Department of Information Systems and Cyber Security

The Department of Information Systems and Cyber Security offers two undergraduate degree programs: one with a major in Information Systems and one with a major in Cyber Security (which is also offered 100 percent online). For admission requirements for the online B.B.A. degree in Cyber Security, see http://catalog.utsa.edu/undergraduate/business/. The Department offers minors in Cyber Security, Digital Forensics, Information Systems, and Network and Data Center Management which are open to all majors in the University. In addition, the Department offers a minor in Technology Management for nonbusiness majors. A Certificate in Pathogenic Outbreak Investigations is also offered in collaboration with the Departments of Biology and Computer Science in the College of Sciences.

Department Honors

The Department of Information Systems and Cyber Security offers the opportunity for certain of its outstanding students to achieve the designation of Honors in Major and provides the opportunity for advanced study under close faculty supervision.

Selection for Honors designation is based on the student’s academic performance and recommendation by the Department Undergraduate Program Committee (UPC) in consultation with the faculty of the student’s major discipline. To be eligible for the designation, students must have a minimum overall grade point average of 3.0 at UTSA and a minimum grade point average of 3.5 in their major. To enroll in honors thesis courses and to graduate with the Honors designation, students must have departmental honors noted on the transcript, students must submit a letter of request for departmental honors to the Department Chair by Census Date of their last semester. Selection for Honors designation is based on the student’s academic performance and recommendation by the Department Undergraduate Program Committee (UPC) in consultation with the faculty of the student’s major discipline. To be eligible for the designation, students must have a minimum overall grade point average of 3.0 at UTSA and a minimum grade point average of 3.5 in their major. To enroll in honors thesis courses and to graduate with the Honors designation, students must have departmental honors noted on the transcript, students must submit a letter of request for departmental honors to the Department Chair by Census Date of their last semester.

- B.B.A. degree in Information Systems (p. 1)
- B.B.A. degree in Cyber Security (p. 3)

Bachelor of Business Administration Degree in Information Systems

The minimum number of semester credit hours for the Bachelor of Business Administration (B.B.A.) degree in Information Systems is 120, at least 39 of which must be at the upper-division level.

All candidates seeking this degree must fulfill the Core Curriculum requirements, the Common Body of Knowledge (CBK) requirements, and the degree requirements, which are listed below.

Core Curriculum Requirements (42 semester credit hours)

Students seeking the B.B.A. degree in Information Systems must fulfill University Core Curriculum requirements in the same manner as other students. The courses listed below satisfy both degree requirements and Core Curriculum requirements; however, if these courses are taken to satisfy both requirements, then students may need to take additional courses in order to meet the minimum number of semester credit hours required for this degree.

MAT 1033 should be used to satisfy the core requirement in Mathematics. ECO 2023 should be used to satisfy the core requirement in Social and Behavioral Sciences.

All degrees in the College of Business require 120 hours. If students elect to take a course that satisfies both a Core and COB requirement, students may need to take an additional course to meet the 120 hours.

Core Curriculum Component Area Requirements (http://catalog.utsa.edu/undergraduate/bachelorsdegreeregulations/ degreerequirements/corecurriculumcomponentarearequirements)

| First Year Experience Requirement | 3 |
| Communication                     | 6 |
| Mathematics                       | 3 |
| Life and Physical Sciences        | 6 |
| Language, Philosophy and Culture  | 3 |
| Creative Arts                     | 3 |
| American History                  | 6 |
| Government-Political Science      | 6 |
| Social and Behavioral Sciences    | 3 |
| Component Area Option             | 3 |
| Total Credit Hours                | 42 |

Common Body of Knowledge (CBK)

All students seeking a B.B.A. degree in the College of Business must complete the following Common Body of Knowledge (CBK) courses in addition to the Core Curriculum.

| ACC 2013 | Principles of Accounting I | 3 |
| ACC 2033 | Principles of Accounting II| 3 |
| COM 1053 | Business and Professional Speech | 3 |
| or COM 1063 | Digital Business Communication | 3 |
| ECO 2013 | Introductory Macroeconomics | 3 |
| ECO 2023 | Introductory Microeconomics (satisfies Social and Behavioral Sciences Core Curriculum requirement) | 3 |
| FIN 3013 | Principles of Business Finance | 3 |
| GBA 2013 | Legal, Social and Ethical Issues in Business | 3 |
| IS 1403 | Business Information Systems Fluency | 3 |
| IS 3003 | Principles of Information Systems for Management | 3 |
| MAT 1033 | Algebra with Calculus for Business (satisfies Mathematics Core Curriculum requirement, Actuarial Science majors must take MAT 1214 in lieu of MAT 1033) | 3 |
| MGT 3003 | Business Communication and Professional Development | 3 |
| MGT 3013 | Introduction to Organization Theory, Behavior, and Management | 3 |
MGT 4893  Management Strategy (taken in semester of graduation) 3
MKT 3013  Principles of Marketing 3
MS 1023  Business Statistics with Computer Applications I
(Actuarial Science majors must take STA 3003 in lieu of MS 1023) 3
MS 3043  Business Statistics with Computer Applications II
(Actuarial Science majors must take STA 3513 in lieu of MS 3043) 3
MS 3053  Management Science and Operations Technology 3

Note: Students must have earned at least 31 hours to enroll in any 3000 and 4000 level courses listed above.

In addition to the Core Curriculum requirements and the College of Business Common Body of Knowledge (CBK), all candidates for the degree must complete the following degree requirements.

Gateway Course
Students pursuing the B.B.A. degree in Information Systems must successfully complete the following Gateway Course with a grade of “C-” or better in no more than two attempts. A student who is unable to successfully complete this course within two attempts, including dropping the course with a grade of “W” or taking an equivalent course at another institution, will be required to change his or her major.

MAT 1033  Algebra with Calculus for Business

Degree Requirements
A. Major Requirements 24
IS 1001  Inside Cyber
IS 2031  Introduction to Programming Concepts Laboratory
IS 2033  Introduction to Programming Concepts
IS 2041  Intermediate Object-Oriented Programming Laboratory
IS 2043  Intermediate Object-Oriented Programming
IS 3063  Database Management for Information Systems
IS 3073  Application Development
IS 3413  Introduction to Telecommunications for Business
IS 4053  Systems Analysis and Design
IS 4063  Advanced Topics in Information Systems

B. Support Work in Major 9
9 semester credit hours of upper-division IS courses which may include ONE of the following courses:
MOT 4023  Essentials of Technology Management
MOT 4143  Introduction to Project Management

Total Credit Hours 33

Course Sequence Guide for B.B.A. Degree in Information Systems
This course sequence guide is designed to assist students in completing their UTSA undergraduate business degree requirements. This is a term-by-term sample course guide. Students must satisfy other requirements in their catalog and meet with their academic advisor for an individualized degree plan. Progress within this guide depends upon such factors as course availability, individual student academic preparation, student time management, work obligations, and individual financial considerations.

Students may choose to take courses during Summer terms to reduce course loads during long semesters.

Recommended Four-Year Academic Plan

First Year
Fall
Credit Hours
AIS 1203  Academic Inquiry and Scholarship (core) 3
MAT 1033  Algebra with Calculus for Business (core and CBK) 1 3
WRC 1013  Freshman Composition I (Q) (core) 3
American History (core) 3
Life & Physical Sciences (core) 3

Spring
COM 1053 or 1063  Business and Professional Speech (CBK) 3
ECO 2023  Introductory Microeconomics (core and CBK) 3
IS 1001  Inside Cyber (major) 1
IS 1403  Business Information Systems Fluency (CBK) 3
WRC 1023  Freshman Composition II (Q) (core) 3
American History (core) 3

Second Year
Fall
ACC 2013  Principles of Accounting I (CBK) 3
ECO 2013  Introductory Macroeconomics (CBK) 3
IS 2031  Introduction to Programming Concepts Laboratory (major) 1
IS 2033  Introduction to Programming Concepts (major) 3
MS 1023  Business Statistics with Computer Applications I (CBK) 3
Government-Political science (core) 3
Evaluation for Admission to the College of Business

Spring
ACC 2033  Principles of Accounting II (CBK) 3
IS 2041  Intermediate Object-Oriented Programming Laboratory (major) 1
IS 2043  Intermediate Object-Oriented Programming (major) 3
IS 3003  Principles of Information Systems for Management (CBK) 3
MS 3043  Business Statistics with Computer Applications II (CBK) 3
Language, Philosophy & Culture (core) 3

Third Year
Fall
IS 3063  Database Management for Information Systems (major) 3
IS 3413  Introduction to Telecommunications for Business (major) 3
MS 3053  Management Science and Operations Technology (CBK) 3
Creative Arts (core) 3
Government-Political Science (core) 3

Spring
FIN 3013 Principles of Business Finance (CBK) 3
IS 3073 Application Development (major) 3
MGT 3003 Business Communication and Professional Development (CBK) 3
MGT 3013 Introduction to Organization Theory, Behavior, and Management (CBK) 3
Upper-division IS elective (3XXX or 4XXX level) (major) 3

Fourth Year
Fall
GBA 2013 Legal, Social and Ethical Issues in Business (CBK) 3
IS 4053 Systems Analysis and Design (major) 3
MKT 3013 Principles of Marketing (CBK) 3
Upper-division IS elective (3XXX or 4XXX level) (major) 3
Component Area Option (core) 3

Spring
IS 4063 Advanced Topics in Information Systems (major) 3
MGT 4893 Management Strategy (CBK) 3
Upper-division IS elective (3XXX or 4XXX level) (major) 3
Life & Physical Sciences (core) 3

Total Credit Hours: 120.0

1 College of Business students should take MAT 1033 and ECO 2023 to satisfy both Core Curriculum and CBK requirements.

Bachelor of Business Administration Degree in Cyber Security

The minimum number of semester credit hours for the Bachelor of Business Administration (B.B.A.) degree in Cyber Security is 120, at least 39 of which must be at the upper-division level.

All candidates seeking this degree must fulfill the Core Curriculum requirements, the Common Body of Knowledge (CBK) requirements, and the degree requirements, which are listed below.

Core Curriculum Requirements (42 semester credit hours)

Students seeking the B.B.A. degree in Cyber Security must fulfill University Core Curriculum requirements in the same manner as other students. The courses listed below satisfy both degree requirements and Core Curriculum requirements; however, if these courses are taken to satisfy both requirements, then students may need to take additional courses in order to meet the minimum number of semester credit hours required for this degree.

MAT 1033 should be used to satisfy the core requirement in Mathematics. ECO 2023 should be used to satisfy the core requirement in Social and Behavioral Sciences.

Core Curriculum Component Area Requirements (http://catalog.utsa.edu/undergraduate/bachelorsdegreeregulations/degreerequirements/corecurriculumcomponentarearequirements)

| First Year Experience Requirement | 3 |
| Communication                     | 6 |
| Mathematics                       | 3 |
| Life and Physical Sciences        | 6 |
| Language, Philosophy and Culture  | 3 |
| Creative Arts                     | 3 |
| American History                  | 6 |
| Government-Political Science      | 6 |
| Social and Behavioral Sciences    | 3 |
| Component Area Option             | 3 |

Total Credit Hours: 42

Common Body of Knowledge (CBK)

All students seeking a B.B.A. degree in the College of Business must complete the following Common Body of Knowledge (CBK) courses in addition to the Core Curriculum.

ACC 2013 Principles of Accounting I 3
ACC 2033 Principles of Accounting II 3
COM 1053 Business and Professional Speech 3
or COM 1063 Digital Business Communication 3
ECO 2013 Introductory Macroeconomics 3
ECO 2023 Introductory Microeconomics (satisfies Social and Behavioral Sciences Core Curriculum requirement) 3
FIN 3013 Principles of Business Finance 3
GBA 2013 Legal, Social and Ethical Issues in Business 3
IS 1403 Business Information Systems Fluency 3
IS 3003 Principles of Information Systems for Management 3
MAT 1033 Algebra with Calculus for Business (satisfies Mathematics Core Curriculum requirement, Actuarial Science majors must take MAT 1214 in lieu of MAT 1033) 3
MGT 3003 Business Communication and Professional Development 3
MGT 3013 Introduction to Organization Theory, Behavior, and Management 3
MGT 4893 Management Strategy (taken in semester of graduation) 3
MKT 3013 Principles of Marketing 3
MS 1023 Business Statistics with Computer Applications I (Actuarial Science majors must take STA 3003 in lieu of MS 1023) 3
MS 3043 Business Statistics with Computer Applications II (Actuarial Science majors must take STA 3513 in lieu of MS 3043) 3
MS 3053 Management Science and Operations Technology 3

Note: Students must have earned at least 31 hours to enroll in any 3000 and 4000 level courses listed above.

In addition to the Core Curriculum requirements and the College of Business Common Body of Knowledge (CBK), all candidates for the degree must complete the following degree requirements.
Gateway Course

Students pursuing the B.B.A. degree in Cyber Security must successfully complete the following Gateway Course with a grade of “C-” or better in no more than two attempts. A student who is unable to successfully complete this course within two attempts, including dropping the course with a grade of “W” or taking an equivalent course at another institution, will be required to change his or her major.

MAT 1033 Algebra with Calculus for Business

Degree Requirements

A. Major Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 1001</td>
<td>3</td>
</tr>
<tr>
<td>IS 2031</td>
<td>3</td>
</tr>
<tr>
<td>IS 2033</td>
<td>3</td>
</tr>
<tr>
<td>IS 2041</td>
<td>3</td>
</tr>
<tr>
<td>IS 2043</td>
<td>3</td>
</tr>
<tr>
<td>IS 3033</td>
<td>3</td>
</tr>
<tr>
<td>IS 3413</td>
<td>3</td>
</tr>
<tr>
<td>IS 3423</td>
<td>3</td>
</tr>
<tr>
<td>IS 3513</td>
<td>3</td>
</tr>
</tbody>
</table>

B. Support Work in Major

12 semester credit hours of upper-division IS courses which may include ONE of the following MOT courses. IS courses must be approved Cyber Security content.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOT 4023</td>
<td>3</td>
</tr>
<tr>
<td>MOT 4143</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 33

Course Sequence Guide for B.B.A. Degree in Cyber Security

This course sequence guide is designed to assist students in completing their UTSA undergraduate business degree requirements. This is a term-by-term sample course guide. Students must satisfy other requirements in their catalog and meet with their academic advisor for an individualized degree plan. Progress within this guide depends upon such factors as course availability, individual student academic preparation, student time management, work obligations, and individual financial considerations. Students may choose to take courses during Summer terms to reduce course loads during long semesters.

Recommended Four-Year Academic Plan

First Year

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS 1203</td>
<td>3</td>
</tr>
<tr>
<td>MAT 1033</td>
<td>3</td>
</tr>
<tr>
<td>WRC 1013</td>
<td>3</td>
</tr>
<tr>
<td>American History (core)</td>
<td>3</td>
</tr>
<tr>
<td>Life &amp; Physical Sciences (core)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 1053 or 1063</td>
<td>3</td>
</tr>
</tbody>
</table>

Second Year

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 2013</td>
<td>3</td>
</tr>
<tr>
<td>ECO 2013</td>
<td>3</td>
</tr>
<tr>
<td>IS 2031</td>
<td>1</td>
</tr>
<tr>
<td>IS 2033</td>
<td>3</td>
</tr>
<tr>
<td>MS 1023</td>
<td>3</td>
</tr>
<tr>
<td>Government-Political Science (core)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 2033</td>
<td>3</td>
</tr>
<tr>
<td>IS 2041</td>
<td>1</td>
</tr>
<tr>
<td>IS 2043</td>
<td>3</td>
</tr>
<tr>
<td>IS 3003</td>
<td>3</td>
</tr>
<tr>
<td>IS 3413</td>
<td>3</td>
</tr>
<tr>
<td>MS 3043</td>
<td>3</td>
</tr>
</tbody>
</table>

Third Year

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 3033</td>
<td>3</td>
</tr>
<tr>
<td>IS 3513</td>
<td>3</td>
</tr>
<tr>
<td>MS 3053</td>
<td>3</td>
</tr>
<tr>
<td>Government-Political Science (core)</td>
<td>3</td>
</tr>
<tr>
<td>Language, Philosophy &amp; Culture (core)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS 3423</td>
<td>3</td>
</tr>
<tr>
<td>MGT 3003</td>
<td>3</td>
</tr>
<tr>
<td>FIN 3013</td>
<td>3</td>
</tr>
<tr>
<td>Upper-division IS elective (major) (must be approved Cyber Security content)</td>
<td>3</td>
</tr>
<tr>
<td>Life &amp; Physical Sciences (core)</td>
<td>3</td>
</tr>
</tbody>
</table>

Fourth Year

**Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBA 2013</td>
<td>3</td>
</tr>
<tr>
<td>MGT 3013</td>
<td>3</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 3013</td>
<td>3</td>
</tr>
</tbody>
</table>

1. Core and CBK

2. Upper-division IS elective (major) (must be approved Cyber Security content)
MKT 3013 Principles of Marketing (CBK) 3
Upper-division IS elective (major) (must be approved 3
Cyber Security content)
Creative Arts (core) 3
Spring
MGT 4893 Management Strategy (CBK) 3
Upper-division IS elective (major) (must be approved 3
Cyber Security content)
Upper-division IS elective (major) (must be approved 3
Cyber Security content)
Component Area Option (core) 3

Total Credit Hours: 120.0

1 College of Business students should take MAT 1033 and ECO 2023 to satisfy both Core Curriculum and CBK requirements.

• Minor in Cyber Security (p. 5)
• Minor in Digital Forensics (p. 5)
• Minor in Information Systems (p. 5)
• Minor in Network and Data Center Management (p. 5)
• Minor in Technology Management for Nonbusiness Majors (p. 6)

Minor in Cyber Security

The Minor in Cyber Security is open to all majors in the University. A student majoring in Information Systems will be required to take 18 semester credit hours of coursework. Other majors may be required to take additional hours depending on their academic background.

A. Required courses 12
IS 3413 Introduction to Telecommunications for Business
IS 3423 Network Security
IS 3513 Information Assurance and Security
IS 3523 Intrusion Detection and Incident Response

B. Elective courses 6
Select two of the following:
IS 3033 Operating Systems Security
IS 3433 Introduction to Digital Forensics
IS 3453 Networking Fundamentals
IS 3533 Cyber Law and Legal System
IS 4033 Network Operations
IS 4143 Wide Area Networks
IS 4223 Emerging Network Technologies
IS 4463 Web Application Security
IS 4473 Information Assurance Policy
IS 4483 Digital Forensic Analysis I
IS 4513 Cyber and Physical Systems
IS 4523 Digital Forensic Analysis II

Total Credit Hours 18

To declare a Minor in Cyber Security, obtain advice, or seek approval of course substitutions for course requirements, students must consult their academic advisor.

Minor in Digital Forensics

The Minor in Digital Forensics is open to all majors in the University. A student majoring in Information Systems will be required to take 18 semester credit hours of coursework. Other majors may be required to take additional hours depending on their academic background.

A. Required courses 18
IS 3433 Introduction to Digital Forensics
IS 3513 Information Assurance and Security
IS 3523 Intrusion Detection and Incident Response
IS 3533 Cyber Law and Legal System
IS 4483 Digital Forensic Analysis I
IS 4523 Digital Forensic Analysis II

Total Credit Hours 18

To declare a Minor in Digital Forensics, obtain advice, or seek approval of course substitutions for course requirements, students must consult their academic advisor.

Minor in Information Systems

The Minor in Information Systems is open to all majors in the University. The number of semester credit hours required for a student in the College of Business is 19. Other students may be required to take additional hours depending on their academic background.

A. Required courses 16
IS 2041 Intermediate Object-Oriented Programming Laboratory
IS 2043 Intermediate Object-Oriented Programming
IS 3003 Principles of Information Systems for Management
IS 3063 Database Management for Information Systems
IS 3413 Introduction to Telecommunications for Business
IS 4053 Systems Analysis and Design

B. Elective course 3
Select one of the following:
MOT 4023 Essentials of Technology Management
MOT 4143 Introduction to Project Management
Any IS junior- or senior-level course that counts for the IS major

Total Credit Hours 19

To declare a Minor in Information Systems, obtain advice, or seek approval of course substitutions for course requirements, students must consult their academic advisor.

Minor in Network and Data Center Management

The Minor in Network and Data Center Management is open to all majors in the University. A student majoring in Information Systems or Cyber Security will be required to take 21 semester credit hours of coursework. Other majors may be required to take additional hours depending on their academic background.

A. Required courses 21
IS 3453 Networking Fundamentals
IS 3513 Information Assurance and Security
IS 3523 Intrusion Detection and Incident Response

To declare a Minor in Network and Data Center Management, obtain advice, or seek approval of course substitutions for course requirements, students must consult their academic advisor.

Minor in Technology Management for Nonbusiness Majors

The Minor in Technology Management for Nonbusiness Majors is open to all majors in the University. The number of semester credit hours required for a student in the College of Business is 20. Other students may be required to take additional hours depending on their academic background.

A. Required courses 17
IS 2041 Intermediate Object-Oriented Programming Laboratory
IS 2043 Intermediate Object-Oriented Programming
IS 3003 Principles of Information Systems for Management
IS 3063 Database Management for Information Systems
IS 3413 Introduction to Telecommunications for Business
IS 3513 Information Assurance and Security
IS 3523 Intrusion Detection and Incident Response
IS 3533 Cyber Law and Legal System
IS 4483 Digital Forensic Analysis I
IS 4523 Digital Forensic Analysis II

Total Credit Hours 20

To declare a Minor in Technology Management for Nonbusiness Majors, obtain advice, or seek approval of course substitutions for course requirements, students must consult their academic advisor.
To declare a Minor in Network and Data Center Management, obtain advice, or seek approval of course substitutions for course requirements, students must consult with their academic advisor.

Minor in Technology Management for Nonbusiness Majors

The Minor in Technology Management for Nonbusiness Majors is only open to nonbusiness majors in the University. The number of required semester credit hours for this minor is 18.

A. Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 2003</td>
<td>Foundations of Accounting</td>
</tr>
<tr>
<td>FIN 3003</td>
<td>Survey of Finance</td>
</tr>
<tr>
<td>MKT 3013</td>
<td>Principles of Marketing</td>
</tr>
<tr>
<td>MOT 4023</td>
<td>Essentials of Technology Management</td>
</tr>
<tr>
<td>MOT 4143</td>
<td>Introduction to Project Management</td>
</tr>
</tbody>
</table>

B. Elective course

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT 3013</td>
<td>Introduction to Organization Theory, Behavior, and Management</td>
</tr>
<tr>
<td>MOT 4203</td>
<td>Strategic Management of Technology and Innovation</td>
</tr>
<tr>
<td>MOT 4313</td>
<td>Disruptive Innovations</td>
</tr>
<tr>
<td>MS 3403</td>
<td>Logistics Management</td>
</tr>
</tbody>
</table>

To declare a Minor in Technology Management, obtain advice, and seek approval of course substitutions for course requirements, students must consult with their academic advisor.

Certificate in Pathogenic Outbreak Investigations

This interdisciplinary certificate program is designed for students in biology, information systems and cyber security, computer science and computer engineering disciplines to investigate biological and digital pathogen identification, propagation prediction, and mitigation. The required capstone project reinforces the cross-disciplinary learning fostered by the program and provides real-world practice.

This certificate is open only to biology, information systems and cyber security, computer science, and computer engineering majors. To apply for the Pathogenic Outbreak Investigations certificate, students should consult with the Director of the Office of Undergraduate Research for specific information about certificate requirements and consult with their academic advisors to verify that they have met all University requirements. All courses used to satisfy the requirements of this undergraduate certificate program must be college-level courses taken at UTSA. Students must fulfill all prerequisite requirements for elective courses.

Students pursuing the Certificate in Pathogenic Outbreak Investigations must complete a minimum of 15 semester credit hours:

A. Courses required by all majors:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Pathogenic Outbreak Investigations</td>
<td>3</td>
</tr>
<tr>
<td>BIO 4953 Special Studies in Biology</td>
<td></td>
</tr>
<tr>
<td>or CS 4953 Special Studies in Computer Science</td>
<td></td>
</tr>
<tr>
<td>or IS 4953 Special Studies in Information Systems</td>
<td></td>
</tr>
</tbody>
</table>

B. Required course according to major:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 3953</td>
<td>Special Studies in Biology (Topic: Cloud-oriented Big Data and Software Engineering)</td>
</tr>
<tr>
<td>IS 4953</td>
<td>Special Studies in Information Systems (Topic: Malware Agent Analysis)</td>
</tr>
</tbody>
</table>

C. Elective courses for each major. Select 6 hours from one of the following groups depending on major:

**Biology elective options**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 3513</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>BIO 3743</td>
<td>Bacteriology</td>
</tr>
<tr>
<td>BIO 4743</td>
<td>Immunology</td>
</tr>
<tr>
<td>BIO 5762</td>
<td>Fundamentals of Immunology for Biotechnology</td>
</tr>
<tr>
<td>BIO 6973</td>
<td>Special Problems (Comparative Genomics)</td>
</tr>
<tr>
<td>BIO 6973</td>
<td>Special Problems (Microbial Genomics)</td>
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**Information Systems/Cyber Security elective options**

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<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>IS 3523</td>
<td>Intrusion Detection and Incident Response</td>
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<td>IS 4463</td>
<td>Web Application Security</td>
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<td>IS 4483</td>
<td>Digital Forensic Analysis I</td>
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<td>IS 4513</td>
<td>Cyber and Physical Systems</td>
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<tr>
<td>IS 4523</td>
<td>Digital Forensic Analysis II</td>
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**Computer Science elective options**

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<tr>
<th>Course Code</th>
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<tr>
<td>CS 3753</td>
<td>Introduction to Data Science</td>
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<td>CS 4223</td>
<td>Bioinformatics and Big Data</td>
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<tr>
<td>CS 4353</td>
<td>Unix and Network Security</td>
</tr>
<tr>
<td>CS 4373</td>
<td>Introduction to Data Mining</td>
</tr>
<tr>
<td>CS 4593</td>
<td>Topics in Computer Science</td>
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<td>CS 4843</td>
<td>Introduction to Cloud Computing</td>
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<tr>
<td>CS 4963</td>
<td>Advanced Topics in Systems and Cloud</td>
</tr>
<tr>
<td>CS 4973</td>
<td>Advanced Topics in Data Science</td>
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Total Credit Hours 15

Undergraduate biology students are permitted to take graduate courses based on need, student background/capability, and instructor consent.
Information Systems (IS) Courses

IS 1001. Inside Cyber. (1-0) 1 Credit Hour.
An introduction to the cyber world with emphases on the security, business, technology, and career aspects of cyber. This course offers a high-level overview of the potential benefits of information systems and technology, along with the associated challenges and risks.

IS 1403. Business Information Systems Fluency. (3-0) 3 Credit Hours. (TCCN = BCIS 1305)
Required course for all students majoring in Business at UTSA. This three-credit course concentrates on a set of core computing skills that are essential to student success, such as using e-mail, word processing, spreadsheets, basic data management, presentation software and on- and off-campus Internet resources. This is a Web-based course. Instructions and exams are accomplished through the use of a computer. Generally offered: Fall, Spring, Summer.

IS 1503. Introduction to Cyber Security. (3-0) 3 Credit Hours.
An introduction to the principles and best practices for cyber security. This course addresses the fundamental aspects of computer and network security. Issues concerning home computer security, internet security, privacy, viruses and worms, spam, and ethics will be included in this course. Public Component software will be used to illustrate the principles discussed in the class.

IS 2031. Introduction to Programming Concepts Laboratory. (0-2) 1 Credit Hour.
Prerequisite: Concurrent enrollment in, or completion of, IS 2033 or an equivalent with a grade of "C-" or better. Laboratory accompanies IS 2033. The laboratory uses an object-oriented programming language and software development tools to develop basic applications that underline the concepts learned in IS 2033. Generally offered: Fall, Spring, Summer.

IS 2033. Introduction to Programming Concepts. (3-0) 3 Credit Hours.
Prerequisite: Concurrent enrollment in, or completion of, IS 2031 or an equivalent with a grade of "C-" or better. An introduction to programming concepts with an object-oriented language. Addresses basic elements of programming concepts and object-oriented programming principles which include control structures, arithmetic and logical operators, classes and objects, methods and class behavior, arrays, ArrayList, and a brief introduction to GUIs (graphical user interfaces) and exception handling. Generally offered: Fall, Spring, Summer.

IS 2041. Intermediate Object-Oriented Programming Laboratory. (0-2) 1 Credit Hour.
Prerequisites: Concurrent enrollment in IS 2043 and completion of IS 2031 and IS 2033, or their equivalents, with a grade of "C-" or better; or completion of IS 2043 or an equivalent with a grade of "C-" or better. Laboratory accompanies IS 2043. Laboratory uses an object-oriented programming language and software development tools to develop applications that underline the concepts learned in IS 2043. Generally offered: Fall, Spring, Summer.

IS 2043. Intermediate Object-Oriented Programming. (3-0) 3 Credit Hours.
Prerequisites: Concurrent enrollment in IS 2041 and completion of IS 2031 and IS 2033, or their equivalents, with a grade of "C-" or better; or completion of IS 2041 or an equivalent with a grade of "C-" or better. An object-oriented programming course designed to reinforce introductory object-oriented principles learned in IS 2033 and focus on concepts including inheritance, polymorphism, exception handling, data structures, searching and sorting, recursion, generic collections, file processing, object serialization, regular expressions, and GUIs (graphical user interfaces). Generally offered: Fall, Spring, Summer.

IS 3003. Principles of Information Systems for Management. (3-0) 3 Credit Hours.
Prerequisite: IS 1403 with a grade of "C-" or better. An analysis of managerial/organizational information needs. Systematic procedures for developing information systems are covered. Includes coverage of hardware and software tools, information structures, and formal problem-solving techniques. Issues related to organizational controls, security, and globalization as a result of changing technologies are discussed. Cases will be assigned to illustrate the use of specific tools and techniques for problem solving. Generally offered: Fall, Spring, Summer.

IS 3033. Operating Systems Security. (3-0) 3 Credit Hours.
Prerequisites: IS 2031, IS 2033, and IS 3413 with a grade of "C-" or better, or consent of instructor. Department Chair, and Dean of the College. This course examines the role of computer operating systems in the overall vulnerability of the network. A comparison of the more popular operating systems will be used to illustrate the concepts to the class.

IS 3043. Mobile Application Development. (3-0) 3 Credit Hours.
Prerequisites: IS 2041 and IS 2043 with a grade of "C-" or better. As mobile devices such as smartphones and tablets become ubiquitous, the demand for developers who specialize in mobile technology also surges. This course will cover the fundamental design principles, programming techniques, and user experience considerations underlying mobile apps and their development environments. To bring these concepts alive, the course will involve hands-on examples from popular mobile platforms such as Android, iOS, and Windows Phone. Students will complete projects that focus on building real-world mobile apps on these platforms and learn how to take their mobile apps to market.

IS 3063. Database Management for Information Systems. (3-0) 3 Credit Hours.
Prerequisites: IS 2041 and IS 2043 with a grade of "C-" or better. A study of database management systems (DBMS) features, functions, and architecture, including logical design, data models, normalization, object-oriented data, and database administration. A DBMS product will be used to illustrate principles. Generally offered: Fall, Spring.

IS 3073. Application Development. (3-0) 3 Credit Hours.
Prerequisites: IS 2041 and IS 2043 with a grade of "C-" or better. A study of the use of information systems techniques to solve managerial problems. Includes cases where students are asked to design and implement information systems that address various classes of analytic problems. Principles of decision theory are addressed. Generally offered: Fall, Spring.

IS 3043. Introduction to Telecommunications for Business. (3-0) 3 Credit Hours.
Includes an in-depth look at basic telecommunications terminology and concepts. Introduction to voice and data networks, signaling and multiplexing. Network topologies and protocol fundamentals and architectures are presented and compared. Ethernet, IEEE 802.11x, TCP/IP, dedicated circuit, and VPN technologies are introduced. Network security fundamentals are explored. Generally offered: Fall, Spring.
IS 3423. Network Security. (3-0) 3 Credit Hours.
Prerequisite: IS 3413 with a grade of "C-" or better or consent of instructor, Department Chair, and Dean of the College. The course provides a foundation in networking technologies that are core to creating secure networks. Topics included in this course are basic cryptography, secure networking protocols, logical and physical security management and security devices. Relation between these technologies and operational and implementation issues for these technologies will also be discussed. (Formerly titled "Secure Network Design.") Generally offered: Fall, Spring.

IS 3433. Introduction to Digital Forensics. (3-0) 3 Credit Hours.
The digital forensic investigation process involves organizational preparation, incident response, data collection, data analysis, and communication of findings. This course will teach students how to prepare for incidents, how to respond to incidents, and how to reliably collect digital data. Students will be introduced to various types of storage media and sources of volatile data. Students will also be introduced to forensic accounting principles and practices as well as fundamental legal issues related to digital forensics.

IS 3453. Networking Fundamentals. (3-0) 3 Credit Hours.
Prerequisite: IS 3413 with a grade of "C-" or better or consent of instructor, Department Chair, and Dean of the College. This course will focus on the principles of telecommunication with particular emphasis on networking. Networking and transmission protocols will be emphasized. Both IPv4 and IPv6 will be included. This class will also include the hardware side of the network. The role of servers, switches and routers will be included. Security will be introduced.

IS 3513. Information Assurance and Security. (3-0) 3 Credit Hours.
This course provides an in-depth presentation of information assurance topics such as fraud, eavesdropping, traffic analysis, intrusion detection and prevention, hacking, viruses, and cryptography. Risk management will also be discussed. (Formerly IS 4453. Credit cannot be earned for both IS 3513 and IS 4453.) Generally offered: Fall, Spring.

IS 3523. Intrusion Detection and Incident Response. (3-0) 3 Credit Hours.
Prerequisite: IS 3513 with a grade of "C-" or better. This course provides an in-depth look at intrusion detection methodologies and tools and the approaches to handling intrusions when they occur; examines the laws that address cybercrime and intellectual property issues; and includes a study of proper computer and network forensics procedures to aid in the identification and tracking of intruders and in the potential prosecution of criminal activity. Generally offered: Spring.

IS 3533. Cyber Law and Legal System. (3-0) 3 Credit Hours.
An introductory course in laws and legal issues that affect law enforcement, businesses, and investigators related to the preservation, collection, and analysis of digital data. Students will examine computer crime laws, civil and criminal laws that often involve electronic evidence, search and seizure of electronic evidence, judicial issues involving the admissibility of electronic evidence and related testimony, and legal issues involved with electronic surveillance. (Formerly titled "Cyber Law").

IS 4033. Network Operations. (3-0) 3 Credit Hours.
Prerequisite: IS 3453 with a grade of "C-" or better or consent of instructor, Department Chair, and Dean of the College. The course will explore the fundamentals of operating a network. Issues to be included are physical security, electrical and air conditioning issues, data storage and retention, and backup and redundancy of data. Other topics include floor loading, patch management, converting user requirements to system requirements and disaster recovery.

IS 4053. Systems Analysis and Design. (3-0) 3 Credit Hours.
Prerequisites: IS 3063 with a grade of "C-" or better and MGT 3003. An introduction to systems theory and development techniques. Topics include problem definition, system development life cycle, feasibility analyses, project management, system models and CASE tools. Generally offered: Fall, Spring.

IS 4063. Advanced Topics in Information Systems. (3-0) 3 Credit Hours.
Prerequisites: MGT 3003 and 15 semester credit hours of information systems courses (excluding IS 1403 and IS 3003). Survey of recent developments in information technology. Analysis will focus on applications in the business community and theoretical developments that relate to those applications. Ordinarily taken during semester of graduation. Generally offered: Fall, Spring, Summer.

IS 4103. Business Process Management and Control. (3-0) 3 Credit Hours.
Prerequisite: IS 3003. Business professionals are frequently responsible for designing, implementing, supporting and managing technology-based business processes in organizations. In order to accomplish those tasks, these professionals must understand the business processes that support an organization and how they are controlled. This course contributes to the student’s understanding of how key business processes are managed, controlled and integrated in enterprise resource planning systems. SAP will be used to illustrate the concepts discussed in the class. (Same as ACC 4103. Credit cannot be earned for both IS 4103 and ACC 4103.)

IS 4143. Wide Area Networks. (3-0) 3 Credit Hours.
Prerequisites: IS 3413 with a grade of "C-" or better and MGT 3003 or consent of instructor, Department Chair, and Dean of the College. This course explores the telecommunication technologies used in wide area networks. Technologies such as frame relay, ATM, TCP/IP, and voice over IP will be studied. The role of the common carriers will also be discussed. Secure network traffic over TCP/IP will be included.

IS 4153. Web Site Development. (3-0) 3 Credit Hours.
Prerequisites: IS 3073 with a grade of "C-" or better and MGT 3003 or consent of instructor, Department Chair, and Dean of the College. A study of issues related to the use of electronic networks to facilitate inter- and intra-organizational business activities. The principles of Web site design from the consumer and the information systems points of view will be presented. The course will also include the development of a Web site. (Formerly titled "Electronic Commerce").

IS 4183. Advanced Database Concepts. (3-0) 3 Credit Hours.
Prerequisites: IS 3063 with a grade of "C-" or better and MGT 3003. In-depth consideration of concepts governing the design and management of database systems. Topics include database design, distributed databases, database administration, object-oriented data modeling, and performance evaluation.
IS 4213. Data Center Infrastructure Planning. (3-0) 3 Credit Hours.
Prerequisite: IS 4033 with a grade of "C-" or better or consent of instructor, Department Chair, and Dean of the College. The purpose of this class will be to explore the electrical power, air conditioning, and fire suppressant requirements of a data center. Electrical grids, standby generators, and uninterruptible power supplies will be discussed. The course explores the various aspects of power quality, interruption of service, voltage flicker and control, voltage swells and sags and power surges. Air conditioning requirements and methods will also be included. Fire suppressant techniques will also be part of the class. A comprehensive project involving the design of the data center to include these three major issues will be part of the class. (Formerly titled "Power and Air Conditioning").

IS 4223. Emerging Network Technologies. (3-0) 3 Credit Hours.
Prerequisite: IS 3453 with a grade of "C-" or better or consent of instructor, Department Chair, and Dean of the College. Cloud computing has become popular in industry. This class will look at what it is and how it works. How cloud computing interfaces with current networks, computing ability and storage requirements will be discussed. Security issues will be an important part of the course. Other topics include virtual machines, storage area networks and remote systems management.

IS 4233. Cloud Technologies for Business. (3-0) 3 Credit Hours.
Prerequisite: IS 3413 with a grade of "C-" or better. Cloud computing has driven a significant shift in how enterprises operate. It changes the way businesses and their customers interact with their applications and data. Cloud technologies offer highly elastic scalability in the delivery of enterprise applications through software, platform, or infrastructure as a service. This course will look at how businesses can benefit from cloud technologies to stay competitive; it will cover fundamental concepts and models of cloud computing, as well as cloud computing mechanisms, architectures, and security.

IS 4463. Web Application Security. (3-0) 3 Credit Hours.
Prerequisites: IS 3513 with a grade of "C-" or better and MGT 3003 or consent of instructor. The security issues related to web applications will be discussed in this course. Topics include web application authentication, authorization, as well as browser and web database security principles. Various web application security attack types such as code injection, cross-site scripting, and cross-site request forgery will be studied. The course will also include discussions about business aspects that contribute to a secure web-based transaction environment. (Formerly titled "Secure Electronic Commerce").

IS 4473. Information Assurance Policy. (3-0) 3 Credit Hours.
Prerequisites: IS 3413 with a grade of "C-" or better, MGT 3003, and one 3-semester-credit-hour security course, or consent of instructor, Department Chair, and Dean of the College. There are many policy issues, within the firm and at various levels of government, that affect information assurance. This course will examine how these policies affect electronic security. Subjects will include privacy of information, intellectual property protection, globalization of information systems, and other policy matters. The protection and control of secured information will also be discussed. Generally offered: Spring.

IS 4483. Digital Forensic Analysis I. (3-0) 3 Credit Hours.
An introductory course in collecting, examining, and preserving evidence of computer crimes. This course examines the issues, tools, and control techniques needed to successfully investigate illegal activities facilitated through the use of information technology. The tools of collecting, examining, and evaluating data in an effort to establish intent, culpability, motive, means, methods, and loss resulting from e-crimes will be examined. (Formerly titled "Cyber Forensics.") Generally offered: Fall.

IS 4513. Cyber and Physical Systems. (3-0) 3 Credit Hours.
Prerequisites: IS 3513 with a grade of "C-" or better and MGT 3003 or consent of instructor, Department Chair, and Dean of the College. Many of the critical infrastructure systems contain a system control and data acquisition (SCADA) component. Frequently, the control systems are remotely accessed and therefore becomes the focal point for attack. This course examines the control system components from the standpoint of vulnerability and protection. (Formerly titled "System Control and Data Acquisition.") Generally offered: Summer.

IS 4523. Digital Forensic Analysis II. (3-0) 3 Credit Hours.
Prerequisite: IS 4483. This course examines advanced digital forensic analysis topics, tools, techniques, and control mechanisms. Advanced topics include operating system artifacts, non-standard file systems, mobile devices, malware, and volatile memory. Students will gain experience with state-of-the-art forensics tools and techniques needed to successfully investigate illegal activities perpetuated through the use of information technology.

IS 4911. Independent Study. (0-0) 1 Credit Hour.
Prerequisites: MGT 3003, a 3.0 College of Business grade point average, and permission in writing from the instructor, the Department Chair, and the Dean of the College. See academic advisor for the required forms. Independent research in an information systems topic under the direction of a faculty member. May be repeated for credit, but not more than 6 semester credit hours of independent study, regardless of discipline, will apply to a bachelor’s degree.

IS 4913. Independent Study. (0-0) 3 Credit Hours.
Prerequisites: MGT 3003, a 3.0 College of Business grade point average, and permission in writing from the instructor, the Department Chair, and the Dean of the College. See academic advisor for the required forms. Independent research in an information systems topic under the direction of a faculty member. May be repeated for credit, but not more than 6 semester credit hours of independent study, regardless of discipline, will apply to a bachelor’s degree.

IS 4933. Internship in Information Systems. (0-0) 3 Credit Hours.
Prerequisites: MGT 3003, 9 semester credit hours of information systems courses (excluding IS 1403 and IS 3003), a 2.5 UTSA grade point average, and permission in writing from the instructor, the Department Chair, and the Dean of the College. See academic advisor for required forms. The opportunity to gain knowledge through experiential activities in professional life. Joint cooperation with business and governmental institutions in structuring and monitoring work experience aimed at supplementing the classroom learning process. May not be repeated for credit.

IS 4943. Internship in Cyber Security. (0-0) 3 Credit Hours.
Prerequisites: MGT 3003, 9 semester credit hours of information systems courses (excluding IS 1403 and IS 3003), a 2.5 UTSA grade point average, and permission in writing from the instructor, the Department Chair, and the Dean of the College. See academic advisor for required forms. The opportunity to gain knowledge through experiential activities in professional life. Joint cooperation with business and governmental institutions in structuring and monitoring work experience aimed at supplementing the classroom learning process. May not be repeated for credit.
IS 4953. Special Studies in Information Systems. (3-0) 3 Credit Hours.
Prerequisite: Consent of instructor. An organized course offering specialized study not normally or not often available as part of the regular course offerings. Special Studies may be repeated for credit when the topics vary, but not more than 6 semester credit hours, regardless of discipline, will apply to a bachelor's degree.

IS 4993. Honors Thesis. (0-0) 3 Credit Hours.
Prerequisite: MGT 3003. Enrollment limited to students applying for Honors in Information Systems. Supervised research and preparation of an honors thesis. May be repeated once for credit with advisor's approval. No more than 3 semester credit hours may apply toward information systems major requirements.

Management of Technology (MOT) Courses

MOT 4023. Essentials of Technology Management. (3-0) 3 Credit Hours.
Prerequisite: MGT 3003 or approval of the Department Chair and the Dean of the College. MGT 3003 is waived for nonbusiness students declaring Technology Management as a minor. This introductory course presents concepts and techniques for the management of many types of projects including engineering, construction, product development, as well as science and technology projects. The course is designed to help students develop the systems thinking necessary to successfully interact with the burgeoning technological world. The course will also provide the opportunity for students to develop the entrepreneurial skills important in managing the design, development, and commercialization of technological goods and services. (Formerly titled "Management of Technology.") Generally offered: Fall, Spring, Summer.

MOT 4143. Introduction to Project Management. (3-0) 3 Credit Hours.
Prerequisite: MGT 3003 or approval of the Department Chair and the Dean of the College. MGT 3003 is waived for nonbusiness students declaring Technology Management as a minor. This introductory course presents concepts and techniques for the management of many types of projects including engineering, construction, product development, as well as science and technology projects. The course is designed to help students develop project planning skills including scope definition, scheduling, cost-estimating and risk assessment. The course will also provide the opportunity for students to develop skills in support of project leadership, team building and communication. Generally offered: Fall, Spring.

MOT 4153. Project Management Certification. (3-0) 3 Credit Hours.
Prerequisite: Consent of instructor. This course is designed to give students the opportunity to prepare for the Project Management Professional (PMP) and Certified Associate in Project Management (CAPM) certification exams. The course is structured around the Project Management Institute Knowledge Areas including: integration, scope, time, cost, quality, risk, procurement, human resources, communication, and stakeholders. The course focuses on the inputs, tools, techniques and outputs associated with the core project management processes. Students will also complete diagnostics exam instruments and practice exams.

MOT 4203. Strategic Management of Technology and Innovation. (3-0) 3 Credit Hours.
Prerequisite: MOT 4023 or approval of the Department Chair and the Dean of the College. This course examines the issues involved in the strategic management of technology in contemporary business organizations. The course will examine new product development, emerging technologies and product portfolios; and will explore the dynamics of innovation in the firm.

MOT 4313. Disruptive Innovations. (3-0) 3 Credit Hours.
Prerequisite: MOT 4023 or approval of the Department Chair and the Dean of the College. This survey course focuses on technologies that may transform society and improve quality of life: the emphasis is on the nexus among biotechnology, information systems, materials, and renewable energy. The course will help students refine the systems thinking necessary to connect technology with users: it investigates the barriers that entrepreneurs face during commercialization. Cooperative learning is a defining characteristic of the course.

MOT 4911. Independent Study. (0-0) 1 Credit Hour.
Prerequisites: A 3.0 College of Business grade point average, MOT 4023 and permission in writing from the instructor, the Department Chair, and the Dean of the College of Business. See academic advisor for the required forms. Independent research in a management of technology topic under the direction of a faculty member. May be repeated for credit, but not more than 6 semester credit hours of independent study, regardless of discipline, will apply to a bachelor's degree.

MOT 4912. Independent Study. (0-0) 2 Credit Hours.
Prerequisites: A 3.0 College of Business grade point average, MOT 4023 and permission in writing from the instructor, the Department Chair, and the Dean of the College of Business. See academic advisor for the required forms. Independent research in a management of technology topic under the direction of a faculty member. May be repeated for credit, but not more than 6 semester credit hours of independent study, regardless of discipline, will apply to a bachelor's degree.

MOT 4913. Independent Study. (0-0) 3 Credit Hours.
Prerequisites: A 3.0 College of Business grade point average, MOT 4023 and permission in writing from the instructor, the Department Chair, and the Dean of the College of Business. See academic advisor for the required forms. Independent research in a management of technology topic under the direction of a faculty member. May be repeated for credit, but not more than 6 semester credit hours of independent study, regardless of discipline, will apply to a bachelor's degree.

MOT 4951. Special Studies in Management of Technology. (1-0) 1 Credit Hour.
Prerequisites: MOT 4023 and approval of the Department Chair and the Dean of the College. An organized course offering specialized study not normally or not often available as part of the regular course offerings. Special Studies may be repeated for credit when the topics vary, but not more than 6 semester credit hours, regardless of discipline, will apply to a bachelor's degree.

MOT 4952. Special Studies in Management of Technology. (2-0) 2 Credit Hours.
Prerequisites: MOT 4023 and approval of the Department Chair and the Dean of the College. An organized course offering specialized study not normally or not often available as part of the regular course offerings. Special Studies may be repeated for credit when the topics vary, but not more than 6 semester credit hours, regardless of discipline, will apply to a bachelor's degree.
MOT 4953. Special Studies in Management of Technology. (3-0) 3
Credit Hours.
Prerequisites: MOT 4023 and approval of the Department Chair and the
Dean of the College. An organized course offering specialized study not
normally or not often available as part of the regular course offerings.
Special Studies may be repeated for credit when the topics vary, but not
more than 6 semester credit hours, regardless of discipline, will apply to a
bachelor's degree.