

CSE 6001: Intro to the CSE PhD (Fall 2018)

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Your research will be judged not just by what you say and do, but how you say and do it. Your technical electives teach you “the what.” This course is about “the how.”

Note that “the how” includes how to frame your work, how to write about it, how to present it, and how to carry out your work in impactful, responsible, and ethical ways. These latter attributes will help you ensure that you follow Georgia Tech’s policies on Responsible Conduct of Research.¹

¹ www.rcr.gatech.edu

Date	Topic [Activity]	Reading (<i>before</i> class!)
Aug. 22	Hello and welcome! [Self-introductions]	
Aug. 29	<i>No class (Vuduc away)</i>	[Guo, 2012]
Sep. 5	Innovation: Guest lecture by Prof. Fujimoto	[Fujimoto, 2011]
Sep. 12	[Your talks, part 1] (5 min each)	
Sep. 19	What is CSE? [Guo response due]	[Rüde et al., 2016]
Sep. 26	Responsibilities of teachers and mentors (RCR) [In-class written response]	[Pinker, 2015]
Oct. 3	Writing, Part 1 [Bring abstract]	[Shewchuk, 1997]; [Zinsser, 2010]
Oct. 10	Writing, Part 2; Authorship and publication (RCR)	
Oct. 17	Plots and charts; Data management (RCR)	[Dumont, 2009]; [Püschel, 2008]
Oct. 24	Collaborative research (RCR)	[Fujimoto, 2011]
Nov. 7	[Your talks, part 2] Research ethics (RCR): conflicts of interest; human subjects research; research misconduct	[Dhavamany and Mohandas, 2013]
Nov. 14	Guest: Sheila Cranman on conflict resolution (RCR) and listening skills	
Nov. 21	<i>No class (Thanksgiving)</i>	
Nov. 28	[Your talks, part 3] Peer review; science and engineering in society (RCR)	[Smith, 1990]

Table 1: What we plan to cover, what activities we will do for each, when, and with what readings (if applicable).

Who should take this class? If you are a Computational Science and Engineering (CSE) PhD student, you *must* pass this course once, and you must take it in your first semester unless extenuating circumstances prevent you from doing so. (Please consult with the instructor in such cases.)

Logistics. The class meets Wednesdays from 1:55–2:45 pm in the Klaus Advanced Computing Building, Room 2456 (classroom side).²

² <https://goo.gl/maps/dANhxGkLktv>

Books. There are no required books for the class. However, if you are serious about science and how to convey it effectively, then I would *highly* recommend Josh Schimel’s *Writing Science*, Doumont’s *Trees, Maps, and Theorems*, and Heath & Heath’s *Made to Stick* (in that order if you must prioritize).³ Aside from those, we will rely primarily on readings available online.

³ Schimel 2012, Doumont 2009, Heath and Heath 2007

Philosophy and approach. The basic philosophy of this course is that you learn best by a combination of reading, thinking, and most importantly, *actively doing*. Therefore, there will be few formal lectures. Rather, we will all do *actual stuff* together in class. This approach only works if you prepare *before* each class, so please do so.

Your grade in the class is based entirely on participating in *all* the exercises. If you really need to miss a class, you should advise the instructors as far in advance as possible.

References

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- Jean-luc Doumont. *Trees, maps, and theorems: Effective communication for rational minds*. Principiae bvba, 2nd edition, 2009. ISBN 978 90 813677 07. URL <http://treesmapsandtheorems.com>.
- Richard M. Fujimoto. On innovation, and building and sustaining a successful career in research. In *Proceedings of the 2011 Winter Simulation Conference (WSC)*, Phoenix, AZ, USA, December 2011. DOI: 10.1109/WSC.2011.6147015.
- Philip Guo. *The Ph.D. grind*. (electronically self-published), 2012. URL <http://pgbovine.net/PhD-memoir.htm>.
- Chip Heath and Dan Heath. *Made to stick: Why some ideas survive and others die*. Random House, 1st edition, 2007. ISBN 978-1400064281. URL <http://heathbrothers.com/books/made-to-stick/>.
- Steven Pinker. The sense of style: Scientific communication for the 21st century, October 2015. URL <https://www.youtube.com/watch?v=0V5J6BfTo5w&t=1829s>. Video Lecture at the Royal Institution.
- Markus Püschel. Small guide to giving presentations, 2008. URL <https://www.inf.ethz.ch/personal/markusp/teaching/guides/guide-presentations.pdf>. (Year is approximate).
- Ulrich Rüde, Karen Willcox, Lois Curfman McInnes, Hans De Sterck, George Biros, Hans-Joachim Bungartz, James Coronas, Evin Cramer, James Crowley, Omar Ghattas, Max Gunzburger, Michael Hanke, Robert J. Harrison, Michael A. Heroux, Jan Hesthaven, Peter K. Jimack, Chris Johnson, Kirk E. Jordan, David E. Keyes, Rolf H. Krause, Vipin Kumar, Stefan Mayer, Juan Meza, Knut Martin Mørken, J. Tinsley Oden, Linda R. Petzold, Padma Raghavan, Suzanne M. Shontz, Anne E. Trefethen, Peter R. Turner, Vladimir Voevodin, Barbara I. Wohlmuth, and Carol S. Woodward. Research and education in computational science and engineering. *CoRR*, abs/1610.02608, 2016. URL <http://arxiv.org/abs/1610.02608>.
- Joshua Schimel. *Writing Science: How to write papers that get cited and proposals that get funded*. Oxford University Press, 2012. ISBN 978-0199760244.

Jonathan Richard Shewchuk. Giving an academic talk, 1997. URL <http://www.cs.berkeley.edu/~jrs/speaking.html>.

Alan Jay Smith. The task of the referee. *IEEE Computer*, 23(4), April 1990. DOI: 10.1109/2.55470.

William Zinsser. Writing English as a second language. *The American Scholar*, 2010. URL <http://theamericanscholar.org/writing-english-as-a-second-language>.