

SECONDARY CERTIFICATION REQUIREMENTS IN CERTIFICATION AREA (Amended August 2004)

The Board of Teacher Education and Professional Standards of the State of New Hampshire provides guidelines to teacher certification programs on the scope and content of study necessary for qualification in secondary school teaching fields. In the listings for each certification subject area that follow, the Education Department identifies the Dartmouth courses that must be taken to meet these standards. *These courses are in addition to the required Education courses.*

While most candidates will find it valuable to do all of their subject area coursework at Dartmouth, it is not absolutely necessary to do so. The requirements may be met by taking comparable courses at other institutions, and submitting those transcripts upon application for certification.

Students must consult with the Director of Secondary Teacher Education to ensure that all subject area requirements are met.

Biology

All Biology Certification candidates must major in Biology.

- Biology 14: Ecology and Evolution
- Biology 5: Philosophy of Biology, or History 57: Scientific Revolutions in Modern Society
- Biology 15 or 19: Cell Biology or Honors Cell Biology
- Biology 16: Genetics
- Biology 21: Biological Diversity
- Biology 23: Molecular Biology
- Biology 24: Processes of Evolution
- Biology 27: Developmental Biology
- Math 3 or 4: Calculus
- Physics 3 or 13 (General or Introductory Physics)
- Chemistry 3 or 5: General Chemistry
- Auditing of the lab-related sections of Physics 257: Undergraduate Teaching

Strongly recommended: three additional Biology courses above 20 (these courses will also help

satisfy the major in Biology), in particular Biology 70: History of Genetics and Biology 72: Biostatistics.

Chemistry

All Chemistry Certification candidates must major in Chemistry

- Chemistry 1 when it is again offered.
- Chemistry 3/5 and 6: General Chemistry
- Chemistry 51-52 or Chemistry 57-58: Organic Chemistry
- Chemistry 41: Biological Chemistry
- Chemistry 61-62 or Chemistry 71-72—73: Physical Chemistry (Math 13 prerequisite)
- Chemistry 64: Inorganic Chemistry
- Math 3 and 8 (or equivalent): Introduction to Calculus
- Physics 13 and Physics 14 (or equivalent): Introductory Physics
- History 57: Scientific Revolutions in Modern Society
- Auditing of the lab-related sections of Physics 257: Undergraduate Teaching

Earth Space Science

All Earth Space Certification candidates must major in Earth Science.

- Earth Science 1: Introduction to Earth Sciences
- Earth Science 3: Elementary Oceanography
- Earth Science 4: Meteorology
- Earth Science 8: Life on Mars, or History 57: Scientific Revolutions in Modern Society
- Earth Science 34: Materials of the Earth
- Earth Science 45: Field Methods: Techniques of Structural and Stratigraphic Analysis
- Earth Science 46: Field Methods: Environmental Monitoring
- Earth Science 47: Field Methods: Resource and Earth Hazards Assessment
- Earth Science 64: Geophysics (strongly recommended) or Physics 1: Physics through the Ages or Physics 3: General Physics
- Earth Science 31: Paleobiology (strongly recommended) or Biology 1: History of Human Biology or Biology 2: Human Biology
- Astronomy 1: Exploration of the Solar System or Astronomy 2: Exploring the Universe or

- Astronomy 3: Exploring the Universe, with Laboratory
 - Chemistry 3 or 5: General Chemistry
 - Math 3: Calculus
 - Auditing of the lab-related sections of Physics 257: Undergraduate Teaching
- Strongly suggested:** Earth Science 62: Geochemistry
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English

All English Certification candidates must major in English.

- English 5 (unless exempted): Expository Writing
 - First Year Seminar: Composition
 - two courses in each of the three major period areas (total of six courses): Before mid-17th Century; mid-17th to end of 19th Century; 20th and 21st Century. At least two of these courses must be in American literature, two in British, at least one must be a poetry course, at least one a course that studies drama, and one a course that explores world literature (may be outside the English Department)
 - English 10: Composition Theory and Practice
 - English 16: Old and New Media or English 17: Introduction to New Media
 - English 18: A History of the English Language
 - Education 10: The Reading Brain, Education and Development
 - Education 58: Language Acquisition
 - a cumulating activity: advanced seminar, special topics course, or honors thesis (taken after sophomore-junior summer term)
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French

- seven courses above the prerequisite level (1, 2, 3) one of which must be French 8: Exploring French Culture and Language, and five of which must involve reading, writing and speaking. One course must be in the history, geography or culture of an area where the language is used
- completion of a Language Study Abroad (French 3, 5, 6) or Foreign Study Program (French 29, 30, 31)

- experience as a language course Teaching Assistant
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General Science

All General Science Certification candidates must major in either Biology, Chemistry, Earth Science or Physics.

- Chemistry 1: Selected Topics in Chemistry or 3 or 5-6: General Chemistry or 10: Honors General Chemistry
 - Physics 1: Understanding the Universe: Physics through the Ages
 - Earth Sciences 1: Introduction to Earth Sciences, or Earth Sciences 2: Earth History, or Earth Sciences 3: Elementary Oceanography, or Earth Sciences 4: Elementary Meteorology
 - Astronomy 1: Formation and Evolution of the Solar System, or Astronomy 2: Stars and their Life Histories, or Astronomy 3: Galaxies and the Universe, or Astronomy 4: The Development of Astronomical Thought, or Astronomy 15: Stars and Galaxies
 - Biology 2: Human Biology, or Biology 14: Ecology and Evolution, or Biology 15: Introduction to Cell, Molecular, and Developmental Biology, or Biology 16: Genetics, or Biology 17: Biology of Plants
 - two additional courses in one of these fields: chemistry, physics, earth sciences or biology
 - Math 3 or 11: Introduction to Calculus
 - Auditing of the lab-related sections of Physics 257: Undergraduate Teaching
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Mathematics

All Mathematics Certification candidates must major in Mathematics.

- Math 3: Calculus
- Math 8: Multivariable Calculus
- Math 10: Introductory Statistics (or Social Sciences 10, Psychology 10 or Economics 10)
- Math 13: Calculus of Vector-Valued Functions
- Math 20: Discrete Probability
- Math 22 or 24: Linear Algebra
- Math 31 or 71: Topics in Algebra
- Math 32: The Shape of Space

- Math 35 or 63: Real Analysis
- Math 28: Combinatorics or Math 38: Graph Theory
- Math 147: Teaching Seminar
- Computer Science 5: Introduction to Computer Science
- Recommended: Math 19: Discrete Mathematics in Computer Science

Physics

All Physics Certification candidates must major in Physics.

- Physics 13 or 15; 14 OR 16; 23; and 24: Introductory Physics I, II, III, and IV;
- Physics 1: Understanding the Universe through the Ages, or History 57: Scientific Revolutions in Modern Society
- Another Physics or electronics course at the junior level or above.
- One additional laboratory course in chemistry
- Math 3 (or 1 and 2): Calculus
- Math 8 (or 11 or 12): Multivariable Calculus
- Math 13 (or 14 or 17 or 18): Calculus of Vector-Valued Functions
- Astronomy 1: Exploration of the Solar System or Astronomy 2: Exploring the Universe or Astronomy 3: Exploring the Universe with Laboratory or Astronomy 15: Stars and the Milky Way
- Auditing of the lab-related sections of Physics 257: Undergraduate Teaching

Strongly recommended: Chemistry 3 or 5-6: Introduction to Chemistry

Social Studies

The social studies course requirements for certification require that students have two focus areas in the subjects listed below, taking all of the courses under those two subjects. Students must also take the courses listed in the two non-focus areas, as recorded below.

Focus Area Requirements:

History:

- History 1 and 2: The United States, 1763-1877 and History of the United States since 1877

- History 13: History of New England or Government 32: American State Politics or independent project with the New Hampshire Historical Society
- History 3: Europe in Medieval and Early Modern Times or History 4: Europe since 1715 or History 5.1: Pre-Colonial African History or History 5.2: The Eye of the Beholder: Introduction to the Islamic World or History 5.3: The History of China since 1800 or History 5.4: Modern Southeast Asian or History 5.5: The Emergence of Modern Japan or History 5.6: Pre-Columbian and Colonial America

Government:

- Government 3: American Political System or Government 6: Political Ideas or History 19: United States Political History in the Twentieth Century
- Government 4: Comparative Politics or Government 5: International Politics
- History 13: History of New England or Government 32: American State Politics

Economics:

- Economics 1: The Price System
- Economics 10 or Equivalent: Introduction to Statistical Methods
- Economics 22: Macroeconomics
- Economics 39: International Trade

Geography:

- Geography 1: Place and Society
- Geography 3: The Natural Environment
- Geography 5: Global Climate Change or Geography 13: Population, Culture, and Environment or Geography 20: Economic Geography and Globalization

Non-Focus:

- History 1: The United States, 1763-1877 or History 2: History of the United States since 1877
- Government 3: The American Political System or Government 5: International Politics

- Economics 2: Introduction to Economic Policy Issues (strongly suggested) or Economics 1: The Price System
 - Geography 1: Place and Society or Geography 3: The Natural Environment
 - Anthropology 1 or Psychology 1 or Sociology 1
- Note:** A major in one of the following academic departments is required for certification in social studies: History, Government, Economics, Sociology, Anthropology, Geography
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Spanish

- seven courses above the introductory level (1, 2, 3) five of which must involve reading, writing and speaking. One course must be in the history, geography or culture of the area where the language is used. One course must involve Spanish literature. One course must be Spanish 40: History of the Spanish Language.
- completion of a Language Study Abroad (Spanish 3, 5, 6), or **strongly suggested** Foreign Study Program (Spanish 23, 33, 35, or 24, 34, 36)
- experience as a language course teaching assistant