

Bachelor of Science in Information Systems

Mission

The mission of the Information Systems program is to provide quality education in the field of information systems based on internationally recognized standards for undergraduate programs; produce information systems professionals who can deploy efficiently IT technologies and implement IT solutions according to market and society needs, particularly in the UAE and Gulf region; and prepare graduates for lifelong learning and research.

Program Educational Goals

Graduates of the Bachelor of Science in Information Systems program will have the following characteristics within few years of graduation:

- PEO_1. Apply acquired knowledge and skills in information systems and implement their skills in public, private, academic and international information systems functional activities.
- PEO_2. Act as information systems professional leaders in performing related skills in technical, business, or ethical duties.
- PEO_3. Engage in life-long learning and professional development in pursuing additional graduate degrees, professional development and self-studies.

Program Learning Outcomes

There are nine Learning Outcomes related to the Information Systems program and three learning outcomes associated to each concentration.

Graduates will be able to:

- IS1. **Comprehend** general education knowledge of diverse fields particularly the business domain in understanding and building IS applications.
- IS2. **Demonstrate** knowledge of core concepts, techniques and practices to IS applications.
- IS3. **Use** analytical and critical thinking skills to solve IS problems.
- IS4. **Organize** information requirements and provide solutions that reflect current business needs and changes.
- IS5. **Examine** emerging technologies for computerized business information systems.
- IS6. **Manage** information systems components to maintain business sustainability.
- IS7. **Demonstrate** social responsibilities in an ethical and professional manner.
- IS8. **Communicate** effectively both orally and in writing.
- IS9. **Operate** independently and as an effective member or a leader of a team.

Concentration in Project Management

IS-PM1 **Apply** Project Management methods and practices in IS environment.

IS-PM2 **Manage** the scope, cost, scheduling and quality of the project.

IS-PM3 **Identify** the services, operations and risks involved in IT projects.

Concentration in E-Business Management

IS-eBM1 **Choose** IT technologies to support an e-business solution.

IS-eBM2 **Develop** plans for the implementation of e-marketing and e-commerce systems.

IS-eBM3 **Differentiate** the use of e-commerce business models and e-marketing strategies.

Program Learning Outcomes and Alignment to UAE Qualification Framework (UAEQF)

Common Program Learning Outcomes

#	Common Program Learning Outcomes	UAEQF Strands
IS1	Comprehend general education knowledge of diverse fields particularly the business domain in understanding and building IS applications.	Knowledge
IS2	Demonstrate knowledge of core concepts, techniques and practices to IS applications.	Knowledge & Skill
IS3	Use analytical and critical thinking skills to solve IS problems.	Skill
IS4	Organize information requirements and provide solutions that reflect current business needs and changes.	Skill
IS5	Examine emerging technologies for computerized business information systems.	Role in context
IS6	Manage information systems components to maintain business sustainability.	Autonomy and Responsibility
IS7	Demonstrate social responsibilities in an ethical and professional manner.	Self-Development
IS8	Communicate effectively both orally and in writing.	Skill
IS9	Operate independently and as an effective member or a leader of a team.	Role in Context

#	E-Business Management Concentration Learning Outcomes	UAEQF Strands
IS-eBM1	Choose IT technologies to support an e-business solution.	Knowledge & Skill
IS-eBM2	Develop plans for the implementation of e-marketing and e-commerce systems.	
IS-eBM3	Differentiate the use of e-commerce business models and e-marketing strategies.	

Concentration Specific Learning Outcomes

#	Project Management Concentration Learning Outcomes	UAEQF Strands
IS-PM1	Apply Project Management methods and practices in IS environment.	Knowledge & Skill
IS-PM2	Manage the scope, cost, scheduling and quality of the project.	
IS-PM3	Identify the services, operations and risks involved in IT projects.	

Admission Requirements

Admission to the program of Bachelor of Science in Information Systems with its two concentrations requires the U.A.E secondary certificate or an equivalent qualification with a minimum average grade of 60% for scientific section and a minimum of 65% for Art section.

Career Opportunities

Information system graduates are required to meet the demands of various stakeholders including industry, commerce, education, health, and government. Some graduates are employed in companies and research organizations, others in resource centers in schools, colleges and universities. There are opportunities in finance, in computing and telecommunications industries, as well as in the medical sector.

Graduation requirements

Students at Ajman University (AU) are eligible for a bachelor in Information Systems after completion of 123 credits hours, which normally takes eight semesters. The minimum cumulative grade point average for graduation is 2.0 for 123 total credits hours.

Degree requirement

The B.Sc. degree in Information Systems requires the completion of a 123 Cr. Hrs. distributed according to the following plan:

Type of Courses	Credit/hour
1. University General Education Courses	
(a) University Compulsory Courses	15
(b) University Elective Courses	9
2. Information Systems Program Compulsory Common Core Courses	
(a) General Business Courses	18
(b) Information Systems Core Courses	63
(c) Internship	3
3. Information Systems Program Concentration Courses	9
4. Information Systems Program Elective Courses	6
Total Credit Hours	123

The student must score a minimum cumulative grade point average CGPA of 2.0.

The study plan is designed so that the normal duration for completing the degree requirements is 4 years but should not exceed 8 years.

A student transferring from other institutions must complete at least 50% of the program requirements at AU.

Any other requirements as per University and Ministry regulations enforce at the time of enrolment.

Information Systems Program

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

(a) University Required Courses (15 Cr.Hrs.)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
ARB 111	Communication skills in Arabic language	3	0	0	3	-
COM 111	IT Fundamentals	2	2	0	3	-
INN 311	Innovation & Entrepreneurship	3	0	0	3	-
ISL 1140	Islamic Culture	3	0	0	3	-
STA 111	Statistics	2	2	0	3	-

(b) University Elective Courses (9 Cr.Hrs.)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
1. Humanities / Arts						
ARB 113	The Art of Written Expression (Arabic)	3	0	0	3	-
ART 111	Introduction to Art	3	0	0	3	-
ART 211	Introduction to Digital Photography	3	0	0	3	-
ENG 113	Academic Writing (English)	3	0	0	3	-
ENG 211	The Art of Public Speaking (English)	3	0	0	3	-
FRE 211	French Language	3	0	0	3	-
ISL 211	Introduction to Hadeeth and Sunna	3	0	0	3	-
LAW 111	Legal Culture	3	0	0	3	-
2. Natural Sciences						
AST 211	Astronomy	3	0	0	3	-
BIO 111	General Biology	3	0	0	3	-
CHM 111	General Chemistry	3	0	0	3	-
PHY 111	Physics	3	0	0	3	-
3. Social or Behavioral Sciences						
ECO 211	Economic Concepts	3	0	0	3	-
EMS 111	Emirates Society (English)	3	0	0	3	-
ENG 111	English Communication Skills	3	0	0	3	-
INF 113	Library Information System	3	0	0	3	-
PSY 111	General Psychology (English)	3	0	0	3	-
SOC 112	Communication Between Cultures	3	0	0	3	-

INFORMATION SYSTEMS COMPULSORY COMMON CORE COURSES

(a) Major Requirements - General Business Courses (18 Cr. Hrs.)

Course No.	Course Title	Th.	Tut.	Lab.	Cr. Hrs.	Prerequisite
ACC 200	Principles of Accounting I	3	0	0	3	-
FIN 210	Fundamentals of Finance	3	0	0	3	ACC 200
MGT 200	Introduction to Management	3	0	0	3	-
MGT 202	Human Resources Management	3	0	0	3	MGT 300
MGT 300	Organizational Behavior	3	0	0	3	MGT 200
MKT 200	Principles of Marketing	3	0	0	3	MGT 200

(b) Major Requirements - Core Courses & Internship (66 Cr. Hrs.)

Course No.	Course Title	Th	Tut	Lab	Cr. Hrs.	Prerequisite
INS 201	Information Systems Management	3	0	0	3	INT 103
INS 202	Business Statistics	3	0	0	3	STA 111
INS 206	Communication Management	3	0	0	3	COM 111
INS 303	Fundamentals of Computer Systems	2	2	0	3	INT 102
INS 305	Systems Analysis and Design	2	2	0	3	INT 103

INS 307	Business Process Management	3	0	2	3	INS 201
INS 309	Knowledge Management	3	0	0	3	INT 103 MGT 200
INS 401	Change Management	3	0	0	3	INS 201
INS 402	Business Intelligence and Data Warehousing	3	0	0	3	INT 302
INS 404	Information Systems Strategy and Acquisition	3	0	0	3	INT 307
INS 405	Information Systems Project	1	4	0	3	INT 307
INS 406	IT Resource Management	3	0	0	3	INS 307
INS 408	Information Systems Internship	0	0	0	3	90 Cr. Hrs
INT 102	Algorithms and Problem Solving	2	2	0	3	-
INT 103	Information Technology in Business	2	2	0	3	COM 111 MGT 200
INT 205	Fundamentals of Data Communications and Networking	2	2	0	3	INT 102
INT 206	Fundamentals of Web Systems	2	2	0	3	INT 102
INT 302	Database Management Systems	2	2	0	3	INT 102 INT 103
INT 303	Fundamentals of Information Security	3	0	0	3	INT 205
INT 306	Computer Ethics and Professional Practices	3	0	0	3	INT 303
INT 307	Information Technology Project Management	2	2	0	3	INS 305
INT 308	Enterprise Systems	3	0	0	3	INT 302 MGT 200

INFORMATION SYSTEMS CONCENTRATION COURSES

Major Requirements - Compulsory Concentration Courses (9 Cr. Hrs.)

Project Management Concentration

Course No.	Course Title	Th	Lab	Tut	Cr. Hrs.	Prerequisite
INS 411	IT Services and Operations Management	3	0	0	3	INS 307
INS 412	Project Planning, Scheduling and Cost Control	3	0	0	3	INT 307
INS 413	Project Quality and Risk Management	3	0	0	3	INT 307

E-Business Management Concentration

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INS 422	E-Marketing	3	0	0	3	MKT 200
INT 322	Web Technologies	2	2	0	3	INT 206
INT 424	E-Commerce	2	2	0	3	INT 206

(b) Major Requirements - Elective Courses (Both Concentrations) (6 Cr. Hrs.)

Course No.	Course Title	Th	Tut	Lab	Cr.Hrs	Prerequisite
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INS 407	Selected Topics in Information Systems	2	2	0	3	INT 307
INS 409	Individual Project	1	4	0	3	INT 307
INT 208	Computerized Accounting	2	2	0	3	ACC 200
INT 304	Human Computer Interaction	2	2	0	3	INS 305
INT 309	Cloud Computing	3	0	0	3	INT 303
INT 321	Database Administration	2	2	0	3	INT 302
INT 423	Advanced Database Design and Implementation	2	2	0	3	INT 302
INT 429	Mobile Applications	2	2	0	3	INS 303 INT 302

Students are allowed to register a maximum of one elective course outside the proposed list after the approval of the Department Head.

Course Sequencing Plan

FIRST SEMESTER (Both Concentrations)

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
ARB 111	Communication skills in Arabic language	3	0	0	3	-
COM 111	IT Fundamentals	2	0	2	3	-
ISL 1140	Islamic Culture	3	0	0	3	-
MGT 200	Introduction to Management	3	0	0	3	-
TOTAL		15	0	2	15	

SECOND SEMESTER (Both Concentrations)

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
INT 102	Algorithms and Problem Solving	2	0	2	3	-
INT 103	Information Technology in Business	2	0	2	3	1041100 MGT 200
MKT 200	Principles of Marketing	3	0	0	3	MGT 200
STA 111	Statistics	2	0	2	3	-
xxxxxxx	University Elective II	3	0	0	3	-
TOTAL		12	0	6	15	

THIRD SEMESTER (Both Concentrations)

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
ACC 200	Principles of Accounting I	3	0	0	3	-
INS 201	Information Systems Management	3	0	0	3	INT 103
INS 202	Business Statistics	3	0	0	3	STA 111
INS 206	Communication Management	3	0	0	3	COM 111
xxxxxxx	University Elective III	3	0	0	3	-
TOTAL		15	0	0	15	

FOURTH SEMESTER (Both Concentrations)

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
INS 307	Business Process Management	3	2	0	3	INS 201
INS 401	Change Management	3	0	0	3	INS 201
INT 205	Fundamentals of Data Communications and Networking	2	0	2	3	INT 102
INT 206	Fundamentals of Web Systems	2	0	2	3	INT 102
MGT 300	Organizational Behavior	3	0	0	3	MGT 200
TOTAL		13	2	4	15	

FIFTH SEMESTER (Both Concentrations)

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
INS 303	Fundamentals of Computer Systems	2	0	2	3	INT 102
INS 305	System Analysis and Design	2	0	2	3	INT 103
INS 309	Knowledge Management	3	0	0	3	INT 103 MGT 200
INT 302	Database Management Systems	2	0	2	3	INT 102 INT 103
INT 303	Fundamentals of Information Security	3	0	0	3	INT 205
TOTAL		12	0	6	15	

SIXTH SEMESTER (Both Concentrations)

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
INN 311	Innovation & Entrepreneurship	3	0	0	3	-
INT 306	Computer Ethics and Professional Practices	3	0	0	3	INT 303
INT 307	IT Project Management	2	0	2	3	INS 305
INT 308	Enterprise Systems	3	0	0	3	INT 302 MGT 200
MGT 202	Human Resources Management	3	0	0	3	MGT 300
TOTAL		14	0	2	15	

SEVENTH SEMESTER

1. Project Management Concentration

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
FIN 210	Fundamentals of Finance	3	0	0	3	ACC 200
INS 402	Business Intelligence and Data warehousing	3	0	0	3	INT 302
INS 411	IT Services and Operations Management	3	0	0	3	INS 307
INS 412	Project Planning, Scheduling and Cost Control	3	0	0	3	INT 307
xxxxxxx	Major Elective I	x	0	x	3	xxxxxxx
TOTAL		x	0	x	15	

2. E-Business Management Concentration

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
FIN 210	Fundamentals of Finance	3	0	0	3	ACC 200
INS 402	Business Intelligence and Data warehousing	3	0	0	3	INT 302
INT 322	Web Technologies	2	0	2	3	INT 206
INT 424	E-Commerce	2	0	2	3	INT 206

xxxxxxx	Major Elective I	x	0	x	3	xxxxxxx
TOTAL		x	0	x	15	

EIGHTH SEMESTER

1. Project Management Concentration

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
INS 404	Information Systems Strategy and Acquisition	3	0	0	3	INT 307
INS 405	Information Systems Project	1	0	4	3	INT 307
INS 406	IT Resource Management	3	0	0	3	INS 307
INS 413	Project Quality and Risk Management	3	0	0	3	INT 307
xxxxxxx	Major Elective II	x	0	x	3	xxxxxxx
TOTAL		x	0	x	15	

SUMMER SESSION: Internship training

2. E-Business Management Concentration

Course Code	Course Name	Credit Hours				Prerequisite
		Lec	Tut	Lab	Cr. Hrs.	
INS 404	Information Systems Strategy and Acquisition	3	0	0	3	INT 307
INS 405	Information Systems Project	1	0	4	3	INT 307
INS 406	IT Resource Management	3	0	0	3	INS 307
INS 422	E-Marketing	3	0	0	3	MKT 200
xxxxxxx	Major Elective II	x	0	x	3	xxxxxxx
TOTAL		x	0	x	15	

SUMMER SESSION: Internship training

MINOR IN COMPUTER SCIENCE

Study Plan-A

The study plan of the Minor in Computer Science for students of the College of Engineering & IT is as follows:

(a) Compulsory Courses (9 Credit Hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 201	Object Oriented Programming	2	2	0	3	INT 102
INT 203	Computer Organization	3	0	0	3	Com 111
INT 204	Data Structures and Algorithms	2	2	0	3	INT 201

* Or equivalent prerequisite.

(b) Optional Courses (6 credit hours)

Course No.	Course Title	Th	Lab	Tut	Cr. Hrs.	Prerequisite
INT 205	Fundamentals of Data Communications and Networking	2	2	0	3	INT 203
INT 302	Database Management Systems	2	2	0	3	INT 201
INT 305	Fundamentals of Software Engineering	2	2	0	3	INT 204

Admission and Completion Requirements

The admission and completion requirements are specified in AU's Minor Programs Policy in addition to the following requirements:

1. Only registered students in the Colleges of Engineering & IT, Business Administration, and Scientific majors of the College of Humanities & Sciences at AU can register for the minor in Computer Science – Plan A. Students with a computing major (such as: Information Technology, Computer Science, Information Systems, Computer Engineering) are not eligible to register in this minor.
2. Students accepted for a Minor in Computer Science must successfully complete 15 credit hours from the courses described in the minor's study plan.
3. Any course taken or to be taken by the student as part of his major study plan cannot count towards the minor and must be replaced by another course from the list of options available for the minor.

MINOR IN COMPUTER SCIENCE

Study Plan-B

The study plan of the Minor in Computer Science for other colleges except College of Engineering & IT is as follows:

(c) Compulsory Courses (12 Credit Hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 102	Algorithms and Problem Solving	2	2	0	3	-
INT 201	Object Oriented Programming	2	2	0	3	INT 102
INT 203	Computer Organization	3	0	0	3	Com 111
INT 204	Data Structures and Algorithms	2	2	0	3	INT 201

(d) Optional Courses (6 credit hours)

Course	Course Title	Th	Lab	Tut	Cr.	Prerequisite
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No.		.	.	.	Hrs.	e
INT 205	Fundamentals of Data Communications and Networking	2	2	0	3	INT 203
INT 302	Database Management Systems	2	2	0	3	INT 201
INT 305	Fundamentals of Software Engineering	2	2	0	3	INT 204

Admission and Completion Requirements

The admission and completion requirements are specified in AU's Minor Programs Policy in addition to the following requirements:

1. Only registered students in the Colleges of Business Administration, Law, Information and Mass Communications and scientific majors of the College of Humanities & Sciences at AU can register for the minor in Computer Science – Plan B. Students with a computing major (such as: Information Technology, Computer Science, Information Systems, Computer Engineering) are not eligible to register in this minor.
2. Students accepted for a Minor in Computer Science must successfully complete 18 credit hours from the courses described in the minor's study plan.
3. Any course taken or to be taken by the student as part of his major study plan cannot count towards the minor and must be replaced by another course from the list of options available for the minor.

MINOR IN INFORMATION SYSTEMS

Study Plan

The Minor in Information Systems provides a range of courses to suit requirements of students of different majors. The study plan of the Minor in Information Systems is as follows:

(e) Compulsory Courses* (9 Credit Hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs	Prerequisite
INS 305	Systems Analysis and Design	2	2	0	3	INT 102
INS 402	Business Intelligence and Data Warehousing	3	0	0	3	INT 302
INT 302	Database Management Systems	2	2	0	3	INT 102 INT 103

* A compulsory course which is part of the student's major must be replaced by another optional course.

(f) Optional Courses** (6 credit hours)

Course No.	Course Title	Th	Lab	Tut	Cr. Hrs	Prerequisite
INS 307	Business Process Management	3	0	2	3	INS 307
INS 404	Information Systems Strategy and Acquisition	3	0	0	3	INT 307
INT 307	IT Project Management	2	2	0	3	INS 305

***An optional course which is part of the student's major cannot be taken.*

Admission and Completion Requirements

The admission and completion requirements are specified in AU's Minor Programs Policy in addition to the following requirements:

1. Students with a computing major (such as: Information Technology, Computer Science, Information Systems, Computer Engineering) are not eligible to register for a Minor in Information Systems.
2. Students accepted for a Minor in Information Systems must successfully complete 15 credit hours from the courses described in the minor's study plan.
3. Any course taken or to be taken by the student as part of his major study plan cannot count towards the minor and must be replaced by another course from the list of options available for the minor.

MINOR IN INFORMATION TECHNOLOGY

Study Plan-A

The study plan of the Minor in Information Technology for students with a major in an Engineering discipline, except Computer Engineering is as follows:

Compulsory Courses (9 Credit Hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 201	Object Oriented Programming	2	2	0	3	INT 102
INT 302	Database Management Systems	2	2	0	3	INT 201
INT 206	Fundamentals of Web Systems	2	2	0	3	INT 201

** Or equivalent prerequisite.*

(g) Optional Courses (6 credit hours)

Course No.	Course Title	Th	Lab	Tut	Cr. Hrs.	Prerequisite
INS 402	Business Intelligence and Data Warehousing	3	0	0	3	INT 302
INT 322	Web Technologies	2	2	0	3	INT 206
INT 424	E-Commerce	2	2	0	3	INT 322

Admission and Completion Requirements

The admission and completion requirements are specified in AU's Minor Programs Policy in addition to the following requirements:

1. Students with a computing major (such as: Information Technology, Computer Science, Information Systems, Computer Engineering) are not eligible to apply for a Minor in Information Technology.

2. Students accepted for a Minor in Information Technology must successfully complete 15 credit hours from the courses described in the minor's study plan.
3. Any course taken or to be taken by the student as part of his major study plan cannot count towards the minor and must be replaced by another course from the list of options available for the minor.

MINOR IN INFORMATION TECHNOLOGY

Study Plan-B

The study plan of the Minor in Information Technology for students of all other colleges except the College of Engineering & IT is as follows:

(h) Compulsory Courses (12 Credit Hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 102	Algorithms and Problem Solving	2	2	0	0	-
INT 201	Object Oriented Programming	2	2	0	3	INT 102
INT 302	Database Management Systems	2	2	0	3	INT 201
INT 206	Fundamentals of Web Systems	2	2	0	3	INT 201

(i) Optional Courses (6 credit hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INS 402	Business Intelligence and Data Warehousing	3	0	0	3	INT 302
INT 322	Web Technologies	2	2	0	3	INT 206
INT 424	E-Commerce	2	2	0	3	INT 322

Admission and Completion Requirements

The admission and completion requirements are specified in AU's Minor Programs Policy in addition to the following requirements:

1. Students with a computing major (such as: Information Technology, Computer Science, Information Systems, Computer Engineering) or Engineering Major are not eligible to register for a minor in Information Technology.
2. Students accepted for a Minor in Information Technology must successfully complete 18 credit hours from the courses described in the minor's study plan.
3. Any course taken or to be taken by the student as part of his major study plan cannot count towards the minor and must be replaced by another course from the list of options available for the minor.

MINOR IN NETWORKING and SECURITY

Study Plan

The study plan of the Minor in Networking & Security for students with a major in an Engineering discipline except Computer Engineering is as follows:

(j) Compulsory Courses (9 Credit Hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 303	Fundamentals of Information security	3	0	0	3	INT 205*
INT 311	Advanced Computer Networks	2	2	0	3	INT 205*
INT 312	Network Security	2	2	0	3	INT 303

* Or equivalent prerequisite.

(k) Optional Courses (6 credit hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 411	Network Design and Implementation	2	2	0	3	INT 311
INT 412	Wireless and Mobile Computing	2	2	0	3	INT 312
INT 414	Enterprise Security	3	0	0	3	INT 312
INT 415	Network Management	2	2	0	3	INT 311

Admission and Completion Requirements

The admission and completion requirements are specified in AU's Minor Programs Policy in addition to the following requirements:

1. Students with a computing major (such as: Information Technology, Computer Science, Information Systems, Computer Engineering) are not eligible to register for a minor in Networking & Security.
2. Students accepted for a Minor in Networking and Security must successfully complete 15 credit hours from the courses described in the minor's study plan.
3. Any course taken or to be taken by the student as part of his major study plan cannot count towards the minor and must be replaced by another course from the list of options available for the minor.

MINOR IN WEB DEVELOPMENT

Study Plan-A

The study plan of the Minor in Web Development for students with a major in an Engineering discipline except Computer Engineering is as follows:

(l) Compulsory Courses (9 Credit Hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 201	Object Oriented Programming	2	2	0	3	INT 102*
INT 206	Fundamentals of Web Systems	2	2	0	3	INT 201
INT 322	Web Technologies	2	2	0	3	INT 206

* Or equivalent prerequisite.

(m) Optional Courses (6 credit hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 302	Database Management Systems	2	2	0	3	INT 201
INT 421	Web Application Design and Development	2	2	0	3	INT 322
INT 427	Advanced Web Topics	2	2	0	3	INT 322

Admission and Completion Requirements

The admission and completion requirements are specified in AU's Minor Programs Policy in addition to the following requirements:

1. Students with a computing major (such as: Information Technology, Computer Science, Information Systems, Computer Engineering) are not eligible to register for a minor in Web Development.
2. Students accepted for a Minor in Web Development must successfully complete 15 credit hours from the courses described in the minor's study plan.
3. Any course taken or to be taken by the student as part of his major study plan cannot count towards the minor and must be replaced by another course from the list of options available for the minor.

MINOR IN WEB DEVELOPMENT

Study Plan-B

The study plan of the Minor in Web Development for students of other colleges except the College of Engineering & IT is as follows:

(n) Compulsory Courses (12 Credit Hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 102	Algorithms and Problem Solving	2	2	0	3	-
INT 201	Object Oriented Programming	2	2	0	3	INT 102
INT 206	Fundamentals of Web Systems	2	2	0	3	INT 201
INT 322	Web Technologies	2	2	0	3	INT 206

(o) Optional Courses (6 credit hours)

Course No.	Course Title	Th.	Lab.	Tut.	Cr. Hrs.	Prerequisite
INT 302	Database Management Systems	2	2	0	3	INT 201
INT 421	Web Application Design and Development	2	2	0	3	INT 322
INT 427	Advanced Web Topics	2	2	0	3	INT 322

Admission and Completion Requirements

The admission and completion requirements are specified in AU's Minor Programs Policy in addition to the following requirements:

1. Students with a computing major (such as: Information Technology, Computer Science, Information Systems, Computer Engineering) or an Engineering Major are not eligible to register for a minor in Web Development – Plan B.
1. Students accepted for a Minor in Web Development must successfully complete 18 credit hours from the courses described in the minor's study plan.
2. Any course taken or to be taken by the student as part of his major study plan cannot count towards the minor and must be replaced by another course from the list of options available for the minor.

Courses Descriptions

INS 201 Information Systems Management

Information systems management is the planning, acquisition, development and use of these systems. This course is designed to give students managerial view of information systems and its role in modern organizations to allow them to evaluate, adopt, and manage existing and new information systems. Topics include Information Systems in Business Today, Global E-business and Collaboration, Information Systems Organizations and Strategy, Achieving Operational Excellence and Customer Intimacy, E-commerce, Digital Goods, Managing Knowledge, Enhancing Decision Making, Building Information Systems, Managing Projects, Managing Global Systems.

INS 202 Business Statistics

This course provides students with good knowledge and skills related to: sampling Methods, parameters estimation, Confidence Intervals for Mean and Proportion; testing the hypothesis about Mean, Proportion, and Variance, for both finite and large populations, and to design and use the Analysis of Variance.

INS 206 Communication Management

The course aims at equipping the students with effective business communication skills. The course provides a thorough practice in business letters, memos, reports, resumes and job applications. In addition to developing written communication, the course teaches verbal communication skills such as speeches, interviews, and other dyadic forms of communication. The entire teaching process is focused on building effective communication skills among students.

INS 303 Fundamentals of Computer Systems

This course covers concepts of computer organization and architecture, main types of memory; central processing unit, memory addressing; principles and concepts of modern operating systems; operating system services: processes and process management, memory management; file systems; multitasking and multithreading; operating system security and configuration; Input/output devices and control; virtualization of computing services.

INS 305 System Analysis and Design

This course introduces the phases of the system development cycle. Topics include: Systems Development Methodologies, Project Team Roles and Skills; software project planning; requirement analysis phase; system design; Human Computer Interaction Layer Design; Physical Architecture Layer Design; and implementation phase. Systems analysis and design using UML will be discussed.

INS 307 Business Process Management

The course introduces the methods and techniques required to analyze, design, implement, automate, and evaluate business processes. Structured along the phases of the Business Process Management (BPM) life cycle, students learn to analyze organizational performance from a process perspective, redesign processes using value-focused techniques, design workflows and implement them in BPM systems, simulate new process designs, and create process analytics applications. The course leads students from process discovery through conceptual and technical process design through the implementation of workflows to the structure of process-aware information systems.

INS 309 Knowledge Management

The aim of this course is to introduce basic concepts, terminologies, tools, and techniques of Knowledge Management (KM). Topics covered include: the origins and units of organizational knowledge; knowledge management life-cycle models, knowledge management implementation models, knowledge capture and codification, knowledge sharing, knowledge management tools and knowledge management strategies.

INS 401 Change Management

Continuous change is inevitable in all organizations for technical, financial, or human reasons. Change management can make the difference between chaos and order, depending on how we understand and manage it. This course provides students with an understanding of the principles, objectives, implementing, and managing changes. Among the topics that Students will be able to master, include comprehending the complexity of change within organizational cultures and systems, managing resistance for change, and understanding the role of leader, manager, and change agent in change management. Besides theoretical component, students will be given case studies to build concrete understanding of real-life examples.

INS 402 Business Intelligence and Data Warehousing

Today's IT deals with gigantic amount of information. The success of any organization greatly depends on its ability to process and understand its information and extract essential knowledge to help managers take well informed decisions. This course teaches students the basic of data warehouse and how to deal with business intelligence – an information technology approach to data collection, data storage and data analysis to support a wide variety of management tasks, from performance evaluation to trend spotting and policy making. The students learn effective modeling techniques and use them to extract business intelligence and present them to users.

INS 404 Information Systems Strategy & Acquisition

This advanced course examines how IT enables organizations to conduct business in radically different and more effective ways. The course defines high-level IT infrastructure and Information Systems that support the operational and strategic needs of organizations. It develops also a framework that will allow IS leaders to assess existing IT infrastructures and emerging technologies as well as how these enabling technologies might affect organizational strategy.

INS 405 Information Systems Project

This course aims to give students the opportunity to work in a guided but independent fashion to investigate a problem by making use of information technology knowledge, techniques, and methodologies acquired in the previous semesters to provide a suitable solution to an IT problem. The course also aims to enhance teamwork and communication skills, both oral and written as well as ethical issues involved.

INS 406 IT Resource Management

This course addresses the tactical/operational responsibilities and roles of the IT Management, and the governance considerations that link the IS-business organizations. The focus is on current/emerging issues in creating and coordinating the key activities necessary to manage the day-to-day operations of the IS function, and coordinating the skills and organizational IS infrastructure.

INS 407 Selected Topics in Information Systems

This course aims to introduce students to new developments in the area of information systems not specifically covered in the curriculum and in which a faculty member has developed interest and proficiency. The intention is to provide a rapid response to current trends and to widen student's knowledge in different areas of IS. Specific content of the course will depend on the particular area taught at the time.

INS 408 Information Systems Internship

Internship familiarizes students with actual working environments. It gives students the opportunity to integrate their knowledge and skills learned in the course by applying it to real world problems encountered in business and industry. Internship also gives the student a feeling of what is involved in working on actual information technology problems and develop communication and team-work skills as well as ethical issues relation to IT.

INS 409 Individual Project

This course aims to give students the opportunity to work *alone* in a guided but independent fashion to investigate a problem by making use of information systems knowledge, techniques, and methodologies acquired in the previous semesters to provide a suitable solution to an IT problem. The course also aims to develop communication skills, both oral and written.

INS 411 IT Services and Operations Management

This course provides a detailed, modular introduction to the concepts, terms, definitions, benefits, objectives, and relationships within IT service management processes and functions, according to the ITIL best practice framework. It is based on principles described in ITIL's Service Support and Service Delivery Standards. It provides a practical understanding of ITIL key concepts, principles, processes, and functions.

INS 412 Project Planning, Scheduling and Cost Control

Most failures of projects are related to either *schedule delays*, or *cost overrun* or both. A balanced cost and time management is in the core of project management, and successful projects will need extensive

attention to budget performance, which is strongly coupled to schedule. This course will explore recent methods and techniques which integrate technical, schedule, and cost objectives to enhance control on projects and ensure their success and timely termination. The course will allow students to get deep understanding of the many factors that affect project time and cost performance, and teaches them how to employ best practices, well known templates, methods and techniques to observe and control them.

INS 413 Project Quality and Risk Management

Project Quality and Risk management are forward looking disciplines, which try to identify potential future problems and plan for effective mitigation or avoidance techniques, leading to greater success in projects and business in general. While it covers all aspects of an organization, this course will introduce students to analytical and mathematical models to enable them measure and evaluate risks and quality related to IS projects.

INS 422 E-Marketing

The course describes common strategies for the marketing of goods and services via the Internet range from public relations and corporate communications to advertising and electronic commerce. Students investigate and evaluate various marketing and communication strategies and tactics for the World Wide Web. Emphasis is placed on critical evaluation skills as well as Web site planning, development, design, and other factors, which contribute to a Web site's success.

INT 102 Algorithms and Problem Solving

This course provides knowledge and skill of problem solving and programming concepts using pseudo code and a computer programming language. Topics cover: the problem- solving process; data types; variables, constants, and memory locations; simple sequential programs; basic input/output; selection and repetition control structures; arrays and strings; and user-defined functions.

INT 103 Information Technology in Business

This course aims to cover a range of general information technology topics that will make the student appreciate the role of IT in business. Topics include: information technology fundamentals; information technologies; business applications; development processes; and ethical, societal and security issues.

INT 201 Object Oriented Programming

The primary objective of this course is to introduce the concepts of object-oriented programming: classes, objects, methods, object interaction, encapsulation, inheritance, container classes, polymorphism, exception handling, and recursive algorithms. This course is not meant as a comprehensive introduction to all of Java concepts such as applets and socket programming.

INT 203 Computer organization

This course covers the organization of the von Neumann machine, explains how instructions are fetched from memory and executed, how numerical values are represented in digital computers, identifies the main types of memory used and design of simple computer interface.

INT 204 Data Structures and Algorithms

The course covers concepts of program performance (time and space complexity); abstract data types; recursion; abstract data structures: lists, stacks, queues, graphs, trees, binary search trees, priority queues, heaps, and operations on them and their applications; sorting; searching and hashing.

INT 205 Fundamental of Data Communications and Networking

Introduction to computer networks and the Internet. Protocol layers and the OSI model. Application layer: HTTP, FTP, SMTP, POP3, DNS and peer-to-peer applications. Transport layer: UDP, TCP and congestion control. Network layer: virtual circuits, routers, IP protocols and routing algorithms. Link layer: error detection and correction, multiple access, MAC addressing, switches, ARP, Ethernet, local area networks and wide area networks. Wireless and mobile networks.

INT 206 Fundamentals of Web Systems

This course introduces the basics of Web systems and how it differs from desktop systems. Students will learn client-server architecture, and how it evolves to multitier system. The course will allow student to learn and use essential Web languages and technologies including XHTML, CSS, and XML. Students will apply this knowledge to generate essential web components like basic browser controls (buttons, links, and menus), forms and frames. They will also understand how these components are managed on the server side.

INT 208 Computerized Accounting

The Computerized accounting information system joins together the skill sets of accounting and information technology. Information technology has created new challenges and opportunities for accountants who also have expertise in information systems. Many traditional accounting functions are now embodied in systems that require a different combination of technical and financial knowledge. The CAIS course is designed to provide this combination of knowledge and skill sets to meet the new challenges and opportunities of the information technology world. The main objective of the course is to introduce students to the design and implementation of a systematic structure for providing information for decision-making.

INT 302 Database Management Systems

This course is designed to give a theoretical and practical background in database techniques. It covers: database concepts, data models, data dictionary, entity relationship diagrams, and relational data model, converting E-R models to relational model, SQL language, and normalization. Oracle software is used in the Lab.

INT 303 Fundamental of Information Security

This course aims at introducing fundamental security concepts to students. Main security threats and related countermeasures are presented. Students will learn the importance of protecting information stored on computer systems from unauthorized access. The students will also learn how to encrypt and decrypt information, control access to objects and recommend a secure system implementation.

INT 304 human Computer Interaction

Concepts, human information processing (cognition, perception, movement, culture, communication, human diversity, motivation for computer interaction, human performance models, etc.), user interface design principles, information presentation, visual, auditory and tactile displays, speech communication, data entry, controls, tools and feedback, human factors in computer programming, workspace design, environmental and legal considerations. We will study the modeling, the building and the evaluation aspects.

INT 305 Fundamentals of Software Engineering

The course emphasizes object-oriented techniques and the use of UML. Topics covered in this course include: overview of the software engineering process, software process models, UML syntax and semantics, software requirement analysis, software design principles and models, component-level design, and software testing. Student will work in teams on software projects.

INT 306 Computer Ethics and Professional Practices

This course will examine the ethical issues that arise in the use of computers, and the responsibilities of those who work with computers, either as computer science professionals or end users. Topics covered include: legal, social and ethical issues surrounding computer technology and its use; privacy; intellectual property rights and copy right laws; information technology code of ethics; issues of privacy and confidentiality; risks of using computers; and computer crime: computer viruses, hacking, phishing & pharming, scams, etc.

INT 307 Information Technology Project Management

This course aims cover: characteristics of IT Project management, initiating an IT project; project planning; defining and managing project scope, structuring a project, project schedule and budget, managing project risk, project communication, tracking, and reporting, IT project quality management, ethics and professional practices, and project implementation.

INT 308 Enterprise Systems

This course introduces students to the new concept of enterprise systems and shows its role in the industry as used by medium and large enterprises. Students will understand the main architectural components of today's enterprise and its infrastructure. The course also introduce different business domain concepts and workflow management and will help student make the link between development and implementation issues on one side and practical enterprise applications on the other side.

INT 309 Cloud Computing

This course aims to introduce students to theory and practice of cloud computing. Topics include: introduction to cloud computing; parallel and distributed systems; cloud infrastructure; applications and paradigms; resource virtualization; resource management and scheduling; networking support; cloud storage systems; cloud security.

INT 311 Advanced Computer Networks

This course will cover the principles of networking with a focus on algorithms, protocols, and implementations for advanced networking services. We will examine a variety of ideas that were proposed to enhance the Internet, why some of these enhancements were successful while others were not. The emphasis in this course is on topics such as routing protocols, advanced routing and switching. It covers Internet architecture, congestion control, QoS, IPv6, and voice over IP. The student will use network simulators for some network models.

INT 312 Network Security

This course introduces students to main security concepts related to the protection of a network from known threats and attacks. This includes digital signatures, authentication protocols, IP & Web security and e-mail security. It also emphasizes the importance of using firewalls in order to secure a network. Packet-filtering routers, application and circuit-level gateways are presented. Advanced cryptographic algorithms are also discussed in details such as AES, MAC & hash operations and cipher modes.

INT 321 Database Administration

This course prepares students to administer and maintain databases by applying best practices and procedures to any database platform. With general, platform independent approach, students will be able to work as database administrators to any of the major industrial databases including Oracle, IBM BD2, Sybase, Microsoft and MySQL. Students will become familiar with DBA roles and responsibilities, be able to create a database environment with modeling and normalization as well as reporting while maintaining data integrity.

INT 322 Web Technologies

This course will introduce students to different Web technologies, languages, and frameworks. The student will review the dynamics of these technologies, their advantages and disadvantages. Students will also learn the applicability of each of these technologies in different Web application settings and environment. Students will also learn how to mix and match these technologies and investigate their compatibility and integration challenges.

INT 411 Network Design & Implementation

The aim of the course is for the student to design a LAN solution detailing structured cabling components, desktop and server hardware, network operating systems, and network administration tools. He can document the design solution with materials and equipment lists, cable installation drawings, telecommunications and server room layouts, software versions and compatibility lists, and budget requirements. Also he demonstrates design feasibility by implementing a LAN prototype with all required functionality including servers, workstations and network infrastructure. This course defines a technical project plan and timeline for implementation, and discussing overall project benefits, possible technical issues and required resources to complete the project.

INT 412 Wireless and Mobile Computing

This course presents the student with the latest in wireless technologies. The first part includes wireless networks such as, cellular and short range wireless technologies, protocols for wireless and wireless

resources management. The second part includes mobile computing such as, VoIP on wireless, computing & programming over wireless. The student will study the legal and the private issues associated with wireless.

INT 414 Enterprise Security

This course aims at introducing students to enterprise security concepts, related risks and cost. It mainly presents a deep coverage of intrusion detection and prevention concepts, including architectures and a survey of most popular IDS implementations and deployments. Students are also introduced to the need of having proper security policies and procedures in order to handle threats properly in addition to forensics techniques to thwart computer attacks.

INT 415 Network Management

The course discusses typical architectures for network management including the management console, aggregators and device agents. This course introduces management paradigms and protocols (SNMP). Remote Monitoring (RMON), Network Management Tools and Systems are examined. The Web-Based Management and Network Management Applications are covered. Configuration of basic network resources and management of multiple servers' network and troubleshooting.

INT 421 Web Application Design and Development

This course prepares students to apply different web technologies and integrate them into a web application. Topics covered include: Web applications and Rich Internet Applications (RIA), programmable Web applications, working with proxies, Yahoo and Google mash up services, Creating a Web application, model view controller pattern, from design, validation and usability, User Interaction Effects and Animation, and Tagging and Rating the Web Application.

INT 423 Advanced Database Design & Implementation

This course builds on top of the first DBMS course by introducing advanced database concepts to allow students to effectively design and implement industrial quality database. The course revisits SQL in a deeper, more practical approach, with a focus on its PL/SQL extension. The student will learn database in a client-server setting, and see how to manage multi-user databases. Students will be able to design and implement functional databases that include major components of an industrial database.

INT 424 E-Commerce

This course aims to expose students to the theory and practice of e-commerce. Topics covered are: Introduction to E-Commerce, E-Commerce Technology Infrastructure, Revenue models, Marketing on the web, Business-to-business online strategies, Web server hardware and software, E-Commerce Commercial Software, E-Commerce security, Payment Systems, and Planning for e-commerce business

INT 427 Advanced Web Topics

This course introduces students to the latest trends and technologies as used by today's information technology industry. The course focuses on advanced Web technologies that are strongly adapted as the next generation IT. Students will learn the role of Web 2.0 and Web 3.0 with special focus on Web services and Service-Oriented Architecture. The course will allow students to understand the current

evolution from Personal Computing (1980s) to Network Computing (1990s) to Internet and Windows (2000s) to today's trends of cloud computing, Web tool kits, mashups, and social networking.