

# Guide to the Science Area

## For History and Science Concentrators

### Science and Society Track

#### Department of the History of Science

This guide provides ideas for designing your own program of study as a concentrator in History and Science. There are two ways to concentrate in History and Science. You may choose our History of Science track, which does not require a science area. Alternatively, you may pursue our Science and Society track, which allows you to combine the study of a specific science with coursework in history of science and its allied disciplines. This document is specifically for ***students choosing our Science and Society track*** and is designed to guide you in your choice of science courses for the concentration.

**Please note that some of the courses mentioned in this document may no longer be offered; other new courses are added to the catalog every year. For a complete list of active courses, please check [my.harvard](https://my.harvard.edu).** Students may petition to have other relevant science courses count for concentration credit by contacting Allie Belsler, Manager of Student Programs.

Students can count no more than two introductory courses toward concentration credit in the science area. Introductory courses are normally considered to be courses that do not have a college-level prerequisite, and we have noted them with an asterisk.

**This list does not define the requirements for the honors-eligible Focus in Medicine and Society or the Focus in Mind, Brain, and Behavior within the Science and Society track.** Please refer to the study guide for each focus.

**Students should submit a list of proposed courses for the science area on the Courses in Concentration Form, which must then be approved by the Manager of Student Programs or the Director of Undergraduate Studies. It is also important that students review their Courses in Concentration form at least once a year and update it whenever there is a change in the list of courses actually being taken for credit in the concentration.**

#### **Common Science Areas**

Astronomy and Astrophysics

Chemistry

Computer Science

Earth and Planetary Sciences/Environmental Sciences

Engineering Sciences

Human Evolutionary Biology

Life Sciences

Mathematics

Molecular and Cellular Biology

Organismic and Evolutionary Biology

Physics

Psychology

Statistics

Stem Cell and Regenerative Biology

## **SCIENCE AREAS**

### **Astronomy and Astrophysics**

#### **Astronomy Courses numbered 100 and above**

Astronomy 2. Celestial Navigation

Astronomy 5. Astrosociology

Astronomy 16. Stellar and Planetary Astronomy

Astronomy 17. Galactic and Extragalactic Astronomy

### **Chemistry**

The Chemistry 17/27 sequence is intended primarily for students in the life sciences; the 20/30 sequence is intended primarily for Chemistry concentrators and other students concentrating in the physical sciences. Either sequence satisfies the organic chemistry requirement for medical school.

**A common chemistry area sequence for History and Science concentrators which normally satisfies the general chemistry and organic chemistry requirement for medical school is:**

**\*Life Sciences 1a.** An Integrated Introduction to the Life Sciences: Chemistry, Molecular Biology, and Cell Biology

**\*Physical Sciences 11.** Foundations and Frontiers of Modern Chemistry: A Molecular and Global Perspective

**Chemistry 17.** Principles of Organic Chemistry

**Chemistry 27.** Organic Chemistry of Life

**Other sequences can include:**

#### **Chemistry and Chemical Biology Department Courses numbered 100 and above**

**\*Life and Physical Sciences A.** Foundational Chemistry and Biology

**\*Life Sciences 1b.** An Integrated Introduction to the Life Sciences: Genetics, Genomics, and Evolution

Life Sciences 50a. Integrated Science

Life Sciences 50b. Integrated Science

Physical Sciences 2. Mechanics, Elasticity, Fluids, and Diffusion

Physical Sciences 3. Electromagnetism, Waves, Imaging, and Information

Physical Sciences 10. Quantum and Statistical Foundations of Chemistry

Chemistry 20. Organic Chemistry

Chemistry 30. Organic Chemistry

Chemistry 40. Inorganic Chemistry

Chemistry 60. Foundations of Physical Chemistry

### **Computer Science**

#### **Computer Science Courses numbered 100 and above**

**\*Computer Science 1.** Great Ideas in Computer Science

**\*Computer Science 50.** Introduction to Computer Science I

Computer Science 51. Abstraction and Design in Computation (formerly Introduction to Computer Science II)

Computer Science 61. Systems Programming and Machine Organization

## **PLEASE NOTE – THIS LIST IS NOT EXHAUSTIVE OR DEFINITIVE**

### **Earth and Planetary Sciences/Environmental Sciences**

#### **Earth and Planetary Sciences courses numbered 100 and above**

E-PSCI 10. A Brief History of the Earth  
E-PSCI 50. The Fluid Earth: Oceans, Atmosphere, Climate, and Environment  
E-PSCI 51. Introduction to Planetary Materials and Earth Resources  
E-PSCI 52: Global Geophysics: A Primer  
E-PSCI 53: Marine Geochemistry  
SPU 12. Natural Disasters  
SPU 14. How to Build a Habitable Planet  
SPU 29. The Climate-Energy Challenge  
SPU 31. Energy Resources and the Environment  
Astronomy 16. Stellar and Planetary Astronomy  
Engineering Sciences 120. Introduction to the Mechanics of Solids  
Engineering Sciences 123. Introduction to Fluid Mechanics and Transport Processes  
Engineering Sciences 164. Environmental Chemistry

### **Engineering Sciences**

#### **Engineering Sciences courses numbered 100 and above**

Engineering Sciences 20. How to Create Things and Have Them Matter  
Engineering Sciences 21. The Innovator's Practice: Finding, Building and Leading Good Ideas with Others  
Engineering Sciences 22. Design Survivor: Experiential Lessons in Designing for Desirability  
Engineering Sciences 24. Flavor Molecules of Food Fermentation: Exploration and Inquiry  
Engineering Sciences 25. Engineering the Acoustical World  
Engineering Sciences 26. Humanity and its Challenges: Systems Thinking and Approaches  
Engineering Sciences 28. Technology, Ethics, and Society  
Engineering Sciences 29. Introduction to Computational Design  
\*Engineering Sciences 50. Introduction to Electrical Engineering  
Engineering Sciences 51. Computer-Aided Machine Design  
Engineering Sciences 53. Quantitative Physiology as a Basis for Bioengineering  
Engineering Sciences 54. Electronics for Engineers

### **Human Evolutionary Biology**

#### **HEB Courses numbered 1200 and above**

\*Life and Physical Sciences A. Foundational Chemistry and Biology  
\*Life Sciences 1a. An Integrated Introduction to the Life Sciences: Chemistry, Molecular Biology, and Cell Biology  
\*Life Sciences 1b. An Integrated Introduction to the Life Sciences: Genetics, Genomics, and Evolution  
Life Sciences 2. Evolutionary Human Physiology and Anatomy  
\*OEB 10. Foundations of Biological Diversity

### **Life Sciences**

\*Life and Physical Sciences A. Foundational Chemistry and Biology  
\*Life Sciences 1a. An Integrated Introduction to the Life Sciences: Chemistry, Molecular Biology, and Cell Biology

## **PLEASE NOTE – THIS LIST IS NOT EXHAUSTIVE OR DEFINITIVE**

\*Life Sciences 1b. An Integrated Introduction to the Life Sciences: Genetics, Genomics, and Evolution

Life Sciences 2. Evolutionary Human Physiology and Anatomy

Life Sciences 50ab. Integrated Science

Life Sciences 100. Experimental Research in the Life Sciences

SCRB 60. Ethics, Biotechnology, and the Future of Human Nature

### **Mathematics**

**Applied Mathematics Department courses numbered 100 and above**

**Mathematics Department courses numbered 100 and above**

**Statistics Department courses numbered 110 and above**

\*Mathematics Ma. Introduction to Functions and Calculus I

\*Mathematics Mb. Introduction to Functions and Calculus II

\*Mathematics 1a. Introduction to Calculus

Mathematics 1b. Calculus, Series, and Differential Equations

Mathematics 18. Multivariable Calculus for Social Sciences

Mathematics 19a. Modeling and Differential Equations for the Life Sciences

Mathematics 19b. Linear Algebra, Probability, and Statistics for the Life Sciences

Mathematics 21a. Multivariable Calculus

Mathematics 21b. Linear Algebra and Differential Equations

Mathematics 22a. Vector Calculus and Linear Algebra 1

Mathematics 22b. Vector Calculus and Linear Algebra II

Mathematics 23a. Linear Algebra and Real Analysis I

Mathematics 23b. Linear Algebra and Real Analysis II

Mathematics 23c. Mathematics for Computation, Statistics, and Data Science

Mathematics 25a. Theoretical Linear Algebra and Real Analysis I

Mathematics 25b. Theoretical Linear Algebra and Real Analysis II

Mathematics 55a. Studies in Algebra and Group Theory

Mathematics 55b. Honors Real and Complex Analysis

### **Molecular and Cellular Biology**

**Molecular and Cellular Biology Department courses numbered 100 and above**

\*Life and Physical Sciences A. Foundational Chemistry and Biology

\*Life Sciences 1a. An Integrated Introduction to the Life Sciences: Chemistry, Molecular Biology, and Cell Biology

\*Life Sciences 1b. An Integrated Introduction to the Life Sciences: Genetics, Genomics, and Evolution

Life Sciences 50A. Integrated Science

Life Sciences 50B. Integrated Science

Life Sciences 100. Experimental Research in the Life Sciences

MCB 60. Cellular Biology and Molecular Medicine

MCB 63. Biochemistry and Molecular Medicine

MCB 64. Cell Biology in the World

MCB 65. Physical Biochemistry: Understanding Macromolecular Machines

MCB 68. Cell Biology Through the Microscope

\*MCB 80. Neurobiology of Behavior

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### **Organismic and Evolutionary Biology**

#### **Organismic and Evolutionary Biology Department courses numbered 100 and above**

\*Life Sciences 1b. An Integrated Introduction to the Life Sciences: Genetics, Genomics, and Evolution

Life Sciences 2. Evolutionary Human Physiology and Anatomy

\*OEB 10. Foundations of Biological Diversity

OEB 50. Genetics and Genomics

OEB 51. Biology and Evolution of Invertebrate Animals

OEB 52. Biology of Plants

OEB 53. Evolutionary Biology

OEB 54. Biology of the Fungi

OEB 55. Ecology: Populations, Communities, and Ecosystems

OEB 56. Geobiology and the History of Life

OEB 57. Animal Behavior

OEB 58. How to Build an Animal

OEB 59. Plants and Human Affairs

### **Physics**

#### **Physics Department Courses numbered 100 and above**

Physical Sciences 2. Mechanics, Elasticity, Fluids, and Diffusion

Physical Sciences 3. Electromagnetism, Waves, Imaging, and Information

Physical Sciences 12a. Mechanics from an Analytic, Numerical, and Experimental Perspective

Physical Sciences 12b. Electromagnetism and Statistical Physics from an Analytic, Numerical, and Experimental Perspective

\*Physics 15a. Introductory Mechanics and Relativity

\*Physics 15b. Introductory Electromagnetism

Physics 15c. Wave Phenomena

Physics 16. Mechanics and Special Relativity

Applied Physics 50a. Physics as a Foundation for Science and Engineering, Part I

Applied Physics 50b. Physics as a Foundation for Science and Engineering, Part II

Applied Physics 195. Introduction to Solid State Physics

Astronomy 191. Astrophysics Laboratory

Chemistry 160. The Quantum World

Chemistry 161. Statistical Thermodynamics

Chemistry 163. Frontiers in Biophysics

Chemistry 165. Experimental Physical Chemistry

Earth and Planetary Sciences 131. Introduction to Physical Oceanography and Climate

Engineering Sciences 120. Introduction to the Mechanics of Solids

Engineering Sciences 123. Introduction to Fluid Mechanics and Transport Processes

Engineering Sciences 154. Electronic Devices and Circuits

Engineering Sciences 173. Electronic and Photonic Devices

Engineering Sciences 181. Engineering Thermodynamics

Engineering Sciences 190. Introduction to Materials Science and Engineering

**(Note: If you take Physics 15a, b, and c, you may count the combination of Math 21a and Math 21b for a fourth physics course)**

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### **Psychology**

The science area in Psychology must include Psychology 1. Introduction to Psychological Science. It is recommended that students who plan to do advanced work in a laboratory setting also enroll in either Psychology 1900 or Statistics 100, 101, or 102. These courses count as introductory courses.

#### **Required Course for All Areas:**

1. \*Psychology 1. Introduction to Psychological Science

The remaining three courses should be chosen from ONE of the following sub-fields. It is recommended that students choose to take the first course listed in each section, since those courses (Psychology 14, 15, 16, and 18) act as a prerequisite for many of the other courses in each respective section.

#### **Cognitive Psychology**

- Psychology 14. Cognitive Neuroscience
- Psychology 1201. Your Brain on Drugs: Psychopharmacology
- Psychology 1202. Modern Neuroanatomy
- Psychology 1304. Brain Damage as a Window in the Mind: Cognitive Neuropsychology
- Psychology 1311. Precision Cognitive Neuroscience: Opportunities Afforded by Deep, Intensive Study Within Individuals
- Psychology 1322. Decisions Big and Small: The Cognitive Science of Making Up Your Mind
- Psychology 1325. The Emotional, Social Brain
- Psychology 1340. Imagination, Pretense, and Make-Believe Worlds

#### **Social Psychology**

- Psychology 15. Social Psychology
- Psychology 1516. The Psychology of Leadership and Influence: How People Lead and Communicate with Impact
- Psychology 1517. Psychology of Diversity and Prejudice
- Psychology 1522. First Impressions
- Psychology 1532. Psychology's Big Questions
- Psychology 1556r. Research Seminar in Implicit Social Cognition

#### **Developmental Psychology**

- Psychology 15. Social Psychology
- Psychology 16. Developmental Psychology
- Psychology 1612. Family, School, and Society: Shaping the Developmental Child
- Psychology 1621: It Takes a Village: Child Development and Social Policy
- Psychology 1622: Emerging Adulthood: Challenges and Possibilities
- Psychology 1651r. Language Development: Undergraduate Laboratory Course: Research Seminar
- Psychology 1652r. Laboratory in Early Cognitive Development

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**Psychopathology**

- Psychology 18. Psychopathology
- Psychology 1801. Anxiety Disorders
- Psychology 1812. Intercultural Perspectives on Trauma
- Psychology 1813. Technology and Mental Health
- Psychology 1816. Broken Brains: Mechanisms and Markers of Mental Illness
- Psychology 1845. Stigma, Discrimination, and Health

**Statistics**

**Statistics Department courses numbered 110 and above**

- \*Statistics 100. Introduction to Quantitative Methods for the Social Sciences and Humanities
- \*Statistics 102. Introduction to Quantitative Methods for Life Sciences
- \*Statistics 104. Introduction to Quantitative Methods for Economics

**Stem Cell and Regenerative Biology**

**Stem Cell and Regenerative Biology Department courses numbered 100 and above**

- SCRB 10. Human Developmental and Regenerative Biology
- SCRB 60. Ethics, Biotechnology, and the Future of Human Nature
- SCRB 91r. Introduction to Research