| **M.S.C.S.**  
| **(Thesis Option)** |
| Core Courses: 15 credit-hours |
| Area of Interest: 9 credit-hours |
| Electives: 3 credit-hours |
| Thesis: 6 credit-hours |
| Total: 33 credit-hours |

| **M.C.S.**  
| **(Non-Thesis Option)** |
| Core Courses: 15 credit-hours |
| Area of Interest: 9 credit-hours |
| Electives: 12 credit-hours |
| Project: 3 credit-hours |
| Total: 39 credit-hours |

### IT Management and Information Assurance (ITMIA) Area of Interest

**Core Courses** (3 credits each)
(Core Courses are required for both Thesis and Non-Thesis Option)

- CECS 6010 – Advanced Design and Analysis of Algorithm
- CECS 6030 – Computational Theory
- CECS 6230 – IT Operations
- CECS 6430 – Advanced Software Architecture
- CECS 6750 – Software Testing

**Area of Interest Courses** (3 credits each)
(These courses are required for both Thesis and Non-Thesis Option)

- CECS 7230 – Network Security
- CECS 7235 – Computer Forensics
- CECS 7570 – Computer Security

**Elective Courses** (3 credits each)

Student must complete the remaining number of required credit-hours by selecting courses from this list of electives. Thesis Option should choose one (1) course. Non-Thesis Option should choose four (4) courses.

- CECS 6005 – Principles of Information Security
- CECS 6015 – IT Auditing and Secure Operations
- CECS 6035 – Contingency Planning
- CECS 6045 – Law, Investigation and Ethics
- CECS 6120 – Computer Architecture
- CECS 6130 – Data Communication Networks
- CECS 6150 – Object Oriented Design (OOD)
- CECS 6240 – Technology-Based Start-Up
- CECS 6510 – Technology-Based Start-Up
- CECS 6715 – E-Commerce and Web Inf. Systems
- CECS 6760 – Internet Engineering I
- CECS 6824A – Special Topics in ITMIA
- CECS 6824B – Special Topics in KDDM
- CECS 6824C – Special Topics in CGGT
- CECS 7130 – Advanced Computer Networks
- CECS 7240 – Database Security
- CECS 7410 – Parallel and Distributed Processing
- CECS 7420 – Modeling and Simulation
- CECS 7510 – Software Engineering II
- CECS 7520 – Human-Computer Interaction (HCI)
- CECS 7760 – Internet Engineering II

**Note:** KDDM or CGGT Specialization Area Courses can be Electives for ITMIA area

### Thesis

- CECS 7980 – Thesis (6 credits)
- CECS 7990 – Thesis Extension (0 credits)

### Project

- CECS 7950 – Project in ITMIA (3 credits)
- CECS 7951 – Project Extension

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Universidad Politécnica de Puerto Rico  
Graduate School  
Master Program in Computer Science

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### M.S.C.S. (Thesis Option)
Core Courses: 15 credit-hours  
Area of Interest: 9 credit-hours  
Electives: 3 credit-hours  
Thesis: 6 credit-hours  
Total: 33 credit-hours

### M.C.S. (Non-Thesis Option)
Core Courses: 15 credit-hours  
Area of Interest: 9 credit-hours  
Electives: 12 credit-hours  
Project: 3 credit-hours  
Total: 39 credit-hours

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**Knowledge Discovery and Data Mining (KDDM)**  
**Area of Interest**

#### Core Courses (3 credits each)
(Core Courses are required for both Thesis and Non-Thesis Option)
- CECS 6010 – Advanced Design and Analysis of Algorithm  
- CECS 6030 – Computational Theory  
- CECS 6230 – IT Operations  
- CECS 6430 – Advanced Software Architecture  
- CECS 6750 – Software Testing

#### Area of Interest Courses (3 credits each)
(These courses are required for both Thesis and Non-Thesis Option)
- CECS 6605 – Database Management Systems  
- CECS 7530 – Data Mining and Data Warehousing  
- CECS 7550 – Artificial Intelligence

#### Elective Courses (3 credits each)
Student must complete the remaining number of required credit-hours by selecting courses from this list of electives. Thesis Option should choose one (1) course. Non-Thesis Option should choose four (4) courses.
- CECS 6120 – Computer Architecture  
- CECS 6150 – Object Oriented Design (OOD)  
- CECS 6510 – Software Engineering I  
- CECS 6715 – E-Commerce and Web Inf. Systems  
- CECS 6760 – Internet Engineering I  
- CECS 6824A – Special Topics in ITMIA  
- CECS 6824B – Special Topics in KDDM  
- CECS 6824C – Special Topics in CGGT  
- CECS 7130 – Advanced Computer Networks  
- CECS 7240 – Database Security  
- CECS 7410 – Parallel and Distributed Processing  
- CECS 7420 – Modeling and Simulation  
- CECS 7510 – Software Engineering II  
- CECS 7520 – Human-Computer Interaction (HCI)  
- CECS 7760 – Internet Engineering II

*Note: ITMIA or CGGT Area Courses can be Electives for KDDM area*

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**Thesis**
- CECS 7980 – Thesis (6 credits)  
- CECS 7990 – Thesis Extension (0 credits)

**Project**
- CECS 7950 – Project in KDDM (3 credits)  
- CECS 7951 – Project Extension

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### M.S.C.S. (Thesis Option)
- Core Courses: 15 credit-hours
- Area of Interest: 9 credit-hours
- Electives: 3 credit-hours
- Thesis: 6 credit-hours
- Total: 33 credit-hours

### M.S.C. (Non-Thesis Option)
- Core Courses: 15 credit-hours
- Area of Interest: 9 credit-hours
- Electives: 12 credit-hours
- Project: 3 credit-hours
- Total: 39 credit-hours

### Computer Graphics & Game Technology (CGGT)
#### Area of Interest

**Core Courses** (3 credits each)
(Core Courses are required for both Thesis and Non-Thesis Option)
- CECS 6010 – Advanced Design and Analysis of Algorithm
- CECS 6030 – Computational Theory
- CECS 6230 – IT Operations
- CECS 6460 – Advanced Software Architecture
- CECS 6750 – Software Testing

**Area of Interest Courses** (3 credits each)
(These courses are required for both Thesis and Non-Thesis Option)
- CECS 7010 – Computer Graphics
- CECS 7020 – Advanced Computer Graphics
- CECS 7550 – Artificial Intelligence

**Elective Courses** (3 credits each)
Student must complete the remaining number of required credit-hours by selecting courses from this list of electives. Thesis Option should choose one (1) course. Non-Thesis Option should choose four (4) courses.
- CECS 6120 – Computer Architecture
- CECS 6150 – Object Oriented Design (OOD)
- CECS 6510 – Software Engineering I
- CECS 6715 – E-Commerce and Web Inf. Systems
- CECS 6760 – Internet Engineering I
- CECS 6824A – Special Topics in ITMIA
- CECS 6824B – Special Topics in KDDM
- CECS 6824C – Special Topics in CGGT
- CECS 6824D – Special Topics in CGGT
- CECS 7130 – Advanced Computer Networks
- CECS 7400 – Parallel and Distributed Processing
- CECS 7420 – Modeling and Simulation
- CECS 7510 – Software Engineering II
- CECS 7520 – Human-Computer Interaction (HCI)
- CECS 7760 – Internet Engineering II

Note: KDDM or ITMIA Specialization Area Courses can be Electives for CGGT area.

### Thesis
- CECS 7980 – Thesis (6 credits)
- CECS 7990 – Thesis Extension (0 credits)

### Project
- CECS 7950 – Project in CGGT (3 credits)
- CECS 7951 – Project Extension