

Communication of Science and Technology

DIRECTOR David A. Weintraub (Physics and Astronomy)

PROFESSORS Michael Bess (History), Jay Clayton (English), David Hess (Sociology and Environmental and Sustainability Studies), M. Shane Hutson (Physics and Astronomy), Lutz Koepnick (German, Cinema and Media Arts), Jeffrey D. Schall (Psychology), Robert J. Scherrer (Physics and Astronomy), Mark Schoenfield (English), David W. Wright (Chemistry)

PROFESSOR OF THE PRACTICE Christopher Rowe (Engineering Management)

ASSOCIATE PROFESSORS Jeffrey A. Bennett (Communication Studies), Jennifer M. Fay (Cinema and Media Arts, English), Douglas H. Fisher (Computer Science and Computer Engineering), Suzana Herculano-Houzel (Biological Sciences, Psychology), Sarah Igo (History), Laura Stark (History), Paul H. Stob (Communication Studies)

ASSISTANT PROFESSOR Ole Molvig (History)

PRINCIPAL SENIOR LECTURER Daniel Morgan (Earth and Environmental Sciences)

SENIOR LECTURERS Kendra H. Oliver (Pharmacology), Stephen K. Ornes

LECTURER Shellie Richards

WRITER IN RESIDENCE Amanda Little (English)

THE Program in Communication of Science and Technology (CSET) sits at the intersection of the sciences and the humanities, and it builds on the vast amount of effort at Vanderbilt devoted to interdisciplinary work that spans the natural sciences, engineering, the social sciences, and the humanities. CSET draws on both the scientific communities (natural sciences, social sciences, engineering, medicine) and the creative communities (public speaking, writing, digital media production) across multiple colleges at Vanderbilt.

CSET is designed for students who have an interest in science and technology and also are interested in communicating science and technology to both peer-professional audiences and to the larger world. CSET is ideal as a second major for students pursuing a first major in one of the natural sciences, any of several of the social sciences, engineering, the Science, Medicine and Technology concentration in History, and the Creative Writing track in English. In the twenty-first century scientists must be able to communicate their work and their ideas to their professional peers, to nonspecialists who review grant proposals, and to lay audiences who ultimately fund, support, and benefit from the discoveries made in laboratories around the world. In return, the scientific community needs support from professional writers, journalists, technical writing specialists, public speakers, film and video writers and producers, and bloggers in communicating modern science, technology, and medicine to lay audiences.

Program of Concentration in Communication of Science and Technology

At least 42 credit hours, as follows. See below for lists of courses that count for each requirement.

- One Introduction to the Communication of Science and Technology course (one 3 credit hour course).
- One public speaking course (one 3 credit hour course).
- One advanced non-science writing course (one 3 credit hour course).
- One advanced (2100 level or higher) CSET or science communication skills course(s) (3 credit hours).
- One course bridging science, engineering, or medicine and health with non-science content and issues (one 3 credit hour course).
- One statistics course (one 3 credit hour course).
- Five courses (15 credit hours; minimum 3 credit hours per course) from the natural sciences and/or engineering.
- Three electives (9 credit hours).

Additional notes:

- Students in the College of Arts and Science must count at least 24 credit hours for CSET that are not also used to fulfill any program requirements for any other major or minor in the College of Arts and Science.

- A course can only be used once to fulfill a single CSET requirement, even if it is eligible under more than one CSET requirement.
- A student may count no more than 3 total credit hours toward any and all requirements of the CSET major from courses in the following list: BME 4951, ChBE 4951W, CE 4950, CE 4951, ENGM 2210, and ES 2100W.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Approved Courses:

- 1) Introductory Course:
CSET 2100, Science Communication Tools and Techniques.
 - 2) Public Speaking: One course from
CMST 1501, The Public Communication of Science; 2100, Argumentation and Debate; 2110, Persuasion; 2120, Business Communication.
 - 3) Advanced Non-Science Writing: One course from
ANTH 2113W, Food, Identity, and Culture; 2160W, Creating Community; 2220W, Human Landscapes; 2242, The Archaeology of Ancient Maya Civilization; 3243W, Ancient Maya Gods and Rulers; 3622W, Classic Maya Language and Hieroglyphs.
CLAS 3030, Death, Disease, and Health in the Ancient World; 3190W, Augustan Rome.
CMA 2500W, Screenwriting; 2600W, Advanced Screenwriting.
CMST 3620/3620W, Rhetoric, Culture, and Critique; 3730/3730W, Communication, Culture, and Consciousness.
ENGL 3210, Intermediate Nonfiction Writing; 3215, The Art of Blogging: Learning to Think and Write in the Age of Online Publishing; 3220, Advanced Nonfiction Writing; 3230, Intermediate Fiction Workshop; 3240, Advanced Fiction Workshop; 3250, Intermediate Poetry Workshop; 3260, Advanced Poetry Workshop; 3726, New Media; 3728/3728W, Science Fiction; all other 2100 level or higher W ENGL classes not included in other CSET requirement listings.
HART 3140, Healing and the Art of East Asia; 3240W, Ancient Landscapes; 3725W, The Skyscraper: Modern Urban Icon; 3810W, Exhibiting Historical Art.
HIST 1385W, Disease and Disorder in the Atlantic World; 1430W, North American Indians and the Environment; 2413W, Global History of Waste; 3045W, Eugenics in the U.S., 1865–present; 3070W, Science, Technology, and Modernity.
MHS 3050W, Medicine and Literature; all other 2100 level or higher W MHS classes.
PHIL 3012W, Writing as Political Resistance; 3606W, Moral Problems; 3610W, Ethics and Law; 3618W, Philosophy and Literature.
RLST 2250W, History of the Bible; 3304W, Evangelical Protestantism and the Culture Wars; 3670W, Buddhism and the State.
THTR 2311W, Writing for the Stage and Screen.
- This requirement, in combination with both requirements #5 (Bridging) and #8 (Electives), is automatically fulfilled by students who have taken at least 15 credit hours of course work from the courses approved by the Department of History in Program G: Science, Medicine, and Technology.
 - This requirement, in combination with requirement #8 (Electives), is automatically fulfilled by students who have completed at least 12 credit hours of the following:
2100 level or higher ENGL courses,
2100 level or higher “W” courses,
3004–3661 PHIL courses,
3000–4939 RLST courses.

- 4) Advanced Science Writing or Science Communications Skills: Three credit hours from ANTH 3150W, Cognitive Anthropology.
- BME 4951, Design of Biomedical Engineering Devices and Systems II.
- CE 4950, Civil Engineering Design I, plus CE 4951, Civil Engineering Design II.
- ChBE 4951W, Chemical Engineering Design Projects.
- CHEM 3135W, Forensic Analytical Chemistry.
- CSET 3090, Introduction to Science and Technology Policy; 3100, Science Policy Bootcamp: Concept to Conclusion; 3200W, Technical Writing; 3220, Fundamentals of Science Writing: How to Make Scientific Research and Discovery Matter; 3240, Science (Non-)Fiction: The Bestselling Books and Astounding Articles That Have Transformed Our Understanding of Science.
- ENGL 3720/3720W, Literature, Science and Technology; 3730, Literature and the Environment; 3896, Special Topics in Investigative Writing in America.
- ENGM 2210, Technology Strategy.
- ES 2100W, Technical Communications.
- ME 4951, Engineering Design Projects.
- Any other 2100 level or higher “W” course also identified as an “MNS” course for purposes of AXLE.
- 5) Bridging: One course from
- ANTH 2109, Food Politics in America; 2113W, Food, Identity, and Culture; 2160W, Creating Community; 2220W, Human Landscapes; 2242, The Archaeology of Ancient Maya Civilization; 3143, Medical Anthropology; 3343, Biology and Culture of Race; 3141, Anthropology of Healing; 3142, Medicine, Culture, and the Body; 3150W, Cognitive Anthropology; 3243W, Ancient Maya Gods and Rulers; 3345, Genetics in Society; 3622W, Classic Maya Language and Hieroglyphs; 4373, Health and Disease in Ancient Populations.
- ASIA 2630, Chinese Medicine.
- ASTR 2130, The Trial of Galileo and Its Background.
- CLAS 3030, Death, Disease, and Health in the Ancient World; 3730: The Roman to Medieval Near East: Caesarea Excavations, Israel.
- CMST 2800, Rhetoric and Civic Life; 3730/3730W, Communication, Culture, and Consciousness; 3740, Rhetoric of Medicine and Health; 3750, Rhetoric of the Body.
- CS 1151, Computers and Ethics.
- CSET 2410, The London Art-Science Scene: Visual Science Communication for the 21st Century.
- ECON 2350, Health Care Policy.
- ENGL 3720/3720W, Science Fiction; 3730, Literature and the Environment; 3896, Special Topics in Investigative Writing in America.
- HART 2815, Digital Heritage: Methods and Practice.
- HIST 1385W, Disease and Disorder in the Atlantic World; 1430W, North American Indians and the Environment; 1470, History of Exploration; 1480, The Darwinian Revolution; 1500, History of Modern Sciences and Society; 1510/1510L, The Scientific Revolution; 1520, Science and the Sea; 1780W, Self and Society in the United States; 2139, Technology, Nature, and Power in Africa; 2160, Medicine in Islam; 2413/2413W, Global History of Waste; 2780, Superhuman Civilization; 2800, Modern Medicine; 2810, Women, Health, and Sexuality; 2830, Medicine, Culture, and the Body; 3030, Epidemics in History; 3040, Health and the African American Experience; 3045W, U.S. Eugenics 1865–present; 3050, Innovation; 3070W, Science, Technology, and Modernity; 3230, The Art of Empire.
- MATH 3000, History of Mathematics.
- MHS: any 2100 level or higher course, with the exception of the following: 3000, Undergraduate Seminar; 3101, Human Anatomy and Physiology I; 3102, Human Anatomy and Physiology II; 3830, Service Learning; 3831, Service Learning Research and Readings; 3850, Independent Study; 3880, Internship Training; 3881, Internship Readings and Research; 3890, Special Topics; 4998, Honors Research, and 4999, Honors Thesis.

PHIL 3608, Ethics and Medicine; 3616, Philosophy and the Natural Sciences.

PSCI 2255, Public Policy Problems; 2256, Politics of Public Policy; 3253, Ethics and Public Policy; 3266, Climate Change Justice; 3268, American Health Policy.

PSY 3605, Industrial and Organizational Psychology; 3635, Health Psychology; 3705, Human Sexuality.

PSY-PC 3210, Hospitalized Child.

RLST 3921, Ethics and Ecology; 3941, Religion, Science, and Evolution.

RUSS 2273, Russian Science Fiction.

SCED 3320: Introduction to Literacies in Science

SOC 3301, Society and Medicine; 3311, Climate Change and Society; 3313, Sociology of Health and Environmental Science; 3315, Human Ecology and Society; 3317, Energy Transitions and Society.

WGS 2240, Introduction to Women's Health; 2268, Gender, Race, Justice, and the Environment; 2270, Ecofeminism: Theory, Politics, and Action.

- This requirement, in combination with both requirements #3 (Advanced Non-Science Writing) and #8 (Electives), is automatically fulfilled by students who have taken at least 15 credit hours of course work from the courses approved by the Department of History in Program G: Science, Medicine, and Technology.

6) Statistics: One course from

BME 3200, Analysis of Biomedical Data.

BSCI 3270, Statistical Methods in Biology.

CE 3300, Risk, Reliability, and Resilience Engineering.

ChBE 3900W, Chemical Engineering Laboratory I.

ECON 1500, Economic Statistics; 1510, Intensive Economic Statistics.

MATH 1011, Probability and Statistical Inference; 2810, Probability and Statistics for Engineering; 2820, Introduction to Probability and Mathematical Statistics.

PSY 2100, Quantitative Methods.

PSY-PC 2110, Introduction to Statistical Analysis; 2120, Statistical Analysis.

SOC 2100, Statistics for Social Scientists.

7) Natural Sciences and Engineering: Five courses (minimum 3 credit hours each)

- As used here, "Natural Science" includes all courses identified by the College of Arts and Science as MNS courses in AXLE, excluding MATH and PHIL courses.
- At least three of these five courses must be Natural Science (MNS) courses numbered 2100 or higher.
- The other two courses must be Natural Science (MNS) courses numbered 2100 or higher or courses taken at any level from the School of Engineering, except those identified below.
- Students may count the three 1 credit hour courses ES 1401, 1402, and 1403 as equivalent to a single 3 credit hour course if they earn credit for all three courses.
- The following School of Engineering courses are excluded from this requirement: all 1000 level CS courses; any courses that may count toward requirement #4, requirement #5, or requirement #6; all research, special topics, design seminar, directed study, independent study, and service learning courses.
- This requirement is automatically fulfilled by students who have taken
 - at least 15 credit hours of 2100 level or higher level MNS courses that are not also counting toward any other CSET requirement; or
 - at least 15 credit hours of 2100 level or higher level ANTH courses that are not also counting toward any other CSET requirement; or
 - at least 15 credit hours of 2100 level or higher level PSY courses that are not also counting toward any other CSET requirement; or

at least 15 credit hours of courses from the Environmental Sociology Core that are not also counting toward any other CSET requirement; or

at least 15 credit hours of 2100 level or higher course work in the School of Engineering that are not also counting toward any other CSET requirement.

- 8) Electives: At least three courses totaling at least 9 credit hours selected from any of requirements #2, #3, #4, #5, and #7 and/or from the Cinema and Media Arts courses listed below and/or from other digital media production courses involving video, audio, visual communication, or social media, and/or any of the below-listed CSET courses.

Digital media production courses may be selected from the following:

CMA 1500, Fundamentals of Film and Video Production; 1600, Introduction to Film and Media Studies; 2250, 16mm Filmmaking; 2260, Digital Production Workshop; 2500W, Screenwriting; 2600W, Advanced Screenwriting.

THTR 2311W, Writing for the Stage and Screen.

Additional CSET courses may be selected from the following:

CSET 1001, Commons iSeminar; 3840, Directed Study; 3841, Project in Science Writing and Communicating; 3890, Special Topics; or 4998, Honors Thesis.

- This requirement, in combination with both requirements #3 (Advanced Non-Science Writing) and #5 (Bridging), is automatically fulfilled by students who have taken at least 15 credit hours of course work from the courses approved by the Department of History in Program G: Science, Medicine, and Technology.
- This requirement, in combination with requirement #3 (Advanced Non-Science Writing), is automatically fulfilled by students who have completed at least 12 credit hours of the following:
 - 2100 level or higher ENGL courses,
 - 2100 level or higher “W” courses,
 - 3004–3661 PHIL courses,
 - 3000–4939 RLST courses.

Honors Program

Honors in CSET is a selective program of individual undergraduate work, supervised by a faculty adviser. Honors candidates propose, construct, and complete a project (written, visual, aural, digital, or a combination) that demonstrates the ability to communicate science, in depth, to a nonexpert audience.

Requirements for Admission to Honors in CSET

To be admitted to the Honors Program in CSET, a student must

- be a CSET major;
- have completed requirements #1, #2, either #3 or #4, and at least 21 credit hours of work that counts toward the CSET major;
- have a cumulative GPA of at least 3.30;
- have a GPA of at least 3.40 in all courses that count toward the CSET major.

Requirements for Completion of Honors in CSET

To earn Honors or Highest Honors in CSET, a student must

- complete the requirements of the CSET major;
- complete at least 6 credit hours of work in any combination of CSET 3840, 3841, and 4998, of which at least 3 credit hours must be in CSET 4998;

- present a written and oral defense of the CSET 4998 project before a faculty examination committee;
- have a cumulative GPA of at least 3.30;
- have a GPA of at least 3.40 in all courses that count toward the CSET major.

Course of Study for Honors in CSET

Interested students may apply in the fall or spring of their junior year or the fall of the senior year. The application includes a one- to two-page proposal of the planned Honors project and the signature of the faculty member who will be the project adviser.

Students in the Honors Program must earn at least 3 credit hours in CSET 4998 (Honors Thesis). Students may earn credit for CSET 4998 for up to four semesters.

An Honors candidate must pass an oral examination of the Honors project no later than the final week of classes in the student's final semester. The examination committee is composed of the Honors project supervisor and two additional faculty members; at least one member of the examination committee must be a faculty member affiliated with the CSET program. The oral examination is public and should take approximately one hour, including time for questions from members of the committee. The faculty examination committee will determine by majority vote whether the student has earned Honors and whether said student should receive Honors or, for exceptional achievement, Highest Honors. Highest Honors is reserved for students whose projects are of dissemination quality and whose oral examinations are completed at the highest level.

Minor in Communication of Science and Technology

The minor in Communication of Science and Technology consists of six courses, totaling a minimum of 18 credit hours, distributed as follows:

1. One Introduction to the Communication of Science course (requirement #1 of the CSET major);
2. One public speaking course (requirement #2 of the CSET major);
3. One advanced CSET or science communications skills course (requirement #4 of the CSET major);
4. One bridging course (requirement #5 of the CSET major);
5. Two 2100 level or higher natural science courses (as defined in requirement #7 of the CSET major).

Additional notes for the minor in CSET:

- Students in the College of Arts and Science must count at least 15 credit hours for the minor in CSET that are not also used to fulfill any program requirements for any other major or minor in the College of Arts and Science.
- A course can be used only once to fulfill a single CSET requirement, even if it is eligible under more than one CSET requirement.

Course descriptions begin on page 165.