

**MANUAL OF THE M.S. DEGREE IN**

**COMPUTER SCIENCE**

**AND**

**CONCENTRATIONS**

**ARIZONA STATE UNIVERSITY**

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*\* For the purposes of a study on a software prototype intended to help students build their iPOS.*

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**I. Objective of the handbook**

The purpose of this handbook is to provide guidance and information related to degree requirements, and general policies and procedures towards making the interactive Plan of Study or iPOS for a Master of Science in Computer Science with a thesis option.

Please read this document carefully. **Note that in some cases you will find differences between the actual Graduate College policies and procedures in practice right now.**

# **II. Deficiencies**

## Depending on prior academic preparation and accomplishments of an applicant, deficiency courses may be specified to ensure adequate background preparation.

Below is a list of prerequisites, along with the associated ASU course numbers:

* CSE 230 - Computer Organization and Assembly Language Programming
* CSE 310 - Data Structures and Algorithms
* CSE 330 - Operating Systems
* CSE 340 - Principles of Programming Languages
* CSE 355 - Introduction to Theoretical Computer Science
* CSE 360 - Introduction to Software Engineering

# **III. MS Degree Requirements**

Degree requirements for the MS include 10 graduate level courses beyond deficiency courses. The MS is comprised of four major milestones, which all students are required to complete successfully prior to graduation:

1. Completion of deficiency courses.
2. Completion of all coursework (including one for each area courses, i.e. foundaiton, applications and systems)
3. Selection of 1 committee chair and 2 committee members to oversee Thesis progress.
4. Specialization in one of three topics, i.e. AI, Big Data or Cybersecurity.
5. Successful oral defense of an approved written thesis.

## a. Coursework

The iPOS must contain 10 graduate level courses amounting to a total of 30 semester hours. Of these, at least one course has to come from all of the three concentrations – Foundations, Systems and Applications (consult Appendix).

*Culminating Experience:* CSE 599a and 599b Thesis

**Note:** Thesis credits (which are included in the count of 10 graduate courses) can only be taken after appointment of a committee chair. CSE 599b has to be taken in the end.

In addition, you must complete a specialization in one of the following topics.

**Specialization in Cyber Security**

Requires *9 credit hours from*

* CSE 543: Information Assurance and Security (3)
* CSE 545: Software Security (3)
* CSE 548: Advanced Computer Network Security (3)

**Specialization in Big Data**

Requires *9 credit hours from*

* CSE 510 Database Management System Implementation (3)
* CSE 512 Distributed Database Systems (3)
* CSE 572 Data Mining (3)

**Specialization in Artificial Intelligence**

Requires *9 credit hours from*

* CSE 575: Statistical Machine Learning (3)
* CSE 574: Planning and Learning Methods in AI (3)
* CSE 571: Artificial Intelligence (3)

## b. Selection of Faculty Advisor – Thesis Option

You must select a faculty advisor from the list of professors. The faculty advisor must be from the same area of specialization. You cannot complete your Specialization and Thesis Credits until you have selected your advisor.

## c. Thesis Supervisory Committee

In addition to the chair, you must appoint two more members of the Thesis Advisory committee which advises the student during the formulation of the research topic and during the completion of the research and thesis. The non-chair members need not be in your specialization area.

## d. Thesis

The iPOS must **end in defense** instead of a normal semester end.

## e. Continuous Enrollment

*Students must enroll in at least one course every semester.*

International students must register for at least three courses. Only Research Assistants (RA) or Teaching Assistants (TA) can register for four courses in a semester.

*It is not possible to register for more than four courses in a single semester.*

**Appendix: List of Approved 500 (Graduate Level) Area Courses**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course** | **Course Title** | **Foundations** | **Systems** | **Applications** |
| CSE 509 | Digital Video Processing |  |  | X |
| CSE 510 | Database Management System Implementation |  |  | X |
| CSE 511 | Semi-Structured Data Management |  |  | X |
| CSE 512 | Distributed Database Systems |  |  | X |
| CSE 515 | Multimedia and Web Databases |  |  | X |
| CSE 520 | Computer Architecture |  | X |  |
| CSE 522 | Real-Time Embedded Systems |  | X |  |
| CSE 530 | Embedded Operating Systems Internals |  | X |  |
| CSE 531 | Distributed and Multiprocessor Operating Systems |  | X |  |
| CSE 534 | Advanced Computer Networks |  | X |  |
| CSE 535 | Mobile Computing |  | X |  |
| CSE 536 | Advanced Operating Systems |  | X |  |
| CSE 539 | Applied Cryptography |  | X |  |
| CSE 543 | Information Assurance and Security |  | X |  |
| CSE 545 | Software Security |  | X |  |
| CSE 546 | Cloud Computing |  | X |  |
| CSE 548 | Advanced Computer Network Security |  | X |  |
| CSE 550 | Combinatorial Algorithms and Intractability | X |  |  |
| CSE 551 | Foundations of Algorithms | X |  |  |
| CSE 552 | Randomized and Approximation Algorithms | X |  |  |
| CSE 555 | Theory of Computation | X |  |  |
| CSE 556 | Game Theory with Applications to Networks | X |  |  |
| CSE 561 | Modeling and Simulation Theory and Applications |  | X |  |
| CSE 563 | Software Requirements and Specification |  | X |  |
| CSE 564 | Software Design |  | X |  |
| CSE 565 | Software Verification, Validation and Testing |  | X |  |
| CSE 566 | Software Project, Process and Quality Management |  | X |  |
| CSE 569 | Fundamentals of Statistical Learning and Pattern Recognition | X |  |  |
| CSE 570 | Advanced Computer Graphics |  |  | X |
| CSE 571 | Artificial Intelligence |  |  | X |
| CSE 572 | Data Mining |  |  | X |
| CSE 573 | Semantic Web Mining |  |  | X |
| CSE 574 | Planning and Learning Methods in AI |  |  | X |
| CSE 575 | Statistical Machine Learning |  |  | X |
| CSE 576 | Topics in Natural Language Processing |  |  | X |
| CSE 577 | Advanced Geometric Modeling |  |  | X |
| CSE 578 | Data Visualization |  |  | X |
| CSE 579 | Knowledge Representation and Reasoning | X |  |  |

**Appendix: List of Professors with their specialization**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Professor | None | AI | Big Data | Cybersecurity |
| Charlie Coulborn | X |  |  |  |
| Arunabha Sen | X |  |  |  |
| Guoliang Xue |  |  | X |  |
| Andrea Richa | X |  |  |  |
| Adam Doupe |  |  |  | X |
| Dijiang Huang |  |  |  | X |
| Mohammad Sarwat |  |  | X |  |
| Selchuk Candan |  |  |  | X |
| Subbarao Kambhampati |  | X |  |  |
| Huan Liu |  |  | X |  |
| Yu Zhang |  | X |  |  |
| Heni Ben Amor |  | X |  |  |

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