Regulations of the PhD Program
USI Faculty of Informatics

Adopted 11 October 2005

1 Overview

The PhD program in the Faculty of Informatics at the University of Lugano promotes the development of new professionals interested in academic or industrial research careers. A successful PhD student will gain a broad knowledge and understanding of the general field of informatics, as well as an in-depth specialization in an area of interest. Working with one or more members of the Faculty, the student will contribute original, useful, and scientifically valid ideas in their chosen area of research. In addition, the student will develop professional skills that will serve them throughout their career.

The PhD program is structured according to *competencies* and *milestones*. Competencies define the general skill set required of all graduates of the program. Milestones are visible achievements that measure progress toward graduation.

It is the responsibility of the Faculty to guarantee that students graduating with a PhD degree have achieved the goals of the program. Toward that end, the Faculty will regularly assess the progress of each student. Students who are determined by the Faculty as not making sufficient progress may be asked to leave the program. It is the responsibility of faculty advisors to give their advisees opportunities to develop the required competencies and to guide them toward successful achievement of the required milestones.

2 Administration

Admission into the PhD program is with official consent of the Faculty of Informatics subject to the general rules and procedures of the University of Lugano. The language of the program is English.

Each PhD student is affiliated with an **academic advisor** and a **research advisor**. Only Regular members of the Faculty can serve as academic advisors. Only Regular and Adjunct members of the Faculty can serve as research advisors. The academic advisor is responsible for ensuring that all requirements of the program are met by their advisee. The research advisor is responsible for supervising the advisee's dissertation work. Typically, Regular members of the Faculty will serve as both a student's academic and research advisor; when a student has an Adjunct member of the Faculty as their research advisor, then a Regular member of the Faculty must serve as the academic advisor. A student may have a **research co-advisor** who may or may not be a member of the Faculty.

One member of the Faculty serves as **Director** of the PhD program. The Director is responsible for general oversight of the program, as delegated by the Faculty. The Director is also responsible for reviewing and approving various milestones, as described below. The Dean of the Faculty is responsible for reviewing and approving the academic milestones of students advised by the Director.

3 Competencies

Every graduate of the PhD program is expected to attain the following competencies:

- ability to *acquire general knowledge* of informatics;

- ability to *acquire specific knowledge* in a subdiscipline of informatics;

- ability to *contribute knowledge* to a subdiscipline of informatics;

- ability to *communicate* in writing and through public presentations;

- ability to *contribute service* to the professional community; and

- ability to *mentor* those having less knowledge or skill.

There are many ways that these competencies can be attained. For example, a suite of courses covering a range of informatics subjects provides a broad introduction to the discipline. Summer schools are a way to learn about specific subdisciplines of informatics. A faculty member might offer a reading course in a particular topic area. A scholarly paper published in a peer-reviewed professional conference contributes knowledge to the field, as does the PhD dissertation. Acting as a teaching assistant is a way to improve mentoring skills. Reviewing papers for a conference is both a service activity and a way to gain specific knowledge in a subdiscipline. Maintaining one of the shared computers, managing a commonly useful application, or helping to organize a seminar series are also professional community services.

Students and advisors are expected to work together to develop a **Plan of Study** for attaining the required competencies in a manner that is best suited to the needs of the individual student and the opportunities available. The plan should include specific and tangible means to demonstrate measurable growth in each area of competence.

The Plan of Study is a living document that should be reviewed and revised regularly. It is used by the Faculty as part of their assessment of adequate student progress.

4 Milestones

Milestones are a means for both the student and the Faculty to assess progress toward graduation. Milestones have some interdependencies, as described below. The student must achieve all milestones in a timely fashion in order to remain in the program and graduate.

4.1 Designation of Research Advisor

Description. The research advisor is responsible for supervising the advisee's dissertation work. The student should discuss research interests and opportunities with members of the faculty during the first semester of studies in an effort to find a good match. Sometimes the initial selection of a research advisor does not work out and the student must find another. The student must notify the Director of the PhD program when the previously designated research advisor is no longer serving.

Typical time frame. Within the first semester of the PhD program.

4.2 Research Prospectus

Description. The student must prepare a document outlining an area of research intended to lead to a dissertation topic. The document, no longer than two to three pages in length, must be approved by the student's academic and research advisors and by the Director of the PhD program. The document should describe the problem to be solved and the basic approach to be explored. It should also offer some evidence of intellectual depth and novelty.

Typical time frame. Within the first year of the PhD program.

Prerequisites. Designation of a Research Advisor.

4.3 Scholarly Publication

Description. The student must be the author or coauthor of at least one peer-reviewed, scholarly publication in informatics. The publication may be either a full conference paper (i.e., not a workshop position statement or short paper) or a journal article. The publication is not required to be in the area of the dissertation. The publication may have been produced prior to the start of their PhD studies (e.g., as part of the student's prior studies or employment).

Typical time frame. Within the first two years of the PhD program.

4.4 Public Presentation

Description. The student must prepare and offer a scholarly presentation to a professional audience. The dissertation defense does not satisfy this requirement, nor does a presentation made as part of a course taken by the student.

Typical time frame. Within the first two years of the PhD program.

4.5 General Knowledge

Description. The student must demonstrate their ability to acquire general knowledge of informatics. General knowledge, in comparison to specific knowledge, is an understanding of the basic principles, practices, achievements, and research problems of areas outside the domain of the dissertation. The ability to acquire general knowledge provides the student with a broader perspective on informatics as an intellectual discipline, as well as a means to interact with informatics colleagues outside the student's area of specialization. For purposes of this milestone, informatics is divided into the following broad areas:

- artificial intelligence;

- computer architecture;

- databases;

- distributed systems;

- operating systems;

- networking;

- programming languages;

- scientific computing;

- security;

- software engineering; and

- theory.

The student must declare one or more of these as their *area of specialization* (i.e., as the area or areas that best encompass their intended dissertation topic); the knowledge acquired would be deeper than that required for demonstrating general knowledge. The student must then demonstrate their ability to acquire general knowledge in at least *three areas other than the ones declared as their specialties*. If the student changes area of specialization, then satisfaction of this requirement holds with respect to the *new* area of specialization. The demonstration for a given area is made by one or more of the following means:

- *course option:* successful completion of a graduate-level course with "high marks" (i.e., a final grade equivalent to at least that of an "A-");

- *paper option:* a scholarly survey paper derived, for example, from attendance at a "summer school" or participation in an internship program; or

- *minor option:* a substantial research project conducted under the guidance of someone other than the research advisor or co-advisor, including relevant work in an internship program.

A *pre-approved* plan for meeting this milestone forms part of the Plan of Study developed in consultation with the student's advisors, and progress toward meeting the milestone is recorded in the General Knowledge Checklist. The course, paper, or minor may be completed prior to or during the student's PhD studies.

Typical time frame. Within the first two years of the PhD program.

4.6 Dissertation Committee

Description. The student must form a committee to review their dissertation research, provide technical advice, and judge the outcome of the dissertation defense. The committee has at least four members, including a chair who is the student's research advisor. Two other members of the committee must be members of the Faculty. The fourth member must be drawn from outside the Faculty. The committee must be approved by the Director of the PhD program.

Typical time frame. Within the first two years of the PhD program.

Prerequisites. Approved research prospectus.

4.7 Dissertation Proposal

Description. The student must prepare a document detailing a research plan intended to lead to a dissertation. The document, typically 30 pages in length, must be unanimously approved by a dissertation committee. The document should describe the hypotheses of the research, the prior and related work in the area, the research methods to be employed, partial results that provide evidence of viability of the research, a plan for validating or evaluating the results of the research, and a schedule for conducting and completing the work.

Typical time frame. Within the first two years of the PhD program.

Prerequisites. Approved dissertation committee.

4.8 Minimum Mentoring Service

Description. The student must serve as a mentor, typically by assisting professors in the teaching of courses. Other ways of satisfying this requirement are possible, but should be discussed with the Director of the PhD program. All students are required to perform *at least* the equivalent level of effort as would be expected of someone assisting with *two* semester-long courses. Students may be expected to perform more than this minimum level effort if required by the Dean of the Faculty. All mentoring experiences should be documented in the student's portfolio.

Typical time frame. Within the first three years of the PhD program.

4.9 Ascent to Candidacy

Description. This milestone acknowledges completed preparation for writing and defending a dissertation. The academic and research advisors and the Director of the PhD program must approve a student's ascent to candidacy.

Typical time frame. Within the first two years of the PhD program.

Prerequisites. Approved dissertation proposal, a scholarly publication, and demonstration of the competencies of general knowledge, specific knowledge, communication, service, and mentoring.

4.10 Dissertation

Description. The student must write a dissertation, which is a book-length presentation of a significant research contribution. The dissertation demonstrates a student's ability to perform scholarly research in a specific field of informatics. Upon completion, the student should be an expert in the topic area of the dissertation.

Typical time frame. Within the first four years of the PhD program.

Prerequisites. Ascent to candidacy.

4.11 Dissertation Defense

Description. The student must make a formal defense of their dissertation research. In attendance must be the members of the dissertation committee. Members of the academic (graduate students and faculty in all disciplines) and professional community may also attend the defense. *The defense is not a public event open to all. In particular, the student's family is not permitted to attend.* Separately, an open, public event may be held to present the results of the dissertation, but this is not a requirement of the PhD program. The defense is treated as an examination in the sense that the dissertation committee is responsible for judging its quality. There are three possible outcomes to be reported to the Director of the PhD program: unconditional pass, conditional pass, and failure. In principle, an unconditional pass means that the student has satisfied the committee and needs only to submit the final version of the dissertation to the Director, possibly after making some minor changes to the dissertation text; a conditional pass means that the student is required to perform some additional and substantial research work to satisfy the committee; and a failure means that the student must begin the research again at the point of writing (or modifying) a dissertation proposal for approval of the dissertation committee. In the case of a conditional pass, the committee can determine whether to delegate final judgment of completion ("unconditional pass") to the research advisor or to require another dissertation defense. In case the committee cannot agree on an outcome of the defense, the judgments of the individual members of the committee are reported to the Director who, in consultation with the committee, determines the outcome.

Typical time frame. Within the first four years of the PhD program.

Prerequisites. Dissertation proposal accepted *not less than one year prior* to the defense. Preparation of a dissertation.

4.12 Final Dissertation Acceptance

Description. The final version of the dissertation must be submitted to the Director of the PhD program. The dissertation must include a cover page displaying the approval signature of the research advisor and, if one, the co-advisor.

Typical time frame. Within the first four years of the PhD program.

Prerequisites. A dissertation defense with an outcome of unconditional pass.

5 Yearly Progress Review

The Faculty as a whole is responsible for maintaining a high standard of scholarly research training and ensuring that students progress through the program in a timely fashion. Toward that end, the Faculty conducts a yearly review of each student's progress in attaining the required competencies and meeting the required milestones of the program. Input to the review is based primarily on a **portfolio**, described below. The review results in feedback given to the student and to the student's advisors. The Faculty may place a student on **probation** due to inadequate progress and establish conditions under which the student may continue in the program. The Faculty may dismiss a student from the program if it is determined that no further adequate progress is likely.

5.1 Portfolio

Each student must maintain a personal portfolio documenting their progress through the program and record of scholarly achievements. A portfolio typically includes the following items:

- a Curriculum Vitae;

- a Plan of Study;

- a General Knowledge Checklist;

- a Milestone Checklist; and

- a Yearly Report, which is a short document providing a yearly summary of activities, accomplishments, and goals for the following year.

The portfolio should also include copies of published papers, the research prospectus, and the dissertation proposal as they become available.

GENERAL KNOWLEDGE CHECKLIST

Name: _____

Entrance Date: _____

Academic Advisor: _____

Research Advisor: _____

	Category (S, G)	Option (C, P, M)	Planned Completion Date	Actual Completion Date
Artificial Intelligence				
Computer Architecture				
Databases				
Distributed Systems				
Operating Systems				
Networking				
Programming Languages				
Scientific Computing				
Security				
Software Engineering				
Theory				

Category is specialty area ("S") or general area ("G"). Options for each general area are course ("C"), paper ("P"), or minor ("M"). There must be at least one specialty area and three general areas indicated.

Use your Plan of Study to document how you intend to carry out each general option. On the back of this form, document how you completed each general option. For the course option, give the institution, course number, instructor, textbook, and grade. For the paper option, give the title, and how the knowledge is acquired (e.g., the summer school attended). For the minor option, give a desription of the project and name of the project advisor.

Satisfaction of the general knowledge milestone is subject to the approval of the academic advisor and the Director of the PhD program. You are strongly advised to seek prior advice and approval from both.

MILESTONE CHECKLIST

Name: _____

Entrance Date: _____

Academic Advisor: _____

Research Advisor: _____

	Planned Completion Date	Actual Completion Date
Designation of Research Advisor		
Research Prospectus		
Scholarly Publication		
Public Presentation		
General Knowledge		
Dissertation Committee		
Dissertation Proposal		
Minimum Mentoring		
Ascent to Candidacy		
Dissertation		
Dissertation Defense		
Final Dissertation Acceptance		

Dissertation Committee Members and Affiliations:

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