Guide to the Focus in Mind, Brain, Behavior

For History and Science Concentrators
Science and Society Track
Honors Eligible
2015-2016

Department of the History of Science
Science Center 371

The Focus in Mind, Brain, Behavior in the Science and Society Track offers opportunities for study that are at once more interdisciplinary and more focused than those available to students doing a conventional plan of study in our Department.

- More interdisciplinary because the track requires students to take a graduated set of specially designed or specially designated interdisciplinary courses in common with the students in all the other MBB tracks, and also because the track offers the option of augmenting a core historical disciplinary approach to the mind, brain, and behavioral sciences with one auxiliary social science or humanities discipline, such as medical anthropology, public policy, philosophy of mind, etc.
- More focused, because it asks students to bring those interdisciplinary perspectives to bear on a particularly vexed arena of scientific inquiry: the mind, brain and behavioral sciences. These include, of course, the neurosciences and cognitive sciences, but also evolutionary perspectives on behavior and cognition, relevant aspects of genetics, and such areas of medical science as psychiatry and psychopharmacology.

This study guide offers some guidelines as you go about composing a study program in MBB. The guide outlines the particular areas of focus you can pursue within MBB and offers suggestions for courses you might take within those areas.

This study guide is not meant to replace the other available MBB resources or the course guides of the various Harvard divisions. Do consult the website (**http://mbb.harvard.edu)** for more comprehensive information about the MBB tracks at Harvard. Check the FAS Courses of Instruction to compile a complete and up-to-date list of potential courses to fulfill your MBB requirements.

- Freshman and sophomore years: take the required MBB foundation science courses (Science of Living Systems 20 and MCB 80)
- Junior year: take an MBB interdisciplinary junior seminar; attend the MBB junior year symposium
- Senior year: enroll in a non-credit MBB senior thesis workshop
- Throughout the concentration: integrate historical studies with an additional social science perspective

We encourage you to take advantage of the creativity Focus in MBB offers. By proactively researching potential courses across Harvard's divisions, and crafting focus and coherence early on, you can design a deeply enriching intellectual experience. We are here to help you achieve these goals, so don't hesitate to ask for our advice.

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PUTTING TOGETHER YOUR FOCUS IN MBB
WITHIN THE HISTORY AND SCIENCE CONCENTRATION

Ideally, a Mind, Brain, Behavior focus within the History and Science Concentration is composed as follows:

I. Establish a guiding principle.

* Choose a field in a cognitive or brain science
* Choose a sociocultural focus to frame/examine it

II. Design a program of study that includes **4 science courses** and **5 sociocultural courses**.

Of your **4 science area** courses:

* one is the **MBB-required MCB 80**
* one can (but need not) be the **MBB-required Science of Living Systems 20.**
* of the four courses, **only two may be introductory**. Therefore, if you choose to count SLS 20 as one of the four courses, your two remaining courses must be advanced courses. **You must take SLS 20 whether you count it as one of these four courses or not; in other words, SLS 20 is required for all MBB students, but you may choose not to include it as one of the four science courses required for the History and Science concentration.**
* your courses should reflect a coherent science field related to MBB (see p. 4-7)

Of your **5 sociocultural area** courses:

* at least **3** courses must be **historical** (normally focused on the history of medicine and/or the human sciences; **2** courses must be in History of Science)
* **1** course must be History of Science 100, Knowing the World: An Introduction to the History of Science
* **2** courses may be in one of the **auxiliary areas** (see p. 8-10)
* only two may be introductory courses
* your courses should reflect a coherent socio-cultural field related to MBB

III. Fulfill additional requirements for MBB students in all participating concentrations.

* attend the two-day MBB symposia at the beginning of the junior year
* senior thesis workshop (non-credit)

Please note that seniors in MBB are eligible for MBB senior thesis funds. Again, check the MBB website for information and deadlines.

PLEASE REFER TO THE MBB WEBSITE FOR INFORMATION ON THESE REQUIREMENTS. THE HISTORY AND SCIENCE CONCENTRATION DOES NOT TRACK YOUR PARTICIPATION IN THESE MBB-RELATED REQUIREMENTS.

IV. Participate in the History and Science tutorial program.

* History of Science 97: Tutorial - Sophomore Year
* History of Science 98: Tutorial - Junior Year
* History of Science 99ab: Tutorial - Senior Year (the expectation is that student honors theses will engage in one way or another with these sciences; a decision to write a senior honors thesis on a topic outside of the mind, brain, and behavioral sciences is certainly possible, but it is likely grounds for being denied an MBB certificate.)

In recognition of your completion of these requirements, you will receive an MBB certificate from the Faculty of the Committee on Mind, Brain, and Behavior, in addition to a degree in History and Science. Please see the MBB website for details about fulfilling the requirements for the Certificate in Mind, Brain, Behavior: http://mbb.harvard.edu/.

General comments on course selection:

In this Study Guide we recommend courses in various Harvard divisions whose content appears to fulfill the MBB requirements within the History and Science Concentration. **We do not guarantee that these courses will meet this year. We do not claim that the list of courses we give you here is an exhaustive list of possible courses you could take. These are suggestions and examples of the kind of courses you might take.**

We do recommend that you research courses in Harvard divisions beyond Arts & Sciences. The Divinity School, the Kennedy School of Government, The Graduate School of Education (Human Development Program), and the Medical School have courses relevant to MBB students.

If you come upon a course you feel would be appropriate for your MBB requirements, you will need to consult with your concentration adviser in History and Science about that course. You may be asked to provide a syllabus for the course to help the adviser make a good decision about the fit. You may be asked to write a brief proposal outlining how you will make the course relevant to your MBB focus. Often the proposal outlines a paper that you will write at the end of the course, tying the material of the course to your MBB interests. You will discuss the course and the proposal with your adviser. It is also a good idea to consult with the instructor of the course before writing your proposal to your adviser. The instructor does need to agree generally with your proposed paper topic.

SCIENCE AREA

The available choices for the science area map onto the MBB science tracks in the other participating concentrations. Because MCB 80 is a required course for MBB concentrators, you can only take **one additional introductory course** in your science area.

Science courses taken by History and Science concentrators are generally required to have a laboratory component. In some of the science courses relevant for the MBB track, this requirement is rather hard to fulfill. In order to fulfill MBB requirements, such courses are required to have a **strong quantitative component**.

Science Area Divisions

Outlined below are six divisions within the Science Area.

1. Cognitive Systems
2. Psychopathology
3. Human Evolutionary Biology
4. Child Development and the Brain
5. Computational Neuroscience
6. Neurobiology

You will choose **one** division as your area of specialization. We do understand that in some ways these divisions are artificial distinctions among overlapping areas of interest. If you have any questions about these divisions, or would like to propose a division that is not covered here, please talk to your adviser.

Please note: The courses listed below are examples only. Some of these courses may no longer be offered; new and relevant courses may not be listed here. Please check the current catalog of courses at my.harvard.edu.

1. Cognitive Systems

Traditionally, cognitive psychologists have thought about mechanisms and processes of the mind, and neuroscientists have thought about mechanisms and processes of the brain. In this science area division you will focus on the integration of these two approaches, as you explore the relationship of the brain to cognition and behavior.

Potential Courses:
Psychology 14. Cognitive Neuroscience
Psychology 1052. The Application of fMRI in Cognitive Neuroscience Research
Psychology 1304: Brain Damage as a Window into the Mind : Cognitive Neuropsychology
Psychology 1307: Brain Genomics
Psychology 1352. Foundations of Cognitive Neuroscience Research
Psychology 1430. Human Memory and Amnesia
Psychology 1452. The Human Face
Psychology 1453. Consciousness Explored
Psychology 1503. Psychology of Close Relationships
Psychology 1504. Social Cognition: Making Sense of our Social World
Psychology 1508. How to Nudge: Using Social Psychology and Decision Science to Change Behavior and Policy
Psychology 1556r. Research Seminar in Implicit Social Cognition
Psychology 1701. Personality Psychology

2. Psychopathology and Brain Disorder

Much of what we know today about neurological structures and cognitive processes, as well as their relationship to behavior, is derived from the study of psychopathology. Pre-meds may be particularly interested in this division. Courses can be in psychopharmacology, as well as in abnormal psychology.

Potential Courses:
Psychology 18. Abnormal Psychology
Psychology 1801. Anxiety Disorders
Psychology 1851. Clinical Psychology: Science and Practice
Psychology 1852. Clinical Psychology in Everyday Life
Psychology 1853. Self-Destructive Behaviors
Psychology 1854. Schizophrenia: Seminar
Psychology 1855. Mood Disorders
Psychology 1856. Cognition and Psychopathology
Psychology 1857. Psychotherapy: Science and Practice
Psychology 1858. Stress, Coping, and Resilience
Psychology 1861. Developmental Psychopathology

3. Human Evolutionary Biology

The primary emphasis in this division is on the brain-behavior relationship, as viewed through the lens of organismic and evolutionary biology. Courses in ethology (animal behavior) may sometimes be appropriate. Courses that include cross-species comparisons may also be appropriate.

Potential Courses:
HEB 1300. Evolutionary Origins of the Human Mind
HEB 1330. Primate Social Behavior
HEB 1390. Game Theory and Social Behavior
OEB 53. Evolutionary Biology
OEB 57. Animal Behavior
OEB 131. Neuroethology

4. Child Development and the Brain

This division emphasizes a developmental perspective of the brain, exploring the relationship between brain and behavior in the course of infancy and early childhood. Courses that focus on development and behavior need to include the development of the brain. Likewise, courses that focus on brain development would ideally include discussion of the brain-behavior relationship.

Potential Courses:
MCB 141. Molecular and Cellular Biology of the Senses and their Disorders
MCB 146. Experience-Based Brain Development: Causes and Consequences
Psychology 1601. Developmental Disabilities
Psychology 1604. Social Development
Psychology 1605. Psychology of Language
Psychology 1651r. Language Development: Undergraduate Laboratory Course: Research Seminar
Psychology 1652r. Laboratory in Early Cognitive Development
Psychology 1655r. Conceptual Development: Undergraduate Laboratory Course

5. Computational Neuroscience

This science division attempts to integrate the results of research in the neurosciences with research in the computer sciences, where models and computer simulations of brain functioning and language development have been developed. This division requires taking an intelligent combination of computer science and neuroscience courses in order to provide a satisfactory background in both.

Potential Courses:
Computer Science 181: Machine Learning
Computer Science 182. Artificial Intelligence
MCB 105. Systems Neuroscience

NB: Students interested in this division are strongly encouraged to investigate courses at MIT in the Brain & Cognitive Sciences department. MIT is particularly strong in the language development area.
Some suggested courses:
9.56J. Abnormal Language
9.59J. Laboratory in Psycholinguistics

6. Neurobiology

The neurobiology division investigates the molecular, biochemical and genetic bases of nervous system functioning. This area is particularly suitable for pre-meds because you may count one course in organic chemistry (Chemistry 17, 20, 27, or 30).

Potential Courses:
MCB 105. Systems Neuroscience
MCB 115. Cellular Basis of Neuronal Function
MCB 129. The Brain: Development, Plasticity, Decline
MCB 141. Molecular and Cellular Biology of the Senses and their Disorders
MCB 148. The Neurobiology of Pain

SOCIOCULTURAL AREA

Ideally, the sociocultural area complements the science area. This second area in MBB for History and Science concentrators provides an opportunity to look at the mind, brain and behavior sciences in an historical and sociocultural context. **The sociocultural area courses should make up a coherent course of study related to the themes of MBB**. You should begin by deciding on a thematic and historical focus, e.g., the history of 19th and 20th century American psychiatry; modernity and understandings of the mind; historical perspectives on race and psychology. This is your opportunity to define the topics and questions that will connect your courses.

Historical Area
At least three of your sociocultural courses should be historical in nature (normally focusing on the history of medicine and/or the human sciences); one course must be History of Science 100, An Introduction to the History of Science, which is a required course for all History and Science concentrators. At least one more historical course must be taught by a faculty member from the Department of the History of Science. The following History of Science courses directly engage with MBB themes:

Culture and Belief 34. Madness and Medicine: Themes in the History of Psychology
History of Science 150. History of the Human Sciences
History of Science 170. Broken Brains
History of Science 171. Narrative and Neurology
History of Science 174. Critical Experiments in the Human Sciences
History of Science 176. Brainwashing and Modern Techniques of Mind Control
History of Science 178. History of the Psychotherapies
History of Science 179. The Freudian Century

Depending on your sociocultural focus, many other History of Science courses will also be relevant. You may also find pertinent historical courses in departments such as African and African American Studies, History, and Women's Studies.

Auxiliary Area
MBB students may also take two additional courses in **one** auxiliary area, such as Health and Science Policy, Medical Anthropology, Religion and Ethics, or Philosophy of Mind and Behavior. The auxiliary area is not equivalent to your sociocultural focus, but rather provides an additional social science perspective on your historical courses and area of study. **If they fit within your overall plan, you may choose two additional historically oriented courses rather than courses in an auxiliary area.** If you have ideas for an auxiliary area not on this list, please consult with your adviser.

Please note: The courses listed below are examples only. Some of these courses may no longer be offered; new and relevant courses may not be listed here. Please check the current catalog of courses at my.harvard.edu.

1. Health and Science Policy

This auxiliary area explores the growing importance of health and science policy from diverse perspectives, including economics, public health, government, history, and sociology. Topics of interest might include the cost of healthcare for the mentally ill; scientific research and funding structures for the cognitive and brain sciences; politics of brain-based theories of gender or racial difference, including intelligence testing; or the legal dimensions of psychiatric illness

Potential Courses:
Economics 980w. Policy Options in Health and Environmental Economics
Economics 1160. Data Science and Behavioral Economics: Application to Systems Medicine
Economics 1460. Economics of Health Care Policy
Economics 2050. Behavioral Economics, Law and Public Policy
Economics 2460. Health Economics Workshop
Ecomonics 2465. Health Economics
Economics 3460c. Research in Health Economics
Global Health and Health Policy 50. The Quality of Health Care in America
STP 100 (Kennedy School). Science, Technology and Public Policy
Sociology 165. Inequalities in Health Care

NB: You may be asked to provide your adviser with a syllabus or a proposal before some of these courses can qualify for MBB credit.

2. Medical Anthropology

Medical anthropologists are interested in the relationship between culture and illness or disease; specifically the ways in which culture may mediate the onset, expression, course, and treatment of bodily and mental suffering. Students who want to include a cross-cultural perspective in their work are especially encouraged to take courses in this auxiliary area.

Potential Courses:

Culture and Belief 58. Case Studies in the Medical Humanities: Interdisciplinary Perspectives on the Experience of Illness and Healing
Sociology 165. Inequalities in Health Care
Sociology 168. Sociology of Biomedicine and Global Health
Anthropology 2796. Medical Anthropology: Advanced Topics
History of Science 246. History and Anthropology of Medicine and Biology

3. Religion and Ethics

This auxiliary area focuses on the ethical and religious dimensions of scientific thinking and practice in the broad context of the mind, brain and behavior sciences. Students can choose courses that explore historical and contemporary issues within, for example, medicine; public health; or the cognitive and brain sciences. The overlapping interests between this auxiliary area and the health and science policy area can be integrated into a focus of study.

Potential Courses:
Ethical Reasoning 33. Medical Ethics and History
History of Science 196. Justice in Health: Ethics of Public Health in the Contemporary World
Sociology 165. Inequalities in Health Care
Sociology 168. Sociology of Biomedicine and Global Health

4. Philosophy of Mind & Behavior

Students interested in this auxiliary area will investigate longstanding philosophical debates surrounding topics such as consciousness; the development of mind, motivation, and language; and the structure of knowledge.

Potential Courses:
Philosophy 156. Philosophy of Mind
Philosophy 158x. Self-Consciousness and Self Knowledge: Proseminar