

### **CS 357 Computing Science Project I**

Using principles and techniques developed in CS 351 or CS 355, a capstone senior project is begun in this course. This includes items such as choosing a project, researching the requirements and technologies needed, and producing a requirements document. A team approach may be used at the discretion of the instructor. Some projects may be projects for real clients. Each project should be done in an area related to one's concentration. Prerequisite or corequisite: CS 351 or CS 355. Offered fall semester. One credit.

### **CS 358 Computing Science Project II**

Using principles and techniques developed in CS 351 or CS 355, the capstone senior project begun in CS 357 is now implemented. A team approach to software development may be used at the discretion of the instructor. Some projects may be projects for real clients. Each project should be done in an area related to one's concentration. Prerequisite: CS 357. Offered spring semester. Two credits.

### **CS 450 Independent Study in Computing and Information Science**

An independent study may be possible by arrangement with an individual faculty member. Course may be repeated with a different topic. Variable credit.

### **CS 465 Information Systems Management**

This course provides an introduction to management information systems, e-commerce, planning, and decision support. It explains how information is used in organizations, the role of information technology professionals, and how information systems are used to an advantage in business settings. Social and ethical issues related to the design, implementation and use of information systems will be addressed. Basic information technology project management skills will be covered as well as the issues and challenges involved in managing an information services department. Offered fall semester alternate years (Fall 2009). Three credits.

### **CS 550 Cooperative Education—Computing and Information Science Internship**

An internship involves practical work experience, typically with a local business. Course may be repeated. Variable credit. May be done for no credit.

## **Economics**

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Given a close collaboration with an excellent mathematics department at Saint Vincent College, the McKenna School's Economics Department is nationally ranked and is known for offering one of the best Ph.D. undergraduate preparations in the United States. The curriculum of the Economics Department is designed to provide a comprehensive education in both theoretical and applied economics. The economics program seeks to provide a strong academic foundation for understanding the complexities of economic activity and decision making within both the private and public sectors and for understanding the relationship between the economy and society as a whole. It seeks to enable students to apply rigorous analysis to economic issues and problems through the use of market-oriented theoretical models, quantitative techniques, and economic reasoning.

The study of economics, as part of the liberal arts and sciences approach to learning, helps students understand one of the most fundamental facets of human life in civil society—economic activity—and helps prepare them to effectively address the socioeconomic challenges and opportunities of contemporary public life. In addition to general economic theory and analysis, the special strengths of the Department include finance (public and international), international trade, game theory, econometrics, and experimental economics. In conjunction with the Center for Political and Economic Thought, the Department also seeks to provide exceptional educational experiences in the study of contemporary public policy and major issues in public life. Through these approaches and by working closely with its students, the goal of the Department's economics major is to help students achieve a strong academic background for successful graduate studies or professional employment. The Department of Economics awards both the Bachelor of Arts and Bachelor of Science degrees. The B.S. degree is designed for students intending to pursue graduate studies in economics, finance, or M.B.A programs with more demanding quantitative requirements. The B.A. is designed for students planning for immediate employment in business, government, or the nonprofit sector, as well as preparation for law school or other professional oriented graduate studies. For students interested in gaining a disciplined understanding of economics, courses in the department may be taken to satisfy the social science requirement of the College core.

The major's capstone requirement is a senior thesis that incorporates original research efforts. The thesis is written in conjunction with EC 480 and is taken during the senior or junior year.

Students are encouraged to join the staff of Center for Political and Economic Thought, which sponsors various lecture series, conferences, and publications; the Economics Club; and Mock Trial Team. The Economics Department is the Delta Sigma branch of Omicron Delta Epsilon, which is the national honor society for outstanding economics students.

### **Economics Learning Objectives:**

- Provide a comprehensive education in both theoretical and applied economics;
- Provide a strong academic foundation for understanding the complexities of economic activity and decision making within both private and public sectors and for understanding the relationship between the economy and society as a whole;
- Enable students to apply rigorous analysis to economic issues and problems through the use of market-oriented theoretical models, quantitative techniques and economic reasoning.

**Requirements for B.A. degree in Economics (43 credits):**

(See Core Curriculum requirements.)

BA 350	Statistics I	3
EC 101	Principles of Microeconomics	3
EC 102	Principles of Macroeconomics	3
EC 201	Microeconomic Theory	3
EC 202	Macroeconomic Theory	3
EC 331	Public Finance	3
EC 351	International Trade & Development	3
EC/BA 353	International Finance	3
EC 360	Econometrics	3
EC 380	Game Theory	3
EC 390	Experimental Economics	3
EC 480	Senior Thesis	3
MA 109/111	Calculus I	4
PS 100	Principles of American Politics	3

This program satisfies the mathematics and the social science core. After completing this major and the core curriculum, a student will have 34 credits for electives.

**Requirements for B.S. degree in Economics (53 credits):**

(See Core Curriculum requirements.)

BA 350	Statistics I	3
or		
MA 208	Probability and Statistics	3
EC 101	Principles of Microeconomics	3
EC 102	Principles of Macroeconomics	3
EC 201	Microeconomic Theory	3
EC 202	Macroeconomic Theory	3
EC 331	Public Finance	3
EC 351	International Trade & Development	3
EC/BA 353	International Finance	3
EC 360	Econometrics	3
EC 380	Game Theory	3
EC 390	Experimental Economics	3
EC 401	Advanced Microeconomic Theory	3
EC 402	Advanced Macroeconomic Theory	3
EC 480	Senior Thesis	3
MA 109/111	Calculus I	4
MA 110/112	Calculus II	4
PS 100	Principles of American Politics	3

Candidates for the B.S. degree who plan to pursue graduate work in economics, finance, or related disciplines are strongly encouraged to complete, at minimum, MA 113 Calculus III, MA 114 Differential Equations, and MA 115 Linear Algebra. Consult with a member of the departmental faculty for further assistance in planning course work. After completing this major and the core curriculum, a student will have 24 credits for electives.

**Typical First-Year Schedule**

	Fall	Spring
EC 101	Principles of Microeconomics	3
and		
EC 102	Principles of Macroeconomics	3
PS 100	Principles of American Politics	3
Foreign Language	3	3
EL 102	Language and Rhetoric	3
or may be taken in the Spring		
TH 119	Exploring Religious Meaning	3
or may be taken in the spring		
Mathematics	3-4	3-4
College core	0-6	0-6

All students will take one course designated as a First-Year Seminar which will satisfy a Core Curriculum requirement.

**Requirements for the Minor in Economics (18 credits):**

EC 101	Principles of Microeconomics	3
EC 102	Principles of Macroeconomics	3
EC 201	Microeconomic Theory	3
EC 202	Macroeconomic Theory	3
BA 350	Statistics I	3
Plus one elective (3 credits) from the following offerings:		
EC 331	Public Finance	3
EC 351	International Trade and Development	3
EC/BA 353	International Finance	3
EC 360	Econometrics	3
EC 380	Game Theory	3
EC 390	Experimental Economics	3
EC 401	Advanced Microeconomic Theory	3
EC 402	Advanced Macroeconomic Theory	3

**Double major in Mathematics and Economics**

For those students who will pursue upon graduation an advanced degree (master's or Ph.D. level) in finance or economics.

**Requirements for B.S. degree in Mathematics and Economics (79 credits in majors):**

(See Core Curriculum requirements.)

BA 350	Statistics I	3
or		
MA 208	Probability and Statistics	3
PS 100	Principles of American Politics	3
EC 101	Principles of Microeconomics	3
EC 102	Principles of Macroeconomics	3
EC 201	Microeconomic Theory	3
EC 202	Macroeconomic Theory	3
EC 331	Public Finance	3
EC 351	International Trade & Development	3
EC 360	Econometrics	3
EC 380	Game Theory	3
EC 390	Experimental Economics	3
EC 401	Advanced Microeconomic Theory	3
EC 402	Advanced Macroeconomic Theory	3
EC 480	Senior Thesis	3
MA 111	Calculus I	4
MA 112	Calculus II	4
MA 113	Calculus III	4
MA 114	Ordinary & Partial Differential Equations	4
MA 115	Linear Algebra	3
MA 203	Complex Variables	3
MA 204	Topology	3
MA 206	Real Analysis I	4
PH 111	General Physics I	3
PH 113	General Physics I Lab	1
PH 112	General Physics II	3
PH 114	General Physics II Lab	1
MA 207	Real Analysis II is strongly suggested.	

This program satisfies the mathematics, natural science, and the social science requirements of the core curriculum for the B.S. After completing this major and the core curriculum, a student will have six (6) credits for electives.

**Course Descriptions****EC 101 Principles of Microeconomics**

The course introduces the student to economic reasoning, terminology and fundamental concepts. Emphasis is placed on individual economic units such as the household and the firm and how they affect and are affected by the various market structures existing in American capitalism. Offered every semester. Three credits.

**EC 102 Principles of Macroeconomics**

An analysis of the functioning of the entire economy, in particular the forces that influence the level of production, unemployment, and prices. Also included are the nature and role of governmental intervention in changing these variables. Offered every semester. Three credits.

**EC 201 Microeconomic Theory**

The course provides rigorous analysis of consumer and producer behavior, market structure in both the product and resource markets, and general equilibrium theory. The course emphasizes the theoretical foundations and techniques of Neoclassical microeconomics. Prerequisite: EC 101. Offered fall semester. Three credits.

**EC 202 Macroeconomic Theory**

An examination and analysis of aggregate economic relationships in the context of competing Keynesian and Classical paradigms. The course emphasizes differences in the choice of appropriate stabilization policy on the part of government, as well as the theoretical structures of macroeconomic models. A brief introduction to economic growth theory is included. Prerequisite: EC 102. Offered spring semester. Three credits.

**EC 331 Public Finance**

This course discusses the role of government in the allocation of resources, criteria for public expenditures, incidence and the economic effects of taxation, sources of demand for public goods, and the impact of government on the private sector. Prerequisite: EC 201. Offered spring semester of odd-numbered years. Three credits.

**EC 351 International Trade and Development**

The course emphasizes the theory behind the international exchange of goods and services among nations of the world. Topics include the Heckscher-Ohlin Theorem, offer curves, the influence of market impediments, the pros and cons of free trade, etc. Prerequisite: EC 201 and MA 109 or MA 111. Offered fall semester of odd-numbered years. Three credits.

**EC 353 International Finance**

The course covers the following topics: recent developments in international financial markets, the utilization of foreign exchange and derivative security markets, exchange rate determination, international asset portfolio theory, and financial risk management strategies. Cross-listed as BA 353. Prerequisite: EC 102. Offered spring semester. Three credits.

**EC 360 Econometrics**

This course is designed as a continuation of BA 350. It is an introduction to regression and correlation analysis, multiple regression, their uses and related problems such as multicollinearity, serial correlation and heteroskedasticity. The course is balanced between theoretical development and applications. Prerequisite: MA 109 or MA 111 and BA 350 or MA 208. Offered spring semester. Three credits.

**EC 380 Game Theory**

The primary goal of this course is to study the scope and methods of game theory, focusing on applications arising within the discipline of economics. Game theory attempts to describe the strategic interaction of agents (e.g., consumers, firms, or the government) in situations where there are competing interests and/or the outcomes depend on the actions chosen by the various agents. The course is designed to expose students to the concepts studied by game theorists as well as the set of analytical skills used in game theory. Prerequisites: EC 201, MA 110 or MA 112. Offered fall semester of even-numbered years. Three credits.

**EC 390 Experimental Economics**

This course focuses on laboratory experimentation as a research tool in applied economics, particularly in the areas of industrial organization, political economy, and game theory. The course offers both an overview of general principles used in designing, conducting, and evaluating behavior in economic experiments and a review of current research in the field of experimental economics. The areas of study include market behavior in alternative institutional settings, allocation decisions in settings with externalities, and individual choice with uncertainty. Prerequisites: EC 201 and MA 109 or MA 111. Offered fall semester of odd-numbered years. Three credits.

**EC 401 Advanced Microeconomic Theory**

This course offers the student an in-depth, mathematical analysis and extension of subject matter covered in EC 201 (Microeconomic Theory). Topics covered include: multivariate economic applications of optimization theory with and without constraints utilizing linear algebra; FOC and SOC; Kuhn-Tucker Conditions; and consumer behavior under conditions of uncertainty. Prerequisites: EC 201, MA 110 or MA 112. Offered spring semester of even-numbered years. Three credits.

**EC 402 Advanced Macroeconomic Theory**

This course examines growth theory models, open economy macroeconomic models, macroeconomic models with rational expectations, dynamic modeling, and stochastic macroeconomic models. Prerequisites: EC 202, MA 110 or MA 112. The course utilizes David Romer's Advanced Macroeconomics and selected RE modeling chapters from Bennett McCallum's Monetary Economics: Theory and Policy. Offered spring semester of odd-numbered years. Three credits.

**EC 480 Senior Thesis**

The purpose of this seminar is to produce a scholarly piece of research and writing. Prerequisites: EC 201, EC 202, EC 390, and MA 109 or MA 111. Offered spring semester of even-numbered years. Three credits.

**EC 500 Independent Study**

May be repeated. Variable credit.

**EC 550 Internship**

Pass/Fail option only. Students are subject to the McKenna School's Student Guide to Internship Procedures and Requirements. See Business Administration section of this Bulletin for a detailed description. Variable credit up to three credits.