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Applying to US graduate schools

This page gives a brief (???) description of the process of applying to graduate schools in the United States.

The timeline for applying to graduate schools in the United States is roughly as follows:

0.1 Step 0: Before you begin

0.1.1 Apply or not?

This is probably the first big *decision*. The *decision* does not need to be taken till July of the final year of studies, though the earlier one decides to apply, the more time one has.

- *Deciding to apply and then later on deciding not to apply*: The thing you could lose in money (fee for registering for examinations) and time (spent in preparing for the examinations)
- *Deciding not to apply and then later on deciding to apply*: This could cause a tremendous squeezing of time for the entire application process

The end of July is usually a good time by which to make a decision.

0.1.2 Envision the checklist

Here are the many items you'd need to have on your final application to a University:

- The name of the University (in other words, you need to decide which University it is)
- Your marksheet/gradesheet for all academic years of undergraduate education prior to the final year (for CMI undergrads, the first four semesters)
- Your general and subject GRE scores
- Your TOEFL iBT scores
- Three letters of recommendation
- Your statement of purpose
- A long and boring application form
- An application fee

All these items need to be at the back of your mind while applying.

0.1.3 Some basic rules about passports

Before beginning, a couple of things about the Education Testing Service (ETS), which administers the GRE and TOEFL. Unlike what the name might suggest, the ETS is not a subsidized public body: it is a private profit-making body that has a near-complete monopoly over standardized testing for the United States. While a lot of the service offered by ETS is good, remember that the ETS can be very rigid about its rules and isn't going to bend over backwards to serve you. So you need to be triply careful when registering for services on the ETS.

The first thing to note:

For all ETS tests, Indian applicants must have a valid passport to take to the test center

This means that if your passport might expire before the test, try to renew it *immediately* so that you have a new passport by the test date. If your passport is likely to expire shortly *after* the test, then do *not* give the passport for renewal because then you would be unable to write the test. This is a completely rigid rule. No deviations from the rule are entertained.

The second thing to note:

All information that you enter, when registering for ETS services, should match information in your passport

In particular, your *first name* and *last name* should match *exactly* with what is written in your passport (middle names do not matter that much).

It is possible to register for the GRE even if you do not have a valid or new passport now; in that case, you can leave the passport number entry blank. However, you should make sure that the name that you give is exactly what will appear in the passport once the passport comes out.

0.1.4 A basic rule about credit cards

The entire application to the United States involves a large number of online payments. Online payment is easy, fast and convenient – *if* you have a credit card or debit card capable of making payments. If you do not have access to a credit card, *get one immediately*. And make sure that the credit card is capable of making online payments upto 250 (*most payments you'll make will be under 200, so 250 is a safe bound*).

Be careful when entering credit card data. In general, it is better if you commit the credit card number, and security verification code (a three-digit number occurring at the back of the card) to memory, so that you do not need to fish for those for all the applications.

Preferably, take a credit card that does not expire for at least the next 1.5 years (a credit card is needed for making various payments to the United States *after* securing admission, and could be useful for the first few days after entry in the United States).

Finally, remember that credit cards often have *limits* in the amount of credit you can owe them per month (the limits keep increasing if you show the ability to pay huge bills regularly, but you should factor this in when using a credit card). So keep track of your credit balance.

0.1.5 Get transcripts from your undergraduate institution

This probably proceeds in parallel with the other steps.

All US graduate schools require transcripts of your academic performance from your undergraduate institution *only* (not from high school or kindergarten) for all except the final year. If you're applying to n graduate schools, then request for approximately $n + 4$ transcripts. *That's because some graduate schools require two transcripts. The transcripts need to be signed – but your undergrad offices should know exactly how to do it, if they've handled this in the past.*

0.2 Step 1: Register the general GRE

You are registering for: general GRE, CBT (Computer-Based Test)

Before registering the general GRE, make sure you:

- Intend to apply to the United States
- Know your real name exactly as it appears in your passport
- Have a working credit card capable of paying the required amount (a little under 200)
- Have an idea of the *date* when you'd like to write the examination
- Have an idea of the *place* where you'd like to write the examination

0.2.1 Get a feel of the examination before registering

Once you register for the general GRE, rescheduling your test-taking date costs a lot of money. So, in order to get a reasonable idea of how much time and effort you'd need to prepare for the general GRE, do a bit of research on it. For instance:

- Visit the ETS website and check if there are any announcements of a changed syllabus or pattern for the general GRE. If there are no such announcements, then go ahead and buy, or otherwise procure, preparatory books for the verbal and essay-writing parts of the general GRE.

- Download the free GRE POWERPREP software from the ETS website. Do not try the sample papers there, but use the software and some sample problems to get an idea of the examination pattern

At the time of this writing, the examination has three components:

- **Quantitative:** This is scored on a denominator of 800. Among mathematics applicants, approximately 10% score a full 800. However, a full score of 800 does not necessarily mean all questions correct (see the note on adaptive testing below). Students with a reasonable skill in solving mathematical problems, such as math undergrads, will usually not need systematic study for the quantitative section. However, some speed practice and accuracy practice may be useful.

The format of this section is approximately 28 questions in 45 minutes. The testing is adaptive, which means that solving the initial questions correctly leads one to very good scores while messing up on the initial problems could lead to poorer scores. Later problems carry less weightage, and solving the last problem incorrectly may still earn a full score.

- **Verbal:** This section is scored on a denominator of 800. There are 30 questions in 30 minutes, including passage comprehension, analogy, antonyms and sentence completion. Scoring is adaptive, as for the quantitative section. The key component for this section is Vocabulary. However, merely having the full GRE Vocabulary is not a guarantee of good performance on the Verbal section. Scores for the verbal section vary widely, and scores above 600 are generally considered fairly respectable. The verbal section is not in general considered extremely important for math applicants.
- **Analytical Writing:** This section has two writing tasks, an Essay and an Argument. Both are scored out of 6.0 and the average of the scores is declared as the official score. Indians in general do worse than the American applicants on Analytical Writing. Scores of 4.5 or above are generally considered respectable. Like the verbal section, this section is not generally considered extremely important for math applicants.

Before buying books, you may want to try some problems at these websites:

<http://www.number2.com>

(add more?)

Number 2 is particularly useful for brushing up quantitative skills, and is excellent for building vocabulary; it can also give a first glimpse of GRE-type questions.

Some good books to consider are:

- Barron's
- Kaplan's Verbal Workbook

0.2.2 Register

When registering, be *realistic* about how much effort you intend to put in for the examination. Do not choose a very early date, if you think you will not be well-prepared, but do not have overt ambitions of preparing for a long time for the general GRE, because its role and importance is limited. Also, if you do not have a valid passport by now, keep in mind the possible delay in arrival of the passport while registering.

Choose a test centre based on where you will be at the time you want to write the examination.

0.2.3 After registration

Once you have registered, check:

- For an output page confirming your registration
- For an email confirming your registration
- For the money being debited from your credit card (use online access)

In case of problems, call the bank or credit card agency and/or Thomson Prometric (the agent in India for ETS services) or whoever is the agent through whom your payment is being routed.

If encountering problems with registration, *do not* resubmit the registration form. This could cause problems with the credit card, like the card getting blocked.

0.3 Step 2: Talk to recommenders, students, and get a list of schools

This can again begin largely independent of Step 1, and to pace things well, you should start this around May. (Even better is to observe carefully how your seniors handle their application process, the previous year, and gather information from them). Collect information about prospective schools. Good sources of information are:

- Alumni of your institute (in this case, CMI) who are currently pursuing studies there
- The University webpage and department webpage
- Faculty at institutes you are interested in applying to
- Faculty in your institute, particularly those whom you might be asking for letters of recommendation

- Web fora or other fora where you can meet or interact with students of the institutes you intend to apply to

Seek information and department-specific opinions first rather than asking specific questions like *what is the best place* or *where should I apply*. The latter kind of questions are things that others cannot answer for you. But questions like *what are the strengths of this department* or *what are the expectations the department has of its grad students* are questions students in the department can answer well.

At the same time, more soul-searching into your strengths, credentials and interests could help you determine what graduate schools you are interested in.

0.3.1 Criteria for a long-list of graduate schools

- Eliminate graduate schools that have eliminated you before you applied. For instance, some graduate schools in the United States have a *strict* four-year requirement. If this is the case, do not apply with a B.Sc. degree.

However, remember that the four-year requirement set by the Graduate School may not be followed by every department. The University of Chicago also has a four-year requirement, but the mathematics department has taken students with three-year B.Sc.s. So if the Graduate School says it has a four-year requirement, but is otherwise suitable for your interests, write to people in the department to find out if the requirement has been circumvented in the past, or whether it is totally rigid.

The University of Michigan has a strict four-year requirement. Harvard has taken a student with three years, but this is not a regular occurrence at Harvard. But do not rely on hearsay; collect original information.

- Put low on your list universities that have very high entry criteria. For instance, Princeton University gives admission to a very small number of graduate students, and entry to it is extremely competitive. If your grade-point average is not extremely high, keep Princeton low on your list.
- Put low on your list universities you don't feel enthusiastic about going to: If whatever you gather about a university makes you think it is lower than the level of CMI, don't bother (*partisan comment?*)
- Factor in areas of interest and people in the University, as well as its general culture, backdrop, and location

0.3.2 Tabulate your information

Tabulate the information that you're collecting on graduate schools. The table should contain the following information:

- Name of the graduate school
- The four-digit ETS code for the school. This code is useful when requesting for Additional Score Reports by phone, and may also be needed/helpful elsewhere
- The full postal address and telephone number
- The application deadline: *Very important*. Keep track of application deadlines
- Contact email addresses of the graduate office
- Names and email IDs of graduate students/professors you know at the graduate school

0.3.3 Determining four definite application choices

Some time around August, you need to decide on four graduate schools that you will *definitely* apply to. These need not be your four top choices, because you may still be trying to figure out whether your top-choice school may be too ambitious to apply to. This is just a list of universities you're anyway going to apply to. Keep this list noted down carefully. You'll use this list at three places:

- While *registering* for the subject GRE (more on this below)
- While *registering* for the TOEFL iBT
- In the examination centre for the general GRE

Another criterion that might be important for determining the top four is application deadlines. If a University has a very early application deadline, it makes sense to select that University in the top four because that means that scores from the ETS reach the University earlier.

If you specify the same four universities at all three places, this reduces the cost later when requesting for Additional Score Reports.

0.4 Step 3: Book the subject GRE

The subject GRE is probably the most critical of the three examinations (subject GRE, general GRE, TOEFL). While the other simply gauge general ability, the subject GRE specifically determines your knowledge of the mathematics that ETS deems is necessary (though not sufficient) to pursue graduate studies. One good thing about booking the subject GRE is that you do not have a plethora of dates to choose from: the subject GRE is offered once in November, once in December, and once in April.

The subject GRE is a paper-based test. Try booking the one in November. A good time to book the subject GRE is the end of July, or the first week of August. *Definitely* try

to book the subject GRE by the second week of September, because November dates close by the third or fourth week of September. You can still try booking the December SGRE, but this means that your SGRE scores reach the Universities fairly late.

For various subjects:

- **Mathematics:** The mathematics subject GRE is required by all mathematics departments taking students for Ph.D. studies. If you are applying purely for a Masters programme, the subject GRE is not required.
- **Physics:** The physics subject GRE is required by all physics departments taking students for Ph.D. studies.
- **Computer Science:** A subject GRE is not required. However, writing a mathematics subject GRE strongly boosts your application. The computer science subject GRE is not very relevant if you plan to pursue research in algorithms or computational complexity, and is not recommended if you are applying for such areas.

While registering for the subject GRE, you need to enter four schools to which Subject GRE score reports will be sent for free. *All* universities require that if you report GRE/TOEFL scores, ETS should send an original copy of these scores. The ETS charges for every score sent to every university, except the first four. So enter the four schools exactly as in your first-four list.

0.5 Step 4: Book the TOEFL iBT

The TOEFL iBT (Internet-based testing) is booked in a manner just like the general GRE. The main difference is that for the TOEFL iBT, you need to enter the top four universities at the time of registration.

0.6 Step 5: Work towards the GRE and TOEFL

This should actually be carried out in parallel to the previous steps. Working towards the general GRE could involve visiting sites like:

- <http://www.number2.com> (excellent vocabulary practice, though doesn't contain some of the harder words in Barron's lists)
- <http://www.majortests.com/gre/> contains some practice problems in the various areas of verbal GRE, though the scoring mechanisms may not be very reliable.
- <http://www.princetonreview.com> has a sample test that you should leave for the later stages of preparation

- The GRE POWERPREP software has sample problems and two sample question papers: Note that *this runs only on Windows*

For essays, preparation (if done) needs to be done in a somewhat different way, as it cannot be segmented into small five-minute silos. Kaplan's Essay Workbook is a good place to get a reasonable feel of the art of churning essays for the GRE. Time is a significant constraint so even if you're a great essay-writer you'll need to sharpen your skills to churn out ETS-type material in ETS-type time. Again, regular practice is the key to success.

For the subject GRE, the book by Princeton Review is probably the best in the subject. Online resources are scarce, so do all the practice problems in this book carefully. Leave the sample papers at the end for the final stages of preparation.

For the TOEFL, concentrate on doing well in the speaking section. Record samples of your work and listen to those, or play them back to others.

0.7 Step 6: Start fleshing out a CV and statement of purpose

0.7.1 The CV or resume

Although a number of graduate schools do not have a place for submitting a CV or resume, it makes sense to prepare one, because a CV or resume is a way to be clear of your own *notable* achievements. This'll help with answering questions in grad school apps about what your notable achievements are, even if you cannot plug in a CV.

Some universities do accept a CV or resume to be uploaded, so having one at hand makes good sense.

0.7.2 The statement of purpose

A statement of purpose is a statement of why you want to pursue graduate studies at the given university, and why you think the graduate school should want you. This is the most tricky part of the application process. While it is not the single most important determinant of success, it *does* probably give the maximum return to investment to work on. Recommendation letters aren't really within your control, and your CGPA is already history, so this is the part that you can control the most.

Writing a Statement of Purpose (SOP) is daunting, so before beginning, consider:

- Writing arbitrary, unstructured stuff that you think might go into a SOP (like why you want to pursue grad studies, what got you interested, how your passion for the subject began)
- Reading the SOPs of lots of people

- Doing some GRE analytical writing practice (does this help or hurt?)

Get started with the SOP as soon as possible. A lot of people will give conflicting advice about what works and what doesn't (for instance, whether to make the SOP university-specific, whether to mention your achievements more or your interests, how much emphasis to give to high-school achievements). Develop your own instincts. While there may be some absolute answers to what works and what doesn't, you're unlikely to know who, of all the people you talk to, knows that absolute answer.

0.8 Step 7: Start application, register recommenders

0.8.1 Register online

Registering online is free – you do *not* need to pay any money to start filling in the form. In fact, the money is only paid once you've actually made the form ready for submission. So start filling out the forms even if you're not sure you'll eventually apply to that university.

Again, enter all data (name, etc.) as they appear on your passport.

0.8.2 Registering recommenders

Registering recommenders online has some caveats:

- Some universities (like MIT, in my time) require that *all* the names of recommenders be filled in together, and that this list not be alterable.
- Some universities (like Rutgers, in my time) have the clause that the recommenders get to recommend only *after* you submit the online application.
- Some universities allow only paper-based recommendations
- Most universities, though, allow you to add/remove recommenders at will, as long as you've not submitted the form. I think it's possible to delete a recommender even after he/she has submitted your recommendation

The *wave my rights* part of registering a recommender: By US law, you can force the graduate school to reveal the contents of your recommendation letters to you. However, without a guarantee of confidentiality, recommenders may not necessarily be so open (or so US grad schools think). So, you need to explicitly waive your rights to the recommendation. This does not mean that the recommender cannot show you what he/she has written for you; it only means that you cannot *demand* the grad school to show the contents to you.

0.8.3 Financial resources

If the form asks for financial resources, fill 0 for the financial resources you're willing to commit towards graduate studies.

In almost all universities, tuition fees are waived for doctoral students, and the students are instead provided a stipend to cover living costs. Thus, even if you write that you're willing to spend 100,000 *towards your graduate studies, it isn't really going to increase your chances of admission (the picture*

0.9 Step 8: Write the examinations

Some overall rules about writing the ETS examinations:

- The *only* things you need to take to the examination centre are your passport, and a copy of the registration confirmation email (even the latter isn't usually asked for, but is good to take in case of problems). Whatever else you take is put in a locker and you aren't allowed to take stuff inside the examination hall
- Arrive 30 minutes before the scheduled test time
- Before beginning the test, you need to sign a non-disclosure agreement. This agreement forbids you from revealing the specific problems you see in the examination, to anybody else. Sign the non-disclosure agreement.

0.9.1 For the general GRE

- The GRE examination shows the sections in an unpredictable order. You may get the Essays first, or the Verbal section first, or the Quantitative section first. You can take breaks between sessions, but not within a session. In general, make sure you are physically comfortable so that you do not need to take a break for the duration of the entire next session
- After the examination ends, you will be asked to enter your top four universities. Enter them. You will be given a final option of whether to have these scores put in your ETS record or not. Accept.
- You'll then be shown your scores on the Verbal and Quantitative sections. The scores on the Essay section usually come out later.

0.9.2 For the TOEFL iBT

Similar to the general GRE, except that you do not need to specify universities.

0.9.3 For the subject GRE

This is a typical, paper-based examination experience.

0.10 Step 9: Additional Score Reports

0.10.1 For GREs

You can order additional score reports for the general and subject GREs *together*. This is also an opportunity to learn your SGRE score early, which allows you to fill it in for online applications.

Guidelines for making the phone call:

- Use a touch-tone phone
- Find out the phone number that you need to call
- Keep at hand the names of the universities for which you want to order additional score reports. Find out the four-digit ETS codes for these universities.
- The department code for mathematics at all universities is 0703. Department codes may be different for various branches of computer science that you are applying to. Find out the department code. If the University you are applying to says it does not utilize department codes, note that down
- Keep at hand the credit card number, and security verification code.
- Keep at hand your registration number for the general GRE and subject GRE
- Determine beforehand whether you would like to know your subject GRE score over the phone. Learning your subject GRE score costs 10.
- Make the phone call, follow the instructions. Listen carefully to the instructions and to the confirmation of whatever you have said. Request for *both* your general *and* your subject GRE scores to be sent to the University.

The total cost is: 10(*if you requested for your score*)+21 per university you requested for, + 6*service charge*

0.10.2 For TOEFL

Additional score reports for TOEFL can be ordered online, using a credit card.

0.11 Step 10: Submit applications, mail transcripts, and track

0.11.1 Submit applications online

You do *not* need to save the application pages that you have filled. Once you have completed the application form, you'll be able to see a preview of your application. Download, save, and scrutinize this preview. Once you are satisfied, make the payment, and submit.

You are usually allowed to submit the application even before all recommendations have been submitted. However, you cannot change your recommenders after submitting the online application, so it is advisable to make sure that all recommendations have been submitted before submitting the application.

It is also advisable to submit online before mailing transcripts, because you may get full details about how to mail your transcripts after you submit the online application. The application deadline is meant to be taken seriously for the online application; transcripts can usually wait till a little later.

0.11.2 Sending transcripts

Caltech allows for transcripts to be submitted online. No other university, at the time of this writing, has that option, and all universities require transcripts. Here are some other points:

- Some universities require *two* transcripts, one for the graduate office and one for the department. Moreover, it's often the case that this fact isn't highlighted in the website, but only comes to your attention after you submit the online form. If in doubt, find out from the admission office and send two transcripts.
- Be careful about *where* the transcripts are to be sent. While some universities require transcripts to be sent to the department's graduate school office, others require transcripts to be sent to a central graduate school office. Double-check the address where transcripts are to be sent.

Some tips on sending transcripts:

- You can send the packets by airmail (Rs. 15 - 40), registered post (Rs. 700), or use DHL's special offers for international students, which allow for couriers to University at a cost of around Rs. 1000. DHL good online tracking and the courier usually reaches in five business days.
- Try to send the packets *well before Christmas*. Universities are deserted in Christmas and there is a huge rush of mail just after Christmas. Make sure you send your package around three weeks before Christmas so that it reaches two weeks before Christmas, and the receipt is acknowledged by the graduate office before

the Christmas celebrations begin. For those Universities with a deadline well after Christmas, you can send the application a little later.

Additional things to send:

- Send paper copies of the GRE and TOEFL scores. This allows the University to process your scores temporarily, pending the official report from ETS.
- Send any other documents that the application form tells you to send.

0.11.3 Track

Track to make sure that:

- The online application is received
- Your credit card is charged correctly
- The transcripts are delivered to the University
- The University acknowledges receiving the transcripts
- The University acknowledges receiving the scores from ETS

0.12 External links

0.12.1 For GRE/TOEFL

- <http://www.ets.org>
- <http://www.number2.com>
- <http://www.princetonreview.com>
- <http://www.majortests.com/gre>

0.12.2 For couriering transcripts

- <http://www.dhl.co.in>