



Indian Institute of Technology Hyderabad Department of Computer Science and Engineering

How to Prepare for Ph.D. Interviews?

This page tells you how to prepare for the PhD written tests and interviews conducted by the CSE department at IIT Hyderabad. For information related to eligibility criteria and other details, please go to <https://cse.iith.ac.in/admissions/phd.html>.

Do you need to prepare?

Yes, preparation is required to clear the Ph.D. interview and written test! Unfortunately, most of the candidates who appear for the interviews do not seem to understand how to prepare for these interviews. By preparation, we do not mean just “reading” through the textbooks and recalling the definitions. You should have understood the concepts rigorously, have thought about them critically, and be able to solve problems related to these concepts intelligently.

What do we expect from an applicant?

We expect that the candidate has a thorough understanding of the concepts in core computer science subjects like Data Structure and Algorithms (DSA), Programming (C/C++/Java/Python), Operating Systems, Computer Architecture, Networking, DMBS, Probability, etc. We ask conceptual questions that require you to not simply recall the material you have read but use the concepts to solve problems. This applies to both written tests and interviews.

Some more expectations:

- If you are currently working as a lecturer we expect that you will be able to answer questions from the subjects that you have taught in the last year.
- If you were involved in a research project then we expect that you will be able to explain the work that you have done.

Don't Dos:

- *“I have forgotten the concepts of DSA because I have studied them a long time back”* — Please note that you have to revise the concepts before the interview.
- *“I was involved in this project but I don't remember what I have done”* – If you were actively involved in a recent project you should be able to answer questions related to it.
- *“I didn't get enough time to prepare after you sent the call letter for the interview”* - You should start your preparation well in advance.

- *“I forgot programming because I have not practiced it for a long time”* – We expect that you should know the fundamentals of at least one programming language like C/C++/Python/Java.

How do you need to prepare for the written test?

The majority of the written test questions (60%) will cover data structures, algorithms and discrete mathematics. However, the remaining questions will be based on the GATE CS syllabus. Written tests will consist of multiple-choice questions. However, we may ask you certain subjective questions. These subjective questions will not be used to shortlist candidates for an interview. However, your method of answering these questions will be discussed during the interview.

Why do you need to answer questions on DSA even if you are interested in doing research in Computer Systems or Machine Learning (ML)?

Data Structures and Algorithms (DSA) is very important for computer science students as it is the backbone for many computer science disciplines including computer programming, software engineering, and machine learning. It is essential for writing effective and efficient computer programs and for storing and processing large amounts of data. DSA is thus a foundation for all computer science disciplines and without it, it is not possible to do a detailed investigation in any area of computer science.

How do we give weightage to your published research paper?

Please note that your in-depth understanding of core CS subjects is the first and foremost thing we will check. If you have good publications then they will add significant weightage to your application but if you fail to answer questions in the core subjects your application will be rejected. Another important point to note is that we have internal standards for deciding the quality of a published paper. Your published paper has to be published in a reputed journal or conference. *One way to determine the ranking is to see if the journal is ranked Q1/Q2 by SCIMAGO and if the conference is ranked better than a C by CORE conference ranking portal. Note that rankings by these portals are not always accurate but they give you a general idea of what we mean when we say “reputed”.*

Does the emphasis on core CS subjects mean that research experience is not important?

Research experience and publications will add significant weight to your application but the first and foremost eligibility criterion that we will be looking for is if you have a clear understanding of core CS concepts, especially those underpinning the area that you will be working in later. For example, if you want to work in ML we expect that you can answer conceptual questions from subjects like Probability, Linear Algebra, Computer Programming, DSA, etc. If you want to work in theoretical computer science, we expect that you can answer questions by applying concepts from DSA, Algorithms, Discrete Mathematics, Probability, etc. A candidate who wants to do research in computer systems should be able to solve problems in DSA, Computer Programming, Operating Systems, Networking, Computer Architecture, Compilers, DBMS, etc.

You may not have prepared to answer questions from all these subjects but you should be ready to take questions from at least a few of them.

Are research-oriented projects done during the B.Tech/M.Tech programs relevant?

If research during your B.Tech or M.Tech led to good publications then it will add significant weight to your application. A candidate with prior knowledge in the research area can quickly adjust to our research environment. However, this is not an essential requirement. We believe that a candidate with a good understanding of core subjects can be trained to do research.

What is the weightage given for the ranking of your UG/PG university/college?

We do not consider the reputation/ranking of your UG/PG institutions in the written test or Ph.D. interview. The only thing we evaluate is how well you can think critically and apply the concepts you have learned to solve problems. However, there is relaxation in the shortlisting criteria for students who have graduated from IITs, NITs, and other CFTI institutes.

Does a poor performance in a previous round of interviews affect your chances of being selected in the current round of admissions?

We only check the candidate's knowledge of computer science concepts and his/her academic and research achievements for admission to our Ph.D. program. If you cannot answer the questions, do not worry – you can always apply for the next round with more preparation! Your previous performance will not be taken into account at any stage of the application process.

After you join, what do we expect from a Ph.D. student?

We expect a Ph.D. student to work sincerely, ask questions, explore their research domain by reading research papers, attending talks, seminars, and conferences, and come up with innovative solutions. It is a long journey, and patience is another virtue that helps!

To summarize,

We want candidates with an in-depth understanding of concepts in core CS subjects who can apply these concepts to solve problems. You do not have to know how to formulate a research problem or how to “do research”, that is what a Ph.D. program will train you for.

=====

All the best!!

For any other queries, please contact, PhD Admission Committee, Department of CSE, IIT Hyderabad, Kandi, Sangareddy, 502284, phd.admissions@cse.iith.ac.in