

# MANAGEMENT INFORMATION SYSTEMS, OPERATIONS MANAGEMENT, AND DECISION SCIENCES

**Majors:**

- Bachelor of Science in Business Administration, Management Information Systems (p. 1)
- Bachelor of Science in Business Administration, Operations and Supply Management (p. 3)

**Minors:**

- Business Analytics (p. 6)
- Business Intelligence (p. 2)
- Cyber-Security (p. 3)
- Management Information Systems (p. 3)
- Operations and Supply Management (p. 5)

The Department of Management Information Systems, Operations Management and Decision Sciences offers courses in several quantitative and systems areas, a major and a minor in management information systems, a major and minor in operations and supply management, and minors in business analytics, business intelligence and cyber-security.

**Faculty**

Jayesh Prasad, Chairperson  
 Professor Emeritus and Distinguished Service Professor: Bohlen  
 Professors Emeriti: Amsden, Hoffer, Ferratt  
 Sherman-Standard Register Professor of Cyber-security Management: Salisbury  
 Sherman-Standard Register Associate Professor of MIS: Wynn  
 Niehaus Chair in Operations Management: Kanet  
 Professors: Dunne, Enns, Gorman, Kanet, Prasad, Salisbury, Wells  
 Associate Professors: Jacobs, Wynn  
 Assistant Professors: Chen, Lee, Nittala, Raman  
 Visiting Assistant Professor: Hvalshagen  
 Lecturers: Edelmann, Hall, Wagner

## Management Information Systems

The MIS major at the University of Dayton is designed primarily to develop business systems analysts. These professionals analyze and design information systems in business organizations and marshal resources (i.e. manage projects) to bring the systems development effort to successful completion. MIS professionals also facilitate the successful operation and maintenance of organizational information systems.

The major is comprised of eighteen hours of required courses which make up the MIS core and six hours of elective courses taken for breadth. Optionally, this breadth requirement can be satisfied by completing a related minor - currently Business Intelligence or Cyber Security - or by completing a double major in another business discipline.

Related minors will change from time to time, reflecting the dynamic nature of the MIS discipline. Students should meet with their advisor to

decide whether to opt for elective courses, a related minor, or a double-major consistent with their interests and career goals.

**Faculty**

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 Lecturers: Edelmann, Hall, Wagner

## Bachelor of Science in Business Administration, Management Information Systems (MIS) minimum 125 hours

<b>Common Academic Program (CAP)</b> <sup>1</sup>		
First-Year Humanities Commons <sup>2</sup>		12 cr. hrs.
HST 103	The West & the World	
REL 103	Introduction to Religious and Theological Studies	
PHL 103	Introduction to Philosophy	
ENG 100	Writing Seminar I <sup>3</sup>	
Second-Year Writing Seminar <sup>4</sup>		0-3 cr. hrs.
ENG 200	Writing Seminar II	
Oral Communication		3 cr. hrs.
CMM 100	Principles of Oral Communication	
Mathematics		3 cr. hrs.
Social Science		3 cr. hrs.
SSC 200	Social Science Integrated	
Arts		3 cr. hrs.
Natural Sciences <sup>5</sup>		7 cr. hrs.
Crossing Boundaries		up to 12 cr. hrs.
Faith Traditions		
Practical Ethical Action Inquiry		

Integrative	
Advanced Study	
Philosophy and/or Religious Studies (6 cr. hrs.)	
Historical Studies (3 cr. hrs.) <sup>6</sup>	
Diversity and Social Justice <sup>7</sup>	3
	cr.
	hrs.
Major Capstone <sup>8</sup>	0-6
	cr.
	hrs.

<sup>1</sup> The credit hours listed reflect what is needed to complete each CAP component. However, they should not be viewed as a cumulative addition to a student's degree requirements because many CAP courses are designed to satisfy more than one CAP component (e.g., Crossing Boundaries and Advanced Studies) and may also satisfy requirements in the student's major.

<sup>2</sup> May be completed with ASI 110 and ASI 120 through the Core Program.

<sup>3</sup> May be completed with ENG 100A and ENG 100B, by placement.

<sup>4</sup> May be completed with ENG 114 or ENG 198 or ASI 120.

<sup>5</sup> Must include two different disciplines and at least one accompanying lab.

<sup>6</sup> U.S. History AP credit will not satisfy this requirement.

<sup>7</sup> May not double count with First-Year Humanities Commons, Second-Year Writing, Oral Communication, Social Science, Arts, or Natural Sciences CAP components, but may double count with courses taken to satisfy other CAP components and/or courses taken in the student's major.

<sup>8</sup> The course or experience is designed by faculty in each major; it may, or may not, be assigned credit hours.

### SBA Core Curriculum

ACC 207	Introduction to Financial Accounting	3
ACC 208	Introduction to Managerial Accounting	3
BIZ 101	Business Education Planning	1
BIZ 201	Introduction to Business	3
DSC 210	Statistics for Business I	3
DSC 211	Statistics for Business II	3
ECO 203	Principles of Microeconomics	3
ECO 204	Principles of Macroeconomics	3
ENG 370	Report & Proposal Writing	3
or ENG 371	Technical Communication	
or ENG 372	Business and Professional Writing	
FIN 301	Introduction to Financial Management	3
MGT 201	Legal Environment of Business	3
MGT 301	Organizational Behavior	3
MGT 490	Managing the Enterprise	3
MTH 128	Finite Mathematics	3
MTH 129	Calculus for Business	3
MIS 301	Information Systems in Organizations	3
MKT 301	Principles of Marketing	3
OPS 301	Survey of Operations & Supply Management	3
PHL 313	Business Ethics	3
or REL 368	Christian Ethics & the Business World	

ECO elective (300/400 level)	3
BWISE requirement	0

### Major Requirements

MIS 150	Professional Development Experiences in Information Systems	0
MIS 305	Introduction to Business Applications: Problem Solving with Visual Tools	1
MIS 325	Programming for Business Systems	4
MIS 380	Systems Analysis & Re-Engineering	3
MIS 381	Principles of Project Management	1
MIS 385	Systems Implementation with Database Management Systems	3
MIS 465	MIS Project I-Analysis & Design in Teams (This course and MIS 475 together satisfy CAP Major Capstone.)	3
MIS 475	MIS Project II-Design & Implementation in Teams (This course and MIS 465 together satisfy CAP Major Capstone.)	3

Breadth courses through electives, related minors, or double majors.	6
Total Hours	24

### Electives Option

Select two courses from:	6
MIS 366	Business Intelligence
MIS 368	Principles of Information Security Management
MIS 430	Telecommunications & Networking
MIS 460	Advanced Web Development
MIS 467	Data Warehousing
MIS 468	Internet Security
MIS 499	Independent Study in Management Information Systems

### Related Minor Option

Complete requirements for one of these two minors: (1) Business Intelligence or (2) Cyber Security

### Double Major Option

Complete the requirements for any other SBA major.

Academic electives to bring total to at least 125 credits

## Minor in Business Intelligence (BIN)

### Minor in Business Intelligence

Business Majors	
MIS 305	Introduction to Business Applications: Problem Solving with Visual Tools
MIS 366	Business Intelligence
MIS 385	Systems Implementation with Database Management Systems
MIS 467	Data Warehousing
MIS elective <sup>1</sup>	3
Total Hours	3

<sup>1</sup> Choose from DSC 375, ECO 410, ECO 441, MIS 368, MIS 460, MKT 436 or as approved by the coordinator. MIS majors must select six semester hours from this list instead of three.

Non-Business Majors	
MIS 300 or MIS 301	Survey of Management Information Systems Information Systems in Organizations
MIS 305	Introduction to Business Applications: Problem Solving with Visual Tools
MIS 366	Business Intelligence
MIS 385	Systems Implementation with Database Management Systems
MIS 467	Data Warehousing
MIS elective <sup>1</sup>	3
<b>Total Hours</b>	<b>3</b>

<sup>1</sup> Choose from DSC 375, ECO 410, ECO 441, MIS 368, MIS 360, MKT 436 or as approved by the coordinator.

## Minor in Cyber-Security (CSM)

### Minor in Cyber-Security

Business Majors		
MIS 305	Introduction to Business Applications: Problem Solving with Visual Tools	1
MIS 368	Principles of Information Security Management	3
MIS 430	Telecommunications & Networking	3
MIS 468	Internet Security	3
300/400 MIS elective <sup>1</sup>		3
<b>Total Hours</b>		<b>13</b>

Non-Business Majors		
MIS 300 or MIS 301	Survey of Management Information Systems Information Systems in Organizations	3
MIS 305	Introduction to Business Applications: Problem Solving with Visual Tools	1
MIS 368	Principles of Information Security Management	3
MIS 430	Telecommunications & Networking	3
MIS 468	Internet Security	3
300/400 MIS elective <sup>1</sup>		3
<b>Total Hours</b>		<b>16</b>

<sup>1</sup> Any 300/400 MIS course except MIS 491 (<http://catalog.udayton.edu/search/?P=MIS%20491>), MIS 492 (<http://catalog.udayton.edu/search/?P=MIS%20492>), MIS 497 (<http://catalog.udayton.edu/search/?P=MIS%20497>), MIS 498 (<http://catalog.udayton.edu/search/?P=MIS%20498>), MIS 499 (<http://catalog.udayton.edu/search/?P=MIS%20499>) or as approved by the coordinator. MIS majors must select from courses that are not required for the major.

## Minor in Management Information Systems (MIS)

### Minor in Management Information Systems

Business Majors		
MIS 305	Introduction to Business Applications: Problem Solving with Visual Tools	1
MIS 380	Systems Analysis & Re-Engineering	3
MIS 381	Principles of Project Management	1

MIS 385	Systems Implementation with Database Management Systems	3
Two 300/400 level courses <sup>1</sup>		6
<b>Total Hours</b>		<b>14</b>

<sup>1</sup> Select six additional semester hours: at least three hours must be a 300 or 400 level MIS course (excluding MIS 491, MIS 492, MIS 497, MIS 498, and MIS 499); three additional hours may be either from the list of approved relevant major courses or another 300 or 400 level MIS course (excluding those listed above). A relevant major course is one that features concepts intended to bridge between the MIS minor and the student's major. For the list of approved relevant major courses see the MIS minor coordinator. Other courses may be taken with approval of the MIS minor coordinator, in consultation with the student's major advisor(s). Currently approved relevant major courses are: ACC 401, DSC 375, ECO 410, ECO 441, MKT 436, and OPS 350.

### Non-Business Majors

MIS 300 or MIS 301	Survey of Management Information Systems Information Systems in Organizations	3
MIS 305	Introduction to Business Applications: Problem Solving with Visual Tools	1
MIS 380	Systems Analysis & Re-Engineering	3
MIS 381	Principles of Project Management	1
MIS 385	Systems Implementation with Database Management Systems	3
Two 300/400 level courses <sup>1</sup>		6
<b>Total Hours</b>		<b>14</b>

<sup>1</sup> Select six additional semester hours: at least three hours must be a 300 or 400 level MIS course (excluding MIS 491, MIS 492, MIS 497, MIS 498, and MIS 499); three additional hours may be either from the list of approved relevant major courses or another 300 or 400 level MIS course (excluding those listed above). A relevant major course is one that features concepts intended to bridge between the MIS minor and the student's major. For the list of approved relevant major courses see the MIS minor coordinator. Other courses may be taken with approval of the MIS minor coordinator, in consultation with the student's major advisor(s). Currently approved relevant major courses are: ACC 401, DSC 375, ECO 410, ECO 441, MKT 436, and OPS 350.

## Operations and Supply Management

The operations and supply management program offered by the Department of Management Information Systems, Operations Management, and Decision Sciences includes a major and a minor in operations and supply management (OPS).

Students who major or minor in operations and supply management learn how to manage the core operations of an organization. These core operations use the human, technical, and financial resources of the organization to create goods and services for customers. Operations managers apply technical and quantitative tools and techniques, together with behavioral skills, to manage the transformation of inputs into outputs desired by customers. Operations managers participate in these transformation processes in many different roles, including:

- Process improvement analyst
- Quality assurance analyst
- Purchasing manager
- Production/inventory manager
- Warehouse manager
- Service facility manager
- Operations consultant

The OPS program is selective and requires a student application process for UD internal transfer students (students transferring to the School of Business from another UD academic unit) and current School of Business students. UD students wishing to declare an OPS major must have an overall GPA of 2.8 or higher. Moreover, to declare and/or remain in the program students must earn a grade of B- or higher in the introductory course (OPS 301) and in DSC 211. Exceptions to these requirements must be approved by the Department Chair.

In addition to other requirements, the major in Operations and Supply Management requires OPS 350, Business Process Management; DSC 375, Management Science; OPS 401, Operations Planning and Control; OPS 480, Supply Chain Management Strategies; OPS 485, Capstone OPS Project I; OPS 495, Capstone OPS Project II; and six semester hours of OPS electives (at least 3 hours of electives in either OPS-or-DSC-designated courses, or permission of Department Chair).

Students who major in OPS are encouraged to consider the many OPS co-op and internship opportunities with regional firms through association with UD's Career Services. Although not a requirement, most students do combine such experiences with their program of study in OPS. Experience shows that co-oping or interning in an OPS-related assignment affords students a richer appreciation of the applicability of their coursework and adds to the already strong position OPS grads enjoy in the job market. Normally the co-op experience requires an additional year to complete the degree, but because of the flexibility in course requirements, with advanced planning it is quite possible to complete a co-op and graduate in OPS within four years.

A minor in operations and supply management is available to students who want to acquire basic skills in this area and understand that doing so will enhance their ability to manage operations in any functional area of a business. A minor in operations and supply management consists of twelve hours for students in the School of Business Administration and 21 hours for non-business students.

**Faculty**

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 Professor Emeritus and Distinguished Service Professor: Bohlen  
 Professors Emeriti: Amsden, Hoffer, Ferratt  
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 Visiting Assistant Professors: Hvalshagen  
 Lecturers: Edlmann, Hall, Wagner

## Bachelor of Science in Business Administration, Operations and Supply Management (OPS) minimum 125 hours

<b>Common Academic Program (CAP) <sup>1</sup></b>		
First-Year Humanities Commons <sup>2</sup>		12 cr. hrs.
HST 103	The West & the World	
REL 103	Introduction to Religious and Theological Studies	
PHL 103	Introduction to Philosophy	
ENG 100	Writing Seminar I <sup>3</sup>	
Second-Year Writing Seminar <sup>4</sup>		0-3 cr. hrs.
ENG 200	Writing Seminar II	
Oral Communication		3 cr. hrs.
CMM 100	Principles of Oral Communication	
Mathematics		3 cr. hrs.
Social Science		3 cr. hrs.
SSC 200	Social Science Integrated	
Arts		3 cr. hrs.
Natural Sciences <sup>5</sup>		7 cr. hrs.
Crossing Boundaries		up to 12 cr. hrs.
Faith Traditions		
Practical Ethical Action		
Inquiry		
Integrative		
Advanced Study		
Philosophy and/or Religious Studies (6 cr. hrs.)		
Historical Studies (3 cr. hrs.) <sup>6</sup>		
Diversity and Social Justice <sup>7</sup>		3 cr. hrs.
Major Capstone <sup>8</sup>		0-6 cr. hrs.

- <sup>1</sup> The credit hours listed reflect what is needed to complete each CAP component. However, they should not be viewed as a cumulative addition to a student's degree requirements because many CAP courses are designed to satisfy more than one CAP component (e.g., Crossing Boundaries and Advanced Studies) and may also satisfy requirements in the student's major.
- <sup>2</sup> May be completed with ASI 110 and ASI 120 through the Core Program.
- <sup>3</sup> May be completed with ENG 100A and ENG 100B, by placement.
- <sup>4</sup> May be completed with ENG 114 or ENG 198 or ASI 120.
- <sup>5</sup> Must include two different disciplines and at least one accompanying lab.
- <sup>6</sup> U.S. History AP credit will not satisfy this requirement.
- <sup>7</sup> May not double count with First-Year Humanities Commons, Second-Year Writing, Oral Communication, Social Science, Arts, or Natural Sciences CAP components, but may double count with courses taken to satisfy other CAP components and/or courses taken in the student's major.
- <sup>8</sup> The course or experience is designed by faculty in each major; it may, or may not, be assigned credit hours.

**SBA Core Curriculum**

ACC 207	Introduction to Financial Accounting	3
ACC 208	Introduction to Managerial Accounting	3
BIZ 101	Business Education Planning	1
BIZ 201	Introduction to Business	3
DSC 210	Statistics for Business I	3
DSC 211	Statistics for Business II	3
ECO 203	Principles of Microeconomics	3
ECO 204	Principles of Macroeconomics	3
ENG 370	Report & Proposal Writing	3
or ENG 371	Technical Communication	
or ENG 372	Business and Professional Writing	
FIN 301	Introduction to Financial Management	3
MGT 201	Legal Environment of Business	3
MGT 301	Organizational Behavior	3
MGT 490	Managing the Enterprise	3
MTH 128	Finite Mathematics	3
MTH 129	Calculus for Business	3
MIS 301	Information Systems in Organizations	3
MKT 301	Principles of Marketing	3
OPS 301	Survey of Operations & Supply Management	3
PHL 313	Business Ethics	3
or REL 368	Christian Ethics & the Business World	
ECO elective (300/400 level)		3
BWISE requirement		0

**Major Requirements**

24

DSC 375	Management Science	3
OPS 350	Business Process Management	3
OPS 401	Operations Planning & Control	3
OPS 480	Supply Chain Management Strategies	3
OPS 485	Capstone Operations & Supply Management Project I (This course and OPS 495 together satisfy CAP Major Capstone.)	1

OPS 495	Capstone Operations & Supply Management Project II (This course and OPS 485 together satisfy CAP Major Capstone.)	5
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OPS electives		6
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Academic electives to bring total to at least 125 credits

## Minor in Operations and Supply Management (OPS)

**Operations and Supply Management**

Business Majors		
DSC 375	Management Science	3
OPS 350	Business Process Management	
OPS 401	Operations Planning & Control	
or OPS 480	Supply Chain Management Strategies	
Select three semester hours from DSC, OPS, MIS, or IET <sup>1</sup>		3
Total Hours		6

<sup>1</sup> Approved by the department chairperson.

Non-Business Majors

DSC 210	Statistics for Business I	3
DSC 211	Statistics for Business II	3
DSC 375	Management Science	3
OPS 300	Introduction to Operations & Supply Management	3
or OPS 301	Survey of Operations & Supply Management	
OPS 350	Business Process Management	3
OPS 401	Operations Planning & Control	3
or OPS 480	Supply Chain Management Strategies	
Select three semester hours from DSC, OPS, MIS, or IET <sup>1</sup>		3
Total Hours		21

<sup>1</sup> Approved by department chairperson.

## Decision Sciences

The Department of Management Information Systems, Operations Management, and Decision Sciences offers courses in several quantitative and systems areas, a major and a minor in management information systems (see MIS), a major and minor in operations and supply management (see OPS), and minors in business analytics, business intelligence and cyber-security.

Decision sciences is the study of analysis, quantitative methodologies, and their application to the functional and behavioral problems of any organization. The major areas of study include applied statistics, operations research, and production and operations management. All business students take three decision sciences and operations management courses as part of their core business coursework.

The minor in business analytics (BAN) offers business majors and other students an opportunity to develop their skills in the quantitative methods which support managerial decision making. A minor in business analytics consists of 21 semester hours for non-business majors and 12 hours for business majors.



Specific courses in other areas (e.g. mathematics) may be used. See department chairperson for approval.

**Faculty**

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 Professors Emeriti: Amsden, Hoffer, Ferratt  
 Sherman-Standard Register Professor of Cyber-security Management: Salisbury  
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 Professors: Dunne, Enns, Gorman, Kanet, Prasad, Salisbury, Wells  
 Associate Professors: Jacobs, Wynn  
 Assistant Professors: Chen, Lee, Nittala, Raman  
 Visiting Assistant Professor: Hvalshagen  
 Lecturers: Edelmann, Hall, Wagner

**Minor in Business Analytics (BAN)**

A minor in Business Analytics consists of 12 hours for students in the School of Business Administration and 21 for non-business students.

**Business Analytics**

Business Majors		
DSC 375	Management Science	3
OPS 350	Business Process Management	
Select six semester hours from DSC, MIS, or OPS (300/400 level) <sup>1,2</sup>		6
<b>Total Hours</b>		<b>9</b>

<sup>1</sup> In addition to courses used to satisfy the requirements of any other major or minor. Approval of the department chairperson.

<sup>2</sup> OPS majors must select nine additional semester hours instead of six.

**Non-Business majors**

DSC 210	Statistics for Business I	3
DSC 211	Statistics for Business II	3
DSC 375	Management Science	3
MIS 300	Survey of Management Information Systems	3
or MIS 301	Information Systems in Organizations	
OPS 300	Introduction to Operations & Supply Management	3
or OPS 301	Survey of Operations & Supply Management	
OPS 350	Business Process Management	3
Select three semester hours from DSC, OPS or MIS (300/400 level)		3
<b>Total Hours</b>		<b>21</b>

**Management Information Systems**

First Year	Hours
MIS 150	0
BIZ 101	1
BIZ 201	3
CMM 100 (Satisfies Cap Oral Communication)	3
ECO 203	3
ECO 204	3
ENG 100 (CAP Humanities Commons)	3
HST 103 (CAP Humanities Commons)	3
MTH 128	3
MTH 129 (Satisfies CAP Mathematics)	3
PHL 103 (CAP Humanities Commons)	3

REL 103 (CAP Humanities Commons)	3
CAP Natural Science	3
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	34
<b>Second Year</b>	<b>Hours</b>
ACC 207	3
ACC 208	3
DSC 210	3
DSC 211	3
ENG 200	3
MIS 301	3
MIS 305	1
MGT 201	3
SSC 200	3
CAP Natural Science and Lab	4
MGT 301	3
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	32
<b>Third Year</b>	<b>Hours</b>
FIN 301	3,4
MIS 325	4
MIS 380	3
MIS 381	1
MIS 385	3
MKT 301	3
OPS 301	3
CAP Adv PHL/REL	3
PHL 313 or REL 368	3
CAP Arts	3
CAP Adv. HST	3
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	32-33
<b>Fourth Year</b>	<b>Hours</b>
MIS Electives/Breadth Requirements	6
MGT 490 (Satisfies CAP Integrative)	3
ENG 370, 371, or 372	3
MIS 465	3
MIS 475 (Satisfies CAP Major Capstone)	3
CAP Faith Trad.	3
CAP Div. & SJ	3
ECO Elective	3
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	27

Total credit hours: 125-126

**Operations Management**

First Year	Hours
BIZ 101	1
BIZ 201	3
MTH 128	3
MTH 129 (Satisfies CAP Mathematics)	3
ENG 100 (CAP Humanities Commons)	3
REL 103 (CAP Humanities Common)	3
HST 103 (Cap Humanities Common)	3
PHL 103 (CAP Humanities Common)	3
ECO 203	3
ECO 204	3
CMM 100 (Satisfies CAP Oral Communication)	3
CAP Natural Science	3
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	34
<b>Second Year</b>	<b>Hours</b>
ACC 207	3
ACC 208	3
DSC 210	3
DSC 211	3

ENG 200	3
MGT 201	3
OPS 301	3
SSC 200	3
MGT 301	3
CAP Natural Science & Lab	4
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	31
<b>Third Year</b>	<b>Hours</b>
DSC 375	3
FIN 301	3,4
MKT 301	3
MIS 301	3
OPS 350	3
OPS Elective	3
CAP Adv. HST	3
Adv. PHL/REL	3
CAP Arts	3
PHL 313 or REL 368	3
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	30-31
<b>Fourth Year</b>	<b>Hours</b>
MGT 490 (Satisfies CAP Integrative)	3
OPS 401	3
OPS 480	3
OPS 485	1
OPS 495 (Satisfies CAP Major Capstone)	5
OPS Elective	3
ECO Elective	3
ENG 370, 371, or 372	3
CAP Faith Trad	3
CAP Div. & SJ	3
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	30

Total credit hours: 125-126

## Decision Sciences Courses

### DSC 210. Statistics for Business I. 3 Hours

Basic concepts of statistics including descriptive statistics, probability, probability distributions, and estimation. Prerequisite(s): MTH 128, MTH 129; BIZ 200, BIZ 201 or BAI 103L (may be taken as a corequisite).

### DSC 211. Statistics for Business II. 3 Hours

Tests of hypotheses, analysis of variance, Chi-square tests, simple and multiple regression and correlation. Use of computer software for statistical data analysis. Prerequisite(s): BAI 103L or BIZ 200 or BIZ 201; DSC 210; MTH 129.

### DSC 313. Advanced Business Statistics. 3 Hours

Selected topics from advanced statistics with emphasis on business applications. Prerequisite(s): DSC 211 or equivalent.

### DSC 375. Management Science. 3 Hours

Quantitative modeling applications for managerial analysis and decision making. Develops skills to analyze and solve problems using computer-based mathematical modeling in a wide variety of business decision situations involving business functional areas such as accounting, economics, finance, human resources, marketing, management information systems, and operations management. Topics include constrained modeling techniques, simulation, and multi-criteria decision making. Prerequisite(s): DSC 211; OPS 301 or OPS 300 (may be taken as a corequisite).

### DSC 410. Decision Theory. 3 Hours

Introduction to the analysis of decisions under uncertainty. Topics include structuring of the decision process, Bayesian decision theory, and multicriteria decision making. Prerequisite(s): DSC 211 or equivalent.

### DSC 415. Simulation Modeling & Analysis. 3 Hours

Introduction to simulation models in support of business decision making. Emphasis on building and analyzing models in a variety of applications, including manufacturing and service systems. Study and use of a simulation language. Prerequisite(s): DSC 211; DSC 375 recommended.

### DSC 435. Analysis of Factory Systems. 3 Hours

Concepts and techniques for the analysis, design, and management of factory production systems. Work-flow layout, scheduling techniques, stochastic process models, simulations, and computerized factory models Prerequisite(s): DSC 375, OPS 301.

### DSC 491. Honors Thesis. 3 Hours

Selection, design, investigation, and completion of an independent original research thesis under the guidance of a departmental faculty member. Restricted to students in the University Honors Program with permission of the director of the program and the departmental chairperson.

### DSC 492. Honors Thesis. 3 Hours

Selection, design, investigation, and completion of an independent original research thesis under the guidance of a departmental faculty member. Restricted to students in the University Honors Program with permission of the director of the program and the departmental chairperson.

### DSC 494. Seminar in Decision Sciences. 3 Hours

Study of selected topics or issues in applied statistics, quantitative business analysis, and production and operations management. Topics vary from time to time. May be taken more than once if topics change. Title will reflect topics covered in a particular offering.

### DSC 497. Laboratory Work Experience. 1-6 Hours

Under faculty sponsorship and in association with a participating industrial, commercial, educational, health-care, or governmental organization, practical experience in work associated with the student's minor concentration. (See internship coordinator for details.) Does not satisfy MIS elective. Permission of chairperson required. Prerequisite(s): Permission of department chairperson.

### DSC 498. Cooperative Education. 3 Hours

Optional full-time work period off campus alternating with study period on campus. Prerequisite(s): Permission of department chairperson.

### DSC 499. Independent Study in Decision Sciences. 1-6 Hours

Research in conjunction with a faculty member on a subject within the general area of decision sciences. Normally open only to juniors and seniors who have attained a cumulative grade-point average of 3.0 or above. Permission of chairperson required. Prerequisite(s): Permission of department chairperson.

## Management Info Systems Courses

### MIS 150. Professional Development Experiences in Information Systems. 0 Hours

Participation in experiences to promote development of practical knowledge, career networks, and professional skills relevant to the field of information systems.

### MIS 203L. Introduction to Spreadsheets. 1 Hour

Introduction to electronic spreadsheet software (e.g., Microsoft Excel) skills. Prerequisite(s): BIZ 200 or BIZ 201 or permission.

**MIS 220. Exploring Careers in Information Systems. 1 Hour**

Designed to immerse students into the contemporary issues of management information systems. Site visits and guest lectures from management information systems leaders. Priority given to first and second year students. Satisfactory/No Credit. Prerequisite(s): Permission of department chairperson.

**MIS 300. Survey of Management Information Systems. 3 Hours**

Introduction to management information systems concepts, terminology, purposes, and applications for the nonbusiness student. Not open to students in the School of Business Administration or to those with credit in MIS 301. Permission of department chairperson required. Prerequisite(s): (BAI 103L or BIZ 200 or BIZ 201 or CPS 111); junior standing.

**MIS 301. Information Systems in Organizations. 3 Hours**

Survey of theory and applications of computer-based information systems in organizations. The role of information in organizational processes, current information technology, decision support systems, and end-user computing and distributed processing systems. Sophomores are encouraged to take this course during their second term. Prerequisite(s): BIZ 200 or BIZ 201 OR (ACC 207; (ACC 208 or ACC 200) (may be taken as a corequisite); ECO 203; (BAI 103L or CPS 111)). Business majors only.

**MIS 302. Systems Thinking in Organizations. 3 Hours**

Focus on understanding systems thinking, decision making, and information systems in organizations. Learn general systems concepts, system diagramming tools, and different approaches to systems thinking as a mode of inquiry. Compare modes of inquiry. Develop a learning community to build knowledge. Apply knowledge by (1) analyzing organizations as systems and the information systems and technologies used to support decision making and (2) suggesting improvements. Prerequisite(s): Completed 45 semester hours.

**MIS 303L. Using Spreadsheets in Business. 1 Hour**

Use of electronic spreadsheets (e.g., Microsoft Excel) as a tool to support business decision making. Prerequisite(s): BIZ 200 or BIZ 201 or MIS 203L or permission.

**MIS 305. Introduction to Business Applications: Problem Solving with Visual Tools. 1 Hour**

Introduction to basic programming structures, graphical user interface design, and other tools using a visual programming language such as Visual Basic.net. Prerequisite(s): BIZ 200 or BIZ 201 or BAI 103L or equivalent.

**MIS 307L. Developing Spreadsheet Applications. 1 Hour**

Application of computer programming concepts to the spreadsheet environment. Development of full-featured spreadsheet applications. Prerequisite(s): MIS 303L, MIS 305.

**MIS 325. Programming for Business Systems. 4 Hours**

Process of software development for business system implementation. Fundamental object-oriented programming concepts include program design, documentation, development, and testing of computer solutions for business problems using a modern programming language, such as Java. Prerequisite(s): MIS 305.

**MIS 360. E-Commerce Processes & Technology. 3 Hours**

Introduction to information systems technologies and techniques that enable business-to-business and business-to-consumer electronic relationships. Development of interactive websites with an introduction to client- and server-side scripting and simple database access. Prerequisite(s): (MIS 300 or MIS 301); (MIS 305 or equivalent); (BAI 103L or equivalent HTML knowledge).

**MIS 365. Protecting Personal Information Resources in an Interconnected World. 3 Hours**

In an increasingly interconnected world, threats to the confidentiality, integrity and availability of valuable information resources are increasingly salient. This creates particular challenges for the individual who wishes to put online resources to their fullest use. This course will identify threats to confidentiality, integrity and availability of information resources, and how individuals can put in place appropriate controls to protect their personal information. Some discussion of how these basic concepts apply in organizational membership will also be discussed. Not available as elective for MIS majors.

**MIS 366. Business Intelligence. 3 Hours**

The use of computer-based data analysis tools to support managers in problem solving and decision making. Prerequisite(s): DSC 211; MIS 300 or MIS 301. Corequisite(s): MIS 385.

**MIS 368. Principles of Information Security Management. 3 Hours**

Addresses issues relevant to creating a systematic information assurance, compliance control structure and systematic security procedures. Information security policy, assets, physical and logical information resource security, business continuity, and compliance with relevant security standards are covered. Prerequisite(s): MIS 300 or MIS 301.

**MIS 380. Systems Analysis & Re-Engineering. 3 Hours**

Concepts, methods, techniques, and tools needed to initiate a systems development project and to conduct the requirements collection, analysis, and structuring activities of systems development. Structured life cycle and alternatives. Re-engineering business processes through information systems. Prerequisite(s): MIS 300 or MIS 301; MIS 385 (may be taken as a corequisite); Business majors only or permission of department chairperson. Corequisite(s): MIS 381.

**MIS 381. Principles of Project Management. 1 Hour**

Introduction to project management concepts and ideas. Possible use of an existing team project from another course to learn principles of scheduling, team management, client management, etc., emphasizing best project management practices. Prerequisite(s): MIS 300 or MIS 301.

**MIS 385. Systems Implementation with Database Management Systems. 3 Hours**

Concepts, techniques, and tools to convert a logical system design into a working application using a relational DBMS. File and data structures, logical and physical database design, security and data integrity, file design and processing. DBMS functions, SQL, 3GL and 4GL access to databases, linkage to WWW pages, database architectures, CASE. Prerequisite(s): MIS 300 or MIS 301; MIS 305 (may be taken as a corequisite).

**MIS 410. Object-Oriented Analysis & Design. 3 Hours**

Introduction to object-oriented concepts and techniques for analyzing and designing systems. Systems development project using an object-oriented CASE tool. Prerequisite(s): MIS 301 or permission of instructor; MIS 305 recommended.

**MIS 420. Expert & Knowledge-Based Systems. 3 Hours**

Introduction to artificial intelligence and expert and knowledge-based systems; knowledge acquisition, implementation, and validation; advanced topics; applications to business. Use of expert system software. Prerequisite(s): BAI 103L or equivalent; DSC 375 recommended.

**MIS 425. Information for Total Quality. 3 Hours**

Theory and practice of total quality management (TQM); applications of TQM in the information systems function, information system requirements for TQM programs. Prerequisite(s): MIS 301; OPS 301.



**MIS 430. Telecommunications & Networking. 3 Hours**

Introduction to computer-based communication networks, underlying concepts; basic hardware components and operating systems; network architectures and protocols; data integrity and security; message routing; network management. Prerequisite(s): MIS 368 (may be taken as corequisite).

**MIS 460. Advanced Web Development. 3 Hours**

Study of web development concepts and techniques. Design and development of dynamic web-sites using technologies such as ASP.NET. Prerequisite(s): MIS 305 or equivalent.

**MIS 461. E-Business. 3 Hours**

Models of how to conduct business electronically. Topics include different forms of e-business, products and services provided on the Internet, how to combine electronic business with brick-and-mortar business, and keys to success for electronically enhanced businesses. Prerequisite(s): MIS 301.

**MIS 465. MIS Project I-Analysis & Design in Teams. 3 Hours**

First of a two-course sequence. Team participation/management and project management skills. Apply these skills in teams to perform an analysis and preliminary re-design of an existing organization's information system. Emphasis on written and oral communications, including team-prepared reports and presentations. Offered fall semester only. Prerequisite(s): MIS 325, MIS 380, MIS 381, MIS 385.

**MIS 467. Data Warehousing. 3 Hours**

Purpose, design, implementation, and effective use of data warehouses and data warehousing technologies. Topics include data warehouse design, data marts, data quality management, extract-transform-load process, and business intelligence. Prerequisite(s): MIS 300 or MIS 301, MIS 385.

**MIS 468. Internet Security. 3 Hours**

This course provides students with an understanding of both defensive and offensive issues of information security. The course includes instruction on information security theory, psychological operations, hacking, viruses, and systems management. The course emphasizes security for e-commerce on the Internet. Prerequisite(s): MIS 430.

**MIS 475. MIS Project II-Design & Implementation in Teams. 3 Hours**

Continuation of MIS 465. With its organizational client, each team carries its project as far as possible toward final design and actual implementation. Students are guided to reflect about how their UD educational experience has influenced understanding of their major in terms of vocation. Emphasis on written and oral communications, including team-prepared reports and presentations. Offered spring semester only. Prerequisite(s): MIS 150, MIS 465.

**MIS 491. Honors Thesis. 3 Hours**

Selection, design, investigation, and completion of an independent original research thesis under the guidance of a departmental faculty member. Restricted to students in the University Honors Program with permission of the director of the program and the departmental chairperson.

**MIS 492. Honors Thesis. 3 Hours**

Selection, design, investigation, and completion of an independent original research thesis under the guidance of a departmental faculty member. Restricted to students in the University Honors Program with permission of the director of the program and the departmental chairperson.

**MIS 494. Seminar in Management Information Systems. 1-4 Hours**

Study of selected technical and/or organizational issues in information systems. Topics vary from time to time. May be taken more than once if topics change. Title will reflect topics covered in a particular offering.

**MIS 497. Laboratory Work Experience. 1-6 Hours**

Under faculty sponsorship and in association with a participating industrial, commercial, educational, health-care, or governmental organization; practical experience in work associated with the student's major concentration. (See internship coordinator for details.) Prerequisite(s): Permission of department chairperson.

**MIS 498. Cooperative Education. 1-6 Hours**

Optional full-time work period off campus alternating with study period on campus. (See Chapter X; consult Cooperative Education Office for details.) Prerequisite(s): Permission of department chairperson.

**MIS 499. Independent Study in Management Information Systems. 1-6 Hours**

Research in conjunction with a faculty member on a subject within the general area of management information systems. Open only to juniors or seniors who have attained a cumulative grade point average of 3.0 or above. Prerequisite(s): Permission of department chairperson.

**Operations Management Courses****OPS 220. Experiences in Operations & Supply Management. 1 Hour**

Designed to immerse students into the contemporary issues of operations and supply management. Site visits and guest lectures from operations management leaders. Priority given to first and second year students. Satisfactory/No Credit. Prerequisite(s): Permission of department chairperson.

**OPS 300. Introduction to Operations & Supply Management. 3 Hours**

Concepts and OPS software-based techniques of designing, implementing, managing, and improving operations in manufacturing and service organizations, including project management, services systems design, resource allocation modeling, facility location, layout, aggregate planning, scheduling, and material requirements planning. Survey of major OPS strategies such as: just-in-time production, total quality management, business process reengineering, synchronous manufacturing, enterprise resource planning, and supply chain management. Not open to students in the School of Business Administration or to those with credit in OPS 301. Student must show aptitude in quantitative materials. Prerequisite(s): (BAI 103L or BIZ 200 or BIZ 201 or equivalent); (MTH 128, MTH 129 or equivalent); junior standing; permission of department chairperson; DSC 210 or equivalent; DSC 211 or equivalent recommended.

**OPS 301. Survey of Operations & Supply Management. 3 Hours**

Concepts and OPS software-based techniques of designing, implementing, managing, and improving operations in manufacturing and service organizations, including project management, service systems design, resource allocation modeling, facility location, layout, aggregate planning, scheduling, and material requirements planning. Survey of major OPS strategies such as: just-in-time production, total quality management, business process reengineering, synchronous manufacturing, enterprise resource planning, and supply chain management. Prerequisite(s): (BIZ 200 or BIZ 201 or BAI 151); DSC 211 (may be taken as a corequisite). Business majors only.

**OPS 350. Business Process Management. 3 Hours**

Analytical and empirical tools for evaluation of operations in manufacturing/service firms. Analytical methods may include flow diagrams, Little's Law, queuing theory, theoretical flow times, critical path networks, resource capacity, and estimates of system flow. Empirical methods include quality sampling and discrete event simulation. Students receive training in simulation software. Projects or case studies require creative problem solving for realist business problems. Prerequisite(s): DSC 211; OPS 301 or OPS 300 (may be taken as a corequisite); Business majors only or permission of department chairperson.

**OPS 401. Operations Planning & Control. 3 Hours**

Concepts and techniques in the planning and control of operations. Advanced treatment topics include: forecasting for operations, operations sequencing and scheduling, inventory and production control, production planning system design, MRP/ERP, warehouse management, purchasing and physical distribution, balanced attention to technical as well as the managerial aspects of operations planning and control. Prerequisite(s): DSC 375.

**OPS 413. Project Management. 3 Hours**

Broad coverage of technical and human management issues in projects. Emphasis on project planning, scheduling, tracking, and close-down. Task time and cost estimation and description. Use of computer software. Team building and other aspects of managing project teams. Prerequisite(s): OPS 301.

**OPS 430. Quality & Just in Time Manufacturing. 3 Hours**

The concepts of just-in-time manufacturing, total quality system, and statistical process control. Projects, tours, and guest speakers. Prerequisite(s): OPS 301.

**OPS 440. Continuous Improvement. 3 Hours**

Theory and practice of continuous improvement especially as applied in manufacturing; comparison to the traditional operations management approach, tools and techniques, the KAIZEN approach. Prerequisite(s): OPS 301.

**OPS 480. Supply Chain Management Strategies. 3 Hours**

Concepts, analytical techniques, and solution methods for designing and managing integrated supply chains. Strategic issues of integrated supply chain design and management, including inventory management, logistics network design, distribution systems, strategic alliances, value of information for centralized decisions and risk-pooling, information technology and decision support, and international supply chain management. Prerequisite(s): DSC 375; OPS 350 (may be taken as a corequisite).

**OPS 481. Principles of Procurement. 3 Hours**

Examination of strategic issues in procurement, purchasing documents and processes, the procurement cycle, supplier management programs, negotiations, sourcing, and value analysis. Prerequisite(s): OPS 301.

**OPS 485. Capstone Operations & Supply Management Project I. 1 Hour**

This course centers on the preparation for an experiential operations improvement project. Students evaluate real-world project proposals from clients, develop clear understanding of operations improvement opportunities, and select projects at hand. Student teams learn about process improvement project design and develop well-defined project plans for execution in OPS 495. Students taking OPS 485 in the fall must take OPS 495 in the subsequent spring semester. Corequisite(s): OPS 401, OPS 480.

**OPS 491. Honors Thesis. 3 Hours**

Selection, design, investigation, and completion of an independent and original research thesis under the guidance of a departmental faculty member. Restricted to students in the University Honors Program with permission of the director of the program and the departmental chairperson.

**OPS 492. Honors Thesis. 3 Hours**

Selection, design, investigation, and completion of an independent original, research thesis under the guidance of a departmental faculty member. Restricted to students in the University Honors Program with permission of the director of the program and the departmental chairperson.

**OPS 494. Seminar in Operations & Supply Management. 3 Hours**

Study of selected topics or issues in operations management. Topics vary from time to time. May be taken more than once if topics change. Title will reflect topics covered in a particular offering.

**OPS 495. Capstone Operations & Supply Management Project II. 5 Hours**

This course centers on the execution of an experiential project applying operations and supply management concepts and techniques to practical problems with faculty supervision. Student teams address significant operational problems and opportunities in real-world service and manufacturing firms. Teams write recommendation/implementation reports and make presentations of their work. Students are guided to reflect about how their UD educational experience has influenced understanding of their major in terms of vocation. Prerequisite(s): OPS 401, OPS 480, OPS 485.

**OPS 497. Laboratory Work Experience. 1-6 Hours**

Under faculty sponsorship and in association with a participating industrial, commercial, educational, health-care, government, or other organization, practical experience in work associated with the student's major. (See internship coordinator for details.) May satisfy OPS elective, with chairperson approval.

**OPS 498. Cooperative Education. 1-6 Hours**

Optional full-time work period off campus alternating with study period on campus. (See Chapter X; consult Cooperative Education Office for details). Permission of chairperson required.

**OPS 499. Independent Study in Operations & Supply Management. 1-6 Hours**

Research in conjunction with a faculty member on a subject within the general area of operations management. Normally open only to juniors and seniors who have attained a cumulative grade-point average of 3.0 or above. Permission of chairperson required.