

Technical Interviews

Technical interviews are done to get a feel for a candidate's scientific/engineering skills. They ask questions to assess problem solving, critical thinking, methodological, data science, and/or mechanical skills. However, they also want to be sure you can articulate your skills to another person.

A number of different methods may be employed:

- General Q&A
- Case studies
- Research seminars
- Project-work
- Team activities
- Brain teasers/numerical reasoning
- Take home tasks
- Other assessments

Sometimes, you will be asked to write out your answers on a white board or sheet of paper; other times, you will just answer verbally. If the former, be sure to show every step of your work.

How to prepare:

- Look for key skills/requirements in the job description and think through how you might demonstrate those skills through stories.
- Brush up on your fundamentals...using a particular lab instrument, unit ops, controls, etc.
- Review your notes! Read through your course notes and lab notebooks, refresh your memory of former design projects, and think through some hypothetical situations.
- As with any interview, get plenty of rest the two nights leading up to the interview so that your brain is sharp!

If you are asked a question you don't recall – or haven't learned yet – that's okay. Be honest, but also share what you *do* know that is related (for example, you haven't learned Javascript, but you self-taught yourself Python in a week).

Sample questions:

- What is flow control, and can you explain how it is used in a chemical engineering process?
- Explain the third law of thermodynamics.
- What is material requirement planning, and how do you use this in your job?
- What are some of the considerations you need to know for a piping system that is used to transfer slurries?
- How do you estimate the efficiency of a pump?
- What is an angle of repose, and why is it important within the chemical industry?
- Can you explain how 'powder coating' works?
- You are in a plant and an alarm is sounding. What do you do?
- You are working as a process engineer on a cheesy macaroni product and notice the cheese powder is sticking together. What do you do?
- Can you write SOP's for equipment (for both the lab building equipment & for the analytical laboratory instruments)? How would you write it at both the Chemist level and the Lab Technician comprehensive level?
- How can you separate hydrogen peroxide into hydrogen and oxygen?
- What would be the optimum HPLC conditions for analyzing _____ (compound on a diagram)?
- What formula will you use to calculate how many mL of 5.5 M NaOH are required to prepare 400 mL of 1.5M NaOH?
- What kind of _____ (instrumentation) experience do you have? How would you troubleshoot a _____?
- How do you know if an analytical method is stability-indicating?
- What is the $^1\text{H-NMR}$ spectra for this molecule? (shown drawing)
- Explain why _____ strategy you used is better than an alternative, and what the assumptions are when using each?
- Why would you need to synthesize this particular ring? How did you improve the _____ (# steps, sequence, etc.) on this synthesis?