

# Qualifying Exam Rules

1. The qualifying exam has two stages: written and oral. Students who are successful in the written exam are admitted to the oral exam. Students who are also successful in the oral exam are considered to have passed the exam. A student who fails the written exam is not admitted to the oral exam and is considered to have failed the exam. If they pass the written exam but fail the oral exam, they are also considered to have failed.
2. The exam is held every semester (spring and autumn). Only students who have completed their course requirements can register for the exam. Students entering with an MS degree must take the exam by the end of their 5th semester at the latest, and students enrolled with a BS degree must take it by the end of their 7th semester at the latest.
3. Students who fail the qualifying exam are re-examined in the parts they failed in the following semester. Students who also fail this exam will be dismissed. Students should not skip a semester between their first exam and their second chance (except for students who have frozen their registration) and must retake the exam in the immediately following semester.
4. The week in which the exam will be held is determined in the first week of each semester. The aim is for the exam week to be a week close to the end of the semester.
5. Students who wish to take the exam notify the department's GSSE representatives at the beginning of the semester that they will take the exam and choose a total of 3 subjects, at least 1 of which is a major and the others are elective. The main subjects are Analysis and Algebra. Elective subjects will be mentioned in later articles.
6. Students take the written exam collectively on Monday morning of the exam week.
7. Each student independently organizes their oral exam to be held during the exam week. This requires forming a qualifying jury of 5 people, at least 2 of whom are from outside the university, and determining a 120-minute period on Wednesday, Thursday, or Friday of the exam week that is suitable for the jury members as the exam date and time. In addition, one of the jury members must be one of the student's supervisors. Other co-supervisors cannot be members of the jury. It is expected that the members selected from within the university are from the mathematics department, and those from outside the university are experts on the thesis topic. This information must be submitted to the GSSE at least 1 week before the written exam.

8. The oral exam will begin with a presentation in which the student explains the original value of the problem they plan to research in their thesis and the methods that can be used. Before the exam week begins, the student sends a summary of no more than 2 pages to the jury members to help them prepare for the presentation.
9. In the written exam, 2 questions are asked from each of the 3 subjects; each question is worth 10 points. The exam duration is 3 hours. In order to pass, the student must get at least 10 points from each of the 3 subjects.
10. On Tuesday of the exam week at 13:00, the grading of the written exams is completed and the result is announced to the student. If the student passes the written exam, they are entitled to take the oral exam. If the student learns that they have not passed the written exam, they immediately inform the qualifying jury and the oral exam is canceled. A student who fails the written exam is considered to have failed that semester's exam, and for this, the 5-person jury informs the institute with the exam result report.
11. The oral exam begins with the student's 20-minute presentation. After the presentation, there is a 10-minute break. After the break, the jury members ask the student questions about the 3 selected subjects and the thesis presentation. Jury members may refer to the student's written exam. The total duration of the question-and-answer phase does not exceed 75 minutes. In the final stage, the student leaves the classroom and the jury members evaluate the student among themselves for a period not exceeding 15 minutes. At the end, each jury member casts a Yes or No vote. A student who receives at least 4 Yes votes passes the oral exam and receives their qualification. If this result is not achieved, the student is considered to have failed the qualifying exam.
12. The main evaluation criteria of the jury members are whether the student has the necessary general mathematics background to move on to the thesis research process, is familiar with the place of the chosen thesis problem in the literature, and is aware of the main techniques that can be used to solve the problem. Evaluating the thesis question is not the jury's priority.
13. Elective subjects: Algebraic Number Theory, Analytic Number Theory, Computational Mathematics, Statistics, Differential Geometry, Algebraic Geometry, Symplectic Geometry, Optimization, Control Theory, Partial Differential Equations, Complex Analysis, Harmonic Analysis, Functional Analysis, Graph Theory, Topology, Probability, Numerical Analysis, Dynamical Systems, Topological Data Analysis, Combinatorial Design Theory.
14. The list of elective subjects may vary from year to year according to the areas of expertise of the department's faculty. The contents of the subjects will be detailed by the department's faculty and will be stored in a place accessible to students.