

School of Management and Information Systems

- Business and Management Systems
- Economics and Finance
- Information Science and Technology

Business and Management Systems

Bachelor of Science

Business and Management Systems is an undergraduate degree that emphasizes the role of technology in business. It is based on broad foundational core courses common for all undergraduates in the school. Students in Business and Management Systems are preparing for careers in the expanding fields of business administration and management information systems. Professionals in these fields analyze organizational needs to provide technology-enabled management and operations.

Today's business environments have a critical need for professionals who have an understanding of information technologies; who feel comfortable in an electronic environment; and who are able to synthesize, analyze, and learn from vast amounts of information. These individuals are needed to realize technology's great potential to support business processes, decision-making, and communication.

As a business and management systems major, you will take courses that are rigorous and oriented toward building the foundation necessary for lifetime learning. Studying at Missouri's technological university, you will benefit from the world-class computer environment and your association with excellent students from around the country and the world. Students in the program are strongly encouraged to do summer internships or co-ops with companies before they graduate. There are many rich opportunities and students benefit greatly in terms of their education and the edge they have seeking full-time employment once they graduate.

Faculty

Associate Professor:

Ray Kluczny (Chair, Associate Dean), Ph.D., Arizona State University

Assistant Professor:

Christian End, Ph.D., Xavier University
 Ray Luechtefeld, Ph.D., Boston College
 Bih-Ru Lea, Ph.D., Clemson University
 Lance Gentry, Ph.D., Michigan State University
 Madhu Reddy, Ph.D., University of California, Irvine

Instructor:

Stephanie Fitch, M.A., University of Texas at Austin
 Amy Light Mills, M.B.A., J.D., University of Missouri-Columbia

Bachelor of Science

Business and Management Systems

FRESHMAN YEAR

First Semester	Credit
BUS 10 Introduction to Mgt & Inf Systems I ¹	1
English 20 Exposition & Argumentation	3
Math 4 College Algebra	3
Biology 110, 231, 235, or 251	3

IST 51 Visual Basic	3
Laboratory w/ Living or Physical Science Course	1
	14

Second Semester

BUS 11 Introduction to Mgt & Inf Systems II ¹	1
Psych 50 General Psychology	3
Survey of Calculus	3
History	3
IST 151-Java	3
Econ 121 Microeconomics	3
	16

SOPHOMORE YEAR

First Semester	Credit
BUS 110 Mgt & Org Behavior	3
Speech 85 Princ of Speech	3
Stat 211 Stat Tools for Decision Making	3
IST 141 Info Systems	3
English 75, 80, 102, 105, 106, or 110 Lit	3
	15

Second Semester

BUS 120 Essentials of Accounting	3
Econ 121 Macroeconomics	3
Chemistry, Geol, Ge Eng, or Physics	3
Art 80, 85; Music 50; Theater 90	3
IST 211 Web Design	3
	15

JUNIOR YEAR

First Semester	Credit
English 60 Writ & Res or English 65 Tech Writ	3
BUS 230 Business Law	3
BUS 240 Basic Marketing	3
BUS 250 Basic Finance	3
Econ 211 Intro to Econ Stat	3
	15

Second Semester

Speech 181 Communication Theory	3
Political Science 90 American Government	3
BUS 260 Business Operations	3
BUS 270 Human Resources	3
Elective (Emphasis Area)	3
	15

SENIOR YEAR

First Semester	Credit
English 260 Practicum in Technical Writing	3
Culture, Sociology, Religion ²	3
BUS 280 Strategic Management	3
Elective (Emphasis Area)	6
	15

Second Semester:

BUS 397 Capstone Seminar in Bus & Mgt Sys ¹	3
Free Electives	12
	15

¹Writing Intensive Course

²Economics 220; English 195, 215, 224, 230, 244, 345, 350; Foreign Language Beyond Second Semester; History 340, 355; Philosophy 25, 35, 75, 212, 340, 355; Any Political Science; Psychology 270, 380; Any Sociology; Speech 235

Emphasis Areas

Choose 3 courses within one of the emphasis areas.

Business Administration

- EMgt 313 - Managerial Decision Making
- EMgt 317 - Comparative and Multi-National Mgt
- EMgt 320 - Technical Entrepreneurship
- EMgt 361 - Project Management
- EMgt 375 - Total Quality Management
- CSc 317 - Intellectual Property for Cmp Scientists
- Foreign Language
- Econ 320 - Money and Banking
- Econ 321 - Finance
- Econ 322 - International Trade
- Econ 330 - Public Finance
- Psych 212 - Industrial Psychology
- Psych 372 - Group Dynamics
- Psych 374 - Organizational Psychology

Management Information Systems

- IST 223 - Database Management
- IST 233 - Networks and Communications
- IST 251 - Systems Analysis
- IST 353 - Law and Ethics in E-Commerce

Minor in Business and Management Systems

A minor in Business and Management Systems will consist of 15 hours made up of the following courses:

- 1) Econ 121-Principles of Microeconomics
- 2) Econ 122-Principles of Macroeconomics
- 3) Bus 110-Management & Organizational Behavior
- 4) Bus 120-Essentials of Accounting
- 5) Bus 230-Business Law

Business Courses

- 010 Introduction to Management & Information Systems I** (Lect 1.0) This course presents an overview of information systems in a variety of economics, business, management and information technology contexts. Discussion will center around examples from industry and the course will include speakers from the private sector who represent different MIS applications. (Co-listed with IST 010 and Econ 010).
- 011 Introduction to Management & Information Systems II** (Lect 1.0) As a continuation of BUS 010, this course presents an overview of information systems in a variety of business, management and information technology contexts. Discussion will center around examples from industry and the course will include speakers from the private sector who represent different MIS applications. (Co-listed with IST 011).
- 100 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Consent of instructor required.
- 101 Special Topics** (Variable) This is designed to give the department an opportunity to test a new course. Variable title.

- 110 Management and Organizational Behavior** (Lect 3.0) The course provides coverage of classic and current management principles, as well as the study of the behavior of individuals and groups in an organizational setting. Topics include motivation, leadership, organizational design, and conflict resolution. Prerequisite: Psych 50.
- 120 Essentials of Accounting** (Lect 3.0) This course is an introduction to accounting and its significant role in making sound business decisions. Emphasis is on what accounting information is, why it is important, and how it is used to make strategic economic decisions. Coverage includes financial and management accounting. Prerequisite: Math 4.
- 200 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Consent of instructor required.
- 201 Special Topics** (Variable) This is designed to give the department an opportunity to test a new course. Variable title.
- 230 Business Law** (Lect 3.0) This course is an introduction to the nature and meaning of law and the legal environment of business. Topics include the legal process, sources of law, and institutions. Prerequisites: Bus 110 and Econ 121.
- 240 Basic Marketing** (Lect 3.0) The course examines the distribution, product, price, and promotion policies that underlie the activities of marketing institutions and the managerial, economic, and societal implications of such policies. Prerequisites: Bus 110 and Econ 122.
- 250 Business Finance** (Lect 3.0) This course studies the need for funds in business and the techniques of analysis used to determine how effectively these funds are invested within the firm. Topics include the institutions, instruments, and markets concerned with raising funds. Prerequisites: Bus 120, Econ 111, and Econ 122.
- 260 Business Operations** (Lect 3.0) This course examines the concepts, processes, and institutions that are fundamental to an understanding of business operations within organizations. Emphasis is on the management and organization of manufacturing and service operations and the application of quantitative methods to the solution of strategic, tactical and operational problems Prerequisites: Bus 120, Mathematics Survey of Calculus, and Econ 121.
- 270 Human Resource Management** (Lect 3.0) The course examines employee selection, performance appraisal, training and development, compensation, legal issues, and labor relations. Prerequisite: Bus 110.
- 280 Strategic Management** (Lect 3.0) Study of the formulation and implementation of corporate, business and functional strategies designed to achieve organizational objectives. Case studies and research reports may be used extensively. (It is preferred that this course be taken during the student's senior year.) Prerequisites: Bus 240 and 250.

- 300 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Consent of instructor required. This is designed to give the department an opportunity to test a new course. Variable title.
- 301 Special Topics** (Variable) This is designed to give the department an opportunity to test a new course. Variable title.
- 390 Undergraduate Research** (Variable) Designed for the undergraduate student who wishes to engage in research. Not for graduate credit. Not more than six credit hours allowed for graduation credit. Subject and credit to be arranged with the instructor.
- 397 Capstone Seminar in Business & Management Systems** (Lect 3.0) Course will cover issues and problems relating to application and integration of business and management systems skills. Group projects will require work as a member of a team, creative problem-solving and application of business systems principles to real and simulated problems. Prerequisite: Senior Standing as Business and Management Systems major.

Management Systems Courses

- 001 Introduction to Management Systems** (Lect 1.0) Introduction to Management Systems as a profession. Orientation to campus facilities and services. Instruction and practice in basic study, test-taking, computer and collaborative learning skills. Prerequisite: Mg Sys Majors.
- 101 Special Topics** (Variable) This course is designed to give the department an opportunity to test a new course. Variable title.
- 202 Cooperative Training in Management Systems** (Variable) On-the-job experience gained through cooperative education with industry with credit arranged through departmental co-op advisor. Grade received depends on quality of reports submitted and work supervisor's evaluation. Prerequisite: Completed 30 hours toward degree.
- 302 Internship** (Variable) Internship will involve students applying critical thinking skills and discipline specific knowledge in a work setting based on a project designed by the advisor and employee. Activities will vary depending on the student's background and the setting. Prerequisite: Completed 30 hours toward degree.
- 397 Capstone Seminar in Management Systems** (Lect 3.0) Issues and problems relating to management and information technology will be presented. Group projects will require work as a member of a team, creative problem-solving and application of management systems principles to real and simulated problems. Prerequisite: Senior standing as management systems major.

Economics and Finance

Bachelor of Arts in Economics Bachelor of Science in Economics Master of Arts in Economics

Master of Arts available as a cooperative degree program with the Economics Department of the University of Missouri-St. Louis. A maximum of 12 graduate semester hours may be taken at UMR.

Economics has been called the "science of scarcity." It is the study of how individuals allocate scarce resources for production in order to satisfy their human needs and wants. This focus on the human condition places economics firmly into the social sciences area. However the application of economic principles to problems of choice in markets and in financial decision-making also gives economics a central role in the theory of business administration and management.

The UMR Economics Department offers a relevant business-oriented educational experience while maintaining the social science flavor of the traditional economics degree. The curriculum is based on a broad foundational core which is common to the other degree programs in the School of Management and Information Systems, Business Administration and Information Science and Technology. Students majoring in economics also take up to 33 hours of economics, finance, and management courses.

The Economics courses are taught rigorously and are technically-oriented. They also provide a solid social science education with studies of the social problems of market failure, monopoly, inflation, and the effectiveness of government economic and social policy. The department also offers a menu of finance courses for those students interested in an economics degree with a finance emphasis. Graduated students have an excellent education with job opportunities across the spectrum from business, finance, study of the law, government and public policy.

The economics program allows for the flexibility of selecting either the Bachelor of Arts or Bachelor of Science programs, depending on which best fits your goals and skills. Either degree will provide you with the necessary skills to compete effectively in the job market or succeed in graduate school.

Students wishing to minor in economics may select from a variety of courses tailored to their own needs. Specific tracks are available in energy/technology, international, financial, business economics, and accounting and finance.

Students majoring in an academic area at UMR other than economics can pursue a secondary B.A. or B.S. in economics to accompany their primary major. See the department chair of economics for more details on this academic option.

The UMR Economics Department has in place a cooperative Bachelor of Science/Master of Science in Ac-

counting with the College of Business and Public Administration at the University of Missouri-Columbia. A student can take at UMR up to 90 hours of the 150 hours required for the BS/MS in accounting. The remaining 60 hours must be taken at Columbia. After completing the 90 hours at UMR the student must take the GRE exam and be admitted into the UMC graduate program.

Faculty

Professors:

Karl E. Burgher, Visiting Professor and (Interim Chair), Ph.D., University of Missouri-Rolla
 Gregory Gelles, Ph.D., University of West Virginia
 David Hentzel (Emeritus), Ph.D., Southern Illinois
 Walter D. Johnson (Emeritus), Ph.D., University of Oklahoma

Associate Professors:

Richard Bryant, Ph.D., University of California-Davis

Assistant Professors:

Michael Davis, Ph.D., University of California San Diego
 Julie Gallaway, Ph.D., Colorado State University
 Eun Soo Park, Ph.D., Northwestern University
 Xuejing Xing, Ph.D., University of Missouri-Columbia
 Duo Zhang, Ph.D., West Virginia University

Bachelor of Arts Economics

In addition to the general university requirements for a Bachelor of Arts degree, a student must complete:

- 1) Economics 121, 122, 221 and 222 with a minimum grade of "C" in each.
- 2) At least 18 additional hours of economics electives, above the 200 level, with a minimum grade of "C" in each.
- 3) Engineering Management 130 and 131; and Statistics 115; or Economics 111; and Economics 211.

Bachelor of Arts Economics (Preparation for Teacher Certification)

The student will fulfill the general requirements for the bachelor of arts degree, *except for foreign language*; the requirement for the Economics major (*teacher certification*); and the requirements for Missouri certification in the teaching of Social Studies. See Economics. Contact the Economics Department for advising. Requirements for Teacher Certification as an Economics major are as follows:

1. Prerequisites for the Economics major are Econ 121, 122, 221, 222 with a minimum grade of "C" in each.
2. Econ 111 and 211 with a minimum grade of "C" in each. In addition, twelve hours of electives in economics with a minimum grade of "C". Stat 115 or 211 can substitute for Econ 111.
3. Eng Mg 130 and 131. Eng Mg 230 can substitute for Eng Mg 130 and 131.
4. Thirty-seven hours of general education requirements to include English 20 and 60 and Speech 85; six hours of humanities and fine arts; twelve hours of social science to include History 175 or 176, Political Science 90, Psychology 50, and Geography;

seven hours of natural science to include Physics or Geology and Biology 110 with one lab and three hours of mathematics to include Math 2 or 4 or higher.

Areas of Concentration

Students are encouraged to use their electives, both in economics and in general, to develop areas of concentration beyond the core requirements. Among the possibilities are business, finance, and international affairs. Faculty advisors will assist students in establishing these curricular tracks.

Bachelor of Science Economics

FRESHMAN YEAR

First Semester	Credit
Bus 10 Freshman Introduction ¹	1
English 20-Exposition & Argumentation ¹	3
Math 4 College Algebra	3
Biology 110, 231, 235, or 251	3
IST 51 Visual Basic	3
Lab w/Living or Physical Science Course	1
	14

Second Semester

BUS 11 Freshman Introduction	1
Psych 50 General Psychology	3
Survey of Calculus	3
History	3
IST 151 Java	3
Economics 121 or 122	3
	16

SOPHOMORE YEAR

First Semester

BUS 110 Mgt & Org. Behavior	3
Speech 85 Princ of Speech	3
Stat 211 Stat Tools for Decision Making	3
IST 141 Info Systems	3
English 75, 80, 102, 105, 106, or 110 lit	3
	15

Second Semester

BUS 120 Essentials of Accounting	3
Econ 121 or 122	3
Chemistry, Geol, Ge Eng, or Physics	3
Art 80, 85; Music 50; Theatre 90	3
IST 211 Web Design	3
	15

JUNIOR YEAR

First Semester

First Semester	Credit
English 60 or 65	3
BUS 230 Business Law	3
Econ 221 Interm Micro	3
Econ 222 Interm Macro	3
Econ 211 Intro To Econ Stat	3
	15

Second Semester

Speech 181 Communication Theory	3
Political Science 90 American Government	3
Emphasis Area Electives	9
	15

216 — Economics and Finance

SENIOR YEAR

	Credit
First Semester	
English 281	3
Culture, Sociology, Religion ²	3
Emphasis Areas Electives	9
	15
Second Semester	
Econ 397 Capstone ¹	3
Free Electives	12
	15

¹In-Major Writing Intensive

²Economics 220; English 195, 215, 224, 230, 233, 244, 345, 350; Foreign Language Beyond Second Semester; History 340, 355; Philosophy 25, 35, 75, 212, 340, 355; Any Political Science; Psychology 270, 380; Any Sociology; Speech 235

Minor in Economics

Students majoring in other disciplines are encouraged to develop a minor in economics. The formal minor in economics is designed to provide students with a solid understanding of economic principles and concepts and the ability to apply this knowledge to a host of economic, public policy and business problems. This program will be of particular benefit to those students whose major field of study may lead them to pursue a management position or later graduate studies in business.

The minor in economics requires the completion of a minimum of 15 hours of economics course work with a grade of "C" or better. Required courses in the minor program include both Economics 121 and 122 and at least one of the intermediate theory courses, Economics 221 and/or Economics 222. The choice of which intermediate theory course depends on which 300 level economic electives the student, in consultation with the department's minor advisor, selects for their program.

Energy/Technology Minor

(15 hours)

Required courses:

- Econ 121-Principles of Microeconomics
- Econ 122-principles of Macroeconomics
- Econ 221-Intermediate Microeconomics Theory

And 6 hours from:

- Econ 311-Econometrics
- Econ 335-Cost Benefit Analysis
- Econ 340-Environmental & Natural Resource Economics
- Econ 345-Energy Economics

International Economics Minor

(15 hours)

Required courses:

- Econ 121-Principles of Microeconomics
- Econ 122-Principles of Macroeconomics
- Econ 222-Intermediate Macroeconomics Theory

And 6 hours from:

- Econ 322-International Trade
- Econ 351-Economic Development
- Econ 360-Comparative Economic Systems

Financial Economics Minor

(15 hours)

Required courses:

- Econ 121-Principles of Microeconomics
- Econ 122-Principles of Macroeconomics
- Econ 221-Intermediate Microeconomic Theory
- Or Econ 222- intermediate Macroeconomic Theory

And 6 hours from:

- Econ 320-Money and Banking
- Econ 321-Finance
- Econ 322-International Trade

Business Economics Minor

(15 hours)

Required courses:

- Econ 121-Principles of Microeconomics
- Econ 122-Principles of Macroeconomics
- Econ 221-Intermediate Microeconomics Theory

And 6 hours from:

- Econ 321-Finance
- Econ 330-Public Finance
- Econ 335-Cost Benefit Analysis
- Econ 375-Labor Economics

Accounting and Finance Minor

(18 hours)

The Accounting and Finance Minor is an interdisciplinary course of study incorporating knowledge from Statistics, Engineering Management and Economics. Students pursuing this minor will be exposed to the interrelationships among statistics, accounting, economics, and finance, and will be introduced to a practical understanding of a number of accounting and business-related topics.

Required courses:

- Econ 211-Intro to Economics Statistics
- Or Stat 213-Stat Methodology in Eng or Stat 215-Eng Stat
- Or Stat 344-Mathematical Stat
- Econ 121-Principles of Microeconomics
- Econ 221-Intermediate Microeconomics
- Eng Mg 230-Managerial Accounting or
- Eng Mg 322-Accounting for Eng Mg

And 6 hours from:

- Eng Mg 252-Financial Management
- Econ 321-Finance
- Econ 323-International Finance
- Econ 330-Public Finance
- Eng Mg 332-Eng Cost Accounting

Economics Courses

010 Introduction to Management & Information Systems I (Lect 1.0) This course presents an overview of information systems in a variety of economics, business, management and information technology contexts. Discussion will center around examples from industry and the course will include speakers from the private sector who represent different MIS applications. (Co-listed with Bus 010 and IST 010).

- 100 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Prerequisite: Consent of instructor required.
- 101 Special Topics** (Variable) This course is designed to give the department an opportunity to test a new course. Variable title.
- 111 Business and Economic Statistics I** (Lect 3.0) This is an introductory course in business and economic statistics. Our main objective is to familiarize the student with elementary statistical concepts within the context of numerous applications in Business and Economics. We will highlight the primary use of statistics, that is, to glean information from an available sample regarding the underlying population. Prerequisite: Math 2 or Math 4. (Co-listed with Stat 111)
- 121 Principles of Microeconomics** (Lect 3.0) An examination of how resources and products are priced and how income is distributed within various types of market structures.
- 121H Principles of Microeconomics** (Lect 3.0)
- 122 Principles of Macroeconomics** (Lect 3.0) A study of alternative strategies for managing the U.S. economy within a global environment, to attain the goals of full employment, stability and growth.
- 200 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Prerequisite: Consent of instructor required.
- 201 Special Topics** (Variable) This course is designed to give the department an opportunity to test a new course. Variable title.
- 211 Introduction To Economic Statistics** (Lect 2.0 and Lab 1.0) Introduction of econometric techniques for the analysis of economic data. Topics will include collection, manipulation, and presentation of economic and business data, linear, economic models, testing economic hypotheses, and forecasting. Application of all techniques using economic data and statistics software. Prerequisites: Econ 121 or 122, and Math 4 or higher and Stat 115 or Stat 211.
- 220 History of Economic Thought** (Lect 3.0) Contributions of the classical and modern economists to the development of economic thought. Course aims at establishing a synthesis of evolving doctrines which have become the basis of currently accepted economic theory. Prerequisites: Econ 121 and 122.
- 221 Intermediate Microeconomic Theory** (Lect 3.0) Analysis of demand and supply in various market environments using the theories of production, resource pricing, and distribution of income. Emphasis on efficiency attainment and the rationale for market intervention. Prerequisites: Econ 121 and 122.
- 222 Intermediate Macroeconomic Theory** (Lect 3.0) Examines the theoretical framework of national income and product generation, and the use of this theory to construct approaches such as, monetary and fiscal policy to attain economic, political and social goals. Prerequisites: Econ 121 and 122.
- 223 Managerial Economics** (Lect 3.0) Business students who become managers of business enterprises should understand how market economic forces create opportunities for making profit. Business students need to be trained in managerial applications of microeconomic theory. Managerial Economics brings together those topics in micro theory that can be applied to business decision making. Prerequisites: Econ 121 & 122.
- 230 Law and Economics** (Lect 3.0) Study of application of economics analysis to legal concepts, issues and reasoning. Emphasizes the use of microeconomic theory to examine questions of efficacy and efficiency of decisions emanating from three major areas of common law -property rights, contracts and torts. Prerequisite: Econ 121 or equivalent.
- 250 Business Finance** (Lect 3.0) This course studies the need for funds in business and the techniques of analysis used to determine how effectively these funds are invested within the firm. Topics include the institutions, instruments, and markets concerned with raising funds. Prerequisites: Bus 120, Econ 111, Econ 122.
- 300 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Consent of instructor required.
- 301 Special Topics** (Variable) This course is designed to give the department an opportunity to test a new course. Variable title.
- 302 Internship** (Variable) Internship will involve students applying critical thinking skills and discipline-specific knowledge in a work setting based on a project designed by the advisor and employee. Activities will vary depending on the student's background and the setting. Prerequisite: Senior status; must have completed 24 hours in major.
- 311 Econometrics** (Lect 3.0) Applied statistical analysis of economic phenomena, including identification, least squares bias, and autocorrelation with emphasis on recent estimation procedures. Prerequisites: Stat 115 & 116, Econ 221 and 222.
- 315 Mathematical Economics** (Lect 3.0) Marginal analysis, calculus, and linear algebraic systems are applied in selected advanced topics in economics such as price theory, general equilibrium theory, input-output analysis, activity analysis, and game theory. Prerequisite: Econ 221, 222, and Math 8.
- 320 Money and Banking** (Lect 3.0) Study of the origin, principles, and functions of money, emphasizing the role of banks in the effectuation of monetary policies geared to achieve various economic and political goals. Prerequisite: Econ 222.
- 321 Finance** (Lect 3.0) This course provides a rigorous and consistent presentation of the theory of financial decisions. Capital markets are analyzed under assumptions of risk aversion and uncertainty. Models of modern portfolio theory are dis-

- cussed including the CAPM and the Modigliani-Miller analysis. Prerequisite: Econ 221 or Econ 222.
- 322 International Trade** (Lect 3.0) Analysis of gains from trade; the effects of factor mobility; effects of trade restrictions on trade flow and income distribution; arguments for restricting trade; and effects of trade on economic development, employment and human capital development. Prerequisite: Econ 221.
- 323 International Finance** (Lect 3.0) Examination of the international monetary system, the Balance of Payments, the foreign exchange market, futures and options markets; foreign exchange and other risk management for firms, financing from a global perspective and direct foreign investment. Prerequisite: Econ 222.
- 330 Public Finance** (Lect 3.0) Study of government expenditures and sources of revenue. Particular emphasis is given to governmental decision making—how these decisions affect the economy and the behavior of individuals, firms, and families within the economy; and how these decisions may be evaluated. Prerequisite: Econ 221.
- 335 Cost-Benefit Analysis** (Lect 3.0) Investigates the rationale for cost-benefit analysis within a free enterprise setting. Discussion of market efficiency and failure; determination of social costs and benefits; applications of cost-benefit analysis; and, problems remaining in theory and practice. Prerequisite: Econ 221.
- 340 Environmental and Natural Resource Economics** (Lect 3.0) Optimum use of replenishable and non-replenishable resources, public goods and common resources, externalities, private vs. public costs, and quality of the environment; emphasis on public policy related to environmental and natural resource economics. Prerequisite: Econ 221.
- 345 Energy Economics** (Lect 3.0) Market structure. World resource development. Supply and demand analysis on energy production and consumption within domestic and global settings. Prerequisite: Econ 221.
- 322 International Trade** (Lect 3.0) Analysis of gains from trade; the effects of factor mobility; effects of trade restrictions on trade flow and income distribution; arguments for restricting trade; and effects of trade on economic development, employment and human capital development. Prerequisite: Econ 221.
- 323 International Finance** (Lect 3.0) Examination of the international monetary system, the Balance of Payments, the foreign exchange market, futures and options markets; foreign exchange and other risk management for firms, financing from a global perspective and direct foreign investment. Prerequisite: Econ 222.
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- the behavior of individuals, firms, and families within the economy; and how these decisions may be evaluated. Prerequisite: Econ 221.
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- 340 Environmental and Natural Resource Economics** (Lect 3.0) Optimum use of replenishable and non-replenishable resources, public goods and common resources, externalities, private vs. public costs, and quality of the environment; emphasis on public policy related to environmental and natural resource economics. Prerequisite: Econ 221.
- 345 Energy Economics** (Lect 3.0) Market structure. World resource development. Supply and demand analysis on energy production and consumption within domestic and global settings. Prerequisite: Econ 221.
- 351 Economic Development** (Lect 3.0) Theoretical analysis of the problem of economic development of the “poor” countries, where two-thirds of the world’s population lives. Treatment of basic problem areas leading to a synthesis of theoretical approaches for the achievement of development. Prerequisite: Econ 221 or 222.
- 357 Network Economy** (Lect 3.0) The course takes a look at the emerging Network/Internet economy, using traditional economic tools. Topics include production and reproduction cost of information, information as an “experience good,” creation of different version of products, switching cost and lock-in affects, market adoption of dynamics, first-mover advantage, and intellectual property rights. Prerequisite: Econom 221. Co-listed with: IST 357
- 375 Labor Economics** (Lect 3.0) Labor as a factor of production, collective bargaining, trade unionism, labor legislation, from the viewpoint of public policy. Prerequisite: Econ 221 or Econ 222.
- 389 Problems in Economic Policy** (Lect 3.0) Advanced course designed for students majoring within the department. Appraisal and analysis of major problems of economic policy. Research and reports. Topics covered vary from year to year. Offered jointly by members of the department. Prerequisite: Seniors with 24 or more hours in Econ.
- 397 Capstone Seminar in Economics** (Lect 3.0) Course will cover issues and problems relating to application and integration of economics, business and management systems skills. Group projects will require work as a member of a team, including creative problem-solving and application of business system principles to real and simulated problems. Prerequisite: Senior standing as an Economics major.

Information Science and Technology

Bachelor of Science
Master of Science

Information Science and Technology offers a bachelors degree focused on today's cutting edge information technology. Students in Information Science and Technology study the latest technology in areas including networking, telecommunications, E-commerce, and integrated business systems. Professionals in this field administer, maintain, and support computer systems and networks.

Today's business environments have a critical need for professionals who have an understanding of information technologies based on a broad knowledge of management practices, economics, psychology, and the humanities. These individuals are needed to implement the technology to support business processes, managerial decision-making, and organizational communication.

As an information science and technology major, you will take courses that are rigorous and oriented toward building the foundation necessary for lifetime learning. Studying at Missouri's technological university, you will benefit from the world-class computer environment and your association with excellent students from around the country and the world. Students in the program are strongly encouraged to do summer internships or co-ops with companies before they graduate. There are many rich opportunities and students benefit greatly in terms of their education and the edge they have seeking full-time employment once they graduate.

Faculty

Professor:

Barry Flachsbart (Chair), Ph.D., Stanford University

Associate Professor:

Richard Hall (Associate Dean), Ph.D., Texas Christian University

Assistant Professor:

Madhu Reddy, Ph.D., University of California, Irvine

Wen-Bin Yu, Ph.D., University of Louisville

Instructor:

Stephanie Fitch, M.A., University of Texas at Austin

William Kehr, Ph.D., University of Missouri-Rolla

Bachelor of Science Information Science and Technology*

FRESHMAN YEAR

First Semester	Credit
IST 10-Introduction to Mgt & Inf Systems I ¹	1
English 20-Exposition & Argumentation	3
Math 4-College Algebra	3
Biology 110, 231, 235, or 251	3
IST 51-Visual Basic	3
Laboratory w/ Living or Physical Science Course	1
	<u>14</u>

Second Semester	Credit
IST 11-Introduction to Mgt & Inf Systems II ¹	1
Psych 50-General Psychology	3
Survey of Calculus	3
History	3
IST 151-Java	3
Econ 121 or 122-Micro or Macro Econ	3
	<u>16</u>

SOPHOMORE YEAR

First Semester	Credit
BUS 110-Mgt & Organizational Behavior	3
Speech 85-Principles of Speech	3
Stat 211-Statistical Tools for Decision Making	3
IST 141-Information Systems	3
English 75, 80, 102, 105, 106, or 110 Literature	3
	<u>15</u>

Second Semester	Credit
BUS 120-Essential of Accounting	3
Econ 121 or 122-Micro or Macro Econ	3
Chem, Geol, or Physics	3
Art 80, 85; Music 50; Theater 90	3
IST 211-Web Design	3
	<u>15</u>

JUNIOR YEAR

First Semester	Credit
English 60 or English 65	3
IST -Business Law	3
IST 233-Networks and Communications	3
IST 243-Systems Analysis	3
Econ 211-Intro to Econ Statistics	3
	<u>15</u>

Second Semester	Credit
Speech 181-Communication Theory	3
Pol Sci 90-American Government	3
IST 221-Internet Concepts and Applications	3
IST 231-Computer Components and Operation	3
IST 241-E-Commerce	3
	<u>15</u>

SENIOR YEAR

First Semester	Credit
English 281-Theory of Written Comm	3
Culture, Sociology, Religion ²	3
IST Electives	9
	<u>15</u>

Second Semester	Credit
BUS 397-Capstone Seminar in IST ¹	3
Free Electives	12
	<u>15</u>

¹Writing Intensive Course

²Culture, Sociology, Religion (any one of the following)
Philosophy 25, 35, 75, 212, 340, 355; English 195, 215, 224, 230, 244, 345, 350; Psychology 270, 380; History 340, 355; Economics 220; Speech 235; Foreign Language Beyond Second Semester; Any Sociology; Any Political Science;

Electives

- CPE 213 Digital Systems Design
- CPE 311 Introduction to VLSI Design
- CPE 313 Microprocessor Systems Design
- CSC 303 Multimedia Systems
- CSC 306 Software Engineering I

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- IST 251 Operating Systems Fundamentals
- IST 321 Network Performance Design and Mgt
- IST 336 Internet Computing
- IST 338 Internet Imaging
- IST 340 Web Administration
- IST 342 E-Commerce Architecture
- IST 353 Law and Ethics in E-Commerce
- IST 354 Multimedia Development and Design
- IST 355 Human Computer Interaction
- IST 357 Economics of E-Commerce

Minor in Information Science and Technology

A minor in Information Science and Technology will require 15 hours to be made up of the following courses:

- 1) IST 51-Algorithms and Programming (Visual Basic)
- 2) IST 141-Information Systems
- 3) IST 151-Intro to Data Structures & App (JAVA)
- 4) IST 211-Web Design and Development
- 5) One other IST course at the 200 level or above.

Information Science and Technology Courses*

(Elective courses will initially be offered as experimental prior to their being assigned the permanent number shown in this catalogue)

- 010 Introduction to Management & Information Systems I** (Lect 1.0) This course presents an overview of information systems in a variety of economics, business, management and information technology contexts. Discussion will center around examples from industry and the course will include speakers from the private sector who represent different MIS applications. (Co-listed with Bus 010 and Econ 010).
- 011 Introduction to Management & Information Systems II** (Lect 1.0) As a continuation of IST 010, this course presents an overview of information systems in a variety of business, management and information technology contexts. Discussion will center around examples from industry and the course will include speakers from the private sector who represent different MIS applications. (Co-listed with Bus 011).
- 051 Algorithms and Programming** (Visual Basic) (Lect 3.0) An introduction to algorithm design and analysis, programming, and use of the World Wide Web for information dissemination and retrieval. Additional topics include use of top-down design and subprograms to tackle complex problems and abstract data types. Interdisciplinary case studies involving both numerical and nonnumeric applications will be covered. Prerequisite: Entrance Requirements
- 100 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Consent of instructor required.
- 101 Special Topics** (Variable) This is designed to give the department an opportunity to test a new course. Variable title.
- 141 Information Systems** (Lect 2.0 and Lab 1.0) This course surveys information/systems technology for the management of enterprise information as a resource. Topics include elements of system design life cycle, database concepts, and decision support. Managerial and technical dimensions of information systems are blended in a framework for IS systems. The implementation, operation, and maintenance of information systems are also discussed. Projects are required. Prerequisite: IST 151.
- 151 Introduction to Data Structures and Applications (JAVA)** (Lect 2.0 and Lab 1.0) Programming concepts: functions, parameter passing, arrays, strings, classes, templates. Mathematical tools: sets, functions, and relations, O-notation, complexity of algorithms, proof by induction. Data structures and their representations: data abstraction, sequences, trees, binary search trees, associative structures. Algorithms: searching and sorting, iterative and recursive algorithms. Methods of testing correctness and measuring performance. Prerequisite: IST 51.
- 200 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Consent of instructor required.
- 201 Special Topics** (Variable) This is designed to give the department an opportunity to test a new course. Variable title.
- 211 Web Development and Design** (Lect 1.5 and Lab 1.5) Students will learn tools and programming techniques for effective web development and design. Tools include software for web editing, graphics development, animation. Programming includes coding techniques for content, style, and dynamic scripting. The course is project based with an emphasis on the application of these tools. Prerequisite: IST 151.
- 221 Internet Concepts and Applications** (Lect 3.0) This course involves a study of the methods used to extract and deliver dynamic information on the World Wide Web. The course uses a hands-on approach in which students actively develop Web-based software systems. Additional topics include installation, configuration and management of Web servers. Prerequisite: IST 211.
- 223 Database Management** (Lect 3.0) The course introduces the concepts of database management systems. Issues in database architecture, design, administration, and implementation are covered. Prerequisite: IST 141.
- 231 Computer Components and Operation** (Lect 3.0) Design-oriented introduction to computer components and operations. Standard codes; number systems; base conversions; computer arithmetic; boolean algebra; minimization and synthesis techniques for combinational and sequential logic; and related issues are covered. Prerequisite: IST 151.
- 233 Introduction to Computer Networks and Communications** (Lect 2.0 and Lab 1.0) The course provides an introduction to current and

evolving computer networks. It includes the construction, operation, and management of those networks as well as discussions of layered network organization, network protocols, switching, and local and wide area networks. The course provides hands-on experience with local area network hardware and software. Prerequisite: IST 151.

- 241 E-Commerce** (Lect 3.0) Introduction to fundamental concepts of management and application to Information Technologies. This course examines the use of IT in business processes and the management issues of integrating IT into organization processes to gain a competitive advantage. Topics include: management; organizations and information systems; development life cycle; project management and systems engineering; process reengineering; and organization learning. Prerequisites: IST 141, IST 211.
- 243 Systems Analysis** (Lect 3.0) The theory and practice of structured analysis are presented. Topics include: traditional vs. structured analysis methods, requirements analysis, user/analyst interaction, investigation of existing systems, human/machine interfaces, case tools, and workbenches. Prerequisite: IST 141.
- 300 Special Problems** (Variable) Problems or readings on specific subjects or projects in the department. Consent of instructor required.
- 301 Special Topics** (Variable) This course is designed to give the department an opportunity to test a new course. Variable title.
- 321 Network Performance Design and Management** (Lect 3.0) This course provides analytical capabilities needed to effectively design, deploy, and manage computer networks and protocols. Prerequisite: IST 233.
- 336 Internet Computing** (Lect 3.0) A survey of computer networks and the Internet. Develops understanding of the concepts of Local Area Networks (LANs), Wide Area Networks (WANs), packet switching, and Internet protocols, along with the underlying technologies they use. Prerequisite: Approved MS entrance requirements in IST.
- 342 E-Commerce Architecture** (Lect 3.0) Course will cover the issues associated with computer architecture, as it relates specifically to e-commerce applications. Topics will include e-commerce systems and processes, specialized software, and databases. Prerequisite: IST 233.
- 351 Leadership in Technology-Based Organizations** (Lect 3.0) The course focuses on the knowledge and skills necessary for the development and implementation of effective strategies for the management of technology-based organizations. This involves: developing a general management perspective on technology and innovation, examining the problems of new product development, identifying distinctive technological competencies, licensing and marketing technologies, assessing the organizational and industrial context of technology.
- 354 Multi-Media Development and Design** (Lect 3.0) Students will learn current practices for development and design of interactive multimedia. The course covers tools for development of 2-D and 3-D graphics, video, audio, animation, and integrated multimedia environments. Prerequisites: IST 51, Cmp Sc 53 or Cmp Sc 73.
- 355 Human Computer Interaction** (Lect 3.0) Fundamental theory and practice of the design, implementation, and evaluation of human - computer interfaces. Principles of design; methods for evaluating interfaces with or without user involvement; techniques for prototyping and implementing graphical user interfaces; relationship of interface design to effective human interaction with computers. Hands on experience in building applications through prototyping tools, windowbased systems, and toolkits. Prerequisite: Psych 50.
- 357 Network Economy** (Lect 3.0) The course takes a look at the emerging Network/Internet economy, using traditional economic tools. Topics include production and reproduction cost of information, information as an "experience good," creation of different version of products, switching cost and lock-in affects, market adoption of dynamics, first-mover advantage, and intellectual property rights. Prerequisite: Econom 221. (Co-listed with Econom 357).
- 361 Information Systems Project Management** (Lect 3.0) The course overviews general project management principles and then focuses on information system application development. Topics include requirements analysis, project scheduling, risk management, quality assurance, testing, and team coordination. Prerequisite: Senior or Graduate Standing.
- 390 Undergraduate Research** (Variable) Designed for the undergraduate student who wishes to engage in research. Not for graduate credit. Not more than six credit hours allowed for graduation credit. Subject and credit to be arranged with the instructor.
- 397 Capstone Seminar in Information Science and Technology** (Lect 3.0) Course will cover issues and problems relating to application and integration of Information Science and Technology skills. Group projects will require work as a member of a team, creative problem-solving and application of IST principles to real and simulated problems. Prerequisite: Senior Standing as IST major.

