

GRADUATE HANDBOOK
Department of Computer Science
College of Engineering
University of Wyoming

Draft of September 29, 2005

© Dept. of Computer Science, University of Wyoming, 2005
ALL RIGHTS RESERVED

Contents

1 Graduate Studies in Computer Science	1
1.1 The Department	1
2 Master of Science	3
2.1 Plan A - Thesis Option	3
2.1.1 Path to a Plan A M.S. in Computer Science	3
2.2 Plan B – Non-thesis	4
2.2.1 Path to a Plan A M.S. in Computer Science	4
2.3 Plan A vs. Plan B	4
3 Doctor of Philosophy (Ph.D.)	5
3.1 Path to a Ph.D.	5
4 Graduate Assistantships	9
4.1 Types of Assistantships	10
4.1.1 Teaching Assistantships	10
4.1.2 Research Assistantships	10
5 Departmental Resources	11
6 How to Choose an Advisor	13
7 International Student Information	15
7.1 English Proficiency	15
8 Useful Links	17

Preface

This handbook is intended to supplement the official documents regarding graduate studies at the University of Wyoming and specifically in the Department of Computer Science. A list of links to other sources of information is included at the end of the document. We have attempted to compile the information specific to Computer Science at Wyoming that are not available elsewhere – stuff that seasoned graduate students wish they’d known when they first started.

If you think there’s something that hasn’t been addressed, please send an email to Ms. Paula Sircin (PSircin@uwyo.edu) or to Professor Caldwell (jlc@cs.uwyo.edu).

Chapter 1

Graduate Studies in Computer Science

*“Computer Science is no more about computers than astronomy
is about telescopes.”* – E.W. Dijkstra

The University of Wyoming Computer Science department offers two graduate degrees; the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.).

Details of the requirements for each degree can be found in the *Graduate Bulletin* [?]. Students should read the Graduate Bulletin as if it was a contract between them and the University (essentially it is.) It presents all the detailed requirements for graduation for each type of degree. That document trumps anything we might say here as far as the official requirements for graduation or regarding rules and regulations of the University.

1.1 The Department

The Computer Science Department at the University of Wyoming has nine professors and three lecturers. There are around 200 undergraduate majors (both Computer Science and MIS) and 30 graduate students.

In general, the research interests of the faculty tend toward theory and applied theory. The research areas of the faculty can be found on the department research page [?] and on individual faculty pages [?]. There are strengths in AI (Dr. William Spears and Dr. Diana Spears), databases (Dr. Yu), complexity theory (Dr. Hitchcock) and formal, logic based methods (Caldwell, Cowles, Gamboa, Van Baalen).

Chapter 2

Master of Science

The Master of Science (MS) degree is a terminal degree for students who intend to work in industry or government. There are some teaching opportunities in academia for master's level graduates, though they are more rare.

Some students do an M.S. to prepare themselves for Ph.D. studies although, strictly speaking, it is not necessary. This is more common for students who wish to continue on to Ph.D. studies in Computer Science, but who do not have an undergraduate degree in the field.

There are two paths to the M.S. in Computer Science.

2.1 Plan A - Thesis Option

Plan A – Thesis The Plan A master's program has course work requirements and students write a thesis documenting their research. This option is the better one for students who intend to eventually continue with a Ph.D. or are interested in positions that may have some research component.

2.1.1 Path to a Plan A M.S. in Computer Science

There are essentially four steps on the path to a plan-A M.S. degree in computer science.

1. **Course Work.** The course work required for an M.S. is intended to give the student a background across the field with a concentration in their chosen research area.
2. **Establishment of a *Graduate Committee*.** Each M.S. student is required to have a committee of at least three members. This would consist of at least one faculty member from the department of Computer Science who is a member of the graduate faculty (the chair) and at least one member from a department other than Computer Science.

3. Plan A students write a *thesis*. Ideally, this should comprise work that could be published as a conference paper in the appropriate area of research.
4. The *defense* is the final step where you orally present your research results to your committee and the scholarly community. Attendance to the defense is open and should be publicly announced. There is usually a period at the end set aside for private questioning by the committee.

2.2 Plan B – Non-thesis

Plan B – Non-thesis The Plan B master’s program has course work requirements, an area examination (this is a three-hour examination in two of the three areas of study. Additionally, students must complete a project – typically documented in a paper. The Plan B option may be the better option for students who intend to go to work in non-research related positions.

2.2.1 Path to a Plan A M.S. in Computer Science

There are essentially four steps on the path to a plan-A M.S. degree in computer science.

1. **Course Work.** The course work required for an M.S. is intended to give the student a background across the field with a concentration in their chosen research area.
2. **Establishment of a *Graduate Committee*.** Each M.S. student is required to have a committee of at least three members. This would consist of at least one faculty member from the department of Computer Science who is a member of the graduate faculty (the chair or advisor) and at least one member from a department other than Computer Science.
3. **Plan B students must pass two sections of the three part Ph.D. qualifying exam offered in the spring of each year.**
4. **Plan B students are required to write a paper.** This is a significantly less involved work than an plan A thesis. It could report on some project or survey a research area of interest to the student. In any case, the topic should be agreed upon by the advisor.

2.3 Plan A vs. Plan B

Which plan is right for you? Well, the Plan B may take less time because writing a thesis takes considerable effort and time. If you are planning to go further with your graduate studies or want to work in a research environment (say a government or industrial lab) or hope to teach, then the thesis option is the best path. If you plan to go on to industry, the Plan B may make the most sense.

Chapter 3

Doctor of Philosophy (Ph.D.)

The Ph.D. is intended for students who wish to pursue research careers in academia, industry or government.

3.1 Path to a Ph.D.

The time required to complete a Ph.D. degree can vary quite a bit. Typically, a student entering the Ph.D. program with an undergraduate degree in Computer Science should be able to finish in five years. It could be done in four (or theoretically even in three) but students may end up taking even more than five years. A student entering who already has an M.S. in Computer Science could theoretically be done in as little as two years, but three to four years would typically be a more realistic estimate for planning your graduate career.

There are essentially five steps on the path to a Ph.D.

1. Establishment of a *Graduate Committee*. The committee consists of an chairperson, no less than three other faculty members from the Computer Science department and an outside committee member. The outside member is an academic who is not in the Computer Science department, this could be a faculty member from another department or from another university. The chairman and the outside member must be members of the Graduate Faculty. A list of Graduate Faculty is available on the Graduate School's website.

You should choose your advisor based on any number of criteria – most importantly, choose an advisor from the research area you are interested in. Other criteria might include availability of funding, personal style, or any other thing.

2. The *Qualifying Exam*. This is a breadth requirement. It is intended to

show that the student has a breadth of understanding of the subject at the level of a senior undergraduate/first year graduate student. Students tend to freak out about this exam – but typically, in reality, it is not as hard as it is in imagination. The Graduate Examination in Computer Science consists of examinations in each of the following areas:

- Computer Theory
- Machine Intelligence
- Parallel Computing and Systems

Each area exam is three hours long; they are typically given over a period of three days sometime near the middle of the Spring semester. The exam is only offered once a year. A specification for the exam – which includes syllabi– is published in December for the following semester’s exam.

3. The *Preliminary Exam* is an oral examination in which Ph.D. students make presentations of their proposed research. When this exam is completed, the student is considered a doctoral student admitted to candidacy. The preliminary exam should be scheduled as soon a possible after the qualifying exams have been passed, ideally within a year or maybe two and not much more than three. There is a graduate school constraint that the preliminary examination must be passed at least one semester (fifteen weeks) before the dissertation defense – but this is not a good model for the average student.

A student is ready for the prelims when they have settled on a thesis topic and an approach which has been agreed upon by the committee. The preliminary examination is an oral presentation of the topic area, related research, the proposed approach and reasons why it is significant within the context of related research. The talk should be publicly announced, usually by email to the faculty and graduate students a week or more in advance.

After the prelims have been passed and a student has been admitted to candidacy he is eligible to sign up for one credit hour per semester and to be considered a full-time student. This could be important for international students if they should loose support.

4. The *Dissertation* is a document that describes and interprets the results of original research. For many students, writing the dissertation is a road-block to completion (in fact you may sometimes hear someone described as being an ABD – all but dissertation). With a disciplined approach and good guidance, this should not be a problem for most students.
5. The *defense* is the final step where you orally present your research results to your committee and the scholarly community. Attendance to the defense is open, though there is usually a period at the end set aside for private questioning by your committee.

There are course work requirements and students should start toward completing their coursework the first semester.

Chapter 4

Graduate Assistantships

There are two types of graduate assistantships (GA's), the teaching assistantship (TA) and the research assistantship (RA). Teaching assistants help with departmental teaching while research assistants work with a professor on a specific research project. TA's are funded by the University and RA's are typically funded by individual professors through their own external grant money *e.g.*, money that comes from the National Science Foundation (NSF), the Department of Defense (DoD), NASA, or other government agencies, private foundations or through industrial collaborations.

Students awarded an assistantship involving any type of teaching responsibility including labs, lectures, paper grading and interpretation to students are required to successfully complete the graduate teaching orientation prior to assuming their duties. Details about the teaching orientation can be found on the graduate school web pages (see the list of "Useful Links" at the end of this handbook).

Assistantships include a stipend and cover tuition and fees – though they do not cover some incidental student fees, such as the College of Engineering computer fee. As of January 2005, the base stipend for a full-time GA for a master's student is \$10,062 and \$14,004 for a full-time GA for doctoral students. These numbers change over time and current information is available on the Graduate School website.

Usually, a student who receives a full stipend must enroll for at least 9 credit hours and is considered a full-time, full-fee-paying graduate student. Students who receive one-half stipend may enroll for 9-15 credit hours. Graduate assistants for summer sessions must enroll for at least one credit and may not enroll for more than six credit hours. The tuition and fee reduction covers only the tuition and mandatory fees for courses in which the graduate assistant actually enrolls. Graduate assistantship tuition and fee reduction will cover up to 12 credit hours of tuition and mandatory fees. Some non-state funded GA's may only cover up to 9 credit hours or sometimes more than 12 depending on the source of funding. Students should check with their department for individual coverage.

Computer Science students with GA's are provided office or lab space (depending on their responsibilities) and are assigned a networked desk-top computer for their own use.

4.1 Types of Assistantships

There are two types of graduate assistantships (GA's): teaching assistantships (TA's) and research assistantships (RA's)

4.1.1 Teaching Assistantships

Teaching duties range from grading, teaching labs, and lecturing.

The full time teaching assistantship should involve 18 – 20 hours a week of work. Often, fractional assistantships are offered – *e.g.*, a student may be offered a half-time assistantship.

International students who will teach must meet the Graduate School English language proficiency requirements. Details of the requirements can be found in the Graduate Bulletin. This entails taking two courses (offered every August) English 5910 *English Communication Skills for International Teaching Assistants*.

Teaching assistantships are useful on a resume for students intending to pursue careers in academia or other teaching careers.

Each semester, TA's are evaluated by students as professors are. These evaluations provide important feedback on teaching performance to the TA and to the department.

These assistantships are paid for by the Graduate School. Money is allocated to the College of Engineering which is then allocated to the various departments in the College, including Computer Science.

4.1.2 Research Assistantships

The character of research assistantships varies widely and the detailed requirements and expectations of such a position depend on the faculty member providing the assistantship.

How Assistantships are Awarded

There are three main criteria for the awarding of teaching assistantships.

- 1.) There is a job that needs to be done.
- 2.) Assistantships are a tool for strengthening the graduate program.
- 3.) State-funded teaching assistantships are intended to support students for up to three years.

Chapter 5

Departmental Resources

Students with GA's are provided office space and desktop machines. The operating systems are Microsoft or Linux based, depending on the requirements of the position. All graduate students should familiarize themselves with the departmental policies regarding computer use [?].

Most TA offices are located in room 4072.¹ The offices there are cubicles. Names of TA's and their office hours are posted outside the room. Other GA offices are located in rooms 4070, 4071B, 4079A, 4091, and 4093. Office space is claimed on a first-come it's yours basis.

The Graduate Teaching Lab in room 4086 contains ten workstations with either Windows- or Linux-based operating systems. Access to the Grad Teaching Lab is restricted to graduate students in the computer science department. The combination to the keypad lock is available from the office staff. The lab also has a small lending library of computer-related books and periodicals. Please return the books or periodicals when you are finished with them; you don't need to check them out.

¹This room is sometimes also called "Caesar's Palace" after a former graduate student (Caesar Marron) who went into the workforce and convinced management at his company (Auto-trol) to donate the cubicles to the department. Reminding us that the part of the building we're now housed in was once Petroleum Engineering, the door to this room is still labeled "Drilling Fluids Lab".

Chapter 6

How to Choose an Advisor

To repeat the advice given in the first chapter of this handbook, "...choose your advisor based on any number of criteria – most importantly, choose an advisor from the research area you are interested in."

Visit the faculty web pages via the links from the department's website to learn about individual faculty members' research interests and activities, and then visit with faculty members.

Chapter 7

International Student Information

The International Student Scholar Office in Knight Hall Room 128 can assist you in a number of areas, including answering your questions about immigration and employment. If you are awarded a GA you will need to visit the International Student Scholar Office to do paperwork before you can be employed.

7.1 English Proficiency

International students who have not been awarded a teaching assistantship often inquire about the availability of assistantships once they arrive on campus. If the student is from a country where English is not the native language, then the student needs to set up an appointment for an oral proficiency interview before the computer science graduate committee will consider an assistantship application. The interview assesses the student's current level of English language proficiency. It does not test knowledge and there is no way to study or prepare for the interview itself. A student's level of English proficiency determines whether that student needs further skills development or just skills refinement before entering an American classroom to teach. Oral proficiency interviews can be done at any point during the semester, however, there is a cut-off date early in the semester for enrolling in the oral skills classes and labs. If you were not awarded an assistantship before you arrived at UW but would like to be considered for current or future assistantship openings, set up an appointment for the oral proficiency interview as early in the semester as possible so that you can enroll in classes or labs if necessary. Contact information for the English language assessment program is on the Useful Links Page of the handbook.

Chapter 8

Useful Links

Boomerang Online: The local Laramie newspaper.
<http://www.laramieboomerang.com/>

Computer Science Department (Home Page)
<http://www.cs.uwo.edu/>

Graduate School (Home Page)
<http://uwadmnweb.uwo.edu/UWGrad/>

Graduate School International Student Information
<http://uwadmnweb.uwo.edu/UWGrad/internationalstudentinformation.asp>

International Student Scholar Office
<http://uwacadweb.uwo.edu/OSL/international/>

Wyoming Department of Transportation Webcams
<http://www.wyoroad.info/highway/webcameras/webcameras.html>

Bibliography