Each degree candidate will be required to pass, with an average of B or better, and not more than two grades below B, the following minimum number of credits, distributed to include core courses and electives.

**Core courses** (12 credits, 4 courses):
- COMP.5030 Algorithms
- One course from Group II
- One course from Group III
- One course from Group IV

**Group I (Foundations):**
- COMP.5020 Foundations of Computer Science
- COMP.5030 Algorithms
- COMP.5310 Design of Programming Languages
- COMP.5340 Compiler Construction
- COMP.7100 Approximation Algorithms

**Group II (Systems and Networks):**
- COMP.5150 Operating Systems I
- COMP.5160 Operating Systems II
- COMP.5300 Special Topics
- COMP.5610 Computer & Network Security I
- COMP.5620 Computer & Network Security II
- COMP.5630 Data Communications I
- COMP.5640 Data Communications II
- COMP.5660 Malware Analysis
- COMP.5670 IoT Security and Privacy
- COMP.5690 Computer and Network Forensics
- COMP.6610 Advanced Topics in Network Security

**Group III (Human-Computer Interaction, Visualization, Robotics and AI):**
- COMP.5230 Computer Vision I
- COMP.5270 Human Computer Interaction
- COMP.5280 Evaluation of Human-Computer Interaction
- COMP.5410 Data Visualization
- COMP.5420 Natural Language Processing
- COMP.5430 Artificial Intelligence
- COMP.5440 Data Mining
COMP.5450 Machine Learning
COMP.5460 Computer Graphics I
COMP.5470 Computer Graphics II
COMP.5480 Robot Design
COMP.5490 Mobile Robots
COMP.5495 Robot Learning
COMP.5520 Foundations in Digital Health
COMP.5500 Topics
COMP.6440 Advanced Topics in Data Mining

**Group IV (Information Management and Analysis):**
- COMP.5130 Internet and Web Systems I
- COMP.5140 Internet and Web Systems II
- COMP.5510 Bioinformatics for CS
- COMP.5730 Database I
- COMP.5740 Database II
- COMP.5800 Topics in Computer Science
- COMP.6730 Advanced Database Systems

**Electives** (18 credits, 6 courses in the COMP.5*** and COMP.6*** series or up to six credits from the list below:)

- **List of other approved courses:**
  - COMP.7010 Computer Science Research
  - COMP.7030 Computer Science Research
  - EECE.5560 Fundamentals of Robotics
  - EECE.5821 Computer Architecture and Design

**Total:** 30 credits

**Master’s Thesis**
An optional master’s thesis can be substituted for six credits and can be used to substitute for two elective courses. Students who wish to do a thesis must file a *Proposed Thesis Committee* form with the Graduate Coordinator prior to beginning working on the thesis.