Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science
6.S080 Introduction to Inference
Fall 2012

FREQUENTLY ASKED QUESTIONS

There has been a lot of interest in this new subject since it's official announcement, and as a result many questions. Here are answers to some of the most frequently asked ones. We'll aim to keep this list up to date.

1. **What is 6.S080 about, why is it important, and who should take it?**

   We live in a world in which we constantly need to extract information from data. This is the central problem of inference. And computational efficient methods for such inference are enabling technologies for an enormous range of applications.

   Example domains abound, and include search and retrieval, data mining, computer vision and imaging, voice recognition, communication and compression, natural language processing, robotics and navigation, computational biology and bioinformatics, medical diagnosis, distributed sensing and monitoring, and finance.

   Many of the most successful inference algorithms arise out of probabilistic modeling and analysis. If you want to learn the fundamentals of this discipline and what you can do with it, this subject is the place to start. Indeed, it will provide a solid foundation for more advanced subjects that build on this framework of reasoning.

2. **What departmental requirements does 6.S080 satisfy?**

   For students in 6-2, you may select 6.S080 as one of either your EE or CS foundation subjects.

3. **If I've elected 6-2, does this mean I could select 6.S080, 6.004, 6.005, and 6.006 as my Foundation subjects?**

   Yes, this is likely to be a popular 6-2 Foundation subject combination.

4. **What if I am committed to 6-1 or 6-3? Can I get credit for 6.S080?**

   In this case you can certainly get credit for 6.S080 as a free elective. You just can't use it to satisfy your Foundation requirement.

5. **Most of our Foundation subjects lead to more advanced subjects in the curriculum. Is this the case for 6.S080?**

   Indeed, it does. We have several advanced subjects in our curriculum in this area, including 6.437, 6.438, and 6.867. Additionally, a new header-level subject entitled Introduction to Machine Learning will be introduced in Spring 2013 that will provide the bridge between 6.S080 and these (and other) more advanced subjects. This subject will be announced shortly, along with its introductory subject number and subject description.

6. **I'm 6-2, I'd like to take 6.S080, 6.004, 6.005, and 6.006 as my foundation subjects. After that I will need to take 3 header subjects, at least one of which must be an acceptable EE header. What are possible headers that can serve this purpose for students like me?**

The new Introduction to Machine Learning header subject launching in Spring 2013 (mentioned above), which will be usable as either an EE or CS header, is likely to be a popular choice. A variety of other existing subjects will also be allowable as headers for 6.S080 students. For example, the department will allow 6.867 Machine Learning, which is currently popular as an advanced undergraduate subject (AUS), to be used as a header for 6.S080 students. Students who use 6.867 as a header could, for example, use some of our key advanced inference subjects like 6.437 Inference and Information and 6.438 Algorithms for Inference as AUS classes.

7. **I'm not in Course 6. Can I take this subject?**

   Of course! This subject is for anyone at MIT who wants an introduction to the fundamentals of inference.

8. **I've already taken 6.041 (or 18.05 or 18.440). Should I take 6.S080?**

   If you've already taken one of these subjects, you will likely want to take one of our more advanced subjects that build on this background.

9. **Will 6.S080 have labs like some of the other Foundation subjects?**

   No, the subject will not have traditional labs. It will be problem set based. However, computational aspects of inference are an important aspect of the subject, and thus problem sets will consist of a combination of analytical and computational exercises to reinforce the material from class.

10. **With my schedule, I'm not sure if I will be able to take the inaugural offering of this subject. On what schedule will this subject be offered in future years?**

    The plan is to offer this subject once per year, in the Fall term, for the next couple of years while it gets up to speed. In the longer term, we anticipate the course being offered each term.

11. **I haven't taken the official prerequisite 6.01, but I notice that students without this subject can take 6.S080 with permission of the intructors. What kind of background is expected?**

    We will assume that students in the class have had at least a brief introduction to probability and random variables in a prior subject. For example, 6.01 provides a roughly two-week introduction to such material. And thus this will be our starting point. In the first week of classes we will hand out a brief diagnostic problem set that will help remind students what we want them to remember from 6.01 if they took it, or otherwise help students assess their background for 6.S080.

12. **I see enrollment is limited. How will it be determined who can take 6.S080?**

    Our aim is to accommodate as many as possible of the students who would like to take the subject. That said, if demand exceeds our resources for managing an initial offering, we will use a lottery system to determine the enrollment.

13. **What's with the funny course number?**

    All new departmental subjects are initially assigned a temporary "special subject" number, which in our case is 6.S080. For subsequent offerings, the subject will have its permanent "double-oh" number.

14. **I've always dreamed MIT would offer such a subject, but never thought it would happen in my time. It sounds too good to be true. Is it really going to be as good as it seems?**

    :-)

15. **I have additional questions about 6.S080. Is there someone I can contact?**

    Sure, feel free to send email to Greg Wornell at gww@mit.edu !