

Graduate Student Guidelines and Expectations

Research Group of Dr. Arturo S. Leon, University of Houston

Welcome to graduate school and the University of Houston (UH)! I am delighted that you have decided to collaborate with me for your graduate school research, and I look forward to having a successful advisor-student relationship with you. As your advisor, I plan to treat you as a **junior colleague**. I hope that this document will provide you some guidelines in managing your graduate school experience and research, and help you towards becoming an independent and successful scientist.

Research Philosophy

Science is not boring, redundant, or useless. There is a creative component to science and a service component to science that we all should appreciate and adopt in our lives. You will learn some components of your science via lectures and advising; however, you will discover most of the components of science by yourself via research, which will bring you many rewards and impart you with multiple useful skills such as – professionalism, technical writing skills, technical presentation skills, fearlessness about technical issues, and an overall ability to think innovatively. **I do not expect you to assume that you belong to an environment where you can sit and wait to learn.** Science is an adventure, and the excitement to figure things out. Asking the many “whys” should be a part of your own research philosophy and attitude.

Collaboration

Collaboration is an integral part of the research environment. Not only does it bring benefits to the individual researcher, it also ensures that science is done in the most open and productive environment. I expect you to be open to not only sharing your ideas and knowledge with your peers and colleagues, but also receiving feedback (critical or appreciative) from them. **There are no “secrets” or “personal ownership” in research.** Research is done to understand and benefit the planet we live in, hence I expect you to always keep the big picture in your mind and be open to teamwork.

Time Management

Time management is a very critical skill that you will need to develop within the next few months, especially if you have had personal struggles with it in the past. I am very open to you selecting your own working hours, but **I expect deadlines to be firmly met.** Hence,

some of you might work through nights getting a task accomplished, while some of you might complete the same task in a few hours. **Your commitments to your research projects should be taken very seriously and should be managed in the most responsible and timely manner.** Additionally, you should not require or expect heavy supervision.

In the beginning of your graduate studies all of you will have to climb a learning curve that will need more than expected hours of your time. Once you develop a regular schedule you will find it easier to get tasks accomplished efficiently. **Graduate school is not a typical 9am to 5pm job! It requires a need-by-need basis scheduling and input of efforts. Identify your overarching research goals in discussion with me.** Then, create an outline of tasks that you will need to accomplish in order to achieve your objectives. Estimate how much time you will need to complete those tasks, and set your own personal deadlines. These deadlines should be taken very seriously, and should be followed closely. I have worked with students in setting or designing their schedules in the past, so I would be happy to help you with it, if you need help or guidance.

I expect you to regard graduate school as at least a full time job. If you have a 49% GRA, your appointment is for 20 hours of research per week. If you have a 25% GRA, your appointment is for 10 hours of research per week. A grad student working an average of **20 hours per week in research** probably is wasting his/her time, as it would be almost impossible to accomplish the research tasks in this amount of time. According to my personal experience, I (and my grad peers) would work in average about 60 hours per week **in research**, especially during the first two years of grad studies. Even when working so many hours, I felt that it was not enough to accomplish the research tasks. Note that I am not mentioning hours for classes or homework. They are NOT part of your research.

Unless you take on a project with unusually heavy time commitments, I expect you to take some personal time off from your work schedule during the year (**about a total of 2 weeks**) to travel or visit family. You can also take time off during religious holidays or other university holidays. However, if you plan to take time off during spring break and/or fall breaks, please count them as part of your two-week vacation quota. I expect research not to be stalled during the rest of the year. In special cases, I am willing to allow additional time off from work, but that is something you will need to discuss with me. I, also, expect you to inform me as soon as you can, once you start building plans for vacations or time off.

Ideas (Intellectual property)

Innovative research ideas that you develop into research products are the intellectual property of this research group, the university, and/or the funding agencies. Hence, proper

acknowledgement should be made to the people you have worked with and the agencies that have supported your research, every time you present your research to any community. In some cases, you might also be required to get permission from the university to use tools, software, etc., once you leave the university. In doubt, always ask!

Authorship of collaborative papers should also be carefully and fairly chosen. If you write your manuscript, you should be the first author of the paper. However, if you do not write a publishable manuscript before graduation and if I have to convert your research into a manuscript then you will be assigned as the second author. If you are the first author then your second author is usually your advisor, unless the manuscript has been done in teamwork with other individuals (e.g. manuscripts that are written based on your class projects and don't involve your current research or input from advisor, etc.). Include third and additional authors only if any individual has been actively involved in completing your research tasks or has contributed to the innovation in your research. Funding agencies should always be included in your acknowledgements. Though, as an advisor, I'll take the responsibility of being the corresponding author of your manuscripts in order to ensure timely submission, review and publishing of the paper, I expect you to be fully involved in responding to questions posed by the reviewers.

Research Responsibilities

Besides creative and critical thinking, the following are also important components of research that you will be expected to undertake.

Reading: Reading existing literature in the field of your research is ***very crucial*** to understanding the state of the art knowledge and scope for future investigations. As part of graduate school, you will find yourself reading a large collection of peer-reviewed manuscripts, books, theses of others, etc. directly related to your field and/or related to other fields that are relevant to your research. These reading materials can be attained from the university library, via Google Scholar, or via other search engines for scientific publications (e.g., Google, Bin). Especially in the beginning, most of your time will be spent on identifying literature that gives you the necessary background to your work and assists you in analyzing existing knowledge. Literature review is also an important part of your thesis and should be done in an exhaustive manner.

Every time you read a scientific document, make notes of the following:

1. What is the general topic that this paper is related to? Collect and organize your reading materials into groups of topics that you read. For example, papers related to hydraulic modeling, papers related to uncertainty analyses, etc. You can organize in computer folders or in plastic folders.

2. For every paper, first identify the main objective of this paper. Read it aloud and write it in your own words on the paper or in your notes.
3. Then, identify what background literature do they cite and why.
4. Identify what approach/solution do they propose and think about the strengths and limitations of their approach.
5. Carefully analyze their results and think about whether the results provide you insights into the topic that you are investigating.
6. Then think about how relevant and useful this paper was for your research. If it was useful and would provide important background to your study, write a critical summary of this paper in a Word document or LaTeX. This summary will be useful when you have to write your thesis or manuscripts. It will make thesis writing much faster and will help you organize your thoughts without re-reading the scientific document all over again (*However, there will always be papers that you will need to read multiple times!*).

Writing: Scientific writing is important for getting your research reviewed by other peers in your scientific field. The peer-review process ensures that high quality research is communicated to the community, and any loop holes identified in the research are addressed by the authors. Besides peer-reviewed papers, you will also be expected to write a thesis, which will be reviewed for its quality by your advisor and your research committee.

Scientific writing is very different from English literature writing! There are certain rules and guidelines that need to be followed, which you should strictly adhere to. I have attached some guidelines to this document. You can get more information on the *world wide web*, and also from “scientific writing” books in the library. With practice, anyone can become proficient in scientific writing. Hence, continuous writing of your research by regularly documenting all your literature, approach, etc. is important. You can also learn a lot about skillful writing by observing scientific writing of your peers, when you read published literature in the field. Carefully observe how people create the various sections of a manuscript, how they describe a scientific problem, its solution, and their results and conclusions, and what kind of grammar and language they use. Hence, reading literature regularly is also important for improving your writing skills.

If your target is a **Masters degree**, I expect you to do innovative, high quality research that produces **at least** one peer-reviewed journal manuscript and one conference manuscript/abstract (two journal manuscripts are recommended for a Masters students). If your target is a **doctoral degree**, I expect you to produce **at least** three peer-reviewed journal manuscripts, besides multiple conference abstracts/manuscripts. If your intention is to pursue an academic career (e.g., professor or research scientist), I recommend you to

produce at least seven to eight journal manuscripts, besides multiple conference abstracts/manuscripts. I highly recommend to write your journal manuscripts and conference abstracts/manuscripts in LaTeX. This will save you a lot of time during the preparation of the manuscript. When using LaTeX, you can generate your thesis in a matter of minutes once you have your journal manuscripts. Please keep in mind that your papers must be publishable in high quality journals that have high impact factors (e.g., ASCE Journals). I also recommend the use of colors when writing a manuscript. For instance, you could use **green** color when you like the text and you don't anticipate significant changes. Likewise, you could use **light blue** when the text needs some revision and you need to go back to this section later. Finally, you can use **red** or **pink** when the text needs major work. This saves me a lot of time when writing a manuscript because I do not need to review the whole manuscript every time but only the areas that need my attention (e.g., areas with light blue and pink).

Any abstract, paper, thesis, report, or presentation you plan to submit or deliver needs to be first reviewed by me. So ensure that you give me advance notice to review your work before your submission deadline. I need time to go over your writing and you will need time to make all the corrections. I expect at least one week notice for abstracts and presentations. Thesis, reports, and papers should be submitted to me in sections so that I can review and send back my comments to you, while you work on other sections. Once your thesis has been completely reviewed by me, then you can submit a clean version of your document to your committee. If you are having a tremendous challenge in editing your work, especially for non-native English speakers, please use professional editing services to improve your document. The writing center at UH may help with this. I also suggest to ask your friends and fellow graduate students to proofread your work.

Laboratory tasks: Once you have figured out your research approach, you will need to implement it. Since our research group is mostly a computational group, you will be expected to perform various computational tasks, e.g. writing code, debugging and running programs on an operating system, learning and executing a software, etc. Therefore, give yourself enough time to learn and execute these tasks. Again, time management will be important to ensure successful completion of all your research tasks. If you are trying to learn and execute specific software, spend enough time reading through its manual and/or searching for web-groups of other people using the same software. You can also ask me for help, if you get stuck on a problem and cannot figure out a solution by yourself.

Travel for Research

As part of your graduate education, you will also be expected to travel to conferences and present your research to peers. There are travel funds available in the Department of Civil

and Environmental Engineering and in the College of Engineering that you should apply for. I usually also have travel funds in my projects, which could be used to support your travel expenses. When travelling for conferences, always use the most economical options. You can search for cheap flights on www.kayak.com and similar websites. Always share hotel rooms and stay in inexpensive, but safe, hotels that have room rates in the range of \$70 to \$100. Daily expenses on food are reimbursed based on either daily rates decided by the university or based on your restaurant receipts. Also, you are expected to fill in a travel form before you leave the city. Always contact Mrs. Cherish Wallace (cwallac3@Central.UH.EDU) before you make any travel arrangements in order to complete all the travel paperwork needed by the university.

Group/Individual Meetings

Group meetings will be held once every week, unless I cancel or postpone a meeting. During group meetings I expect you to report your weekly accomplishments and update your status. Group meetings are excellent opportunities for discussing any hurdles you are having with your research and getting feedback from your peers to help you figure out solutions. Based on where you are with your research, you will also be expected to present your research at least once every semester. As a presenter, you will be expected to use this opportunity to improve your presentation skills and confidence in delivering in front of a critical audience.

I am in my office most of the time, and you can generally interrupt me with questions or to discuss a problem. Appointments are more convenient, but I prefer to deal with questions as they arise. However, you should be aware that every interruption, no matter how minor, costs me at least 5 minutes, and usually more, while I refocus on my task. Hence, please think about whether a particular question merits an interruption or whether you might be able to wait until another better time with a series of questions. On the other hand, you and I will meet every week for up to one hour to discuss the progress of your research.

Professionalism

Part of what I will expect you to learn or develop with me is an attitude of “professionalism”. How do I define professionalism? I view professionalism as (1) taking responsibility for one’s own actions and duties, (2) reasonable respect for and tolerance of other views, (3) a willingness to make reasonable compromises to meet shared goals, (4) a pleasant demeanor (real or false), (5) a focus on getting things accomplished, and (6) an ability to escape, avoid, or ignore petty arguments, bickering, and gossip. Note that a professional relationship does not require friendship. In fact, a good professional

relationship should allow you to work reasonably well even with people you personally detest or who detest you (although we all hope it never comes to that).

A professional manner carries us through periods of disagreement and difficulty with minimal strain and stress. While a serious disagreement with a friend may make it impossible to continue any relationship with that friend, it normally shouldn't destroy a professional relationship. A professional manner should allow you to get deeply angry with me or another coworker, yet not erupt into furious denunciation and accusation. It should allow you to calmly think about a situation and discuss it with those involved as a problem to be solved. It should allow you to invite and accept reasonable criticism as constructive rather than destructive (criticism normally from a mentor or supervisor, but at times from coworkers as well). As a mentor, I expect to offer honest judgments about professional abilities that I might never offer to a friend. I expect also to ignore things that I consider irrelevant from a professional standpoint, including specific political or religious views. If you have any questions about these or other topics please ask me. There are not taboo subjects or questions.

Evaluation (Each semester)

As part of tracking your **progress in research (not coursework)**, you will be evaluated at the end of each semester. You and I will independently fill a form about your research performance. Then we will compare these forms and discuss your progress in research and the areas for improvement. If at the end of the academic year, you progress in research is not satisfactory, you will not receive financial support for the next academic year.

Please sign below and return to me a copy indicating that you have read this guideline completely and understand your obligations and expectations. Also, if you have any suggestions on issues you would like me to include in this document, please feel free to share it with me.

Student Signature: _____

Date: _____

Student Name: _____