



MIS Computer Science

**Norfolk State University
Department of Computer Science**

Graduate Program Student Handbook

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*Department Chair: George C. Harrison
Graduate Program Director: George Hsieh*

*Approved by CS Graduate Committee
May 24, 2007*

Graduate Program Goals¹

The goal of this graduate program is to provide quality computer science graduate education to equip students, especially those from the underrepresented sector of the population, with analytic skills, sound research experiences and development training in computer science.

Graduate Program Objectives²

Graduates of the Master of Science in Computer Science program will be able to demonstrate:

- Advanced mastery of data communications, operating systems, computer architecture, and algorithm analysis and design
- Proficiency in applying computing fundamentals in several application areas
- Mastery of a significant body of advanced topics in computing, computational science, communication networks, or information assurance.
- The ability to conduct independent research and understand the body of literature in one or more advanced topics.

The Graduate Program

The Graduate Program Committee consists of the members of the faculty in the Computer Science Department designated to advise graduate students and teach graduate courses.

The Committee is responsible for

- admitting new graduate students,
- awarding and renewing assistantship awards,
- scheduling classes in conjunction with the Undergraduate Program Director,
- approving thesis and project proposals,
- maintaining and enforcing the standards of disciplinary conduct,
- overseeing the work of assistantship, project, and thesis directors,
- conducting graduation audits and approvals,
- maintaining standards and procedures.

¹ From SCHEV MS CS Program Proposal

² First three objects from SCHEV MS CS Program Proposal

Honor Code and Standards of Conduct

All graduate students are expected to agree to and practice the ACM Code of Ethics and Professional Conduct www.acm.org/constitution/code.html and the University's and Department's standards of conduct.

Plagiarism

All written work, whether in preliminary or final form, submitted by a student in the course of study toward the Masters Degree in Computer Science is assumed to be the student's own work. Anything copied or paraphrased from another author or source must be appropriately identified, acknowledged, and attributed. The use of the exact language of another without identification as a direct quotation by quotation marks or otherwise is plagiarism even though the source is cited in the student's work. Violation of the rules stated in this paragraph may be subject to disciplinary action.³ If plagiarism occurs in thesis or project drafts, proposals, or final documents, the student will receive an "F" grade for the course and be dropped from the program.

Core Courses and Curriculum Requirements

The Core Curriculum

All students must take the following four courses except for a waiver (see below):

CSC 530 Data Communications
CSC 564 Operating Systems
CSC 625 Analysis of Algorithms
CSC 668 Advanced Computer Architecture

Waiver

If a student has already taken one of the above courses at the undergraduate level and earned a B+ or above, s/he may ask the Graduate Program Director for a *waiver* of that core requirement. Credit will not be awarded for any course waived. The student will be required to take the requisite number of credits for the degree.

³ Derived from **Boston University School of Law Disciplinary Regulations Regarding Plagiarism**

Limit on 500-Level Courses

Only *three* 500-level courses will be credited for the MS degree in computer science including the two core courses.

Limit on Transfer Credits

Six credits may be transferred into the graduate program from another accredited institution not previously applied to a degree at another institution. Those grades must be B or above. The courses must be comparable to those offered in the Computer Science MS Program. The credits must be earned within five years prior to registration.

Minimum Passing Grade

The minimum passing grade for all courses applied to MS in Computer Science is "B." A grade of "B-" is a failure.

Academic Probation

Any student failing to maintain a 3.0 cumulative average (GPA) will be on academic probation for one semester. If the student's cumulative average does not return to 3.0 at the end of the probation semester, the student will be required to leave the program.

Graduation Options

There are two options for completing the MS in Computer Science:

- 1) ***The Thesis Option***: twenty-four credits of course work plus six credits of thesis work.
- 2) ***The Project Option***: thirty credits of course work plus three credits of project.

The Master's Thesis will be an expository writing giving evidence of the student's ability to understand and present a solution of one or more problems in computer science. Every thesis must include the following: a background and rationale of the research; the problem statement; a complete, contemporary review of the state of the problem; a systematic analysis of the problem, an evaluation of new solutions or attempts at solutions, a conclusion, and a complete bibliography and set of references.

The Thesis I course should be taken in the second semester before expected graduation. The student must choose a Thesis Director before starting the Thesis I course. The student should choose a director based on the faculty member's availability to take thesis students and his/her research interests. The candidate must obtain the approval of the Graduate Committee by way of a research proposal by the last full month of the Thesis I course. During the progress of the Thesis I course, the director and candidate form a thesis committee comprised of the thesis director and two graduate faculty members one normally chosen by the director and one by the candidate. In some circumstances, one of the members of the team may be outside the list of computer science graduate faculty members. This should be approved by the Graduate Program Committee. The thesis director may be a member of the graduate faculty of another graduate program. In this case the Graduate Program Committee must approve and appoint one of its own to chair the candidate's thesis committee.

Before the end of the Thesis I course, the candidate must have a thesis proposal approved.

At the end of the thesis candidate will present a public colloquium followed by a private defense of the thesis to the Thesis Committee.

The candidate is also required to produce three bound copies of the thesis: one for the department, one for the Graduate Studies office, and one for the Library.

The Master's Project will be expository writing giving a complete state-of-the-art status of a computer science problem including a thorough annotated understanding of the literature addressing the problem. Although the objectives of a project are similar to a thesis, it will be the intent of the project to replicate known solutions, understand and propose additional possible solutions, and to demonstrate these solutions in some form. It is expected that the student will demonstrate good computer science research methodology and with projects involving the building of software products, the student will practice good software

engineering methodologies. The Masters Project course should be taken the second semester before expected graduation.

The student must choose a project director. The student will present a written proposal for approval by the Graduate Committee within two weeks after the beginning of the Masters Project course. He/she will provide a public presentation of the project. The student will provide access to the project paper to the public at least two weeks before the presentation. After the student completes the project editing process, the project director and another member of the Graduate Committee will evaluate the project and present the paper to the Graduate Committee.

Other Thesis and Project Requirements are included later in this document.

Program Emphases

Information Assurance: Three courses must be taken from

- CSC 535 (Required) Computer Security I
- CSC 635 Computer Security II
- CSC 650 Cryptography
- CSC 760 Secure Software Development
- CSC 765 Advanced Topics in Information Assurance

Communications Networks: These three courses must be taken

- CSC 530 Data Communications (Core-Required)
- CSC 630 Computer Networks
- CSC 720 Wireless Sensor Networks
- CSC 730 Optical Networks

Computational Science: Three courses must be taken from

- CSC 611 Computational Science I
- CSC 612 Computational Science II
- CSC 660 Parallel Computing
- CSC 678 Scientific Visualization

Courses and Their Descriptions

(Each course is 3 credit hours except as noted)

CSC 420/521 Database Principles and Design

An introductory course emphasizing the basic concepts and principles of database systems. Topics include relational, hierarchical, and network approaches to data organization.

CSC 430/530 Data Communications

Focuses on the basic principles of computer communication as well as hardware and software designs. Topics include transmission media, data encoding, transmission techniques, protocols, switching networks, broadcast networks, and local area networks.

CSC 435/535 Computer Security I

Security for computer systems. Includes an introduction to Information Assurance concepts in addition to logging, encryption and decryption, effects on operating systems and machine architecture, countermeasures, risk analysis, security administration, legality and ethics, and computer forensics.

CSC 464/564 Operating Systems

Topics include the history and evolution of operating systems, the concepts behind and structure of various operating systems, process scheduling, interprocess communication, input and output, multiprogramming, memory management, and file systems. Concepts of distributed operating systems are also introduced.

CSC 466/566 Advanced Computer Topics I

Advanced computer topics not generally covered in the curriculum. Designed as a computer science elective -- not as a replacement for any specific required course.

CSC 467/567 Advanced Computer Topics II

Advanced computer topics not generally covered in the curriculum. Designed as a computer science elective -- not as a replacement for any specific required course.

CSC 470/570 Artificial Intelligence

In depth study of concepts and problem solving techniques of artificial intelligence. Topics include knowledge representation, functional and logic programming, machine learning, natural language understanding, computer vision, robotics, and societal impact.

CSC 476/576 Advanced Computer Topics III

Advanced computer topics not generally covered in the curriculum. Designed as a computer science elective -- not as a replacement for any specific required course.

CSC 477/577 Advanced Computer Topics IV

Advanced computer topics not generally covered in the curriculum. Designed as a computer science elective -- not as a replacement for any specific required course.

CSC 480/580 Computer Graphics

Designed to focus on interactive computer graphics hardware and software: display devices, 2D and 3D geometric transformations, raster algorithms, representation of curves and surfaces, hidden line removal and surfaces, shading algorithms, and color graphics.

CSC 493/593 System Programming

Fundamentals of system and network programming methodology, techniques, system calls and library calls.

CSC 496/596 Compiler Construction

An introduction to the fundamentals of compiler construction and language translation. Topics include lexical analysis, specifications of syntax, algorithms for syntactic analysis, code generation, and optimization techniques.

CSC-526 Structured Programming, 3 credit hours (Does not count towards MS.CSC degree credits)

This is a one semester course that extensively covers programming concepts and techniques at an accelerated pace. Students learn how to develop, test, and debug programs on both Unix and Microsoft platforms. Topics covered include control structures, files, arrays, strings, classes and data abstractions, pointers, virtual functions, object-oriented concepts, linked lists, stacks, and queues.

CSC 611 Computational Science I

Computational Science is an emerging field of study focusing on collaborative research conversing a wide variety of science disciplines. This is a one-semester course to provide students with an overview of applications of computational skills to solve scientific research problems. The computational skills in review include: Programming Languages, Algorithms, Database Implementation, Internet technologies, data visualization, statistics, Modeling and Simulation, and Operations Research. The course will be team-taught by a group of scientists from the Mathematics, Chemistry, Physics, Biology, and Engineering departments and The Center for Material Research, SciViz Laboratory, and The B.E.S.T. Laboratory; and other applied science laboratories to cover a wide-range of expertise.

CSC 612 Computational Science II

Computational Science is a rapidly emerging field to foster collaborative research by teams of mathematicians, computer scientists, and scientists, to cover a wide variety of science disciplines. This is a one-semester course to provide students with an overview of applications of computational skills to solve scientific research problems. The computational skills in review include: programming languages, algorithms, database implementation, Internet technologies, data visualization, statistics, modeling and simulation, and operations research. The course will be team-taught by a group of scientists from the Mathematics, Chemistry, Physics, Biology and Engineering Departments and The Center for Material Research, SciViz Laboratory and The B.E.S.T. Laboratory, and other applied science laboratories to cover a wide-range of expertise.

CSC 625 Analysis of Algorithms

Design and analysis of algorithms. Topics include Turing machines, NP-Complete theory, best, average, and worst case analysis; divide-and-conquer, greedy method, dynamic programming, graph traversal, backtracking, and branch-and bound techniques. sorting, searching, graph algorithms, and optimization.

CSC 630 Communications Networks

A one-semester, advanced graduate-level course focusing on the concept of internetworking in general and the TCP/IP Internet technology in particular. The course reviews both the architecture of network interconnections and the principles underlying protocols that make interconnected networks function as a single, unified communication system. It also covers how an Internet communication system can be used for distributed computation and communication

CSC 635 Computer Security II

Intrusion Detection Systems, Malicious software (viruses, worms, and other rogue programs), Advanced risk analysis methodologies, international standards and computer security models (Bell and LaPadula, Biba, Clark and Wilson), Network and Distributed Security, Database Security.

CSC 650 Cryptography

Study of historical and modern cryptographic techniques and algorithms. Topics include symmetric and asymmetric key cryptography, one-way functions, secure hash functions, digital signatures, key exchange, authentication, key management, PKI, DES, AES (Rijndael), current topics.

CSC 660 Parallel Computing

Study of high performance computing techniques. Includes the study of parallel computer architecture, memory, and I/O. Also, parallel computer algorithms to include shared and distributed memory, parallel computation models, graph algorithms, numerical algorithms, divide-and-conquer.

CSC 668 Advanced Computer Architecture

Principles and advanced topics of the instruction set architecture for uni-processors, embedded system processors, and multi-processors.

CSC 678 Scientific Visualization

Fundamental concepts of the algorithms and design principles underlying modern 3D computer graphics, data and scientific visualization.

CSC 691 Graduate Independent Study I

Supervised independent project designed to give computer science graduate students the opportunity to explore a single topic in a one-on-one learning relationship with a faculty member.

CSC 701 Continuing Registration One Credit (Does not count towards MS.CSC degree credits)

A one credit hour course that allows students to maintain continuous registration status.

CSC 702 Practicum One Credit (Does not count towards MS.CSC degree credits)

A one credit-hour course that allows students to apply their skills in a work setting. The credit earned through this course will not be counted towards MS.CSC degree credit. A student can take this course, and repeat it for up to three times, when he/she is away from campus on outside employment for internship or practical training in a related technical field. This is a Pass/Fail course.

CSC 720 Wireless Sensor Networks

An advanced, graduate-level course focusing on study of wireless sensor networks from communications, security, and computing platform viewpoints. Wireless sensor networks are a sensing, computing and communication infrastructure enabling the monitoring and manipulating of the environment.

CSC 730 Optical Networks

Fundamentals of enabling technologies, network design and engineering for optical network.

CSC 750 Evolutionary Computing

The fundamentals of applying biological evolutionary characteristics to optimization of very complex problems.

CSC 760 Secure Software Development

Secure computing APIs, Java security, sandboxing, vulnerability assessment and code analysis techniques, secure middleware.

CSC 765 Advanced Topics in Information Assurance

Survey of current topics in Information Assurance

CSC 781 Advanced Graduate Computer Topics I

Advanced computer topics not generally covered in the graduate 600/700 level curriculum. Designed as a computer science graduate elective -- not as a replacement for any core course.

CSC 782 Advanced Graduate Computer Topics II

Advanced computer topics not generally covered in the graduate 600/700 level curriculum. Designed as a computer science graduate elective -- not as a replacement for any core course.

CSC 791 Graduate Independent Study II

Supervised independent project designed to give computer science graduate students the opportunity to explore a single topic in a one-on-one learning relationship with a faculty member.

CSC 795 Master's Project

Guided master's degree project under the supervision of the course instructor; requires extensive expository and other tasks and a formal 45 minute public presentation of the project's work. Projects must be approved by the Computer Science Graduate Committee.

CSC 798 Master's Thesis I

First semester of the Master's Thesis sequence. Under the supervision of the thesis director, students prepare a thesis proposal and work toward the goal of completing all background material needed for their research. Minimally, a satisfactory thesis draft will be used to satisfy completion of the course. The Graduate Committee must approve the thesis topic.

CSC 799 Master's Thesis II

The culmination of the two semester master's thesis sequence. Students must complete the thesis and defend it to a committee.

Assistantships and Other Awards

There are different types of assistantship awards from many sources: department personnel budget, special grants, and research grants and contracts. Some awards may be for an academic term (9 months); some may be for a calendar year. If a student receives a calendar year award, work will be expected to continue throughout the summer. If the student receives a calendar year award and does not wish to work in the summer, the graduate student should inform the Graduate Program Director by April 15. The graduate program will not make awards beyond expected time for graduation except in circumstances that benefit the University. Generally, this means that awards are limited to four academic semesters plus possibly any intervening summers.

An Assistantship Award is a contract between the student and the Computer Science Graduate Program. Full-time students should expect to work approximately twenty hours a week during the academic term and full time during the summer. Vacation time includes all holidays taken at the University by employees and at least two contiguous weeks during the summer all other times must be with the approval of the student's supervisor. To continue to receive such an award, the student should maintain full-time status.

Students must seek permission of the Graduate Committee to work beyond their assistantship duties. Students not receiving permission to work outside of their duties may lose their assistantships immediately. The amount of work outside the duties is stated in the admissions letter or letter of support.

If the student's supervisor assigns more work than the student can complete in the hours contracted for, the student should first try to work out a compromise with the supervisor. If there can be no compromise, the student may appeal to the Graduate Program Director in conjunction with the Graduate Program Committee. If a supervisor is not satisfied that his/her graduate assistant is working as agreed to in the contract, the supervisor should try to work with the graduate assistant towards achieving satisfactory work. In any case the Graduate Program Committee has the right to terminate all contractual obligations of the graduate program at any time as long as it can justify that a student has not met his/her contractual obligations.

Advisors who fund graduate students from their grants or contracts may terminate an assistant at any time with the consent of the CS Graduate Committee, although the assistant may protest the termination.

There may be other types of awards including tuition-waivers, grader-ships, and scholarships. Graduate students should understand any agreements entered into when receiving these awards. Generally, a grader should be expected to work ten hours a week grading work in two courses. There may be other duties substituted for grading. Graders may work outside of the program for not more than ten hours a week.

Students may apply for new or different awards at any time.

A **Research Assistant** is a student enrolled full time in the MS program in Computer Science and receives a tuition waiver and a stipend for the academic year to perform specified duties for an average of twenty hours per week. The research assistant may apply for re-appointment at the end of the academic year and must maintain a minimum GPA of 3.0.

Duties

The Research Assistant shall:

- a) Assist the faculty in research activities.
- b) Attend workshops sponsored by various University offices as required by the Computer Science Graduate Director.
- c) Attend graduate seminars and departmental colloquia.
- d) Present research progress and results at the graduate seminar at least once each semester.
- e) Submit a year-end final research report.
- f) Hold weekly meetings with the research advisor.
- g) Assist the research advisor in mentoring undergraduate senior seminar student projects.
- h) Assist the advisor in data collection, data analysis, maintaining records, writing papers, presenting papers, preparing papers for publication, and other tasks required of the advisor.
- i) Be conditionally evaluated by the research advisor at each semester with a final evaluation at the end of the first summer session.
- j) Work on assigned system administration duties in a laboratory.

Other Requirements: Each Research Assistant should choose a research advisor among those available for advising. This is generally a yearlong employment. The Research Assistant may be assigned a different advisor during the summer sessions if the advisor is not available. Vacation times during the academic year correspond to the advisor's vacation as a member of the faculty. For the summer (5/16 through 8/15) the Research Assistant will have at least two weeks contiguous vacation time. If the assistant is supported by a research grant this may slightly differ in agreement with the selected advisor at the time of assigning duties.

If there are difficulties with the advisor, the assistant should speak to the Graduate Director. The procedure for making complaints begins with the Director and then the Chairman and the Dean of the School of Science and Technology.

A **Teaching Assistant** is a student enrolled full time in the MS program in Computer Science and receives a tuition waiver and a stipend for the academic year to perform specified duties for an average of twenty hours a week.. The teaching assistant may apply for re-appointment at the end of the academic year and must maintain a minimum GPA of 3.0.

Duties

The teaching assistant shall:

- a) Teach or work with an instructor on an undergraduate computer science course. Depending on the work load determined by the Department Chair and the Graduate Program Director this may include several different types of responsibilities.
- b) Hold eight office and tutoring an assigned number of hours each week.
- c) Attend workshops sponsored by various University offices as required by the Computer Science Graduate Director.
- d) Attend graduate seminars and departmental colloquia.
- e) Be closely supervised by the course coordinator working in conjunction with the Department Chair.
- f) Work to gain skills to become a competent teacher.
- g) Not be assigned as an assistant for a course while enrolled in that course.
- h) Be assigned space, equipment and support needed to perform duties.
- i) Be professionally attired when teaching and working in the department.
- j) Be conditionally evaluated by the course coordinator at each semester with a final evaluation by the Chair and the Undergraduate Director at the end of the first summer session.

Other Requirements: A Teaching Assistant will be assigned duties by the Undergraduate and Graduate Directors This is generally an academic year employment. Vacation times during the academic year correspond to the advisor's vacation as a member of the faculty.

If there are difficulties with the advisor, the assistant should speak to the Graduate Director. The procedure for making complaints begins with the Director and then the Chairman and the Dean of the School of Science and Technology.

A Laboratory Assistant is a student enrolled full time in the MS program in Computer Science and receives a tuition waiver and a stipend for the academic year to perform specified duties for an average of twenty hours a week. The laboratory assistant may apply for re-appointment at the end of the academic year and must maintain a minimum GPA of 3.0.

Duties

The Laboratory Assistant shall:

- a) Do a variety of duties including assisting with tutoring in the laboratories, work with the fulltime laboratory staff in support of the undergraduate and graduate computer science programs, manage and set up specialized laboratories and computer configurations.
- b) Attend workshops sponsored by various University offices as required by the Computer Science Graduate Director.
- c) Attend graduate seminars and departmental colloquia.
- d) Be supervised by the Faculty Laboratory Director
- e) Submit a report of all work completed to the Faculty Laboratory Director once each month.

- f) Be assigned space, equipment and support needed to perform duties.
- g) Be conditionally evaluated by the Faculty Laboratory Director at the end of each semester with a final evaluation by the Graduate Committee at the end of the first summer session.

Other Requirements: Each Laboratory Assistant will be assigned duties by the Faculty Laboratory Director. These duties may be numerous and varied. This is generally a yearlong employment. Vacation times during the academic year correspond to the advisor's vacation as a member of the faculty. For the summer (5/16 through 8/15) the Research Assistant will have at least two weeks contiguous vacation time. If the Laboratory Assistant is supported by a research grant, the vacation times may differ slightly depending upon the advisor's assignment of duties.

If there are difficulties with the advisor, the assistant should speak to the Graduate Director. The procedure for making complaints begins with the Director and then the Chairman and the Dean of the School of Science and Technology.

There may be **combined duties** of TAs, RAs, and LAs depending on the needs of the department.

Office Responsibilities

Most graduate assistants will be allowed to use special workstations in the graduate offices. They must log out of these computers after their use. After-hours access is permitted, but the graduate student must keep all doors locked after entering and leaving. Any intentional or unintentional destruction of office equipment will be the student's responsibility. Replication of documents on the photocopier is permitted within the legal bounds of U.S. copyright laws. Telephone use is permitted, but no long distance calls may be charged to the University.

Other Policies and Procedures

Other policies dealing with standards of content, graduation requirements, minimum and maximum loads, make up of incomplete grades, and so forth are outlined in the Graduate Studies Office web site and the University's academic catalogue.

Thesis and Project Requirements

Copyright

A thesis is legally classified as a publication. Thus, authors should take care to void violating the United States copyright laws. Standard styles and reference credit should be given for quoted or paraphrased text within the narrative. Authors should receive permissions from the copyright holder for figure and tables taken from copyrighted sources. Evidence of written permission must be included in the thesis.

Binding and Distribution

The Computer Science Department requires thesis authors to arrange and pay for three hard copies of the thesis: one for the Department, one for the Graduate Studies Office, and one for the Library. The thesis must be bound at Longs-Roullet Bindery in Norfolk (757-623-4244 www.longs-roullet.com) in Norfolk, Virginia. Since binding takes two to three weeks to complete, the author must present the original receipt from Longs-Roullet for proof of binding to the Graduate Director before the Department can approve graduation. The Graduate Director is responsible for distributing copies of the thesis to the Graduate Studies Office and the Library.

The original bound thesis (with original signatures on the title page) will be kept in the Department.

Thesis/Project and Supplemental Materials on CD

Required along with the bound thesis or project is a CD containing all electronic materials that deal directly with the documentation (word processor files, graphics, source code, models, program binaries, and so forth). Thesis students should give the completed CD to the Graduate Director at the same time as the receipt for binding. Project students should hand in the CD at the same time as the bound project document.

Type, Paper Quality and Spacing

The entire thesis must be written in Times New Roman font size 12. The manuscript may be double-spaced or one and a half spaced. Mixing of spacing in the text is not appropriate. Single spacing is used only for long, blocked, and inserted quotations; footnotes; endnotes; and itemized or tabular material. Any quotations of six or fewer typed lines should use the same spacing as the narrative text.

Font size reduction may be made in footnotes, tables, superscripts, subscripts, figures and appendix material only. Mathematical and other symbols must be large enough to be readable and logical.

All thesis materials must be one-sided on white paper. This must be used for all pages except for special photographic paper or fold-out pages. However, all figures or tables on those pages must conform to the margins.

The left-hand margin must be 1.5"; the other three margins are 1". All typing must be within the 9" x 6" area except for the page number. All page numbers must be placed in the upper right corner.

Every page in the thesis except the Title and Approval Page (TAP) must be numbered. The preliminary pages are numbered with lower-case Roman numerals. The TAP is numbered (i) but should not be shown. The second numbered page is the Abstract, which is numbered (ii).

Digitized photographs are acceptable if they are good reproductions. Do not include color within the thesis at all unless color reproduction is necessary to the content of the thesis. In any case permission should be sought from the Graduate Director.

Separate tables and figures from the text body by using the equivalent of a triple-space. Tables and figures should also have titles appearing immediately under or above the table. It is preferable to place figures on the top or bottom of the page, not in the middle between the text.

Bold type should be used for new chapters and sections only. New chapters should be bold, capitalized and centered. New chapters should begin on a new page and separated by at least a double-space from the text below. You may choose to make the font size of a chapter heading slightly larger (14). Example

NEW CHAPTER

Second headings should be bold, left-justified and separated from the paragraph above and below it. Example

New Section

Thesis Content Order

Preliminary Pages

*Title and Approval page (page (i), page number doesn't appear)

Copyright Page (optional)

*Abstract

Dedication and Acknowledgments

*Table of Contents

List of Tables (if two or more tables in text)

List of Figures (if two or more tables in text)

Text (with Arabic numeral page numbers)

- *Introduction (as first chapter or section)
- *Main body of text divided into various chapters or sections
- *Summary of Conclusion (as last chapter or section)

References and Supplemental Sections

- *Reference section
- *Bibliography
- Appendix material

Sections marked with an asterisk (*) must be included in the thesis.

Title and Approval Page

Spacing must match the sample page that is included with this document. No bold font except in the title. No page number should be on the Title and Approval page.

The title must be centered in capital letters. Do not place a period at the end of the title. The thesis statement should be as it is in the sample page using single spacing. The student's name should be the same as in the official records at Norfolk State University and typed in all capital letters.

The submittal statement must use single spacing with Norfolk State University on a line by itself. Double-space between the submittal statement and the degree. Put the degree in capital letters.

Type out the month and year without a comma.
Type COMPUTER SCIENCE in all capital letters.

The approval statement must include the director and the other members of the student's thesis committee. Do not include titles (Dr., Ph.D., Prof.). Signature lines and names must be placed on the right side as in the sample page.

Copyright Page

If the student chooses to reserve the copyright of his/her thesis, a copyright page needs to be added following the Title and Approval page. The format is to put

Copyright by
Author name
Year

centered at the bottom of the page. In addition, the student must pay some fees to the US Copyright Office. Check <http://www.loc.gov/copyright/> for further information. If the Copyright Page appears, this should be the second page and numbered (ii). All the following pages should increase in numbering correspondingly.

Abstract

This is page (ii). Bold type should not be used on this page except for the word (ABSTRACT). The Abstract contains a statement of the problem, procedure or methods, results, and conclusions. All explanatory matter and opinion should be omitted.

The title of the abstract appears in upper case letters with a period at the end of the title. Place Dr. before the thesis director's name (if the director does not have an earned doctorate, use the title Prof.)

Begin the text one triple space below the preliminary lines, with a paragraph indentation. Text may be no more than 350 words.

See the sample below for further formatting information.

**AN EVOLUTIONARY SECURE ROUTING ALGORITHM FOR
WIRELESS SENSORY NETWORKS**

by

David Emmet Davis
B.S., June 2001, Florida State University

A Thesis submitted to the Faculty of
Norfolk State University in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE

COMPUTER SCIENCE

NORFOLK
May 2007

Approved by:

Morris D. Kettleman (director)

Sharon Lewis-Smythe (member)

George W. Wiggins (member)

ABSTRACT

**AN EVOLUTIONARY SECURE ROUTING ALGORITHM FOR
WIRELESS SENSORY NETWORKS.**

David Emmet Davis
Norfolk State University, 2004
Director: Dr. Morris D. Kettleman

The text of the Abstract starts one triple-space below the heading, with a paragraph indentation. The text of the Abstract is typed double-spaced or one space and a-half according to the spacing style followed in the narrative text; it must not exceed 350 words in length. Any term (or numeral) with a space on either side of it will be counted as a word.

Dedication and Acknowledgement Page

A dedication and acknowledgement page may be used if desired. This should be no longer than one page in the same format as the text. It will be numbered (iii).

Lists of Tables and Figures

Such listings may be included if there is more than one table or one figure and should be in the same format as the text.

The Text

Most of the information is explained above. Some items to note: use only single columns. Don't use footnotes if they fall below the margins. Use only complete sentences except in tables and figures. Right-justification is not necessary; it can force a separation of words on lines with long sequences of letters.

References

The title of the required page for references should be capitalized and in bold as **REFERENCES**. Reference standards should be used in all cases including Internet references where the exact data read should be noted. All references must be cited in the text. This is not a bibliography. References may be cited in the text using numbers like [24] or by author, year, or chronological ordering as in [Williams], [Williams98], and [Williams98a].

Bibliography

The bibliography normally includes all the references and an extensive compilation of the literature related to the area of study. Normally, but not always, a bibliography includes annotations about the content of the works.

Appendices

Appendices normally include supporting materials (proofs, program code, and so forth) that are of significance.

Project Document Requirements

The project document requirements are exactly the same as the thesis requirements except for the following:

1. There is no binding requirement except that the student and his/her project director should bind the project document within the department with the cover page similar to the Title and Approval Page but with no signatures.

2. Paper may be ordinary high quality 20 lb paper.
3. All source code used in the project must be included in the appendix.
4. The binding of the project must be complete before graduation is certified.

Exceptions to Requirements

All exceptions to the requirements in this document must be approved by the Computer Science Graduate Program Committee and placed in its minutes.

This Handbook is assumed to be consistent with University, Graduate Studies, and School requirements. The procedures included here, if incorrect or inconsistent, revert to University guidelines.