2012-2013 CURRICULUM (Updated 03/22/13)
PROGRAM IN SCIENCE, TECHNOLOGY & SOCIETY (STS)

All degree courses must 1) be taken for a letter grade where offered, and 2) for at least the minimum amount of units listed below and approved for STS - even if the course offers registration for fewer credits.

The required course units and quarter offered are indicated in parentheses after each course title below (A = Autumn, W = Winter, S = Spring, SUM = Summer, and NO = Not offered in 2012-2013 but should be offered in the future). Always confirm course quarter offerings with ExploreCourses for the most up-to-date course information.

I. CORE REQUIREMENTS (30+ units)

A. STS 1: The Public Life of Science and Technology (5, W)
   ➔ students may use STS 101 or 101Q to fulfill this requirement if already completed

B. STS PERSPECTIVES (20 or more units)

   Select 2 courses from each of the following areas. One of the 6 courses must fulfill the WIM (*) requirement (WIM courses are designated with an asterisk). Students may not double-count courses in the core and the concentration areas.

   1. Social scientific perspectives
      • *ANTHRO 90C: Theory of Ecological and Environmental Anthropology (5, W)
      • COMM 1A: Media Technologies, People, and Society (4-5, A)
      • COMM 1B: Media, Culture, and Society (5, W)
      • *COMM 120W: Digital Media in Society (4-5, A)
      • EDUC 120X: Sociology of Knowledge Creation (4, NO)
      • POLISCI 110Y: War and Peace in American Foreign Policy (5, NO)
      • SOC 114: Economic Sociology (5, A)
      • SOC 126: Introduction to Social Networks (5, NO)

   2. Cultural & historical perspectives
      • ANTHRO 180: Science, Technology, and Gender (4-5, NO)
      • HISTORY 131: Science, Technology, and Art: The Worlds of Leonardo da Vinci (5, NO)
      • HISTORY 140: World History of Science (5, W)
      • *HISTORY 140A: The Scientific Revolution (5, W)
      • HISTORY 144 (or 44Q): History of Women and Gender in Science, Medicine and Engineering (4-5, W)
      • STS 112: Ten Things: An Archaeology of Design (4-5, A)

   3. Scientific & engineering perspectives
      • CS 106A: Programming Methodology (3-5, A/W/S/SUM)
      • *CS 181W: Computers, Ethics, and Public Policy (4, A/S)
      • ME 214: Good Products, Bad Products (4, W)
      • MS&E 189: Social Networks - Theory, Methods, and Applications (3, A)
      • *MS&E 193W: Technology and National Security (3, A)
      • *STS 110: Ethics and Public Policy (5, NO)
      • STS 115: Ethical Issues in Engineering (4, NO)

C. STS 200 A, B, or C: SENIOR CAPSTONE (5 units, A/W/S) or STS 299: HONORS THESIS (10 units or more)
II. CONCENTRATION AREA (50+ units)

B.A. students
50+ units in a single concentration area. All courses must be chosen from the list of approved courses for student’s concentration (see relevant appendix). At least 8 classes must be from the social science and/or humanities course menus and should form a cohesive focus of courses that build on one another and address each of the dimensions of the concentration. At least 4 classes must be from the science and engineering course menus and should form a sequence of courses that build on one another (see example sequences at end of document). When filling out planned coursework on the curriculum form, please group courses by department where applicable.

B.S. students
50+ units in a single concentration area. All courses must be chosen from the list of approved courses for student’s concentration (see the relevant appendix). At least 8 classes must be from the science and engineering course menu and at least 4 classes must be from social science and/or humanities course menus. The science and engineering courses should include 2-3 sequences of courses that build on one another. When filling out planned coursework on the curriculum form, please group courses by department where applicable.

Important Policies for All Majors

• AP credit does not count toward the STS major.

• All courses must be taken for a letter grade where offered.

• Courses taken for the STS core requirements cannot be double-counted for the concentration area.

• Students are responsible for any prerequisites. It is recommended that STS majors take the Math Calculus sequence (or have AP credit), as many technical courses approved for concentration areas require it.

• Students may take up to 5 units of STS 199 doing research in approved Stanford labs or in internships.

• Students may petition only one course from outside the list of approved courses to count toward their STS degree plan (subject to staff approval). Courses eligible for petition include BOSP, SIW, independent study sections, or a course offered only one time at Stanford.

• Additionally, STS majors are encouraged to nominate Stanford courses that are offered consistently and are available to all students to be permanently added to concentration area course menus.

• If a course petition or nomination form is denied approval, students may not re-submit. Course petition and course nomination forms are available on the STS website.

• Transfer students may petition equivalent and/or relevant STS coursework from institutions outside Stanford University, provided the Registrar has already awarded transfer credit. All such petitions are subject to approval by the STS faculty director.

STS Concentration Areas (See next page for details)

➢ INFORMATION TECHNOLOGY, MEDIA & SOCIETY
➢ INNOVATION, TECHNOLOGY & ORGANIZATIONS
➢ ENVIRONMENT & SUSTAINABILITY
➢ LIFE SCIENCES & BIOTECHNOLOGY
➢ POLICY, SECURITY & TECHNOLOGY
➢ SELF-DESIGNED CONCENTRATION
**STS Concentration Areas: Organizing Questions & Themes**

**A. INFORMATION TECHNOLOGY, MEDIA & SOCIETY**
- How do information technologies transform social structures and vice versa?
- What have been the historical drivers and consequences of information societies?
- How do we evaluate a technology’s potential applications?
- How do different media technologies change what we think art is?
- How do cultural practices impact computing?
- What are the social and cognitive ramifications of design choices and user-interface frameworks?

**B. INNOVATION, TECHNOLOGY & ORGANIZATIONS**
- What are the social, historical and economic sources of innovation?
- Why does innovation occur in certain contexts and not others?
- Under what social and cultural conditions does technological and scientific innovation occur?
- How does the design of devices and infrastructure shape political systems?
- What are the historical relationships between work, entrepreneurship and innovation?
- How does the organization of work impact the design of technologies?

**C. ENVIRONMENT & SUSTAINABILITY**
- How do scientists and engineers understand the natural world?
- How is environmental science communicated and translated into policy in different contexts?
- How do cultural understandings of nature, species and place influence human relationships to the environment? How have these understandings changed over time?
- What roles do scientific research and technological innovation play in natural resource extraction, distribution and conflict?
- Can science and technology address environmental problems? How so? What are the risks and potentials?
- What are the relationships between designed / built environments and natural / wild ecosystems in particular contexts?

**D. LIFE SCIENCES & BIOTECHNOLOGY**
- How do biotechnologies interact with society and law?
- What are the boundaries among species? What are the ethical obligations of human societies to other organisms?
- What are the historical precursors for contemporary biotechnologies?
- How do biological and social systems interact?
- What intellectual frameworks and social practices drive lab science?
- What are the possibilities and constraints for technologically transforming the human body? What role do technologically transformed bodies play in philosophy, literature and art?

**E. POLICY, SECURITY & TECHNOLOGY**
- How do science and technology shape public policy and policymaking?
- What role does technology development play in sparking warfare?
- How do resource conflicts and crises become problems of national security and militarized conflict?
- What devices, infrastructures and practices conduce to peace?
- How do narrative and ideology shape the science and technology of conflict?

**F. SELF-DESIGNED CONCENTRATION**
Students interested in this option must submit a 5-page proposal in which they describe their self-designed concentration in detail, compare their proposed area of study to similar majors at Stanford and explain the rationale for why a self-designed concentration is the optimal way to pursue their academic interests. B.S. students must include at least 8 courses from science and /or engineering and at least 4 courses from the humanities and/or social sciences related to their proposed course of study. B.A. students must include at least 8 courses from the humanities and/or social sciences and at least 4 courses from science and/or engineering related to their proposed course of study. For both B.A. and B.S. students, the courses should include sequences of classes that build on one another. Students also need to identify a faculty mentor who will approve and oversee the self-designed concentration.
APPENDIX A. INFORMATION TECHNOLOGY, MEDIA & SOCIETY
APPROVED COURSES

SOCIAL SCIENCE COURSE MENU
- COMM 106: Communication Research Methods (4-5, A)
- COMM 108: Media Processes and Effects (4-5, W)
- COMM 117: Digital Journalism (4-5, W)
- COMM 120W: Digital Media in Society (4-5, A)
- COMM 131: Media Ethics and Responsibility (4-5, NO)
- COMM 137W: The Dialogue of Democracy (4-5, W)
- COMM 140: Digital Media Entrepreneurship (4-5, S)
- COMM 166: Virtual People (4-5, A)
- COMM 168: Experimental Research in Advanced User Interfaces (4-5, A/W)
- COMM 169: Computers and Interfaces (4-5, W)
- COMM 172: Media Psychology (4-5, S)
- COMM 182: Virtual Communities and Social Media (4-5, A)
- CS 546: Seminar on Liberation Technology (1, A/W)
- ECON 153: Economics of the Internet [Prerequisite: ECON 51, ECON 102B] (5, W)
- EDUC 358X: Learning, Sharing, Publishing, and Intellectual Property (4, S)
- MS&E 180: Organizations: Theory and Management (4, A/S)
- MS&E 181: Issues in Technology and Work for a Postindustrial Economy (3, S)
- PSYCH 30: Introduction to Perception (3, A)
- PSYCH 142S: The Psychology of Social Media (3, NO)
- SYMSYS 100: Intro to Cognitive and Information Sciences (4, W)
- SYMSYS 145: Cognition in Interaction Design (3, W)

HUMANITIES COURSE MENU
- ARTHIST 158A: History of Photography (4, NO)
- ARTHIST 173: Issues in Contemporary Art (4, NO)
- ARTHIST 264A: Picturing the Cosmos (5, S)
- ARTSTUDI 160: Design I: Fundamental Visual Language (4, A/W)
- ARTSTUDI 177: Video Art I (4, A)
- ARTSTUDI 179: Digital Art I (4, A/W)
- ARTSTUDI 260: Design II: The Bridge (4, W/S)
- COMPLIT 145A: Digital Codex: Religion, Literary Culture, and Technology in South Asia (4-5, A)
- ENGLISH 152A: “Mutually Assured Destruction:” American Culture and the Cold War (5, W)
- ENGLISH 202: History of the Book (5, W)
- FILMSTUD 6: Introduction to Digital Media (5, W)
- FILMSTUD 140: Film Aesthetics: Editing (4, NO)
- FILMSTUD 251: Media in Transition (5, NO)
- GERMAN 184: Technology, Innovation, and the History of the Book (4-5, W)
- HISTORY 205A: History of Information (4-5, S)
- MUSIC 220A: Fundamentals of Computer-Generated Sound (4, A)
- MUSIC 220B: Compositional Algorithms, Psychoacoustics, and Computational Music (4, W)

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Dated 03/22/13
SCIENCE & ENGINEERING COURSE MENU

• CEE 112A: Industry Applications of Virtual Design & Construction (3-4, A)
• CME 108: Introduction to Scientific Computing [Prerequisites: CS 106A, MATH 51, 52, 53] (3-4, W/SUM)
• CS 105: Introduction to Computers [Equivalent to CS 101] (3-5, A/W)
• CS 106A: Programming Methodology (3-5, A/W/S/SUM)
• CS 106B: Programming Abstractions [Prerequisite: CS 106A] (3-5, A/W/S/SUM)
• CS 106X: Programming Abstractions (Accelerated) [Prerequisite: CS 106A] (3-5, A/S)
• CS 107: Computer Organization and Systems [Prerequisite: CS 106B or CS 106X] (3-5, A/W/S/SUM)
• CS 108: Object-Oriented Systems Design [Prerequisite: CS 107] (3-4, A/W/SUM)
• CS 110: Principles of Computing Systems [Prerequisite: CS 107] (3-5, A/W/S)
• CS 116: From Nand to Tetris [Prerequisite: programming experience] (3, NO)
• CS 124: From Languages to Information [Prerequisite: CS 103, 107, 109] (3-4, W)
• CS 144: Introduction to Computer Networking [Prerequisite: CS 110] (3-4, A)
• CS 147: Intro to Human-Computer Interaction Design [Prerequisite: CS 106B or CS 106X] (3-4, A)
• CS 148: Introduction to Computer Graphics and Imaging [Prerequisites: CS 107, MATH 51] (3-4, A/SUM)
• CS 178: Digital Photography (3-5, S)
• CS 181: Computers, Ethics, and Public Policy [Prerequisite: CS 106B or CS106X] (4, A/S)
• CS 193R: Green Computing [Prerequisite: CS 107, CS 110] (3, NO)
• CS 247: Human-Computer Interaction Design Studio [Prerequisites: CS 106A and 147] (3-4, W)
• CS 255: Introduction to Cryptography (3, W)
• CS 378: Phenomenological Foundations of Cognition, Language and Computation (3-4, NO)
• CS 379L: Designing Liberation Technology (4, S)
• ENGR 110: Perspectives in Assistive Technology (3, W)
• ENGR 145: Technology Entrepreneurship (4, W/SUM)
• MS&E 107: Interactive Management Science (3, A/SUM)
• MS&E 111: Introduction to Optimization [Prerequisite: Math 51] (4, A/S)
• MS&E 120: Probabilistic Analysis [Prerequisite: Math 51] (5, A)
• MS&E 130: Information Networks and Services [Prerequisite: MS&E 111, MS&E 120, CS 106A] (3, W)
• MS&E 134: Organization Change and Information Systems [Prerequisite: CS 106A or 180] (3, NO)
• MS&E 189: Social Networks - Theory, Methods, and Applications (3, A)
• MUSIC 257: Neuroplasticity and Musical Gaming (3-5, W)
• STS 115: Ethical Issues in Engineering (4, NO)

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APPENDIX B. INNOVATION, TECHNOLOGY & ORGANIZATIONS
APPROVED COURSES

SOCIAL SCIENCE COURSE MENU
- COMM 140: Digital Media Entrepreneurship (4-5, S)
- COMM 169: Computers and Interfaces (4-5, W)
- CS 546: Seminar on Liberation Technology (1, A/W)
- ECON 1A: Introductory Economics A (5, A/W/SUM)
- ECON 1B: Introductory Economics B [Prerequisite: ECON 1A] (5, W/S)
- ECON 50: Economic Analysis I [Prerequisite: ECON 1A, MATH 51] (5, A/S/SUM)
- ECON 51: Economic Analysis II [Prerequisite: ECON 50] (5, A/S/SUM)
- ECON 52: Economic Analysis III [Prerequisite: ECON 1B, 50] (5, W/S/SUM)
- ECON 102B: Introduction to Econometrics [Prerequisite: ECON 50, ECON 102A] (5, W/S/SUM)
- ECON 113: Economics of Innovation [Prerequisite: ECON 51, ECON 102B] (5, NO)
- ECON 116: American Economic History [Prerequisite: ECON 1A] (5, S)
- ECON 118: Development Economics [Prerequisite: ECON 52, ECON 102B] (5, S)
- ECON 145: Labor Economics [Prerequisite: ECON 51, ECON 102B] (5, A)
- ECON 153: Economics of the Internet [Prerequisite: ECON 51, ECON 102B] (5, W)
- ECON 158: Regulatory Economics [Prerequisite: ECON 51] (5, W)
- EDUC 120X: Sociology of Knowledge Creation (4, NO)
- EDUC 224A: Social Entrepreneurship and Social Innovation (3, S)
- HUMBIO 173: Science, Innovation, and the Law (3, S)
- ME 297: Forecasting for Innovators: Technology, Tools, and Social Change (3, W)
- MS&E 175: Innovation, Creativity, and Change (4, NO)
- MS&E 180: Organizations: Theory and Management (4, A/S)
- MS&E 181: Issues in Technology and Work for a Postindustrial Economy (3, S)
- MS&E 185: Global Work (4, W/S)
- MS&E 271: Global Entrepreneurial Marketing (4, W/S)
- MS&E 277: Creativity and Innovation (4, S)
- OSPMOSC 68: From Science to Market: Technical Innovation Policy in Post-Soviet Russia (5, A)
- POLISCI 218S: Political Economy of International Trade and Investment Prerequisite: ECON 1A, ECON 1B, statistics] (5, S)
- PUBLPOL 102: Organizations and Public Policy [Prerequisite: ECON 1A] (4-5, S)
- PUBLPOL 183: Philanthropy and Social Innovation (4, A)
- PUBLPOL 194: Technology Policy (4, W)
- PUBLPOL 235: From Innovation to Implementation: How Government Can Development and Apply New Ideas (4-5, A)
- PUBLPOL 240: Designing the Way Up: Disruptive Solutions to Poverty in America (3-4, W)
- PUBLPOL 353: Science and Technology Policy (4-5, A)
- SOC 114: Economic Sociology (5, A)
- SOC 160: Formal Organizations (5, NO)
- SOC 161: The Social Science of Entrepreneurship (5, S)
- STS 140: Science, Technology and Politics (4, S)
- STS 190: Issues in Technology and the Environment (4, W)
- SYMSYS 145: Cognition in Interaction Design (3, W)

HUMANITIES COURSE MENU
- ARTHIST 147: The Visual Culture of Modernism and its Discontents (4, A)
- ARTHIST 232B: Design Theory (4, W)
- ARTSTUDI 11AX: Digital Art and Design in Practice (2, NO)
- ARTSTUDI 160: Design I: Fundamental Visual Language (4, A/W)
- ARTSTUDI 260: Design II: The Bridge [Prerequisite: ARTSTUDI 160] (4, W/S)
- BIO 182: Modeling Cultural Evolution (3, W)
- ENGLISH 152A: “Mutually Assured Destruction:” American Culture and the Cold War (5, W)
- GERMAN 184: Technology, Innovation, and the History of the Book (4-5, W)
- HISTORY 307B: Environment, Technology and Revolution in World History (4-5, S)
HUMANITIES COURSE MENU (cont.)

- MUSIC 220A: Fundamentals of Computer-Generated Sound (4, A)
- MUSIC 220B: Compositional Algorithms, Psychoacoustics, and Computational Music (4, W)
- OSPFLOR 58: Space as History: Urban Change & Social Vision in Florence 1059-Present (4, S)
- OSPFLOR 134F: Modernist Italian Cinema (5, A)
- PHIL 74: Business Ethics (4, S)

APPENDIX B. INNOVATION, TECHNOLOGY & ORGANIZATIONS
APPROVED COURSES (CONTINUED)

SCIENCE & ENGINEERING COURSE MENU

- CS 105: Introduction to Computers [Equivalent to CS 101] (3-5, A/W)
- CS 106A: Programming Methodology (3-5, A/W/S/SUM)
- CS 106B: Programming Abstractions [Prerequisite: CS 106A] (3-5, A/W/S/SUM)
- CS 106X: Programming Abstractions (Accelerated) [Prerequisite: CS 106A] (3-5, A/S)
- CS 107: Computer Organization and Systems [Prerequisite: CS 106B or CS 106X] (3-5, A/W/S/SUM)
- CS 108: Object-Oriented Systems Design [Prerequisite: CS 107] (3-4, A/W/SUM)
- CS 124: From Languages to Information [Prerequisite: CS 103, 107, 109] (3-4, W)
- CS 181: Computers, Ethics and Public Policy (4, A/S)
- CS 377I: Prototyping Interactive Systems (4, NO)
- CS 379L: Designing Liberation Technology (4, S)
- CS 402: Beyond Bits and Atoms: Designing Technological Tools (3-5, A)
- CS 402L: Beyond Bits and Atoms – Lab (1-3, A)
- ENGR 14: Intro to Solid Mechanics (4, A/W/S)
- ENGR 60: Engineering Economy [Prerequisite: MATH 41] (3, SUM)
  - ENGR 145: Technology Entrepreneurship (4, W/SUM)
- ENGR 150: Social Innovation and Entrepreneurship (3-6, A/W/S)
- ME 101: Visual Thinking: (4, A/W/S)
- ME 115A: Introduction to Human Values in Design [Prerequisite: ME 101] (3, A)
- ME 115B: Product Design Methods [Prerequisite: ME 115A] (3, W)
- ME 120: History and Philosophy of Design (3, S)
- ME 203: Design and Manufacturing (4, A/W/S)
- ME 216A: Advanced Product Design: Needfinding [Prerequisites: ME 116 and 203] (3-4, A)
- ME 216B: Advanced Product Design: Implementation [Prerequisite: ME 216A] (3-4, S)
- ME 216C: Advanced Product Design: Implementation 2 (4, S)
- MS&E 52: Introduction to Decision Making (3, SUM)
- MS&E 107: Interactive Management Science (3, A/SUM)
- MS&E 111: Introduction to Optimization [Prerequisite: Math 51] (4, A/S)
- MS&E 120: Probabilistic Analysis [Prerequisite: Math 51] (5, A)
- MS&E 121: Introduction to Stochastic Modeling [Prerequisite: MS&E 120 or STATS 116] (4, W)
- MS&E 130: Information Networks and Services [Prerequisite: MS&E 111, MS&E 120, CS 106A] (3, W)
- MS&E 134: Organization Change and Information Systems [Prerequisite: CS 106A] (3, NO)
- MS&E 152: Introduction to Decision Analysis (3-4, S)
- MS&E 189: Social Networks - Theory, Methods, and Applications (3-4, A)
- MS&E 260: Introduction to Operations Management (3-4, A/SUM)
- MS&E 266: Management of New Product Development (3, W)
- MUSIC 257: Neuroplasticity and Musical Gaming (3-5, W)

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APPENDIX C. ENVIRONMENT & SUSTAINABILITY
APPROVED COURSES

SOCIAL SCIENCE COURSE MENU
• ANTHRO 31: Ecology, Evolution, and Human Health (4-5, NO)
• ANTHRO 90C: Theory of Ecological and Environmental Anthropology (5, W)
• ANTHRO 104A: Foraging for a Living (5, NO)
• ANTHRO 160: Social and Environmental Sustainability: The Costa Rican Case (4-5, NO)
• EARTHSYS 61Q: Food and Security (3, NO)
• EARTHSYS 106: World Food Economy (5, W)
• EARTHSYS 112: Human Society & Environmental Change [Prerequisite: ECON 1A] (4, A)
• EARTHSYS 143J: Climate Change in the West: A History of the Future (5, NO)
• EARTHSYS 147: Controlling Climate Change in the 21st Century (3, A)
• EARTHSYS 174: Marine Biodiversity: Law, Science, and Policy (3, A)
• EARTHSYS 181: Concepts of Urban Agriculture (3, S)
• EARTHSYS 184: Climate and Agriculture (3-4, S)
• ECON 1A: Introductory Economics (5, A/W/SUM)
• ECON 50: Economic Analysis I [Prerequisite: ECON 1A, MATH 51] (5, A/S/SUM)
• ECON 155: Environmental Economics and Policy [Prerequisite: ECON 50] (5, W)
• ECON 156: Marine Resource Economics and Conservation (5, S)
• HUMBIO 28: Culture, Evolution and Society (5, A)
• HUMBIO 4B: Environmental and Health Policy Analysis (5, S)
• INTNLREL 170: Energy and Climate (5, NO)
• ME 297: Forecasting for Innovators: Technology, Tools, and Social Change (3, W)
• MS&E 92Q: International Environmental Policy (3, W)
• PUBLPOL 121: Policy and Climate Change (4-5, NO)
• PUBLPOL 125: Law and Public Policy (5, S)
• SIW (Stanford in Washington) 137: Energy and Environment: Technology, Economics and Policy (5, NO)
• STS 140: Science, Technology and Politics (4, S)
• STS 190: Issues in Technology and the Environment (4, W)
• URBANST 160: Environmental Policy and the City in U.S. History (5, A)

HUMANITIES COURSE MENU
• EARTHSYS 145: The Environmental History of North America (4-5, S)
• ENGLISH 157C: Collapse: Twentieth-Century Narratives of Disaster (4-5, SUM)
• HISTORY 131: Science, Technology and Art: The Worlds of Leonardo da Vinci (5, NO)
• HISTORY 142: Darwin in the History of Life (5, S)
• HISTORY 208A: Science and Law in History (4-5, A)
• HISTORY 254: Popular Culture and American Nature (5, A)
• HISTORY 307B: Environment, Technology and Revolution in World History (4-5, S)
• OSPBER 115X: The German Economy: Past and Present (4-5, A)
• POLisci 233F: Science, Technology, and Society in the Face of the Looming Disaster (4-5, W)
• URBANST 115: Urban Sustainability: Long-Term Archaeological Perspectives (4-5, A)

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APPENDIX C. ENVIRONMENT & SUSTAINABILITY
APPROVED COURSES (CONTINUED)

SCIENCE & ENGINEERING COURSE MENU
• BIO 43: Plant Biology, Evolution, and Ecology [Prerequisites: CHEM 31A and 31B or 31X, 33] (5, S)
• BIO 101: Ecology [Prerequisite: BIO 43] (4, A)
• BIO 121: Biogeography (3, NO)
• BIO 220: Introduction to Theoretical Population Biology (2, W)
• BIO 221: Methods in Theoretical Population Biology [Prerequisite: BIO 220] (4, NO)
• BIOHOPK 172H: Marine Ecology [Prerequisite: BIO core] (5, W)
• BIOHOPK 187H: Sensory Ecology (4, W)
• CEE 64: Air Pollution and Global Warming: History, Science, and Solutions (3, W)
• CEE 70: Environmental Science and Technology (3, A/SUM)
• CEE 100: Managing Sustainable Building Projects (4, A)
• CEE 110: Building Information Modeling (3-4, A/W/S)
• CEE 115: Goals and Methods of Sustainable Building Projects (3, NO)
• CEE 124: Sustainable Development Studio (3-5, A/W/S)
• CEE 129: Climate Change Adaptation for Seaports: Engineering and Policy for a Sustainable Future (3, A/W/S)
• CEE 134A: Site and Space (4, NO)
• CEE 136: Green Architecture (4, W)
• CEE 173A: Energy Resources (4-5, A)
• CEE 177P: Sustainability in Theory and Practice (3, NO)
• EARTHSYS 101: Energy and the Environment (3, W)
• EARTHSYS 102: Renewable Sources and Greener Energy Processes (3, S)
• EE 151: Sustainable Energy Systems (3, NO)
• ENERGY 104: Transition to Sustainable Energy Systems (3, S)
• ENERGY 120: Fundamentals of Petroleum Engineering (3, A)
• ENERGY 160: Modeling Uncertainty in the Earth Sciences [Prerequisite: algebra and introductory statistics course (3, W)
• MATSCI 156: Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution (3-4, A)
• MS&E 264: Sustainable Product Development and Manufacturing (3-4, A)

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APPENDIX D. LIFE SCIENCES & BIOTECHNOLOGY
APPROVED COURSES

Note to students: HUMBIO typically requires students to take the entire core, which is HUMBIO 2A, 2B, 3A, 3B, 4A, and 4B

SOCIAL SCIENCE COURSE MENU
• ANTHRO 82: Medical Anthropology (4-5, A)
• ANTHRO 185A: Race and Biomedicine (4-5, NO)
• BIOE 131: Ethics in Bioengineering (3, S)
• EARTHSYS 174: Marine Biodiversity: Law, Science, and Policy (3, A)
• GENE 104Q: Law and the Biosciences (3, W)
• HUMBIO 2B: Culture, Evolution, Society (5, A)
• HUMBIO 3B: Behavior, Health, and Development (5, W)
• HUMBIO 4B: Environmental and Health Policy Analysis (5, S)
• HUMBIO 174: Foundations in Bioethics (3, W)
• MED 157: Foundations for Community Health Engagement (3, A)
• OSPFLOR 85: Bioethics: Between Human Rights, Responsibility, and Care Ethics (4, S)
• PSYCH 30: Introduction to Perception (3, A)
• PUBLPOL 122: Biosecurity and Bioterrorism Response (4-6, S)
• PUBLPOL 125: Law and Public Policy (5, S)
• STEMREM 83Q: The Stem Cell: Biological, Social, & Practical Aspects of Stem Cell Research [Prerequisite: AP Biology] (3, NO)
• STS 190: Issues in Technology and the Environment (4, W)

HUMANITIES COURSE MENU
• AMSTUD 156H: Women and Medicine in US History: Women as Patients, Healers and Doctors (5, S)
• ARTSTUDI 284: Art & Biology (4, S)
• CLASSGEN 133: Invention of Science (4-5, NO)
• FRENCH 219: The Renaissance Body in French Literature and Medicine (4-5, A)
• HISTORY 130A: The Rise of Scientific Medicine in the United States, 1825-Present (5, A)
• HISTORY 140: World History of Science (5, W)
• HISTORY 141A: The Age of Plague: Medicine and Society, 1000-1750 (5, A)
• HISTORY 144: Gender in Science, Medicine, and Engineering (5, W)
• HISTORY 208A: Science and Law in History (4-5, A)
• HISTORY 243C: Colonial Science and Medicine (4-5, S)
• HISTORY 243G: Tobacco and Health in World History (4-5, A)
• HISTORY 244C: The History of the Body in Science, Medicine, and Culture (4-5, NO)
• HUMBIO 175: Health Care as Seen Through Medical History, Literature, and the Arts (3, A)
• HUMBIO 175S: Novels and Theater of Illness (3, S)
• PHIL 60: Introduction to Philosophy of Science (5, W)
• PHIL 63S: Introduction to Bioethics (3, NO)
• PHIL 167A: Philosophy of Biology (4, NO)
• PHIL 167B: Philosophy, Biology, & Behavior [Prerequisite: 167A; or one PHIL course & a BIO course or HUMBIO core] (4, NO)
• POLISCI 216E: International History and International Relations Theory (5, W)
• OSPMADR 72: Issues in Bioethics Across Cultures (5, W)

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SCIENCE & ENGINEERING COURSE MENU

NOTE: Majors can count either HUMBIO 2A or BIO 41; either HUMBIO 3A or BIO 42

- BIO 41: Genetics, Biochemistry and Molecular Biology [Prerequisite: CHEM 31X (or 31A,B), 33] (5, A)
- BIO 42: Cell Biology and Animal Physiology [Prerequisite: CHEM 31X (or 31A,B), 33] (5, W)
- BIO 43: Plant Biology, Evolution, and Ecology [Prerequisites: CHEM 31X or 31a and 31B, 33] (5, S)
- BIO 44X: Core Molecular Biology Laboratory (5, A/W)
- BIO 44Y: Core Plant Biology & Eco Evo Laboratory (5, S)
- BIO 109A: The Human Genome and Disease (3, W)
  - OR BIO109B: The Human Genome and Disease: Genetic Diversity and Personalized Medicine (3, S)
- BIO 150: Human Behavioral Biology (5, NO)
- BIO 220: Introduction to Theoretical Population Biology (2, W)
- BIO 221: Methods in Theoretical Population Biology [Prerequisite: BIO 220] (4, NO)
- BIOE 44: Fundamentals for Engineering Biology Lab (4, A/S)
- BIOE 45: Computational Modeling for Microbial Communities (4, NO)
- BIOE 80: Introduction to Bioengineering (4, S)
  - Prerequisite: BIO 41, BIO 42
- CHEM 31A: Chemical Principles I (5, A/SUM)
- CHEM 31B: Chemical Principles II [Prerequisite: CHEM 31A] (4, W/SUM)
- CHEM 31X: Chemical Principles [Prerequisite: AP CHEM] (4, A)
- CHEM 33: Structure and Reactivity [Prerequisite: CHEM 31A, 31B (or 31x)] (4, W/S)
- CHEM 35: Organic Monofunctional Compounds [Prerequisite: CHEM 33] (4, A/S)
- CHEM 36: Organic Chemistry Laboratory I [Prerequisite/corequisite: CHEM 35] (3, A/S)
- CHEM 130: Organic Chemistry Laboratory II [Prerequisite: CHEM 36] (4, A/W)
- CHEM 131: Organic Polyfunctional Compounds [Prerequisite: CHEM 35] (3, A/W)
- CHEM 135: Physical Chemical Principles [Prerequisites: CHEM 31A and 31B or 31X] (3, W)
- CHEM 171: Physical Chemistry [Prerequisites: CHEM 31A and 31B or 31X, 35, MATH 51] (3, S)
- COMPMED 87Q: Introduction to the Mouse in Biomedical Research (3, A)
- HUMBIO 2A: Genetics, Evolution and Ecology (5, A)
- HUMBIO 3A: Cell and Developmental Biology (5, W)
- HUMBIO 4A: The Human Organism (5, S)
- IMMUNOL 231: Medicine for Innovators & Entrepreneurs [Prerequisite: college level biology] (3-4, NO)
- MS&E 292: Health Policy Modeling (3, W)

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APPENDIX E. POLICY, SECURITY & TECHNOLOGY
APPROVED COURSES

SOCIAL SCIENCE COURSE MENU
- ANTHRO 135A: The Anthropology of Security (4-5, NO)
- ANTHRO 180: Democracy and Political Authority (3, A)
- COMM 133: Need to Know: The Tension between a Free Press and National Security Decision Making (4-5, S)
- EARTH SYS 61Q: Food and Security (3, NO)
- IPS 203: Issues in International Economics (5, W)
- IPS 219: Intelligence and National Security (4, A)
- IPS 250: International Conflict: Management and Resolution (3, W)
- POLISCI 2: Introduction to American National Government and Politics (5, W)
- POLISCI 110Y: War and Peace in American Foreign Policy (5, NO)
- POLISCI 114D: Democracy, Development, and the Rule of Law (5, A)
- POLISCI 147: Comparative Democratic Development (5, W)
- POLISCI 122: Introduction to American Law (4-5, A)
- POLISCI 212S: Ethics, Law and War (4-5, NO)
- POLISCI 214R: Challenges and Dilemmas in American Foreign Policy (5, W)
- POLISCI 215F: Nuclear Weapons and International Politics (5, S)
- POLISCI 218T: Terrorism (5, S)
- POLISCI 248L: Political-Economy of Crime and Violence in Latin America (5, S)
- PUBLPOL 121: Policy and Climate Change (4-5, NO)
- PUBLPOL 122: Biosecurity and Bioterrorism Response (4-6, W)
- PUBLPOL 125: Law and Public Policy (5, S)
- PUBLPOL 194: Technology Policy (4, W)
- PUBLPOL 353: Science and Technology Policy (4-5, A)
- STS 110: Ethics and Public Policy (5, NO)
- STS 140: Science, Technology and Politics (4, S)
- STS 190: Issues in Technology and the Environment (4, W)

HUMANITIES COURSE MENU
- ARTHIST 264A: Picturing the Cosmos (5, S)
- COMPLIT 137: War Creations: World War II and the Novel (4-5, NO)
- ENGLISH 157C: Collapse: Twentieth-Century Narratives of Disaster (4-5, NO)
- GERMAN 182: War and Warfare in Germany (3, S)
- HISTORY 102: The History of the International System since 1914 (5, S)
- HISTORY 201D: The Changing Face of War: An Introduction to Military History (4-5, NO)
- HISTORY 234F: Science, Technology, and Empire (4-5, NO)
- HISTORY 277D: U.S. Intervention and Regime Change in Latin American (5, S)
- HISTORY 282: The United States and the Middle East since 1945 (4-5, NO)
- PHIL 90B: The Ethics of War (4, NO)
- POLISCI 116: History of Nuclear Weapons (5, S)
- POLISCI 216E: International History & International Relations Theory (5, W)
- POLISCI 233F: Science, Technology, and Society in the Face of the Looming Disaster (4-5, W)

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APPENDIX E. POLICY, SECURITY & TECHNOLOGY
APPROVED COURSES (CONTINUED)

SCIENCE & ENGINEERING COURSE MENU
• APPPHYS 219: Solid State Physics and the Energy Challenge (3, NO)
• CHEM 33: Structure and Reactivity [Prerequisite: CHEM 31A, 31B (or 31x)] (4, W/S)
• CHEM 35: Organic Monofunctional Compounds [Prerequisite: CHEM 33] (4, A/S)
• CS 105: Introduction to Computers [Equivalent to CS 101] (3-5, A/W)
• CS 106A: Programming Methodology (3-5, A/W/S/SUM)
• CS 106B: Programming Abstractions [Prerequisite: CS 106A] (3-5, A/W/S/SUM)
• CS 106X: Programming Abstractions (Accelerated) [Prerequisite: CS 106A] (3-5, A/S)
• CS 107: Computer Organization and Systems [Prerequisite: CS 106B or CS 106X] (3-5, A/W/S/SUM)
• CS 110: Principles of Computing Systems [Prerequisite: CS 107] (3-5, A/W/S)
• CS 181: Computers, Ethics and Public Policy (4, A/S) [Prerequisite: CS 106B or CS 106X]
• CS 255: Introduction to Cryptography (3, W)
• MS&E 93Q: Nuclear Weapons, Energy, Proliferation and Terrorism (3, NO)
• MS&E 107: Interactive Management Science (3, A/SUM)
• MS&E 193: Technology and National Security (3, A)
• PHYSICS 41 & 42: Mechanics & Mechanics Lab [Prerequisite: PHYSICS 19, MATH 19 or 41] (4 + 1, W)
• PHYSICS 43: Electricity and Magnetism [Prerequisite: PHYSICS 41, MATH 20 or 42 or 51] (4, S)
• PHYSICS 240: Introduction to the Physics of Energy (3, A)

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APPENDIX F
Examples of Science and Engineering Sequences from Approved Course Menus for BA Majors

A. Information Technology, Media & Society

- CS 106A: Programming Methodology
- CS 106B: Programming Abstractions [Prerequisite: CS 106A]
- CS 107: Computer Organization and Systems [Prerequisite: CS 106A, CS 106B]
- CS 110: Principles of Computing Systems [Prerequisite: CS 107]
- CS 106A: Programming Methodology
- MS&E 111: Introduction to Optimization [Prerequisite: MATH 51]
- MS&E 120: Probabilistic Analysis [Prerequisite: MATH 51]
- MS&E 130: Information Networks and Services [Prerequisite: MS&E 111, MS&E 120, CS 106A]

B. Innovation, Technology & Organizations

- CS 106A: Programming Methodology
- MS&E 111: Introduction to Optimization [Prerequisite: MATH 51]
- MS&E 120: Probabilistic Analysis [Prerequisite: MATH 51]
- MS&E 130: Information Networks and Services [Prerequisite: MS&E 111, MS&E 120, CS 106A]

- CS 106A: Programming Methodology
- MS&E 134: Organization Change and Information Systems [Prerequisite: CS 106A]
- MS&E 152: Introduction to Decision Analysis
- MS&E 189: Social Networks - Theory, Methods, and Applications

C. Environment & Sustainability

- BIO 43: Plant Biology, Evolution, and Ecology
- BIO 101: Ecology [Prerequisite: Bio 43]
- BIO 121: Biogeography
- CEE 70: Environmental Science and Technology

- ENERGY 104: Transition to Sustainable Energy Systems
- ENERGY 160: Modeling Uncertainty in the Earth Sciences [Prerequisite: MATH 21 or 42, MATH 51, CME 106 or STATS 110]
- BIOHOPK 172H: Marine Ecology [Prerequisite: BIO core]
- BIOHOPK 187H: Sensory Ecology

D. Life Sciences & Biotechnology

- HUMBIO 2A: Genetics, Evolution and Ecology OR BIO 41: Genetics, Biochemistry and Molecular Biology
- HUMBIO 3A: Cell and Developmental Biology OR BIO 42: Cell Biology and Animal Physiology
- BIO 109A OR BIO 109B: The Human Genome and Disease
- MS&E 292: Health Policy Modeling

- BIO 41: Genetics, Biochemistry and Molecular Biology [Prerequisite: CHEM 31X (or 31A,B), 33] [5, A]
- BIO 42: Cell Biology and Animal Physiology [Prerequisite: CHEM 31X (or 31A,B), 33] [5, W]
- BIOE 45: Computational Modeling for Microbial Communities
- BIOE 101: Systems Biology [Prerequisite: CME 102; BIO 41, BIO 42]

E. Policy, Security & Technology

- CS 106A: Programming Methodology
- CS 106B: Programming Abstractions [Prerequisite: CS 106A]
- CS 107: Computer Organization and Systems [Prerequisite: CS 106A, CS 106B]
- CS 181: Computers, Ethics and Public Policy [Prerequisite: CS 106B or CS 106X]

- CHEM 33: Structure and Reactivity [Prerequisites: CHEM 31A and B (or 31x)]
- CHEM 35: Organic Monofunctional Compounds [Prerequisites: CHEM 33]
- PHYSICS 41 & 42: Mechanics and Mechanics Laboratory [Prerequisites: MATH 20 or 42 or 51]
- APPPHYS 219: Solid State Physics and the Energy Challenge

Dated 03/22/13