. Emphasis is on use of econometric software to analyze data and to test hypotheses. This course fulfills the second-level Computer Competency requirement in the core curriculum.

Prerequisites: 251 and 252, QMCS 220 or MATH 303

321 Law and Economics

The relationship between legal and economic aspects of selected issues: property rights, liability laws, product-safety legislation, discrimination, crime control, and related topics.

Prerequisites: 251, 252 or permission of instructor

326 Industry Studies

This course provides an analysis of a particular industry or sector of the U.S. economy. Among the topics included in the analysis will be: identification and description of the industry in question, past and present performance of the industry, the importance of the industry within the national and global economy, the level of competition present in the industry, and the role of government in this industry. Among the anticipated course offerings are Agricultural Economics, Economics of the Arts, Economics of Sports, Economics of Health Care, and Transportation Economics.

Prerequisites: 251 and 252

332 Industrial Organization

Relationship between market structure, behavior and performance of business enterprises; government intervention and regulation; antitrust and other public-policy issues.

Prerequisites: 251 and 252

333 Regional and Urban Economics

Principles underlying the location of economic activity; land-use patterns; transfer cost; location and structure of urban areas; growth of cities and regions; urban and regional problems and policies.

Prerequisite: 252

335 Money, Financial Markets, and the Economy

The nature, evolution, and functions of money; the role of depository financial institutions; structure of financial markets; principles of central banking; monetary theory and monetary policy; introduction to international banking and finance.

Prerequisites: 251 and 252

337 Economics of the Public Sector

This course examines the role of government in a modern economy. It develops a set of concepts that will allow students to evaluate policy alternatives. The following are among the particular topics likely to be addressed: externalities and environmental protection, education, the redistribution of income, health care, social insurance, taxation and tax reform, cost-benefit analysis, fiscal federalism, and state and local government finance. In each case, the focus is on whether intervention by government is appropriate, what the most effective form of any such intervention is, and how alternative policy interventions affect the private decisions made by citizens and business firms.

Prerequisite: 252

339 Labor Economics

Labor supply and demand; determinants of the wage structure; education and training decisions; the role of labor unions; mobility and migration, discrimination; public policies in labor markets.

Prerequisite: 252

345 Economics of Development and Growth

Nature and measures of economic growth and development; theories of growth; developed and less-developed nations; economic planning; selection and financing of projects for economic growth and human development; environment, resources, and limits to growth. This course fulfills the Human Diversity requirement in the core curriculum.

Prerequisites: 251, 252

346 Country and Area Studies in Economics

An analysis of the economic system(s) of a particular country or region of the world. Among the topics included in the analysis will be: functioning of key sectors of the system; the role of government in the economy; the resource base; the income distribution; trade and financial relations with other countries; contemporary economic issues and policies; past and present economic performance. Course offerings are anticipated for Japan, Russia, European Union, Latin America and Australia. Students may take this course more than once provided the specific country/region is not duplicated. Some offerings of this course fulfill the Human Diversity requirement in the core curriculum.

Prerequisites: 251 and 252

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348 International Economics

Analysis of trade between nations and regions of the world; trade and trade policy; economic integration; foreign-exchange markets; global financial system and world payments; cross-border movement of resources; economic interdependency of nations and regions; the economic system in a global framework.

Prerequisites: 251 and 252

349 Comparative Economic Systems

Analysis of the tools used to evaluate alternative economic systems; study of the structure and performance of laissez faire, centralized planning, democratic socialism and market socialism; historical evolution of economic systems; consideration of efficiency, growth, and social welfare; case studies: United States., CIS, China, the new market economies of Central Europe, others.

Prerequisites: 251 and 252

351 Macroeconomic Theory

Theories of money, interest, income and expenditure, employment, and inflation; monetary and fiscal policies; introduction to the theory of growth.

Prerequisites: 251 and 252

352 Microeconomic Theory

Analysis of consumer behavior and demand theory; theory of production and costs; analysis of the firm and industry under various market structures; factor pricing; general equilibrium. Selected additional topics such as market failure, economics of information, welfare economics, income distribution.

Prerequisites: 251, 252 and MATH 109 or 111 or 113 or equivalent.

355 Game Theory

Game theory seeks to explain how rational people make decisions when outcomes are mutually interdependent. This course introduces the methods of game theory from a historical perspective with primary emphasis on applications to economics. Applications to the other social sciences, business and biology are also considered. Topics covered include: normal and extensive forms of games, strict and weak dominance, sub-game perfections, pure and mixed strategies, Nash equilibrium, bargaining, oligopoly, New Keynesian and Classical Economics, trade policy, environmental economics and conflict resolution.

Prerequisites: 251 and 252, plus completion of the core curriculum mathematics requirement.

360 Experimental Economics

Experimental economics refers to the practice of testing economic hypotheses by conducting controlled experiments rather than relying on more traditional econometric testing. This course provides a survey of experiments conducted by economists in a variety of areas. Discussion will focus on the basics of the theory being tested, the methodology employed, and the results for each experiment. In addition, attempts will be made to replicate some results by conducting these same experiments in the classroom. Topics may include experiments conducted in the theory of competitive markets, oligopoly markets, auctions, decision-making under risk and uncertainty, public goods and search theory.

Prerequisites: 251, 252, and one additional ECON course numbered 300 or higher

370 Environmental and Natural Resource Economics

This course employs economic principles to analyze the problems of environmental pollution and natural-resource depletion. Economic systems, such as the private-market mechanism, are evaluated with respect to their effectiveness in the management of natural resources and the environment. Domestic and international environmental policies are examined and critiqued.

Prerequisite: 252

401 Managerial Decision Making

Microeconomic theory applied to business decision making. Emphasis on quantitative techniques applied to business decision making under uncertainty, demand and cost estimation, linear production models, pricing decisions, capital budgeting, inventory problems, and group decision making. Quantitative tools include linear regression, statistical decision analysis and linear programming.

Prerequisites: 352, and QMCS 220 or MATH 303 or permission of the instructor

418 Mathematical Economics

Introduction to a mathematical treatment of models of economic behavior; economic content includes consumer theory, theory of the firm and selected topics in macroeconomics.

Prerequisites: 352, and MATH 200 or MATH 114 with permission of instructor

470 Research in Economics

The Research in Economics course deals with data collection and statistical analysis of economic hypotheses. It culminates in writing a research paper on a topic of the student's choosing.

Prerequisites: Senior standing and 315, or permission of the instructor

Engineering

475, 476	Experiential Learning	2 credits
477, 478	Experiential Learning	
See the description of these courses at the beginning of the "Curricula" section of this catalog.		
483, 484	Seminar	2 credits
485, 486	Seminar	
See the description of these courses at the beginning of the "Curricula" section of this catalog.		
487, 488	Topics	2 credits
489, 490	Topics	
The subject matter of these courses, announced in the annual <i>Class Schedule</i> , will vary from year to year, but will not duplicate existing courses. See the description of these courses at the beginning of the "Curricula" section of this catalog.		
491, 492	Research	2 credits
493, 494	Research	
See the description of these courses at the beginning of the "Curricula" section of this catalog.		
495, 496	Individual Study	2 credits
497, 498	Individual Study	
See the description of these courses at the beginning of the "Curricula" section of this catalog.		

Engineering (ENGR)

Bennett (chair), George, Greene, Hennessey, Jalkio, Zimmerman; Abraham, Cottles, Jaedike, Sparrow
Faculty from other departments and adjunct faculty from industry teach specialized courses.

The University of St. Thomas offers five tracks in engineering:

- A program in electrical engineering
- A program in mechanical engineering
- A dual degree program in mechanical engineering and business
- A pre-engineering program
- A minor in engineering

The mechanical and electrical engineering curricula combine the study of basic sciences, general engineering, design and mechanical or electrical engineering with the study of the liberal arts. Emphasis is placed on applied engineering. Our mission states: "We provide a practical, values-based learning experience that produces well-rounded, entrepreneurial engineers and technology leaders who have the technical skills, passion and courage to make a difference."

Students graduating with a major in either mechanical or electrical engineering will meet the program objectives and outcomes designed to exceed the requirements of the Accreditation Board for Engineering and Technology's (ABET) Engineering Criteria 2000. These are a comprehensive set of criteria designed to provide graduates with the technical, ethical, attitudinal and communications skills required to be a productive contributor to society and to aggressively seek life-long learning experiences. These program objectives and outcomes are designed to provide the graduate with a foundation for clear thinking and expression in a balanced liberal arts educational program. Graduates will demonstrate competence in a variety of skills that enhance their ability to solve problems in diverse ways to meet the needs of the global community. Graduates will also develop teamwork and communication skills while gaining a comprehensive understanding of the design process and engineering systems.

Graduates will be prepared for direct entry into an engineering position in industry or for advanced study in graduate school.

Degree in Electrical Engineering (B.S.E.E.)

The bachelor of science in electrical engineering (B.S.E.E.) curriculum includes courses in circuits and electronics, signal processing and control system design, digital electronics and microprocessors, and electromagnetic fields and waves with a focus on embedded system design. The electrical engineering program is academically rigorous, complemented with a full liberal arts curriculum.

150	Introduction to Engineering (0 credit)
151	Introduction to Engineering Design (1 credit)
230	Digital Design
240	Circuit Analysis
330	Design with Microprocessors I
331	Design with Microprocessors II
340	Signals and Systems
342	Electromagnetic Fields and Waves
345	Electronics I
346	Electronics II
410	Control Systems and Automation