Advising Toolkit: Checklists for initial advisors

UNL Department of Mathematics
Graduate Advisory Committee
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The following is a collection of tools for faculty (usually, but not exclusively) from the GAC for advising students who have not yet formed a supervisory committee. This document is organized into separate pages, each page corresponding to the number of semesters the student has completed in their studies, containing a checklist of suggested items for advising discussion.

First year students - First semester

☐: **Advising Form:** Fill out the Advising Form, both pages 1 and 2, with the advisee (available at www.math.unl.edu/current-graduate/ under "Departmental Forms"):

- ◯: **Page 1: Coursework.** *From the GIOGP* (General Information on Graduate Programs, at http://www.math.unl.edu/graduate/giogp/) requirements for the PhD:
  Each student must complete (with a grade of B or better) at least three two-course sequences. At least one must be from Group A, and at least one from Group B:
  - **Group A:** Math 825-826 (analysis), Math 830-831-842 (any 2 courses; differential equations and applied mathematics)
  - **Group B:** Math 817-818 (algebra), Math 850-852 (discrete mathematics), Math 871-872 (topology)

  Each student must pass, at the qualifying (Q) level, two subject exams from among the five above.

  Advice: Most students should be advised to take three of these two-course sequences in the first year, with at least one of them Math 817-818 or Math 825-826 (often both).
  (*Note:* Any student who will be asked to teach their own course for the first time during their first year (this is rare) is also required to take the 2 credit hour Math 896 teaching professional development course in the Fall semester.)

- ◯: **Page 2: Future requirements.** Many entering graduate students are not familiar with the expected timeline for various graduate requirements, and some are not aware that they can get a Master's degree along the way to getting a PhD.
  Recommendation: Go through the relevant portions of the GIOGP with the student at the same time.
  Filling out page 2 of the Advising Form with the student and talking through the requirements can be helpful for them to see the overall plan of the program.

☐: **Seminars:**

- ◯: **GSS:** First year students should be advised to attend the GSS (Graduate Student Seminar) each week. This is an excellent opportunity to meet and get to know more senior grads, and the talks are particularly geared toward the entering graduate students, in particular by not requiring mathematical background.
- ◯: **Colloquium:** First year students should also be encouraged to attend the Department's Colloquium each week.

☐: **Fellowships:** Consider advising students to apply for external fellowships, for example NSF Graduate Research Fellowships, National Physical Science Consortium Fellowships (includes all math, primarily for women/minorities), National Defense Science and Engineering Graduate (NDSEG) fellowships, Science, Mathematics And Research for Transformation (SMART) fellowships, etc.; for more see
http://www.unl.edu/gradstudies/current/funding/external.
Deadlines are usually in October/November.

First year students - Second semester

☐: **Advising Form:** Fill out the Advising Form, both pages 1 and 2, with the advisee (available at www.math.unl.edu/current-graduate/ under "Departmental Forms"):

◯: **Page 1: Coursework.** *From the GIOGP* (General Information on Graduate Programs, at http://www.math.unl.edu/graduate/giogp/) requirements for the PhD:
Each student must complete (with a grade of B or better) at least three two-course sequences. At least one must be from Group A, and at least one from Group B:

Group A: Math 825-826 (analysis), Math 830-831-842 (any 2 courses; differential equations and applied mathematics)

Group B: Math 817-818 (algebra), Math 850-852 (discrete mathematics), Math 871-872 (topology)

Each student must pass, at the qualifying (Q) level, two subject exams from among the five above.

Advice: Most students should be advised to finish the three two-course sequences that they began in the Fall.

Landscape: In addition, every first year student with GTA/fellowship funds is required to take the Math 896 Mathematical Landscape course. This class consists of talks by faculty describing research areas in the department, giving the students a broad view of departmental research and helping the grads in choosing a thesis area.

◯: **Page 2: Future requirements.** It's helpful again to go through this page of the Advising Form, in particular focusing on the Master's Memorandum of Courses (see below) and on a discussion of the student's plans for qualifying exams in May/June.

☐: **Master's degree Memorandum of Courses:** The Memorandum of Courses form for the Master's degree, at http://www.unl.edu/gradstudies/current/degrees/masters, must be completed before half of the program is complete. The Master's degree requires 36 hours of coursework, and most students use Option 3, which requires at least 18 hours of graduate-only coursework. This form usually needs be filled out and turned in to the Math department's Graduate Programs Coordinator before the end of the student's (first year) second semester.

Advice: The advisor should offer to help the student choose courses for their summer and second year for this form. Consider further sequences from among the five listed above for further foundations and breadth, in addition to more advanced/topics courses.

☐: **Seminars:** First year students should be advised to attend the GSS (Graduate Student Seminar) and the Department's Colloquium each week.

☐: **Internships:** For students wishing to consider a nonacademic (industry or government) career after their Ph.D., an internship is an important experience, and pursuing this in the summer after the first or second year is best (less disruptive of thesis research). For example, internships include work at national labs, NASA, NSA's Graduate Mathematics Program, Bell Labs, etc. See www.math.unl.edu/ smh/gcintern for more information. Applications are usually due in December/January, some later/earlier.

☐: **Mathematical Literature summer course:** This course is highly recommended and targeted for all first year students (other than those doing an internship in that summer). The students read research papers and present them in class, with mentoring and class discussions on the process.

Second year students - First semester

☐: **Advising Form:** Fill out the Advising Form, both pages 1 and 2, with the advisee (available at www.math.unl.edu/current-graduate/ under "Departmental Forms"):

- ◯: **Page 1: Coursework.** *Advice:* Students should typically take the courses agreed upon in the Memorandum of Courses they filed in the second semester of their first year. However, modifications can be made to this form as needed. Any student who did not complete (with grades of B or better) their three two-course sequences (at least one of Math 825-826, 830-831-842 and one of Math 817-818, 850-852, 871-872) in their first year should be advised to do so in their second year.

  Teaching Mathematics: Any student who will teach their own course for the first time during their second year (this will be all or almost all students) is also required to take the 2 credit hour Math 896 teaching professional development course in the Fall semester.

- ◯: **Page 2: Future requirements.** It's helpful again to go through this page of the Advising Form in particular focusing on the Master's Comprehensive Exam and Final Exam Report Form (see below), on the student's plans for completing qualifying exams in January if they were not completed the previous June, and on plans for forming a supervisory committee (more below).

☐: **Master's degree Final Exam Report Form:** Most students pass the Master's Comprehensive Exam using Option B. *From the GIOGP:* (B) Pass the final exam and earn a grade of at least 'B' in each of four courses chosen by the student from the following list of core courses: Math 817, 818, 825, 826, 830, 831, 842, 850, 852, 871, 872. The last day of the semester in which the student receives the fourth 'B' will be the date on which the student passes the Master's Comprehensive Exam.
Most students will have passed the Master's Comp Exam at the end of their first year, and should be notified by the Graduate Chair in the Fall of their second year that they should file the Final Exam Report Form (at http://www.unl.edu/gradstudies/current/degrees/masters) for the Master's degree. This should be submitted to the Math department's Graduate Programs Coordinator.

☐: **Choosing a research area and supervisory committee:** Students should be advised to work toward choosing their field and advisor in their second year.

☐: **Seminars:**

- ◯: **Research seminars:** Second year students should start attending, and consider speaking in, a variety of the department's research seminars. This is important not only in learning about research topics toward choosing a supervisory committee, but also is a great learning experience. *Advice:* It's also important to attend and participate in seminars in order to demonstrate the student's interest in the topic to potential advisors.
- ◯: **GSS and Colloquium:** Second year students should also be advised to attend both the GSS and the Department's Colloquium each week.

☐: **Fellowships:** Consider advising students (who did particularly well in their first year) to apply for external fellowships. For many graduate fellowships (eg NSF), the fall of the second year is the last opportunity for a student to apply.

Second year students - Second semester

☐: **Advising Form:** Fill out the Advising Form, both pages 1 and 2, with the advisee (available at www.math.unl.edu/current-graduate/ under "Departmental Forms"):

- ◯: **Page 1: Coursework.** *Advice:* Students should typically take the courses agreed upon in the Memorandum of Courses they filed in the second semester of their first year. However, modifications can be made to this form as needed. Any student who did not complete (with grades of B or better) their three two-course sequences (at least one of Math 825-826, 830-831-842 and one of Math 817-818, 850-852, 871-872) in their first year should be advised to finish them in this semester. GTA's are also required to continue with the (1 credit hour) Math 896 teaching professional development sequence.
- ◯: **Page 2: Future requirements.** On this page of the Advising Form focus on applying for the Master's Degree, on the student's plans for completing qualifying exams in the January of this semester (and if not successful, in the following May/June), and on forming a supervisory committee (3 forms described below).

☐: **Application for Master's degree:** Most students will complete the requirements for this degree in their fourth semester, and should file the Application for Master's Degree form (see http://www.unl.edu/gradstudies/current/degrees/masters; this form is filled out in MyRED). **Warning:** Although the graduation is in May, this form is due in **January**.

☐: **Retention and advising:** In the second year many students decide whether to continue to the Ph.D. or to finish with a Master's. Retention can be improved by discussing details of careers and job options (academic and nonacademic) if they continue. For those who decide to leave, advice should be offered for continuing studies in another field, and/or pursuing an academic (e.g., at a community college) or nonacademic career in the mathematical sciences.

☐: **Appointment of Supervisory Committee, Program of Studies, and Comp Exam Progress Form:** Students should be advised to form their supervisory committee by the end of their second year. *Note:* The following 3 forms should be submitted (to the Math Graduate Programs Coordinator) in the same semester, and before the end of the second year, but cannot be submitted before the Qualifying Exams are completed:

- ◯: **Appointment of Supervisory Committee (ASC) form.** This transfers advising from the GAC to the supervisory committee.
- ◯: **Comprehensive Exam Progress Form, Part A.** (Aka Form Pi.) The newly established supervisory committee records its decision on the required subject areas.
- ◯: **Program of Studies.** Submit before 45 credit hours of coursework for the PhD are completed, and submit in the same semester as the ASC form.

☐: **Seminars:**

- ◯: **Research seminars:** Students should attend, and consider speaking in, a variety of research seminars. This is important both to learn about potential dissertation research areas and to demonstrate the student's level of interest to potential advisors.
- ◯: **GSS and Colloquium:** All grads should be advised to attend these.

☐: **Internships:** For students wishing to consider a nonacademic (industry or government) career after their Ph.D., an internship is an important experience, and pursuing this in the summer after the first or second year is best (less disruptive of thesis research). For example, internships include work at national labs, NASA, NSA's Graduate Mathematics Program, Bell Labs, etc. See www.math.unl.edu/ smh/gcintern for more information. Applications are usually due in December/January, some later/earlier.

Third year students without a supervisory committee

☐: **Advising Form:** Fill out the Advising Form, both pages 1 and 2, with the advisee (available at www.math.unl.edu/current-graduate/ under "Departmental Forms"):

- ◯: **Page 1: Coursework.** *Advice:* Ideally students would have formed a supervisory committee by the start of the third year and would obtain their advice on coursework from that committee. For those who have not, advice on courses can be guided by what will most help the student toward narrowing their choice of area.

- ◯: **Page 2: Future requirements.** It's helpful again to go through this page of the Advising Form, in particular focusing on forming a supervisory committee with the attendant 3 forms (more below). For third year students in their first semester who have not yet completed their qualifying exams, plans for taking the exams one last time in January should be discussed.

  For students who decide to end their studies this year and not complete their Ph.D., advice should be offered on either continuing their studies in another field, pursuing a career in academia (e.g., teaching at a community college, etc.), or pursuing a nonacademic career in the mathematical sciences.

☐: **Advice to give students on finding an advisor:** Third year students who have not yet formed their supervisory committee should be advised to do so as soon as possible, early in the third year. Suggestions for this process:

- ◯: Attend research seminars, both to learn about research topics and to signal your interest to potential advisors
- ◯: Peruse papers by faculty, on their websites and the arXiv.
- ◯: Chat with fellow grads on how advisors work - e.g. some are more (or less) hands-on (preferring frequent meetings, etc.) - and determine best fit for you.
- ◯: Talk with faculty about what they do, what they would want you to do.

☐: **Appointment of Supervisory Committee, Program of Studies, and Comp Exam Progress Form:** Students should be advised to form their supervisory committee by the end of their second year. *Note:* The following 3 forms should be submitted (to the Math Graduate Programs Coordinator) in the same semester, and before the end of the second year, but cannot be submitted before the Qualifying Exams are completed:

- ◯: **Appointment of Supervisory Committee (ASC) form.** This transfers advising from the GAC to the supervisory committee.
- ◯: **Comprehensive Exam Progress Form, Part A.** (Aka Form Pi.) The newly established supervisory committee records its decision on the required subject areas.
- ◯: **Program of Studies.** Submit before 45 credit hours of coursework for the PhD are completed, and submit in the same semester as the ASC form.

☐: **Seminars:** Third year students should actively participate/speak in research seminars. They should also be advised to attend GSS and the Department's Colloquium each week.