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. Students may petition to have other relevant science courses count for concentration credit by contacting Allie Belser, 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

PLEASE NOTE – THIS LIST IS NOT EXHAUSTIVE OR DEFINITIVE

SCIENCE AREAS

Astronomy and Astrophysics

Astonomy 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 50. Introduction to Computer Science I
Computer Science 51. Abstraction and Design in Computation
Computer Science 61. Systems Programming and Machine Organization
Computer Science 73. Code, Data, and Art
Computer Science 79. Design of Useful and Usable Interactive Systems

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Earth and Planetary Sciences/Environmental Sciences

Earth and Planetary Sciences courses numbered 100 and above

E-PSCI 6. Introduction to Environmental Science and Engineering
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
E-PSCI 53. Marine Geochemistry
E-PSCI 54. Minerals and Rocks of the Earth and Planets
E-PSCI 56. The History and Evolution of Life on Earth
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
*Science 5. An Introduction to Computation for Contemporary Science

Engineering Sciences

Engineering Sciences courses numbered 100 and above

Engineering Sciences 20r. Physics of Sports
Engineering Sciences 24. Flavor Molecules of Food Fermentation: Exploration and Inquiry
*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
*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

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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

Organismic and Evolutionary Biology

Oganismic 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)

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

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 20. Molecular Genetics and Genomics in Development and Disease
SCRB 25. Biochemistry and Human Metabolism
SCRB 60. Ethics, Biotechnology, and the Future of Human Nature
SCRB 91r. Introduction to Research
Biomedical Engineering 110. Physiological Systems Analysis
Biomedical Engineering 121. Cellular Engineering
Biomedical Engineering 125. Tissue Engineering
Biomedical Engineering 130. Neural Control of Movement
Biomedical Engineering 153. Bioelectromagnetics
Biomedical Engineering 160. Chemical Kinetics and Reactor Design
Biomedical Engineering 191. Introduction to Biomaterials
Engineering Sciences 53. Quantitative Physiology as a Basis for Bioengineering