

 FLORIDA ATLANTIC UNIVERSITY	PROGRAM CHANGE REQUEST Graduate Programs		UGPC Approval _____ UFS Approval _____ Banner Posted _____ Catalog _____
	Department Computer & Electrical Eng. and Computer Sci. College Engineering and Computer Science		
Program Name MS in Computer Science, MS in Computer Engineering, MS in Information Technology and Management		Effective Date (TERM & YEAR) FALL 2017	
Please explain the requested change(s) and offer rationale below or on an attachment This proposal updates the MS in Computer Science, MS in Computer Engineering, and MS in Information Technology and Management (MSITM) programs: <ul style="list-style-type: none"> • Delete the course "COP 5595 Component Programming with .NET" • Replace the course "CAP 6673 Data Mining and Machine Learning" by the course "CAP 6778 Advanced Data Mining and Machine Learning" in the elective course section of the MSITM Advanced Information Technology program. Students in this program are already taking CAP 6673 as a required course. 			
Faculty Contact/Email/Phone Dr. Mihaela Cardei, mcardei@fau.edu		Consult and list departments that may be affected by the change(s) and attach documentation NA	
Approved by Department Chair _____ College Curriculum Chair _____ College Dean _____ UGPC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____		Date 3/3/17 3/7/17 3/10/17	

Email this form and attachments to UGPC@fau.edu one week before the UGPC meeting so that materials may be viewed on the UGPC website prior to the meeting.

Master of Science with Major in Computer Engineering

The non-thesis option for this degree requires a minimum of 33 credits. The thesis option requires a minimum of 30 credits, including 6 credits of thesis. All students must take at least one course from each of the three groups listed in **Option A**.

With approval of the advisor, substitution can sometimes be made among similar courses. See the Department of Computer & Electrical Engineering and Computer Science [website](#) for updates.

Admission Requirements

Applications for admission to the master's program are approved by the University upon the recommendation of the department. All applicants must submit with their applications the official transcripts from previous institutions attended and have official GRE scores forwarded to the University. Applications for admission are evaluated on an individual basis. As a minimum, applicants are expected to meet the following requirements. Students with non-engineering bachelor's degrees, click [here](#) for additional requirements.

1. A baccalaureate degree in Engineering or a related field. (Students who do not have a computer engineering background will be expected to take additional courses; see link above);
2. At least a 3.0 (of a 4.0 maximum) GPA in the last 60 credits attempted prior to graduation; and
3. A combined score (verbal + quantitative) of at least 295 on the Graduate Record Examination (GRE). GRE scores more than five years old are normally not acceptable; and
4. A score of 213 or higher in the Test of English as a Foreign Language (TOEFL).

Applicants are expected to have taken the following prerequisite courses (or equivalents) before pursuing a master's degree. In some cases, prerequisite courses may be taken after admission to the graduate program. Equivalent FAU courses follow.

Introduction to Microprocessor Systems	CDA 3331C
Structured Computer Architecture	CDA 4102 or
CAD-Based Computer Design	CDA 4204
Electronics 1	EEE 3300 or
Introduction to VLSI	CDA 4210
Data Structures and Algorithm Analysis	COP 3530
Calculus with Analytic Geometry 1	MAC 2311
Calculus with Analytic Geometry 2	MAC 2312
Stochastic Models for Computer Science	STA 4821

Submission of Plan of Study

Students are required to submit a Plan of Study when they have completed between 9 and 15 credits of coursework with a minimum cumulative GPA of 3.0. All courses must be approved by the student's advisor. A student may not register for thesis credits prior to submitting a Plan of Study.



Degree Requirements

The **degree without thesis option** requires a minimum of 33 credits of coursework in relevant technical areas. The following rules apply to the selection of courses:

1. A minimum of 3 credits must be selected from each of the three groups listed in **Option A**.
2. A minimum of 18 credits of 6000-level courses must be completed.

3. No more than 3 credits of directed independent study may be taken.
4. No course can be counted toward the degree that is more than 10 years old at the time the degree is awarded.
5. A maximum of one 4000-level course may be allowed toward the degree with the prior approval of the student's advisor. This course must be passed with a minimum grade of "B." Courses taken to make up for deficiencies will not be counted toward the degree.
6. Must have a GPA of 3.0 (out of 4.0 maximum) or better.
7. All courses in the degree programs must be completed with a grade of "C" or better.
8. Every non-thesis student must maintain a Research Portfolio containing research papers (book chapter, conference or journal contributions accepted or published, patents, directed independent study-based research papers, graduate course-based research papers, technical reports) done throughout the student's M.S. degree studies. Every non-thesis student is expected to have at least one research paper in the Research Portfolio prior to graduation. The Portfolio must be approved by a graduate advisor prior to graduation certification.

The **degree with thesis option** requires a minimum of 24 credits of graduate coursework (5000 level or higher) and a minimum of 6 credits of thesis work. The following rules apply to the selection of courses:

1. A minimum of 3 credits must be selected from each of the three groups listed in **Option A**.
2. A minimum of 18 credits of 6000-level courses must be completed.
3. No more than 3 credits of directed independent study may be taken.
4. No course can be counted toward the degree that is more than 10 years old at the time the degree is awarded.
5. No 4000-level courses are allowed toward the degree. Courses taken to make up for deficiencies will not be counted toward the degree.
6. Must have a GPA of 3.0 (out of 4.0 maximum) or better.
7. All courses in the degree programs must be completed with a grade of "C" or better.
8. Every master's student must maintain a Research Portfolio containing research papers (book chapter, conference or journal contributions accepted or published, patents, directed independent study-based research papers, graduate course-based research papers, technical reports) done throughout the student's M.S. degree studies. The M.S. thesis will be added to the Research Portfolio prior to graduation. The Portfolio must be approved by a graduate advisor prior to graduation certification.

Transfer Credits

Any transfer credits toward the requirements for a master's degree in Computer Engineering must be approved by the department, the College and the University. The transfer credits must correspond to equivalent requirements and performance levels expected for the degree. Normally, no more than 6 credits of coursework (that have not been applied to a degree) can be transferred from another institution.

Option A

Group 1: Computer Architecture and Design	
Advanced Computer Architecture	CDA 6155
Embedded System Design 1	CDA 6316
Multiprocessor Architecture	CDA 6132
Structured VLSI Design	CDA 6214

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Group 3: Computer Systems	
CEN 6405	Computer Performance Modeling
CIS 6370	Computer Data Security
COP 6731	Theory and Implementation of Database Systems
CNT 6517	Mobile Computing
CAP 6673	Data Mining and Machine Learning
CAP 6010	Multimedia Systems
CDA 6122	Evaluation of Parallel and Distributed Systems
CAP 5615	Introduction to Neural Networks
EEL 6591	Wireless Networks
CAP 6778	Advanced Data Mining and Machine Learning
CNT 6885	Video Communication
CAP 6411	Foundations of Vision
CNT 6516	Advanced Computer Networking
CNT 6528	Vehicle Networks

Group 2: Software Development	
CAP 6018	Multimedia Programming
CEN 5035	Software Engineering
CEN 6027	Software Maintenance and Evolution
CEN 6075	Software Requirements Engineering
CEN 6076	Software Testing
CEN 6085	Software Architecture and Patterns
COP 5339	Object-Oriented Software Design
COP 6595	Component Programming with .NET

Master of Science with Major in Computer Science

The non-thesis option for this degree requires a minimum of 33 credits. The thesis option requires a minimum of 30 credits, including 6 credits of thesis. All master's degree students must take at least one course from each of the three groups listed in **Option B**.

With approval of the advisor, substitution can sometimes be made among similar courses. See the Department of Computer & Electrical and Computer Science [website](#) for updates.

Admission Requirements

Applicants for admission to the master's program are approved by the University upon the recommendation of the department. All applicants must submit with their applications the official transcripts from previous institutions attended and have official GRE scores forwarded to the University. Applications for admission are evaluated on an individual basis. As a minimum, applicants are expected to meet the following requirements. Students with non-engineering bachelor's degrees, click [here](#) for additional requirements.

1. A baccalaureate degree in Computer Science or a related field (Students without a computer science background will be expected to take additional courses);

2. At least a 3.0 (of a 4.0 minimum) GPA in the last 60 credits attempted prior to graduation;
3. A combined score (verbal + quantitative) of at least 295 on the Graduate Record Examination (GRE). GRE scores more than five years old are normally not acceptable; and
4. A score of 213 or higher in the Test of English as a Foreign Language (TOEFL).

Applicants are expected to have taken the following prerequisite courses (or equivalents) before pursuing a master's degree. In some cases, prerequisite courses may be taken after admission to the graduate program. Equivalent FAU courses follow.

Structured Computer Architecture	CDA 4102 or
Introduction to Microprocessor Systems	CDA 3331C or
CAD-Based Computer Design	CDA 4204
Data Structures and Algorithm Analysis	COP 3530
Computer Operating Systems	COP 4610
Design and Analysis of Algorithms	COT 4400
Calculus with Analytic Geometry 1	MAC 2311
Calculus with Analytic Geometry 2	MAC 2312
Stochastic Models for Computer Science	STA 4821

Submission of Plan of Study

Students are required to submit a Plan of Study when they have completed between 9 and 15 credits of coursework with a minimum cumulative GPA of 3.0. All courses must be approved by the student's advisor. A student may not register for thesis credits prior to submitting a Plan of Study.

Degree Requirements

The **degree without thesis option** requires a minimum of 33 credits of coursework in relevant technical areas. The following rules apply to the selection of courses.

1. A minimum of 3 credits must be selected from each of the three groups listed in **Option B**.
2. A minimum of 18 credits of 6000-level courses must be completed.
3. No more than 3 credits of directed independent study may be taken.
4. No course can be counted toward the degree that is more than 10 years old at the time the degree is awarded.
5. A maximum of one 4000-level course may be allowed toward the degree with the prior approval of the student's advisor. This course must be passed with a minimum grade of "B." Courses taken to make up for deficiencies will not be counted toward the degree.
6. Must have a GPA of 3.0 (out of 4.0 max.) or better.
7. All courses in the degree program must be completed with a grade of "C" or better.
8. Every non-thesis student must maintain a Research Portfolio containing research papers (book chapter, conference or journal contributions accepted or published, patents, directed independent study-based research papers, graduate course-based research papers, technical reports) done throughout the student's M.S. degree studies. Every non-thesis student is expected to have at least one research paper in the Research Portfolio prior to graduation. The Portfolio must be approved by a graduate advisor prior to graduation certification.

The **degree with thesis option** requires a minimum of 24 credits of graduate coursework (5000 level or higher) and a minimum of 6 credits of thesis work. The following rules apply to the selection of courses.

1. A minimum of 3 credits must be selected from each of the three groups listed in **Option B**.
2. A minimum of 18 credits of 6000-level courses must be completed.
3. No more than 3 credits of directed independent study may be taken.
4. No course can be counted toward the degree that is more than 10 years old at the time the degree is awarded.
5. No 4000-level courses are allowed toward the degree. Courses taken to make up for deficiencies will not be counted toward the degree.
6. Must have a GPA of 3.0 (out of 4.0 max.) or better.
7. All courses in the degree program must be completed with a grade of "C" or better.
8. Every master's student must maintain a Research Portfolio containing research papers (book chapter, conference or journal contributions accepted or published, patents, directed independent study-based research papers, graduate course-based research papers, technical reports) done throughout the student's M.S. degree studies. The M.S. thesis will be added to the Research Portfolio prior to graduation. The Portfolio must be approved by a graduate advisor prior to graduation certification.

Transfer Credits

Any transfer credits toward the requirements for a master's degree in Computer Science must be approved by the department, the College and the University. The transfer credits must correspond to equivalent requirements and performance levels expected for the degree. Normally no more than 6 credits of coursework (that have not been applied to a degree) can be transferred from another institution.

Option B

Group 1: Theory	
Analysis of Algorithms	COT 6405
Queueing Theory	MAP 6264
Philosophy of Computation	COT 6200

Group 2: Software Development	
Multimedia Programming	CAP 6018
Software Engineering	CEN 5035
Software Maintenance and Evolution	CEN 6027
Software Requirements Engineering	CEN 6075
Software Testing	CEN 6076
Software Architecture and Patterns	CEN 6085
Object-Oriented Software Design	COP 5339
Component Programming with .NET	COP 5595

Group 3: Computer Systems	
Computer Performance Modeling	CEN 6405
Computer Data Security	CIS 6370
Theory and Implementation of Database Systems	COP 6731

Mobile Computing	CNT 6517
Data Mining and Machine Learning	CAP 6673
Multimedia Systems	CAP 6010
Evaluation of Parallel and Distributed Systems	CDA 6122
Introduction to Neural Networks	CAP 5615
Wireless Networks	EEL 6591
Advanced Data Mining and Machine Learning	CAP 6778
Video Communication	CNT 6885
Foundations of Vision	CAP 6411
Advanced Computer Networking	CNT 6516
Vehicular Networks	CNT 6528

Master of Science with Major in Information Technology and Management

The Master of Science with Major in Information Technology and Management (MSITM) is jointly offered by the Department of Computer & Electrical Engineering and Computer Science (CEECS) in the College of Engineering and Computer Science and the Department of Information Technology and Operations Management (ITOM) in the College of Business. Designed for highly motivated individuals with computing and/or managerial backgrounds, the program aims to prepare students for a management career in the area of information technology in organizations. To allow for maximum flexibility in career aspirations, students can select from two options: Advanced Information Technology, emphasizing the technical aspect of organizational IT systems; and Information Technology Management, focusing on the management issues of IT in organizations.

Admission Requirements

To be admitted to the MSITM program applicants must have:

1. An undergraduate degree in Computer Science, Information Engineering Technology or an IT-related field of study. Applicants with another undergraduate degree and documented work experience of two or more years in an IT function will be evaluated as well;
2. An undergraduate GPA of 3.0 or higher;
3. A combined score (verbal + quantitative) of at least 295 on the Graduate Record Examination (GRE) or a GMAT score of 500 or higher. GRE scores more than five years old are normally not acceptable;
4. A satisfactory score on the Test of English as a Foreign Language (TOEFL) or the International Language Testing System (IELTS) for international students;
5. Met other requirements of the FAU Graduate College.

Curriculum Requirements

Students are required to complete 33 graduate-level credits, or 11 three-credit courses, with a 3.0 GPA or better to graduate. Students in Advanced Information Technology will be awarded the degree by the College of Engineering and Computer Science, while those in Information Technology Management will have their degrees awarded by the College of Business. For more information about the Master of Science in Information Technology and Management degree program, call the Department of Computer & Electrical Engineering and Computer Science at 561-297-3482, or email ceecs@fau.edu.

Advanced Information Technology

Students are required to take the following four courses:

CEN 5035	Software Engineering
COP 5339	Object-Oriented Software Design
CAP 6673	Data Mining and Machine Learning
ISM 6026	Management of Information Systems and Technology
In addition, students need to take five electives from the following CEECS courses:	
CAP 6778 673	Advanced Data Mining and Machine Learning
CEN 6027	Software Maintenance and Evolution
CEN 6076	Software Testing
CIS 6370	Computer Data Security
CNT 6517	Mobile Computing
COP 5595	Component Programming with .NET
COT 5930	Topics in Computer Science
COT 6930	Topics in Computer Science
CEN 6405	Computer Performance Modeling
CNT 6885	Video Communication
CEN 6085	Software Architecture and Patterns
EEL 6591	Wireless Networks
The last two electives can be chosen from the following ITOM courses:	
ISM 6316	Information Technology Project and Change Management
ISM 6328	Management of Information Assurance and Security
ISM 6368	Enterprise Information Technology Service Management
ISM 6508	Web-Based Business Development
ISM 6509	Information Technology Sourcing Management

Information Technology Management
Students are required to take the following eight courses offered by the College of Business:

ISM 6026	Management of Information Systems and Technology
ISM 6316	Information Technology Project and Change Management
ISM 6405	Advanced Business Analytics
ISM 6328	Information Security Management
ISM 6368	Enterprise Information Technology Service Management

Electronic Commerce and Internet Business Applications	ISM 6508
Information Technology Sourcing Management	ISM 6509
Graduate Business Communication Applications	GEB 6215
In addition, students need to take three electives from the following courses offered by the College of Engineering and Computer Science:	
Data Mining and Machine Learning	CAP 6673
Software Maintenance and Evolution	CEN 6076
Software Testing	CEN 6076
Computer Data Security	CIS 6370
Computer Network Programming	CNT 5715
Mobile Computing	CNT 6517
Object-Oriented Software Design	COP 5339
Component Programming with .NET	COP 5595
Theory and Implementation of Database Systems	COP 6731
Topics in Computer Science	COT 5930
Wireless Networks	EEL 6591

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