



Graduate Admissions Information Session Q&A

Questions	Answers
Can I still apply to the MIT PhD program if I have previously attended another institute for PhD but withdrew later?	Yes, you may apply but you must submit your PhD transcripts as part of your educational background information.
How many letters of reference can we submit?	Applicants may submit three (3) letters of recommendation.
When writing about attended universities, do you have to list a university you did a few basic courses for or just the university you are primarily in?	You should submit information from all universities where you have attended and earned grades that counted toward your undergraduate degree.
I am currently working on a publication that will be published after the deadline, how would you advise me to include it within the application?	You would include this information in your resume/CV under publications.
Is there a certain number of publications undergraduates should garner prior to application?	No, there is no specific number of publications that a prospective student should garner prior to admission.
Is there any possibility of deferring admission for a year if we are accepted?	On rare occasions, deferral requests are approved for one year. Approved deferrals will only be for admission and not for any departmental financial aid award a student received upon admission.
If my application gets rejected, does that affect future applications?	No, you may apply again in the future without bias.
Will students applying to the MSCEP program also have an interview?	No, the MSCEP application cycle does not include interviews.
Do applicants to the MSCEP need research to be admitted?	No, the MSCEP program does not require research to be admitted as it is a practical program and not a research-based program.
Is it recommended or even necessary to contact faculty professors before submitting the application?	It is recommended that applicants NOT reach out to faculty or professors before submitting their application as they will forward all inquiries back to chemegrad@mit.edu .
Will funding be available for the PhD students?	All students admitted to MIT ChemE's graduate programs are fully funded for the duration of their program. The first year is funded via departmental fellowship but the remaining funding is determined between the student and their research advisor.
What kind of questions are asked in the interview? is it based on the technical subject or general topic?	If you are invited to interview, you will receive a list of the interview questions with the request to schedule an interview.



Graduate Admissions Info Session

September 9, 2022

1:30 – 2:30pm ET

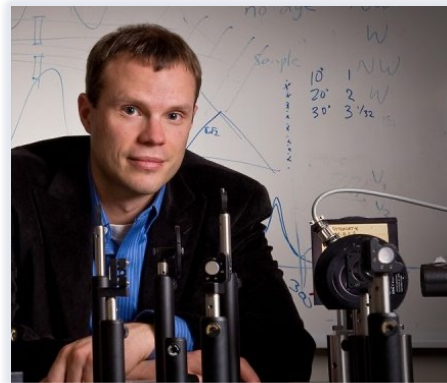
Introductions



Professor Paula Hammond
Department Head



Melanie Charette
Academic Administrator



Professor Bradley Olsen
Admissions Co-Chair



Caitlin Stier
Communication Lab Manager



Matthew Sweeney
Graduate Academic Coordinator

Today's agenda



Introduction

PROF. PAULA HAMMOND, DEPARTMENT HEAD

How to Apply

MELANIE CHARETTE, ACADEMIC ADMINISTRATOR

Admissions Committee Perspective

PROF. BRAD OLSEN, ADMISSIONS CHAIR

Effective Short Responses and ChemE Application Mentoring Program (ChAMP)

CAITLIN STIER, COMMUNICATION LAB MANAGER



Introduction

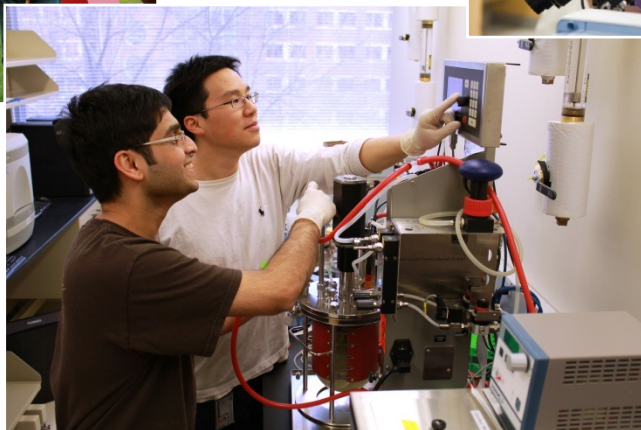
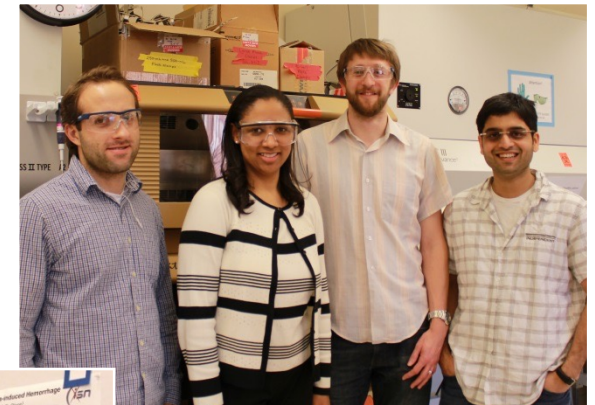
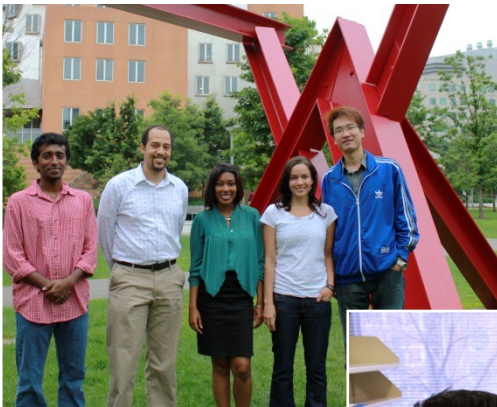
How to Apply

Admissions Committee Perspective

Effective Short Responses and ChemE Application Mentoring Program
(ChAMP)

Welcome to MIT Chemical Engineering

- A dynamic department, with academic programs defining the future of the chemical, biological, materials, and energy industries.
- Our faculty and students exercise leadership in education and research and have significant impact in addressing societal needs.



Our Graduate Programs

- **PhD:** The Doctor of Philosophy in Chemical Engineering is a traditional, research-based doctoral degree program provides a thorough grounding in the fundamental principles of chemical engineering, as well as an intensive research experience.
- **PhDCEP:** An MIT innovation, the Doctor of Philosophy in Chemical Engineering Practice degree program enhances and extends doctoral research with the unique resources of MIT's David H. Koch School of Chemical Engineering Practice ("Practice School"), and the world-class leadership instruction of MIT's Sloan School of Management. The PhDCEP program builds a solid foundation of industrial experience, research, and business, preparing you for a fast launch into leadership.
- **MSCEP:** Also unique to MIT, the Master of Science in Chemical Engineering Practice degree program provides hands-on, real-world experience in industrial settings. Students complete two semesters of graduate-level courses at MIT, followed by one semester at industrial sites of the Practice School under the direction of resident MIT staff.

Interdisciplinary Programs

- **The Leaders for Global Operations (LGO)** Program is a two-year dual degree program in which you earn both your Master's in Engineering and your MBA at the Sloan School of Management. Within LGO, as you hone your technical skills to solve problems in operations and technology, you also gain the tools to become an innovative leader making direct impact within your industry. LGO is ideal for candidates with a STEM background ready to lead strategic innovation in a variety of industries, particularly high technology, operations, and manufacturing.
- The interdepartmental **Program in Polymers and Soft Matter (PPSM)** offers a core curriculum and a doctoral qualifying examination for first-year graduate students in several departments. The PPSM option facilitates an early launch into polymer-centered graduate-level study and research for those students who have made a clear commitment the field of polymers.
- The **Computational Science and Engineering (CSE) PhD** program allows students to specialize at the doctoral level in a computation-related field of their choice, through focused coursework and a doctoral thesis. Applications from candidates who have a strong foundation in core disciplinary areas of mathematics, engineering, physics, or related fields are strongly encouraged.

Our Graduates Have Many Opportunities

- **Academia:** At the top 10 ranked Chemical Engineering departments (not counting MIT), *16% of the tenure-track faculty hold a degree from MIT*. At Caltech, Wisconsin, & Delaware, it is above 20%.
- **Industry:** Our graduates join leading materials, energy, chemistry and pharmaceutical companies, e.g., Amgen, BMS, Dow, Novartis, Pfizer, ExxonMobil, Merck, 3M, St. Gobain...
- **Start-Ups:** Students and graduates are active participants in the innovation and entrepreneurial ecosystems surrounding MIT



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How to Apply

Admissions Committee Perspective

Effective Short Responses and ChemE Application Mentoring Program (ChAMP)

How to Apply to MIT Chemical Engineering?

- Application opens in early September and all materials are due by **November 20 at 11:59pm Eastern Time**
- What is required?
 - Personal information
 - Field(s) of interest
 - Three letters of recommendation
 - Scanned copies of your college transcripts
 - TOEFL/IELTS scores for international applicants
 - Application fee of \$75 (fee waivers are available)
 - Resume/CV
 - Short essay responses
- We do not accept additional documentation above what is required

Required Documentation

- **GRE** scores are no longer accepted or considered as part of the PhD and MSCEP programs. PhDCEP applicants are recommended to submit unofficial GRE test scores for Sloan's admission review.
- **TOEFL/IELTS** is waived for applicants who are citizens of Australia, Canada, India, Ireland, New Zealand, Nigeria, Singapore, or the United Kingdom. Waivers are also provided for applicants who have or will earn a 4-year undergraduate degree from an institution in said countries that provides instruction primarily in English.
- **Letters of recommendation** may arrive after the deadline but incomplete applications will not immediately be reviewed.

Fee Waivers

The Office of Graduate Education (OGE) is pleased to offer fee waivers for **US Citizens and US Permanent Residents** who demonstrate financial hardship, are current or former members of the US Armed Forces, or who have participated in special fellowship programs, including MIT-sponsored diversity programs.

Eligibility

US citizens and US permanent residents may request a graduate application fee waiver if they meet one of the criteria below:

- Demonstrated financial hardship in the past year.
- Participated in an MIT/OGE-sponsored diversity program in the past five years.
- Participated in a special fellowship program in the past three years.
- Attended a diversity recruiting event in the past three years.
- Served as a current or former member of the United States Armed Forces.

Things To Keep In Mind

- MIT Chemical Engineering only admits for Fall start. There are no Spring and Summer admissions.
- Applicants may only apply for ONE degree program in Chemical Engineering
- **Doctoral and Masters applications are reviewed by separate committees.** If you are not admitted to your primary program, you will not be considered for the other program.
- Applicants may apply to programs in other MIT departments
- Application materials are not shared between MIT departments
- Admitted students are invited to campus in March to learn more about MIT, meet faculty, current graduate students, and visit the Cambridge area



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Effective Short Responses and ChemE Application Mentoring Program (ChAMP)

What Are the Steps in Application Review?

- Applications are screened for completeness after the application closes in November.
- Applications are assigned to specific readers typically before Thanksgiving. Applications are assigned without regard to research area.
- During December and January, we receive back reports on written applications and select candidates for oral interviews. Candidates may receive interview invitations throughout December and the first half of January; the order of invitations is governed by how we receive back reviews from our readers.
- After interviews, candidates are discussed by the full admissions committee and final decisions are made. Typically the process closes in early February for Ph.D. candidates.

What is the Interview Like?

- Applicants selected for interview will receive an email from the admissions committee chair inviting them to interview. The interviews are about 20 minutes in length and conducted remotely typically via Zoom.
- Invited candidates will have an opportunity to choose their interview time in a first-come, first-served sign-up system. We do our best to accommodate time zone differences.
- Selected candidates will be sent a list of questions/discussion topics that the interviewers would like to touch on.
- The candidate will be welcomed from the Zoom waiting room at the appointed time when the two faculty performing the interview are ready to begin. Sometimes they run a few minutes late so please be patient with us! Our staff do their best to help with any technical difficulties then log off.
- Different faculty members read the application and perform the interview in most cases.

Our Holistic Review Process

- Our department has had long deliberations and discussions of the skills and abilities that we think are important, and we have settled on six core criteria that we evaluate (next slide).
- Applications are reviewed holistically, treating all criteria as important pillars of excellence.
- There are no score or grade cut-offs!
- We do not weight one criteria more importantly than the other!

MIT's Criteria for Excellence in Graduate Admission

- **Understanding of the Chemical Engineering Fundamentals:** The candidate's core knowledge of chemical kinetics, transport phenomena, thermodynamics, and the underlying quantitative skills that form the core solution methods for Chemical Engineers.
- **Analytical and Scientific Preparation:** A candidate's background in chemistry, biology, physics, mathematics, and computer science as relevant to the candidate's area(s) of interest.
- **Drive and Persistence:** A candidate's commitment to education and research and ability to overcome adversity when challenges are encountered.
- **Excellence in Research:** A candidate's demonstrated accomplishment in scientific research, including scientific creativity and ability to formulate important scientific questions.
- **Character:** A candidate's integrity, leadership potential, and ability to work effectively on teams and as a community member within a diverse and multicultural environment.
- **Communication Skills:** A candidate's demonstrated effectiveness with scientific written and oral communication in English on technical and non-technical subjects.

How Does Your Application Address Our Criteria for Excellence?

For everything you enter in your application, ask yourself how it addresses our criteria for excellence.

- **Chemical Engineering Fundamentals:** this refers to the listed topical areas of thermodynamics, transport phenomena (i.e. fluid mechanics + heat and mass transfer), chemical kinetics, and math up to at least differential equations. In ChemE, these are all standard classes. If you are coming from outside ChemE, help us to understand how you have gained knowledge of each of these topics that will help you to succeed.
- **Analytical and Scientific Preparation:** MIT is particularly focused on your ability to apply quantitative skills in the context of whatever area of science and engineering you love best. This doesn't mean you have to write code or do theory, but show us how deep quantitative thinking is a part of whatever your passion is.
- **Excellence in Research:** While formal research experience isn't required, most candidates have some and it is highly valued. Share with us what you've accomplished using scientific inquiry outside of the classroom, regardless of the setting, and why you think a Ph.D., which is a research degree, is the right fit for you.

Research Area is Not a Criteria

- While we do endeavor to balance our classes somewhat to match prevailing research themes, we aim to admit the best candidates irrespective of research area.
- Listing specific faculty you wish to work for, research centers, or research projects gives no advantage to a candidate during the admissions process, so do not feel obliged to do so.
- The one exception is if your research interests are primarily outside our department, in which case please consider applying to one of MIT's other programs as well!

A Good Letter of Reference Will...

- ...advocate for your application by explaining how you are excellent with respect to our six criteria.
- ...be written by someone who knows you well and is willing to take the time to provide concrete examples relevant to these criteria. Cultivate relationships with these folks well in advance!
- ...be written by someone with experience in the evaluation of candidates who can provide a richer context for the letter. Typically faculty members have much more experience with candidate evaluation and therefore write better letters, but some industry letters are also strong.
- We strongly recommend a minimum of two letters from faculty members with up to one from industry. We strongly discourage letters written by graduate student research mentors or postdocs.
- Ask your letter writers in advance (more than 30 days is customary) and provide them with information about you like your resume and a summary of your accomplishments to help them write a more detailed and meaningful letter.



Introduction



How to Apply



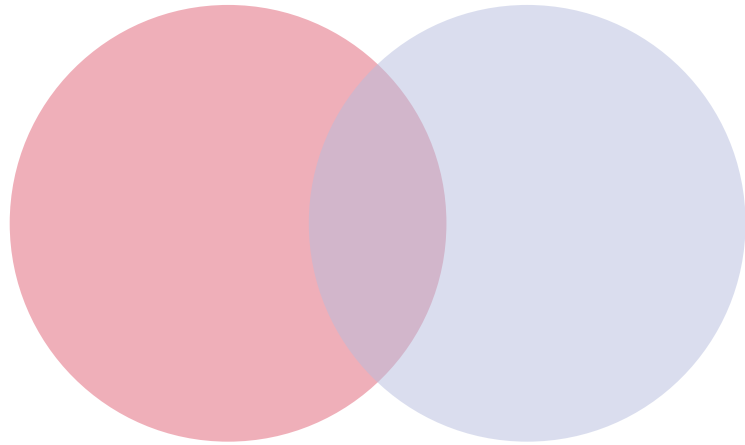
Admissions Committee Perspective



**Effective Short Responses and ChemE Application
Mentoring Program (ChAMP)**



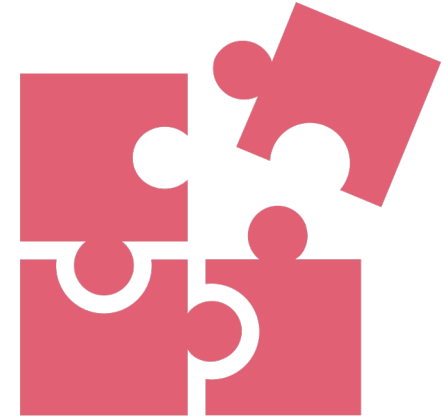
Three strategies for making an impact in your short essays



Identify match



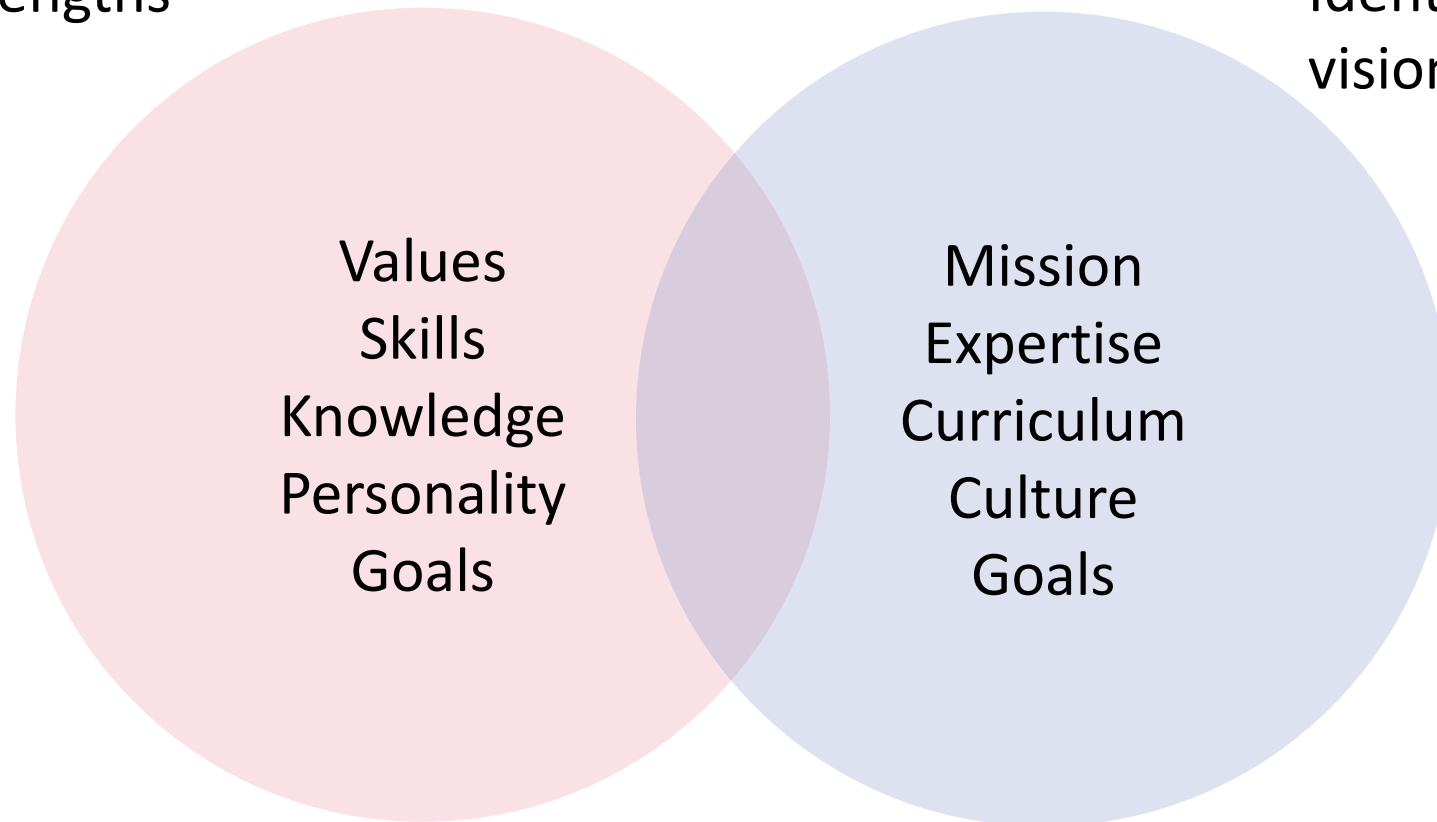
Experiences →
concrete qualifications



Explain “so what”

Successful essays show how the applicant is a **match** for MIT ChemE.

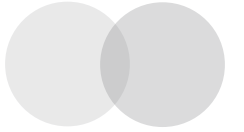
Identify **your** strengths and goals.



Identify the **program** vision, needs, and criteria.

Highlight attributes that demonstrate **MATCH**.

Match starts with a deep understanding of the department + research groups of interest.



DEPARTMENTS

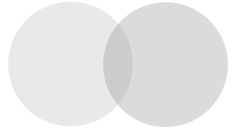
Explore our **website** for:

- Mission
- Values
- Research areas
- Academic requirements
- Events
- Alumni

RESEARCH GROUPS

- Read students' **research summaries**
- Browse **recent publications**

The **mission** of the MIT's Chemical Engineering Department comprises three key areas:

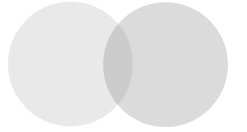


Education: To offer academic programs that prepare students to master physical, chemical, and biological processes, engineering design, and synthesis skills; creatively shape and solve complex problems, such as translating molecular information into new products and processes; and exercise leadership in industry, academia, and government in terms of technological, economic, and social issues.

Research: To provide a vibrant interdisciplinary research program that attracts the best young people; creatively shapes engineering science and design through interfaces with chemistry, biology, and materials science; and contributes to solving the technological needs of the global economy and human society.

Social responsibility: To promote active and vigorous leadership by our people in shaping the scientific and technological context of debates around social, political, economic, and environmental issues facing the country and the world.

The **mission** of the MIT's Chemical Engineering Department comprises three key areas:



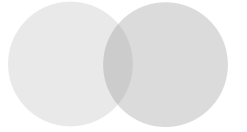
Education: To offer academic programs that prepare students to master physical, chemical, and biological processes, engineering design, and synthesis skills; **creatively shape and solve complex problems**, such as translating molecular information into new products and processes; and **exercise leadership** in industry, academia, and government in terms of technological, economic, and social issues.

Research: To provide a **vibrant interdisciplinary research program** that attracts the best young people; creatively shapes engineering science and design through interfaces with chemistry, biology, and materials science; and contributes to **solving the technological needs of the global economy and human society**.

Social responsibility: To promote active and vigorous leadership by our people in **shaping the scientific and technological context of debates** around social, political, economic, and environmental issues facing the country and the world.

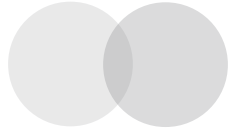
Read closely and identify attributes that resonate with your **strengths** and **goals**.

Read and reflect on MIT ChemE's selection criteria...



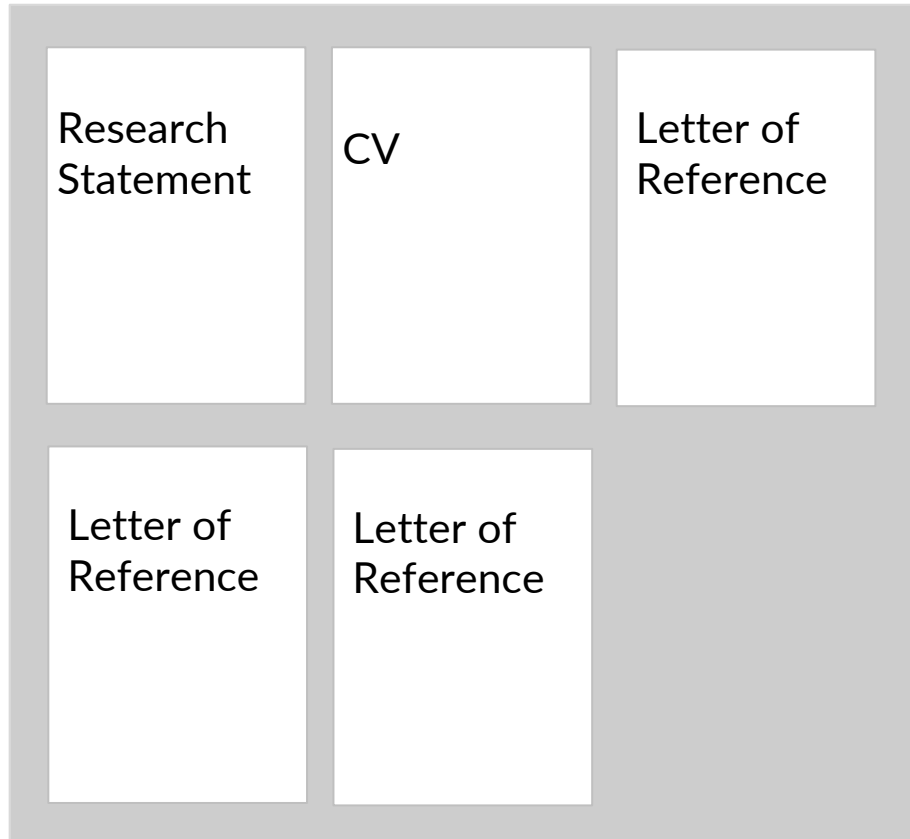
- **Understanding of the Chemical Engineering Fundamentals:** The candidate's core knowledge of chemical kinetics, transport phenomena, thermodynamics, and the underlying quantitative skills that form the core solution methods for Chemical Engineers.
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- **Communication Skills:** A candidate's demonstrated effectiveness with scientific written and oral communication in English on technical and non-technical subjects.

And focus on criteria where you can demonstrate **match**



- **Understanding of the Chemical Engineering Fundamentals:** The candidate's core knowledge of chemical kinetics, transport phenomena, thermodynamics, and the underlying quantitative skills that form the core solution methods for Chemical Engineers.
- **Analytical and Scientific Preparation:** A candidate's background in chemistry, biology, physics, mathematics, and computer science as relevant to the candidate's area(s) of interest.
- **Drive and Persistence:** A candidate's commitment to education and research and ability to overcome adversity when challenges are encountered.
- **Excellence in Research:** A candidate's demonstrated **accomplishment in scientific research**, including **scientific creativity** and ability to formulate important scientific questions.
- **Character:** A candidate's **integrity, leadership potential**, and ability to work effectively on teams and as a **community member** within a diverse and multicultural environment.
- **Communication Skills:** A candidate's demonstrated effectiveness with scientific written and oral communication in English on technical and non-technical subjects.

This **match** should be conveyed throughout your entire application package



BRAND



Select experiences deliberately

Responses convey **technical attributes** with a personal brand or outcome.

Technical

concrete
well-researched
significant accomplishments

Personal

memorable
motivated
creative, critical thinker

INCLUDE

- ✓ Motivations
- ✓ Experiences
- ✓ Ambitions

AVOID

- × Dwelling on personality
- × Fishing for sympathy



Be specific, concrete, and quantitative in describing your experiences

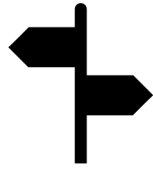
- Applies to curricular and extracurricular activities
- Quantify: time, number of people, and results
- Explicitly state contributions
 - What ideas did you bring?
 - What did you do in the lab?
 - What did you learn from each experience?

Be specific, concrete, and quantitative in describing your experiences



VAGUE EXPERIENCE	CONCRETE EXPERIENCE
During this project, my mind was opened to the possibility of using different programming languages together to create code that is faster to run and easier to understand and modify.	During this project, I collaborated with other group members to develop a user-friendly Python wrapper for a 10,000-line Fortran library.
I got involved in organic chemistry projects.	I designed and synthesized three different molecular wire configurations in order to optimize electrostatic properties.
I learned about the role of enzymes in cancer.	I quantified the kinetics of three enzymes implicated in cancer onset.
I won the physics department's Laser Focus prize.	I won the physics department's prize for top student among my cohort of 20 students.

Explain “so what” and make the takeaway explicit



Experience

- Research
- Internships/work
- Tutoring
- Classwork
- Volunteering
- ...



How it's shaped you

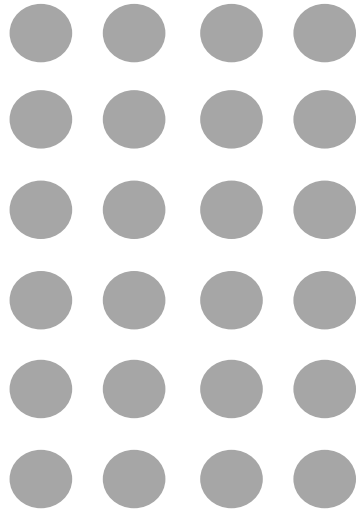
- Laboratory skills
- Analytic capability
- Technical knowledge
- Interpersonal or management abilities
- Interest and passions
- ...



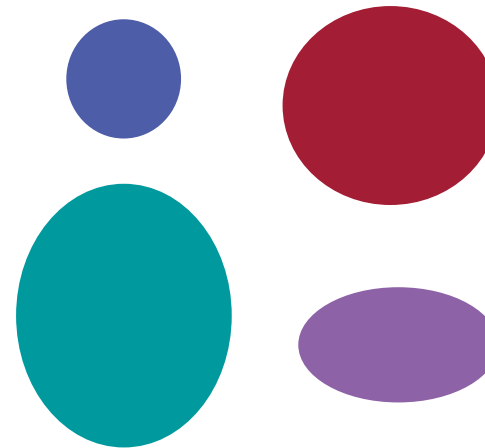
... and makes you a strong candidate

- Ability to succeed in graduate level courses
- Capabilities as a graduate researcher
- Effectiveness in a group or lab team setting
- Professional promise
- ...

Your application shouldn't be cookie-cutter.
Invest time into customization.



DON'T use the same
application for every school



Customize
your applications

But you will not need
to start from scratch.

Statements of purpose often follow a similar structure

Introduction

- Who are you?
- What are your goals and motivations
- Why are you applying to grad school?
- Why should I be curious about you?

Research experiences and meaning

- How have your research experiences changed you?
- What skills have you developed?
- What problems have you tackled?
- What challenges did you have to overcome?

Research experiences and meaning

- What were the tangible outcomes?
- How did these experiences motivate your future research or future experiences?

Other relevant experiences

- How have other relevant experiences shaped you as a...
 - researcher and scientist?
 - leader?
 - person?

Demonstrate Match

Should appear throughout!

Helps to state explicitly... don't make the reviewer guess

Wrap-up and Look Ahead

How will graduate school help you achieve your goals

Unify the message

MIT short answers cover many of these same sections broken out

What motivates you to earn a Ph.D./PhD.CEP/MSCEP in chemical engineering at MIT?

- Who are you?
- What are your goals and motivations
- Why are you applying to grad school?
- Why should I be curious about you?

For your two most important science/work experiences over the last four years, describe your specific role, the new knowledge or discovery that you made, and the potential impacts of the project on science and society

- What skills have you developed?
- What problems have you tackled?
- What challenges did you have to overcome?
- What were the tangible outcomes?
- How do these experiences fit into the bigger picture?

In what type of environment do you and others thrive? How do you find, create, and maintain those environments?

- Demonstrate applicant's match to MIT community

State explicitly. Don't make the reviewer guess

Please tell us anything else about yourself that you think we should know.

- How have other relevant experiences shaped you?

Examples: DEI work, gaps in resume.

MIT short answers cover many of these same sections broken out

What motivates you to earn a Ph.D./PhD.CEP/MSCEP in chemical engineering at MIT?

I want to run a translational academic lab that harnesses synthetic biology to produce widely accessible consumer products.

For your two most important science/work experiences over the last four years, describe your specific role, the new knowledge or discovery that you made, and the potential impacts of the project on science and society

Our lab focuses on investigating industrial fabrication processes for soft materials. I validated a new protocol for fabricating lipid nanoparticles, used in the delivery of vaccines and genetic therapies, at industrial scale. I presented this new protocol along with a techno-economic analysis at an annual university symposium.

In what type of environment do you and others thrive? How do you find, create, and maintain those environments?

I thrive in scientific communities that center societal needs in decision making and motivation.

Please tell us anything else about yourself that you think we should know.

I was the vice president of a 9-12 STEM outreach program, where I managed external relations with ten primary and secondary schools to bring speakers in leading scientific industries.

Explore more science communication resources available on our website

- Check out our CommKit for more tips including an **authentic annotated example** from a successful 2021 applicant.
- Also, check out resources to tighten your CV.

mitcommlab.mit.edu/cheme/commkit/

Resources and Annotated Examples

The image shows a laptop displaying the MIT ChemE Communication Lab website. The website header includes the MIT logo, 'ChemE COMMUNICATION LAB', and 'Massachusetts Institute of Technology'. Navigation links for 'COMMKIT', 'BLOG', and 'MAKE AN APPOINTMENT' are visible. The main content area is titled 'CV/Resume' and features a search bar with the text 'SEARCH THE SITE: e.g. Article, Poster, CV'. A large white box is overlaid on the page, displaying an annotated example of a short answer response. The text in the box is as follows:

ANSWER EVIDENCE

What motivates you to earn a Ph.D./PhD.CEP/MScEP in Chemical Engineering at MIT? (300 words or less)

Directly answers question: **What drove me to begin research was the idea of discovery. I wanted to explore beyond the confines of our current knowledge and share what I found on the other side.** Now, with three years of research experience, a published second author paper, two first author manuscripts in preparation, and a Goldwater scholarship, I can confidently say I reached that goal. **However, my drive to continue has not filtered. In fact, my experiences have shaped this passion into a new form: helping to lead others to their own discoveries. I hope to one day lead a group of researchers in an academic or national lab setting, and it is clear to me that a PhD is the next step towards that goal. Pursuing a graduate degree at MIT in Chemical Engineering will not only enhance my ability to conduct research and make discoveries but will also strengthen my skills to guide others toward their own.**

Provides succinct summary of accomplishments: **My undergraduate research experiences opened my eyes to the largely unexplored world of the nanoscale, and how we can manipulate structure and composition on the order of nanometers to optimize and tailor material properties at the macroscale. Specifically, I am intrigued by systems involving self-assembly, where we can leverage chemistry and morphology to generate ordered structures unfeasible with top-down approaches. I would love to explore these systems further in graduate school, and the MIT ChemE program provides many opportunities to do so.** The Hammond and Doyle groups fit especially well with these interests, utilizing self-assembly and interface science for applications in drug delivery and beyond. The Olsen and Blankschtein groups also align with my interests, utilizing polymer and colloidal science, respectively, to tackle applications ranging from separations to sustainability.

Provides more concrete answer of getting Ph.D.: **For up to two of your most important scientific, engineering, research, or work experiences over the last four years, describe your specific role, the new knowledge or discovery that you made, and the potential impacts of the project on science or society. (300 words or less per experience)**

Annotations on the right side of the text include: 'Accomplishments are quantitative', 'Provides evidence that MIT ChemE is a right fit', and 'Provides evidence that MIT ChemE is a right fit'.

Below the annotated text, there is a red PDF icon and the text: **Annotated Example 1**
These 2021 short answer responses are from an MIT ChemE graduate student's successful application to the MIT ChemE program.
172 KB

Connect with a mentor through the ChemE Application Mentorship Program (ChAMP)

- Volunteer-based and graduate student run **mentoring program**.
- Goal is to support applicants from **communities that have been historically underrepresented** in higher education including...
 - groups underrepresented in STEM,
 - non-traditional academic backgrounds
 - students from institutions which have not historically sent many students to MIT
- Mentees are paired with current grad students who can answer questions about MIT ChemE and provide application guidance.
- Participation is completely voluntary and **will not affect your decision**.
- Requests will be accepted through October 21.

Wrapping Up

- Please direct all questions to chemegrad@mit.edu. We are excited to hear from you!
- In the interest of fairness to all applicants, we discourage individual MIT ChemE faculty from answering questions regarding your individual admissions situation or your application. Please direct these questions to chemegrad@mit.edu as well.