Department of Information Systems, Statistics and Management Science

Professor Charles R. Sox, Department Head
Office: 300 Alston Hall

The Department of Information Systems, Statistics and Management Science provides students with opportunities to learn about the design and development of information systems, the application of statistical analysis to support business decision making and the design and analysis of business operations and processes. The department has three functional areas: Management Information Systems, Operations Management and Statistics.

The Management Information Systems (MIS) faculty offer an introductory course in MIS, as well as courses for students majoring in MIS and students specializing in Business Information Technology, eDecision Support or Health Information Systems. The MIS program partners with a range of businesses and organizations to prepare students to leverage information technology to solve business problems.

The Operations Management faculty offer introductory courses in operations as well as courses for students majoring in Operations Management and those students specializing in Supply Chain Management or Production Management. The OM program has strong relationships with manufacturers, distributors, retailers, transportation carriers and logistics service providers.

The Statistics faculty offer introductory statistics courses for undergraduate students as well as for students specializing in Business Intelligence. The Statistics program supports the business analytics initiative for the College and has strong partnerships with leading providers of business analytics software.

Majors
Management Information Systems
Operations Management

Specializations
MIS
Business Information Technology
e-Decision Support
Health Information Systems
OM
Production Management
Supply Chain Management
Statistics
Business Intelligence

Management Information Systems Major
Program Director: David Hale
Academic Advisor: Heather Davis

The MIS program focuses on the innovation of business oriented information technology to open new markets and improve business operations by leveraging information systems. Students learn to combine knowledge of core business and technology to excel in future careers such as business analyst, consultant or app designer. Graduates choose from opportunities in consulting, corporate, government, not-for-profit and start-up organizations.

The program culminates with a two-semester, industry-sponsored practicum project beginning with situational analysis, then proceeding through cause and effect analysis—determining the features needed to solve the problem—and then designing, building, testing and delivering the business solution. This emphasis on experiential learning through application of classroom concepts results in graduates who are highly sought after by firms across the nation.

Continual client feedback and faculty guidance ensure project success and educational growth. Students in MIS are encouraged to broaden their business and international knowledge through a specialization in health care management, marketing, accounting, finance, operations management or international studies/foreign language. The MIS program and corporations sponsor more than 90 scholarships solely for MIS majors. Prospective students are encouraged to find out more about the MIS program by visiting cba.ua.edu/mis or calling the program office at (205) 348-5525 to set up a visit with a student ambassador or faculty member.

Admission and Retention Policies

Each prospective MIS student must submit an application verifying that all admission criteria have been met. A student is eligible for admission if he or she:

• meets the admission criteria to the upper division of the Culverhouse College of Commerce

• has completed at least 60 semester hours of college credit with a cumulative GPA of 2.5 or higher for all coursework attempted or a GPA of at least 3.0 for the last 30 hours attempted

• has completed CS 120 Business Programming I and MIS 295 Business Analysis Project Management with grades of C- or higher

MIS 295 Business Analysis Project Management is recommended for second-semester freshmen or sophomores who are interested in majoring in MIS. MIS 200 Fundamentals of Management Information Systems is an introductory course for non-majors and can be taken by freshmen.

MIS majors must complete all required MIS courses with a grade of C- or higher. A student who enrolls in any of the required MIS courses twice and fails to earn a passing grade will not be permitted to take additional MIS courses or to receive a degree with MIS as the major from The University of Alabama. Enrollment is defined as registration for a course that results in the recording of hours attempted on the student’s record. A grade of W is counted as an enrollment. Priority for enrollment in upper-division MIS courses is given to students who are not repeating the courses.

Major Program Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MIS 320</td>
<td>3</td>
</tr>
<tr>
<td>MIS 330</td>
<td>3</td>
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<tr>
<td>MIS 430</td>
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<td>MIS 431</td>
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<tr>
<td>MIS 450</td>
<td>3</td>
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<td>MIS 451</td>
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Operations Management Major

Faculty Advisors: Charles Sox and William Petty
Academic Advisor: Heather Davis

Operations management focuses on the effective management of the resources and activities that produce and deliver the goods and services of any business. OM professionals manage the people, materials, equipment and information resources that a business needs in order to produce and deliver its goods and services. They also design and manage the business processes and activities that actually produce those goods and services.

Business operations are a critical element of every business, so there are a wide range of opportunities for OM professionals. Manufacturing management has been—and continues to be—a significant area of opportunity. The tremendous growth of the automotive industry in the state of Alabama has produced great job opportunities for OM professionals with major automobile manufacturers and their suppliers. OM professionals can also pursue careers in the distribution and warehousing of products, as well as transportation and logistics operations. The entire field of supply chain management relies heavily on the effective management and coordination of business operations, from manufacturing to transportation and distribution. Whether products sold in the U.S. are manufactured overseas or in the U.S., some part of the supply chain is operated and managed in the U.S.

The growth of service industries in the state (banking, for example) also provides opportunities for OM professionals to manage business operations in service-oriented companies. OM professionals hold a wide range of job titles, such as materials manager, production planner, scheduler, inventory manager, transportation/logistics manager, purchasing/procurement manager, supply chain manager and quality manager. All of these positions employ OM techniques and concepts to effectively manage the resources and processes of their business operations. Because OM professionals are familiar with the resources and operations that are critical to success, they are often well-positioned for promotion to upper levels of business management. OM majors must take OM 385 Information Tech Oper Mgt to complete their core computer language requirement.

Admission and Retention Policies

Each prospective OM student must submit an application demonstrating that all criteria for admission have been met. Students are eligible for admission to the program if they meet the criteria for admission to the upper division of the College of Commerce and Business Administration. A student whose grade point average falls below these standards may petition for admission to the upper division and declare Operations Management if the student’s grade point average for the last 30 hours attempted at this institution is 2.5 or higher.
Operations Management majors must complete all required OM courses with a grade of C- or higher. A student who enrolls in any of these courses twice and fails to make a grade of C- or higher will not be permitted to take additional OM courses without special permission. Enrollment is defined as registration for a course resulting in the recording of hours attempted on the student’s record. Priority for enrollment in upper-division OM courses is given to students who are not repeating the courses.

### Major Program Requirements

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<th>Title</th>
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<tbody>
<tr>
<td>OM 310</td>
<td>Introduction Management Science</td>
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<tr>
<td>OM 321</td>
<td>Prod Planning &amp; Control</td>
<td>3</td>
</tr>
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<td>OM 375</td>
<td>Statistical Quality Control</td>
<td>3</td>
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<td>OM 420</td>
<td>Computer Simulation</td>
<td>3</td>
</tr>
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<td>OM 422</td>
<td>Operations Scheduling</td>
<td>3</td>
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<td>OM 432</td>
<td>Inventory Management</td>
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### Specializations in MIS

#### Business Information Technology

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CS 120</td>
<td>Business Programming I</td>
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<tr>
<td>CS 220</td>
<td>Business Programming II</td>
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<tr>
<td>MIS 295</td>
<td>Business Analysis Project Management</td>
<td>3</td>
</tr>
<tr>
<td>MIS 320</td>
<td>Application &amp; Information Architecture</td>
<td>3</td>
</tr>
<tr>
<td>MIS 330</td>
<td>Database Administration</td>
<td>3</td>
</tr>
<tr>
<td>MIS 340</td>
<td>Data Communication in a Global Environment</td>
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#### e-Decision Support

<table>
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<tr>
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<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MIS 200</td>
<td>Fundamentals of Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>MIS 340</td>
<td>Data Communication in a Global Environment</td>
<td>3</td>
</tr>
<tr>
<td>MIS 440</td>
<td>Decision Support Systems</td>
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### Specializations in OM

#### Production Management

Students must major in Operations Management.

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>OM 417</td>
<td>Logistics Management</td>
<td>3</td>
</tr>
<tr>
<td>OM 427</td>
<td>Purchasing and Sourcing</td>
<td>3</td>
</tr>
<tr>
<td>OM 450</td>
<td>Process Mgmt &amp; Improvement</td>
<td>3</td>
</tr>
<tr>
<td>OM 487</td>
<td>Capstone Project Seminar</td>
<td>3</td>
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#### Supply Chain Management

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>OM 417</td>
<td>Logistics Management</td>
<td>3</td>
</tr>
<tr>
<td>OM 427</td>
<td>Purchasing and Sourcing</td>
<td>3</td>
</tr>
<tr>
<td>MKT 422</td>
<td>Supply Chain Strategy</td>
<td>3</td>
</tr>
<tr>
<td>IBA 460</td>
<td>Export/Import Management</td>
<td>3</td>
</tr>
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### Specializations in Statistics

#### Business Intelligence

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>OM 310</td>
<td>Introduction Management Science</td>
<td>3</td>
</tr>
<tr>
<td>MIS 440</td>
<td>Decision Support Systems</td>
<td>3</td>
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<tr>
<td>ST 451</td>
<td>Stat Methods In Res II</td>
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<tr>
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### Faculty

- **Department Head**: Sox, Charles
- **Professors**
  - Adams, Michael
  - Chakraborti, Subha
  - Gray, Brian
  - Hale, David
  - Hale, Joanne
  - Hardin, J. Michael
  - Miller, David
- **Associate professors**
  - Barrett, Bruce
  - Kacmar, Charles
  - Keskin, Burcu
  - Lodree, Emmett
  - McManus, Denise
  - Melouk, Sharif
  - Mittenhal, John
  - Perry, Marcus
  - Raja, Uzma
- **Assistant professors**
  - Melnykov, Volodymyr
  - Porter, Michael
  - Posey, Clay
  - Zhang, Minjiao
- **Instructors**
  - Coburn, Brett
  - Doherty, Richard
  - Hogan, Robert
  - Lucas, Jeff
  - Petty, William

### Management Information Systems (MIS) Courses

- **MIS 120. Business Programming I. 3 sem. hrs.**
  First computing class designed for students that will be majoring in Management Information Systems.
  Prerequisite(s): MATH 112 or MATH 115 or MATH 121 or MATH 125 or MATH 145 or MATH 126 or MATH 146.

- **MIS 200. Fundamentals of Management Information Systems. 3 sem. hrs.**
  Business process coordination and decision making through the use of information technology will be explored, emphasizing IT use by organizations in increasingly global markets.
  Prerequisite(s): CS 102 with a grade of C- or higher; or UA Computer Science Placement Test Score of 380.

- **MIS 220. Business Programming II. 3 sem. hrs.**
  A second computing class designed for students that will be majoring in Management Information Systems.
  Prerequisite(s): CS 120 or MIS 120 or CS 150 or CBH 101.

- **MIS 295. Business Analysis Project Management. 3 sem. hrs.**
  An introduction to the fundamental concepts of business-process analysis, team-based project management, and use of information technology resources to develop information systems. Emphasis is placed on creating business value in systems ranging from transactional processing to e-commerce.
  Prerequisite(s): CS 150 or CS 120 or MIS 120
  Prerequisite(s) with concurrency: CS 120 or CS 150 or MIS 120.

- **MIS 310. Applied Organizational Information Technologies. 3 sem. hrs.**
  Students learn the IS development process and how to leverage underlying organizational IT components. Provides non-technology major students with the essentials of how IS are developed and used. Emphasis is on databases, data networks, mobile computing, and decision support.
  Prerequisite(s): CS 102 or CS 120.

- **MIS 320. Application & Information Architecture. 3 sem. hrs.**
  The study and application of software engineering, application patterns, and file structures. Students design, construct, and test software structures for effective information management.
  Prerequisite(s): MIS 295; CS 491 or CS 220 or MIS 220.
### MIS 330. Database Administration. 3 sem. hrs.
Logical data modeling, RDBMS, and their use in the business enterprise are presented. Topics include anomalies/normalization, database-connections performance, n-tier architecture, query operations, stored processes and integrity triggers, and Web applications.
Prerequisite(s): MIS 295 and CS 120 or CS 150 or MIS 120.

### MIS 340. Data Communication in a Global Environment. 3 sem. hrs.
Enabling international exchange of digital data to support business operations. Cultural, legal, security and operational requirements coupled with international standards evaluated in multiple network architectural configurations supporting transactional knowledge workers, e-business and e-commerce applications.
Prerequisite(s): MIS 200 or MIS 295; and CS 120 or CS 150 or MIS 120.

### MIS 430. Systems Analysis & Design I. 3 sem. hrs.
Intermediate-level skills in systems analysis and design techniques are presented. Emphasis is placed on systems development and delivery tools, methods, standards, and processes.
Prerequisite(s): MIS 320 and MIS 330
Prerequisite(s) with concurrency: MIS 450.

### MIS 431. Systems Analysis & Design II. 3 sem. hrs.
Advanced-level skills in systems analysis and design techniques are presented. Emphasis is placed on enterprise-level systems development, creation of tailored methodologies, creation of architectural standards, metrics, and business strategy alignment.
Prerequisite(s): MIS 340 and MIS 430 and MIS 450
Prerequisite(s) with concurrency: MIS 451.

### MIS 440. Decision Support Systems. 3 sem. hrs.
This course assesses information and process requirements to support business decisions in organizations. Students conceptualize, design, develop, and model-based information systems designed to support effective managerial decision making.
Prerequisite(s): MIS 200 or MIS 295.

Leveraging software development skills from prior MIS and CS courses, students construct, test, and deploy IT-based business solutions.
Prerequisite(s): MIS 320 and MIS 330
Prerequisite(s) with concurrency: MIS 430.

Development of advanced software engineering skills to develop, deploy, test, document, and assess large-scale IT-based business solutions. Conversion, migration, training, maintenance, and operations plans and budget are emphasized.
Prerequisite(s): MIS 340 and MIS 430 and MIS 450
Prerequisite(s) with concurrency: MIS 431.

### MIS 491. Independent Study. 1-3 sem. hr.
Students are selected through a competitive process for assignments in approved business or public-sector organizations. The internship is administered through the C&BA Office of Student Services. Students may earn degree credit for only one internship (492).

### MIS 497. Special Topics. 1-3 sem. hr.
Special topics in MIS.

### Operations Management (OM) Courses

#### OM 300. Intro Operations Management. 3 sem. hrs.
This course is an introduction to the field of operations management and addresses the design and management of the activities and resources that a firm uses to produce and deliver its products or services. Topics include operations strategy, product and process design, total quality management, statistical quality control, supply chain management, location analysis, forecasting, inventory management, operations planning, and lean/JIT business processes.
Prerequisite(s): ST 260.

#### OM 310. Introduction Management Scienc. 3 sem. hrs.
Concepts of management science and their application to decision making. Topics include linear programming, transportation models, integer programming, dynamic programming, queuing theory, decision theory, and network models.
Prerequisite(s): OM 300.

#### OM 321. Prod Planning & Contrl. 3 sem. hrs.
The planning and control of production and service systems. Attention is given to forecasting, operations planning, scheduling, materials management, and operations control.
Prerequisite(s): OM 300.

#### OM 375. Statistical Quality Control. 3 sem. hrs.
Statistical methods useful in control of quality of manufactured products. Topics include Shewhart and cumulative sum control charts; process capability analysis; and acceptance sampling procedures by attributes and variables. Emphasis is on understanding, design, implementation, and interpretation of these techniques.

#### OM 385. Information Tech Oper Mgt. 3 sem. hrs.
Introduction to the components of management information systems and applications of computer-based systems to business decisions. Open only to OM majors or by permission of the instructor. Computing proficiency is required for a passing grade in this course.
Prerequisite(s): ST 260 or ST 250 and ST 251.

#### OM 417. Logistics Management. 3 sem. hrs.
Logistics deals with the planning and control of material flows and related information in organizations. This course covers logistics systems planning, organization, and control of these activities with a special emphasis on quantitative aspects of the decisions.
Prerequisite(s): OM 300.

#### OM 420. Computer Simulation. 3 sem. hrs.
The use of simulation as a tool to understand and improve the performance of complex systems and processes. Students will learn the details of a specific simulation language. Applications to production processes and operational activities. Computing proficiency is required for a passing grade in this course.
Prerequisite(s): OM 310.

#### OM 422. Operations Scheduling. 3 sem. hrs.
A broad investigation into a variety of scheduling activities in a variety of environments. Topics include scheduling as applied to projects, job-shops, assembly lines, parallel machine systems, workforce, and transportation.
Prerequisite(s): OM 321.

#### OM 423. Inventory Management. 3 sem. hrs.
Control techniques for the large multi-item inventories frequently associated with manufacturing supply and wholesale-retail operations. The limitations and usefulness of models in actual practice.
Prerequisite(s): OM 321.

#### OM 427. Purchasing and Sourcing. 3 sem. hrs.
Course covers fundamental purchasing systems applications, supplier relations and evaluation, strategic planning in purchasing, purchasing techniques, value analysis and cost analysis.
Prerequisite(s): OM 300.

#### OM 450. Process Mgmt & Improvement. 3 sem. hrs.
An analytical study of strategies, tactics, and techniques for designing, evaluating and analyzing, controlling and improving processes. Emphasis is on topics such as Design for Flexibility, Lean, Six Sigma, Constraint Management will all be included along with process application of OM analytical tools such as simulation, queuing analysis, and value stream mapping.
Prerequisite(s): OM 300.

#### OM 487. Capstone Project Seminar. 3 sem. hrs.
Course addresses the design, operation, and continuous improvement of business operations that deliver products and services. Students will work in teams on an operations oriented project with a local company. The student teams will provide periodic reports and presentations on their project work.
Prerequisite(s): OM 300.

#### OM 492. Internship In Operations Mgt. 1-3 sem. hr.
Students are selected through a competitive process for assignments in approved business or public sector organizations.

#### OM 497. Special Topics. 1-3 sem. hr.
Special topics in OM.

### Statistics (ST) Courses

#### ST 260. Statistical Data Analysis. 3 sem. hrs.
Introduction to the use of basic statistical concepts in business applications. Topics include extensive graphing; descriptive statistics; measures of central tendency and variation; regression, including transformations for curvature; sampling techniques; designs; conditional probability; random variables; probability distributions; sampling distributions; confidence intervals; and statistical inference. Computer software applications are utilized extensively. Emphasis throughout the course in on interpretation. Computing proficiency is required for a passing grade in this course.
Prerequisite(s): MATH 112 or MATH 115 or MATH 121 or MATH 125 or MATH 126 or MATH 145 or MATH 146; and CS 102 or CS 150 or CS 120 or GES 131 or GES 145 or UA Computer Placement Test Score of 380; minimum grade of C- required in any qualifying prerequisite.
Development of fundamental concepts of organizing, exploring, and summarizing data; probability; common probability distributions; sampling and sampling distributions; estimation and hypothesis testing for means, proportions, and variances using parametric and nonparametric procedures; power analysis; goodness of fit; contingency tables. Statistical software packages are used extensively to facilitate valid analysis and interpretation of results. Emphasis is on methods and on selecting proper statistical techniques for analyzing real situations.

Analysis of variance and design of experiments, including randomization, replication, and blocking; multiple comparisons; correlation; simple and multiple regression techniques, including variable selection, detection of outliers, and model diagnostics. Statistical software packages are used extensively to facilitate valid analysis and interpretation of results. Emphasis is on appropriate analysis of data in real situations.
Prerequisite(s): ST 450 or GES 255.

ST 452. Applied Regression Analysis. 3 sem. hrs.
Data analysis using multiple linear regression, including residual plots, transformations, hypothesis tests, outlier diagnostics, analysis of covariance, variable selection techniques and co-linearity. Logistic regression uses similarly discussed for dealing with binary valued independent variables.
Prerequisite(s): ST 260.

Distributions of random variables, moments of random variables, probability distributions, joint distributions, and change of variable techniques.
Prerequisite(s): MATH 227 or MATH 247.

Theory of order statistics, point estimation, interval estimation, and hypothesis testing.
Prerequisite(s): ST 454.

ST 497. Special Topics. 1-3 sem. hr.