

FREQUENTLY ASKED QUESTIONS ABOUT THE COMPUTER SCIENCE MBB TRACK

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This document is available at <http://tiny.cc/CSMBB>.

The Mind, Brain, and Behavior (MBB) track of the Computer Science (CS) concentration provides the opportunity to tailor the CS concentration requirements for those interested in computational approaches to mind, brain, and behavior. The MBB track requirements are in some ways more flexible and in others more constrained than the regular CS concentration, and for that reason require some attention in developing an appropriate plan of study. This document is intended to help you efficiently devise a plan of study for the CS-MBB track and get it smoothly approved so you can get on to the interesting bit – the study and modeling of the systems that underlie the most sophisticated behaviors in the universe.

BACKGROUND

1. *What is the CS MBB track?*

It is an honors degree track within the undergraduate computer science concentration designed for students interested in the connections between computation and the processes that govern mental phenomena and their control of behavior. It connects CS to fields such as cognitive psychology, neurobiology, linguistics, and philosophy of mind. Students interested in this interdisciplinary area, who might at other colleges major in cognitive science or symbolic systems and often have special interest in artificial intelligence, are likely prospects for the CS MBB track.

2. *Who is the CS MBB adviser?*

The CS MBB adviser, who serves as the de facto (and usually de jure) adviser for all CS-MBB students, is [Professor Stuart Shieber](#).

3. *Where can I get background information on the CS concentration, the MBB program, and the CS MBB track?*

Start with the online descriptions of the [CS concentration](#) and the [MBB undergraduate program](#). If you find the combination of the two topics intriguing, make an appointment to meet with the CS MBB adviser.

4. *What are the requirements for the CS MBB track?*

The requirements are described in the [Handbook for Students section on the CS concentration](#) in the section entitled “The Mind, Brain, and Behavior Program”. The

structure of the requirements is that of the Honors CS concentration with some added flexibility in some areas and stipulations in others.

5. *How do I join the CS MBB concentration?*

1. You should familiarize yourself with the concentration and track, including reading this document. You may want to work through the CS plan of study form available for download from the [CS Undergraduate Program site](#).
2. You should then meet with the CS MBB advisor. You can schedule a time at his office hours or at another time convenient for you as specified [here](#).
3. You fill out a copy of the plan of study spreadsheet available [here](#). In doing so, be sure to select the “MBB” option in the top dropdown.
4. Email the completed spreadsheet to the CS MBB adviser (*not to the DUS*, as you would for non-MBB plans of study).
5. If the plan of study is conformant, the CS MBB adviser will forward it to the DUS, cc-ing you, so stating.
6. Once you have an approved plan of study, you declare the CS concentration through [my.harvard](#). The Director of Undergraduate Studies (DUS) in Computer Science will approve the my.harvard declaration *after* the process of filing a satisfactory spreadsheet (see above) has been completed.

DEVISING A PLAN OF STUDY

1. *What constraints and flexibilities in course choice does the track involve?*

The CS MBB track imposes certain changes to the normal honors requirements for CS. Some constraints are added: First, a thesis is required. Second, particular theory courses are stipulated. Third, some of the technical electives are further specified. Some flexibility is introduced in allowing certain courses to count as theory courses or technical electives that would otherwise not be allowed.

2. *What courses should I take for the theory requirement?*

The theory requirement for MBB is always CS121 (or equivalent) and either CS124 or Stat 110. If you take CS125 instead of CS121, then it should be paired with Stat 110 in this requirement.

3. *I note that SLS20 is mentioned as a requirement for the MBB certificate. Where does this course fit into the CS MBB requirements?*

The [MBB certificate requirements](#) (which the CS MBB requirements fall under and satisfy) do mention SLS 20 and MCB 80/81 as specifically required for the MBB certificate and therefore for the MBB tracks within several concentrations. However, CS MBB students are specifically exempted from the SLS 20 requirement, and it does not count toward the CS MBB degree requirements. You are of course still welcome to take this course, which can provide a valuable broad background to psychology, but it would serve as an elective course.

4. *Can I take MCB 81 as an alternative to MCB 80?*

Yes, and in fact many CS concentrators find MCB 81 the preferable alternative.

5. *What is an “approved biology or psychology course”? Is there a list somewhere of courses that satisfy this requirement?*

Because courses come and go and even change over time, there is no definitive list of courses that satisfy the “approved biology or psychology course” requirement. The spirit of the requirement is that the course have significant emphasis on MBB topics and issues from a specifically biological or (experimental) psychological point of view. In general, any biology, neurobiology, or psychology course with “cognitive” or “neuro-” in the title is typically acceptable.

Examples of just a few of the courses appropriate for this purpose as of the date of this document include Psych 14 (Cognitive Neuroscience), Psych 18 (Abnormal Psychology), Psych 1358 (Cognitive and Neural Aspects of Object and Action Knowledge), Psych 1401 (Computational Cognitive Neuroscience: Building Models of the Brain), MCB 105 (Systems Neuroscience), MCB 125 (Molecular Basis of Behavior), MCB 131 (Computational Neuroscience), MCB 145 (Neurobiology of Perception and Decision Making), and many Neurobio courses. The MBB Trento Summer School program has been deemed appropriate for the requirement. *This is by no means an exhaustive list*, and is just intended to give a sense of the types of courses that are appropriate.

Certain courses, though excellent in their own right, do not fulfill the spirit of this requirement and therefore do not count toward the concentration. These include survey courses that include a broad range of topics only a few of which are MBB related – for example, SLS 20, Psych 15, MCB 60, LPS A, LS 1ab, Ling 101, 102, etc. By all means take these courses, but as electives outside the concentration.

You should speak with the CS MBB adviser to verify that particular courses that you are interested in taking will satisfy this requirement.

6. *What are MBB junior tutorials aka MBB interdisciplinary seminars? What courses count toward this requirement?*

These small seminar courses of 15 or fewer students address an MBB-related topic from several disciplinary angles. Many are listed under the course number MBB 980a-z. Many departmental seminars also qualify for the junior tutorial requirement. [A full list is maintained at the MBB website](#). Any listed course will count towards the CS MBB junior tutorial requirement.

7. *Should I take CS 181 or 182?*

It’s up to you depending on your interests. In fact, you might take both; many CS MBB students do. However, only one will count towards the concentration requirements.

8. *What courses count towards the breadth requirement?*

Any two CS courses with different middle digits 3, 4, 5, 6, or 7 or CS 91r. Note that CS x8x courses do not count (as that area of breadth is already covered by the CS181/182 requirement) nor do other CS x9x other than CS 91r.

THE THESIS

1. *Is a thesis required for the CS MBB track?*

Yes, a thesis is required for all of the MBB tracks, including CS.

2. *What is a suitable topic for a CS MBB thesis?*

First and foremost, a CS MBB thesis is a CS thesis. It must be on a computer science topic. Beyond that, however, we construe the MBB aspect quite broadly. Any CS thesis that involves minds, brains, or behavior in some way is suitable. CS MBB theses have run the gamut from theoretical to engineering-oriented; investigating behaviors like visual perception, human language, or inference and reasoning; computer modeling of psychological phenomena of all sorts; examining the philosophy of AI.

3. *How do I find a CS MBB thesis topic?*

The same way you would with any CS thesis. Start by talking with faculty working in areas that you are interested in. They may run regular lab meetings with their groups that you can attend, thereby insinuating yourself into the research process. They may have topics they're interested in looking into that you could help with.

4. *Where can I find examples of CS theses to give me an idea of what is involved?*

Harvard's DASH repository has a selection of undergraduate senior theses, **including many CS senior theses**. When you've completed your own senior thesis (in whatever department), please submit it to DASH so that others can read it and benefit from your work.

5. *Do I have to take CS91r when working on my thesis?*

No, there's no requirement to take CS91r. Some students however find it useful to take CS91r to codify time in their course schedule for work on the thesis.

6. *When is the best time to take CS91r for thesis work?*

If you do choose to take CS91r to serve as a course slot for thesis work, the most appropriate time to do so is fall term of your senior year, when the bulk of thesis research is typically done. Since a full draft of the thesis should be provided to your adviser about a month into spring term, taking CS91r in spring term isn't nearly as effective.