Am I on Track?
A Guide to Completing a CS Graduate Degree in a Timely Manner

Completing any graduate degree can be a long and difficult process. Like any long and difficult task, our best coping mechanism is to break that task into subtasks. To help students reach their academic goals, the University and the CS Department require that students complete various milestones along the way. These are meant either to help you with planning, or to force a certain amount of intermediate progress.This document provides suggested timelines for completing these milestones for each of our graduate degree offerings.

What if I do not stay "on track"?

Timing recommendations made in this document generally assume that a student hopes to complete the degree in the "normal timeframe" of 1-2 years for a MEng student, 2 years for a MS student, and 5 years for a PhD student. Some students do not feel the need to be on that schedule, perhaps because they are part time, or due to life events that require them to put degree progress on hold temporarily. In general, the CS Department will not "kick people out" due to slow progress. The primary negative impact from failing to meet departmental deadlines for milestones (aside from probably taking longer than the "standard" time for graduation) comes if you are relying on the department for GTA funding. In our GTA priority funding formula, students get credit for passing milestones, and receive negative credit when they are late on those milestones. If you don't need a GTA, then there is not much that we are likely to do to you if you miss your milestones. (But beware of Grad School rules that require their prior milestones to be completed before you can continue to the next step.)

The Role of Milestones

Some students---even some faculty---take on the mindset that some or all intermediate milestones are unnecessary bureaucracy. If everything goes perfectly for you, then perhaps this is a sustainable attitude for your situation. (Well… until the existence of the milestone requirement itself gets in your way. For example, you can't schedule a prelim or final exam without an approved plan of study on file.) But the reality is that the milestones represent everyone's best effort to protect you when things don't go perfectly. Ideally, they will help to keep things going perfectly. It is hard enough to stay on track if you keep to the intermediate steps in the schedule. It's a whole lot harder if you can't even do that.

Master of Engineering

From a management perspective, the MEng degree is fairly straightforward: Take and pass an appropriate set of classes. (Which is not to say that the MEng is easy, the courses are pretty much the same for everyone. But the ruleset is simpler.) Aside from the courses themselves, there is only one milestone that students must meet: Submit their plan of study and have it approved. So the question becomes: When do I submit my plan of study? The default Grad School requirement for Master's students is to submit the plan by the end of the 2nd semester. Certainly this is the **latest** that you should submit your plan. But there is a lot of variance for how quickly people choose to complete their courses. Some people do this in 12 months (4 courses each academic semester and 2 courses in the summer). If that were your situation, then waiting until the end of the second semester to submit your plan might lead to not graduating on schedule. The most important consideration is this: **You don't want any nasty surprises**, especially when it is too late to correct a problem without a graduation delay. So, you should submit your plan in time to get the positive feedback that it will be accepted before you have committed to a course of action that will not work. No matter what else, you want your plan at least informally approved by the MEng Program Director prior to your last full semester. The extreme case is the student who enters in Fall semester, and is trying to graduate by the end of the following summer. The smart thing to do in this case is to submit the plan of study **before** the start of Spring classes. That allows the Program Director to let you know if the proposed course set must be adjusted, either because it does not meet the requirements, or because of a faulty assumption about what courses will be available that summer. For students on a more relaxed schedule (such as a student who enters in Fall and plans to graduate at the end of the following Fall semester), observing the standard deadline of submitting by the end of the second semester should work.

Accelerated BS/MEng students

For you, things are fairly straightforward. You probably should submit the plan of study right when you graduate with your BS degree. Please read the section for "Master of Engineering" students if you skipped straight to here.

Getting Started in the Research Track: Finding an Advisor

For MS and PhD students, the first hurdle to completing a research-track degree is finding a research advisor. Picking the right research advisor for you is one of the most important decisions that you make as a graduate student, especially for PhD students. This is the person who you will work with for a substantial amount of time as you conduct your research and eventually complete your thesis or dissertation. Perhaps one third of new students come in with a pretty good idea of who they will be working with. About two thirds of new students are starting more-or-less from scratch when they arrive.

There are many different dimensions to consider when selecting an advisor. The two that strike students as most obvious are someone working in a research area that you are interested in, and someone who can fund you. But other important considerations include how well you can get along with the person, how well their management style works for you, how much time they have for you, and resources aside from direct funding that they can provide (lab space, lab mates, intellectual environment, equipment).

The first step to finding an advisor for most people is to decide what research areas are of most interest to you. From there, you can hope to identify faculty who seem to be doing work that looks interesting. A resource that can help is the Research Areas pages (see https://cs.vt.edu/research.html). These list faculty associated with a given research area. But even the most interesting faculty member cannot help you if they are already so busy that they won't take you on. So another useful document is the spreadsheet of faculty status that shows how actively any given faculty member is looking for students (you can reach this from gpc.cs.vt.edu).

For many students, finding an advisor involves sending emails or visiting faculty during their office hours. (For information on office hours, see the faculty office hours spreadsheet available from gpc.cs.vt.edu.) Keep in mind that the typical faculty member is contacted by many students (both students already in the department and ones who are considering whether to apply). The most important piece of advice regarding sending email to faculty is that it should clearly indicate that you are contacting that specific faculty member because you are interested in their specific research (and your email should prove that you know something about what they do). Sending an email that looks like it could have been sent to any professor, especially if it comes across as looking for funding instead of looking for an advisor, is likely to be ignored. So don't send form letters -- every contact email should be personalized or it's not worth sending at all.

How soon do you need to find an advisor? In part, that depends on which program you are in. Finding an advisor sooner rather than later and getting started on a research project is always a good thing. But most people are fine if they can start working with someone by the end of their first semester. PhD students might have a bit more time, but see the discussion on advisors in the PhD section.

Master of Science

Getting an MS in our department means doing a thesis. It is extremely rare that an MS student can complete in less than 4 academic semesters. So the student who enters the program in Fall semester of year 1 will normally graduate in the Spring semester of year 2. Some students will need to wrap up their thesis work in the 2nd summer.

MS students have two official milestones: Submitting the plan and completing the thesis/final defense. The default Grad School requirement for Master's students is to submit the plan by the end of the 2nd semester. Generally, MS students don't have much trouble with figuring out what

classes to take. The key issue regarding the plan of study for MS students is finding their advisor and selecting the committee members. This might make an MS student feel a bit rushed to get the plan submitted by the end of their second semester. But here is why this is so important: It pushes the student to do the other thing that they have to do if they want to graduate “on time”. An MS student should expect that the typical thesis takes 12 months to complete. Consider the student who enters the program in the Fall semester. If they hope to graduate by the end of Spring semester in their second year, they generally have to make good progress toward their thesis project either in their first Spring semester, or during the summer. Many students want to go on internship in the summer. Since it is hard to be on internship and also make progress on the thesis, this means in practice starting the thesis work during the second semester in the program.

The other thing that MS students need to know in order to do proper planning is how much “dead time” there will be in their final semester. There is a deadline for when the final ETD is submitted. The actual defense has its own deadline, around two weeks before. The final version of the thesis has to go to the committee **two weeks before the defense**. Before that can happen, there will typically be a period of two to four weeks of intensive back-and-forth between the student and the advisor to revise and complete the thesis. This comes **after** the student submits their “final draft”, the version that **they** think is “done”. In case that is confusing, the bottom line is this: You probably will have to submit your final draft (the one that **you** think is “done”) by the beginning of March if you hope to graduate in May.

Accelerated BS/MS students

If you are an accelerated BS/MS student and you jumped straight to here, then please read the section for Master of Science students. All of that applies to you as well. Except, you are even more rushed. If you hope to graduate two semesters after the official start of your graduate program (meaning, typically, 9 actual months), you will have to start your thesis work **before** you even complete your BS degree! (Alternatively, you can work on it diligently during the summer between the BS and MS, which means no internship.) In any case, you should submit your plan of study right when you complete your BS. If you are hoping to get a GTA during your graduate year, having submitted your plan by June is pretty much a practical requirement to be competitive.

PhD Program Timeline

A PhD program is a longer-term endeavor, with students typically taking about five years to complete the degree process. Some students need less time than that, some take a lot more. The University and the CS Department both recognize that a project as big and complicated as completing a PhD degree requires a certain amount of structuring, scaffolding, and planning --

much like any other big multi-year project. So we require that certain milestones be met, as we believe that doing so provides a necessary part of this structure and planning support.

The timeline described in this section assumes that you are a full-time graduate student. Students who are part time (one common reason being that you have a full-time job) should check in periodically with the Graduate Program Director, or otherwise make the Department aware of your situation. Ideally your annual SAR evaluation will acknowledge and interpret your progress in light of your part-time status.

The section on finding an advisor mentions that a PhD student has more time to find an advisor than does a MS student. Ideally, you will start working with someone in your first year, say by your second semester. A PhD student who doesn't start working on research until their second year might do fine, timewise. But only if nothing goes wrong. Far better is to get started in the first year with someone, doing something, even if you are not sure that it will be a great fit for you. Then, if you need to find a new advisor in the second year, you will have some research experience, know more about the process, and still be able to maintain a reasonable timeline. Many PhD students in our department have had successful research programs with on-time graduation after switching advisors in the second year. Be aware that switching advisors later than this will probably lead to delayed graduation. But if things are not working out between you and your advisor, then in the long run you might do better to switch even if it happens later.

Typically, the first milestone that a PhD student completes is their Plan of Study. This is required to be submitted by the end of the third semester of the program. The implication is that by this point, you should have an advisor and enough idea about what you will work on that you can select some faculty members to be on your committee. (If you do switch advisors after this point, there is a simple form for changing the advisor and committee.) The final committee for a PhD student must have five faculty members, one of whom is outside of Virginia Tech. However, your initial plan of study may have only four faculty members. It is common not to have selected the outside member at this stage. The final committee with five members only needs to be in place prior to scheduling the prelim exam.

The next milestone is the PhD Qualifier. This is a departmental requirement, not a University requirement. It is a process with various components. One component is the requirement for courses (4 courses spanning at least 3 areas, see the CS grad program website for details). The other component requires getting points from a mix of the qualifier exam and research accomplishments. If you came to VT having already completed a Master’s thesis with peer-reviewed publications, then you will likely be able to skip taking the exam. Everyone else should take the exam when it is offered in their second year. This is true regardless of whether you joined the program in Fall or Spring. The exam is normally given around January of each year. So you will most likely take the exam toward the start of your second or your third semester, depending on when you started the program. A student with a weak CS background who is starting in Spring might want to talk with the Graduate Program Director about possibly delaying a year, but know that delaying will likely slow your overall progress. Students are considered late in completing the Qualifier process if they have not completed the various parts

within 24 months of joining the graduate program (with slight adjustments for students who start in the MS program and then switch to the PhD -- talk with the Graduate Program Director if you are in this situation, to work out a reasonable schedule that won't delay you too much).

The next milestone for PhD students is the Preliminary Exam, which involves writing the Preliminary Proposal. This is probably the most important of all the milestones in determining graduation time. This is the point where some students disappear into a black hole of "doing stuff" but not really "making progress" toward graduation. The prior milestones -- doing the plan of study and the PhD qualifier -- are pretty standard student-like activities that most students can just crank out in the normal way that students are used to doing. The prelim proposal and exam requires clearly defining the "contract" for the body of work that will make up the dissertation. It is much easier to be in a research lab just doing your week-to-week work than it is to come to your dissertation definition.

When the prelim should be done is subject to some debate. Historically, really fast students have completed the prelim at the end of their third year, with most students completing it sometime during their fourth year. The Department historically has considered a student to be late on their prelim if they do not complete it by the end of their fourth year. Be aware that there is likely to be a cultural shift within the department toward finishing by the end of the third year, or at worst in the first semester of the fourth year. This is driven by the University having established Candidacy status, which is triggered by completing the Prelim. Candidacy can start after the third year, and is used to take a significant tuition discount (with planned increases over time) for four semesters. Meaning that a student who hopes to graduate in five years has to complete the Prelim by the end of the third year to take full advantage.

What is the role of the prelim in actually getting your dissertation done? And how long after the prelim will it take to graduate? Some view the mechanics of the prelim document and exam as just a bureaucratic hurdle. Be aware that, apart from any other consideration, the Grad School will not allow the Final Defense to be scheduled less than six months after the Prelim exam (and the Department will not generally support an exception to this rule). More importantly, the prelim proposal is meant to serve as a planning document and roadmap to completing the dissertation. It lets you specify the research questions that you need to answer, and ideally the timetable for your body of work. Regardless of when the prelim exam itself takes place, we find that it usually takes about three years from the time when a student and advisor come to a clear understanding of "what the dissertation is about" and when the student graduates. When in that three year period the actual prelim exam takes place depends on the individual circumstances and lab culture. How long it takes between when a student starts working with an advisor and when this understanding is truly reached is hugely variable. It is probably the biggest unknown in the entire PhD process, and is a major reason why some students take much, much longer than five years to graduate. It is common for this understanding to take about a year or maybe two to reach, but has the risk of stretching indefinitely. So, it is wise for a student to start thinking as early as possible, once they join a research group, about what their own dissertation topic will be. (By the way, the other common cause for graduation delay is taking on outside responsibilities, most often a full-time job.)

The last two milestones for the PhD are the Research Defense and the Final Defense. The Research Defense is an internal Departmental requirement, not recognized by the Graduate School. We treat this fairly informally, all that you really need to do officially is inform the Graduate Program Director when yours is completed. But you ought to take this extremely seriously, since the purpose of the Research Defense is entirely to protect the student from things going wrong at the Final Defense. The process for how the Research Defense is conducted is up to the student, advisor, and committee. But the goal is for the committee to clearly communicate to the student whether they are ready for the Final Defense, and if not, what needs to be done to become ready. So, the committee will need enough information about the state of progress and what work remains, so they can give sensible feedback. Committees are not likely to want to sit through a dress rehearsal of the final exam to do this. A typical Research Defense is accompanied by a short document that outlines the tasks completed, a timeline for whatever needs to be completed, an explanation for any major deviation from the prelim proposal, a listing of related publications by the student, and a list of any publications yet to be completed. The advisor is likely to set an expectation for how long any presentation should be. The Research Defense might typically be scheduled three months before the expected date of the Final Defense. Though, if significant problems are uncovered at the Research Defense, that would likely cause the Final Defense date to be pushed back.

The Final Defense itself should be viewed as a process that involves a number of steps. This process starts when the student gives their advisor their “final draft” of the dissertation document. This normally then involves some number of rounds of feedback and corrections, resulting in a final document that goes to the committee a minimum of two weeks prior to the Final Exam date. The time needed for these rounds of corrections depends on how final the draft really is when it is delivered to your advisor, and how quickly the advisor and student work. The document that goes to the committee is required to truly be the final version, something that the advisor would be willing to sign off on as complete with no further changes needed. After the Final Exam, the committee typically requests some minor changes to the dissertation document. The final ETD is expected to be submitted within two weeks of the Final Defense.