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Math Department
Student Handbook

Honors Program

2011 Department Honors Committee
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1 Purpose

The purpose of this document is to inform Honors students and faculty directing Honors students of the *departmental* requirements for graduating with Latin Honors. **Nothing in this document overrides requirements of the Honors College or of the College of Science and Technology.** Should any conflict exist, priority lies with the guidelines of each College.

2 Guidelines for Mathematics Honors Students

Students seeking an honors designation in mathematics must meet all requirements for Senior Honors as described in the Honors College Handbook. In addition, students must meet the departmental requirements as set forth below. Please be particularly attentive of deadlines for the completion of the comprehensive exam, the prospectus, the thesis, and the thesis defense. A timeline is available to assist students in planning their course of study.

3 Dual majors

Some projects successfully integrate research in different fields, such as mathematics and music, or mathematics and physics. In such cases, it is very important that the advisor and the student communicate this intent with the department at a very early stage.

Students who are dual majors in mathematics and another field may choose to pursue Latin Honors in the other field. In this case, the student should follow the guidelines of that department. The Department of Mathematics cannot evaluate, nor endorse, research in other specialties.

4 Departmental Honors Committee

The Mathematics Department Honors Committee is comprised of 3–4 members of the mathematics faculty, chosen by the chair. The committee is responsible for designing and administering the Honors Comprehensive Examination, reviewing the Prospectus, and hearing the defense of the Honors Thesis.

5 Comprehensive Examination

In accordance with the guidelines of the Honors College, students must take a comprehensive examination before submitting their thesis. The student should schedule her or his first attempt at the exam at least one semester *before* the student intends to graduate.

Honors students are expected to demonstrate a mastery of mathematics on the Comprehensive Examination. At the present time, the Honors Committee has decided to measure this mastery using the ETS Major Field Test. This test is required of all students taking MAT 423. A student is deemed to have passed the exam if she or he performs above the mean score of all students taking it in that semester. If no students take the exam that semester, the previous semester's mean will be used.

In case of an unsatisfactory performance, the committee may reschedule the examination once. At least one semester should elapse before the examination is rescheduled.

6 Thesis Advisor

The student should select a mathematics faculty advisor who will direct the research work for the Honors Thesis. Because students are expected to begin research during the Junior year, while taking HON 301 (Prospectus Writing), a student should have found an advisor no later than the sophomore year.

7 Prospectus

The Honors College requires Senior Honors students to complete HON 301 (Prospectus Writing), and recommends that it be completed during the first semester of the junior year. In order to allow adequate time for writing the thesis, it is normally assumed that the Prospectus will have been approved by the end of the first semester of the junior year. The Prospectus should be prepared under the direction of a thesis advisor.

Each student presenting a Prospectus in mathematics during a semester, along with his or her thesis advisor, will meet with the departmental Honors Committee. The purposes of this prospectus review are to establish realistic objectives for the Honors Thesis and to determine appropriate prerequisites. It is not the intent of the committee to impose inflexible guidelines for the thesis. The prospectus review should occur no later than four weeks prior to the end of the semester in which the Prospectus will be submitted to the Honors College.

Although the Honors College does not require the signatures of either the Department Chair nor of the Honors Committee, advisors are urged not to neglect their duty of informing the Committee of their students' projects and progress.

8 Thesis

After the Prospectus has been approved, two complete semesters should be allowed for writing the thesis (normally the 2nd semester of the junior year and the 1st semester of the senior year). A first draft would be presented to the faculty advisor by the end of the first semester. The student should obtain a copy of the Guide for Writing the Senior Thesis from the Honors College. (The Honors College requires that a draft of the thesis be approved no later than the five weeks before the end of the semester in which the student will graduate.)

Faculty are reminded that undergraduate students do not have a good sense of how long a research project will take, or how much effort and dedication it requires. The Honors Committee urges advisors to meet frequently with their students, *at least* once a week.

9 Thesis Defense

After the thesis advisor has approved the thesis, the student should provide a copy of the thesis to each member of the mathematics honors committee. The committee will review the thesis, and within the next two weeks of regularly scheduled classes, will approve the scheduling of an oral defense, or else will return written comments detailing aspects of the thesis that need to be addressed prior to the scheduling of that defense. If a thesis is returned for further work, the process will repeat until the thesis is deemed acceptable by the committee.

Once the committee accepts the thesis, the student, in conjunction with his or her advisor, will schedule an oral defense of the thesis. During this defense, the student will present his or her results to the committee, and the student will be expected to answer questions pertaining to the thesis. If the committee still feels further work is needed, the student will be given detailed advice by the committee, and upon the completion of the committee's recommendations, another oral defense can be scheduled if the committee deems it desirable. Upon successful completion of the oral defense, the committee will provide the chair of the department with written notice that the thesis has been approved, and that the thesis may be signed.

The department chair should not approve a thesis without the committee's approval. Students who do not communicate with the Honors Committee according to the schedule given here risk not graduating with Latin Honors.

The Honors College requires that a draft of the thesis must be submitted to the thesis advisor and to the Senior Honors Coordinator at least five weeks prior to the end of the semester of graduation, and that the completed thesis be submitted to the thesis advisor at least three weeks prior to the end of the semester. In order for the departmental honors committee to have adequate time to review the thesis, the department requires that the student deliver a draft of the thesis to the thesis advisor, and with the advisor's approval, to the committee at least seven weeks prior to the end of the semester in which the student will graduate.

Students should consult with their advisors on how to prepare a mathematical document, and which software to use. The committee urges students to avoid packages such as Microsoft Word that do not produce high-quality mathematical output; the use of packages such as \LaTeX or Lyx is preferred.

A comprehensive Honors Thesis/MS Thesis/PhD Dissertation package is also supported and provided by the Department of Mathematics. The package contains tutorials and examples on various common environments used in \LaTeX , including the use of bibliography databases, indices, cross referencing and the use of figures and images in documents.

In addition to style manuals recommended by the Honors College, the following manuals which are specifically concerned with mathematical manuscripts should be consulted

- *Mathematical Writing*, Donald E. Knuth, Tracy Larrabee, and Paul M. Roberts, Mathematical Association of America, Washington, D.C. (1990); and,
- *Writing Mathematics Well*, Leonard Gilman, Mathematical Association of America, Washington, D.C (1987).

The following texts contain references and/or tutorials for \LaTeX .

- *First steps in L^AT_EX*, George Grätzer, Birkhäuser, Boston (1999)
- *The L^AT_EX Companion*, Michel Goossens, Frank Mittelbach, and Alexander Samarin, Addison, Reading, Mass. (1994);
- *Learning L^AT_EX*, David Griffiths and Desmond Higham, SIAM, Philadelphia (1997);
and,
- *Math into L^AT_EX*, 3rd Edition, George Grätzer, Birkhäuser-Springer, Boston (2004).

10 Timeline for Mathematics Honors Students

- Freshman and Sophomore Years:
 - Complete core courses in calculus, differential equations, linear algebra and discrete mathematics.
 - Interview faculty members to learn about their research interests and their background directing undergraduate research. Select a thesis advisor in mathematics.
- Junior Year:
 - 1st Semester:
 - Select a thesis advisor in mathematics, if not done already.
 - Enroll in HON 301 (Prospectus Writing).
 - Meet with Department Honors Committee.
 - Complete and submit Prospectus.
 - 2nd Semester:
 - Enroll in HON 301 and complete Prospectus, if not done in 1st semester.
 - Enroll in MAT 492H under your advisor's name.
- Senior Year:
 - 1st Semester:
 - Petition to take the Comprehensive exam, and pass it.
 - Complete first draft of thesis by mid-semester.
 - Complete final draft of thesis.
 - Enroll in MAT 492H under your advisor's name.
 - 2nd Semester:
 - Petition to take the Comprehensive exam, and pass it, if not done in 1st semester.
 - Submit final draft of thesis to departmental Honors Committee at least seven weeks before the end of the semester.
 - Defend thesis.
 - Submit final, signed thesis to Honors College at least three weeks before the end of the semester.

Although there is some flexibility with the timeline, the following must be observed:

- The Prospectus can be submitted no later than one semester prior to graduation.
- The committee must be able to review the thesis before the oral defense. Thus the student must submit a thesis no later than seven weeks before graduation.
- Since the Honors College requires the thesis to be signed and submitted at least three weeks before the end of the semester, the defense can occur no later than three weeks before graduation.