# [How to Do Great Research](https://greatresearch.org/)

* time management
* productivity and (selective) procrastination
* how to read a research paper
* how to review a research paper
* how to write a research paper (technical writing)
* how to generate ideas, creativity, sources of problems
* information management (research notebooks, etc.)
* how to give a good talk
* how to write a proposal
* how to be a good TA

|  |  |  |
| --- | --- | --- |
| **Week** | **Lessons** | **Preparation** |
| August 29 | Introduction and Overview   * Why do I want a Ph.D.? * What job do I want? | [**Why Ph.D.?**](https://greatresearch.org/exercises/why-ph-d/) |
| September 5 | Fellowships: Why, where, how? |  |
| September 12 | Motivation and Time Management People Skills and Advisor Managment | [**Time Log**](https://greatresearch.org/exercises/time-log/) |
| September 19 | Recognizing Great Ideas   * Scientific revolutions * Examples of scientific revolutions * Examples of great researchers | [**Recognizing Ideas**](https://greatresearch.org/exercises/recognizing-good-ideas/) |
| September 26 | Generating Great Ideas   * Research patterns * Creativity * Cross-disciplinary thinking | [**Creating Ideas**](https://greatresearch.org/exercises/creating-an-idea/) |
| October 3 | Practical Survival Skills   * Data analysis and presentation * Programming and math * Human subjects studies | [**Applying Ideas**](https://greatresearch.org/exercises/applying-ideas/) |
| October 10 | Spreading Ideas   * Writing papers and articles * Presentations and talks * Publication 2.0 (blogging, etc.) * *Science and engineering in society* | [**Multi-Resolution Elevator Pitch**](https://greatresearch.org/exercises/elevator-pitch/) |
| October 17 | Critiquing Ideas   * *Peer review* * Reading papers * Reviewing papers and the review process * Offering feedback | [**Critiquing Ideas**](https://greatresearch.org/exercises/critiquing-ideas/) |
| October 24 | Graduate Student Panels   * Fun outside the lab * Grad student survival skills | [**Research Web Page**](https://greatresearch.org/exercises/research-web-page/) |
| October 31 | **Mock Program Committee Meeting** |  |
| November 7 | Teaching and Mentoring   * Teaching advice and methods * How to give a good lecture * How to get the most out of your TA experience * *Responsibilities of mentors and trainees* |  |
| November 14 | Research Ethics I   * *Human Subjects/Institutional Review Board* * Authorship and publication * Plagiarism * Collaborative Research |  |
| November 21 | Research Ethics II   * *Conflicts of interest* * *Workplace conduct* * *Data management* |  |
| December 12 | **Mini-Conference** |  |

# [Managing Your Advisor](https://greatresearch.org/2013/08/14/managing-your-advisor/)

—including various **niceties**

how to submit **reimbursements**

how to gain **traction** on their research as quickly as possible

 the Ph.D. is a true **apprenticeship**

you should be suspicious of any advisor who wants to **constantly** hold you to tight **deliverables**

bossing you **around** or restricting your **autonomy** or creativity

it is **incumbent** on you to work with your advisor

 You may find you are **stuck in a rathole**, and you may not even realize it

 Here is a simple rule of **thumb**

I do not consider this to be rude, **nagging**, or **pestering** behaviour

 Even a plot that appears buggy or **inexplicable** is sometimes a good topic for a meeting

**albeit** at a higher level

What is a research proposal?

**Answer the Four “Whys”: Why Important, Why Hard, Why Now, Why You?**

# word

we will **codify** the modules from the course

 To help you **get your feet wet** with research as soon as possible

 an inherently uncertain process and ideas take time to **germinate**

In all likelihood,  nobody **will hold you to the plan** that

research can take unintended **twists and turns**

I think the process of writing a research proposal can be **tremendously** fun.

 be **introspective** about what problems you think are really important

Industry has the capability to hire armies of software engineers to rapidly **churn out** code.

This aspect is where some **delicate** balancing comes in

their sales job may **edge** your proposal **out**

 so you **might as well** **put your best foot forward**

if you can’t even be **meticulous** with a short research proposal

if he or she can’t trust your ability to **proofread** a short,

some funding agencies are extremely **regimented** about the format and content of a proposal

**Scour the solicitation** for words like “must” and “should” and  “required”