

Ankara Yıldırım Beyazıt University
Department of Computer Engineering
PhD Qualification Examination Regulations

1. Principles

The PhD Qualification Examination consists of two separate stages: **written** and **oral**.

In the written exam, candidates are asked questions from the following areas, totaling 4:

- Algorithms (mandatory)
- Data Structures (mandatory)
- Formal Languages and Automata Theory (elective)
- Computer Architecture (elective)
- Operating Systems (elective)
- Databases (elective)
- Computer Networks (elective)
- Discrete Mathematics (elective)
- Programming Languages (elective)

Each candidate must answer questions in Algorithms and Data Structures. In addition to these two areas, candidates select 2 more areas they wish to take the written exam in.

Candidates must inform the Department Secretariat in writing of the areas they have selected for the written exam **two weeks before the exam**. Each candidate's exam paper contains only the questions from the areas they are taking the exam in.

Candidates are asked two questions from each area. Thus, candidates answer a total of **8 questions**, including two mandatory and two elective areas (with two questions from each area). Each question carries equal weight.

Candidates who score **70/100** or above in the written exam are considered successful and are eligible to take the oral exam.

1.2. Oral Exam

Unless there are extraordinary circumstances, the oral exam is held in the week when the results of the written exam are announced, and all candidates take the exam on the same day.

1.2.1. Expectations from the Student before the Exam

In the oral exam, candidates are required to present a compilation report they have prepared in advance. In this context, the candidate should have conducted a comprehensive literature review on an academic topic determined in consultation with

their advisor and should have written it in the format of a compilation article. This article must be sent to the members of the PhD qualification jury by the candidate before the oral exam.

The purpose of the oral exam is to evaluate the candidate's presentation skills, the scope and quality of the compilation report, and the competence of the candidate in the research area in addition to the topics they are responsible for in the written exam.

1.2.2. Evaluation of the Oral Exam

Each candidate is evaluated as **pass** or **fail** in the oral exam.

Candidates who have previously turned their compilation report into an article and had it accepted by a journal in the Q1 or Q2 category will be considered successful in the oral exam.

Candidates who fail the oral exam can take it again in the next term without taking the written exam again.

2. PhD Qualification Examination Committee

The PhD Qualification Examination Committee consists of a total of 5 members and is selected by the Head of Department of Computer Engineering among the faculty members in the department.

3. Preparation of the Written Exam Questions

The PhD Qualification Examination Committee collects candidate questions to be asked in the written exam from academics within and outside the university. Questions may be modified by the committee. It is intended that the questions asked in the exam have multiple sections, that the correct answer to one section does not require the correct answer to other sections, and that it consists of sections that are easy enough to identify weak candidates and at the same time difficult enough to identify strong candidates.

4. Formation of Juries

A PhD Qualification Examination jury is determined for each candidate by the PhD Qualification Examination Committee. Each jury consists of five members, including at least two academics from outside the university. The candidate's doctoral thesis advisor may be a member of the jury and may cast a vote.

Written Exam Areas

Area	Textbook	Mandatory/Elective
Algorithms	<ul style="list-style-type: none">Introduction to Algorithms, T. H. Cormen, C. E. Lieserson, R. L. Rivest, C. Stein, Mc Graw-Gill	Mandatory
Data Structures	<ul style="list-style-type: none">Data Structures and Algorithms in Java, 6th Edition, by Goodrich, Tamassia and Goldwasser. Wiley.	Mandatory

Formal Languages and Automata Theory	<ul style="list-style-type: none"> Automata Theory, Languages and Computation, by John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman. (Pearson – 3rd Edition) 	Elective
Computer Architecture	<ul style="list-style-type: none"> Digital Design, M. Mano, Prentice-Hall, ISBN 0-13-212994-9, 1991. Computer Systems: A Programmer's Perspective by Randal E. Bryant and David R. O'Hallaron Prentice Hall, 2003 	Elective
Operating Systems	<ul style="list-style-type: none"> Modern Operating Systems, A.S. Tanenbaum, Prentice-Hall, ISBN 0-13-595752-4, 1992. Operating System Concepts, A. Silberschatz, P.B. Galvin, (4th ed.), Addison-Wesley, ISBN 0-201-50480-4, 1994. Design and Implementation of the 4.3BSD Operating System, S.J. Leffler, M.K. McKusick, M.J. Karels, J.S. Quarterman, Addison-Wesley, ISBN 0-201-06196-1, 1989. 	Elective
Databases	<ul style="list-style-type: none"> Database Management Systems, Raghu Ramakrishnan, McGraw-Hill. Principles of Database and Knowledge-base Systems, volume 1, Ullman, Computer Science Press. Database system concepts, Silberschatz & Korth, McGraw-Hill. 	Elective
Computer Networks	<ul style="list-style-type: none"> Computer Networking: A top down approach, 6th Ed., J.F. Kurose, K.W. Ross, Addison-Wesley, 2012. Computer Networks, 5th Ed., A.S. Tanenbaum, Prentice Hall, 2011. Cryptography and Network Security: Principles and Practice, 5th Ed., W. Stallings, Prentice Hall, 2011. 	Elective

<p>Discrete Mathematics</p>	<ul style="list-style-type: none"> • K.H. Rosen, Discrete Mathematics and its Applications, (Sixth Edition) McGraw-Hill, 2007. • W.K. Grassmann and J.P. Tremblay, Logic and Discrete Mathematics: A Computer Science Perspective, Prentice Hall, 1996 	<p>Elective</p>
<p>Programming Languages</p>	<ul style="list-style-type: none"> • Programming Language Concepts and Paradigms, D.A. Watt, Prentice-Hall, 1990. • Programming Languages: Concepts and Constructs, R. Sethi, Addison Wesley, 1996. 	<p>Elective</p>