



**College of Liberal Arts  
and Human Sciences**

**Department of Science and Technology in Society**  
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March 20, 2017

To: CLAHS Undergraduate Curriculum Committee  
From: Daniel Breslau, Chair, Department of Science and Technology in Society  
Re: Proposal for new undergraduate degree

A handwritten signature in blue ink, appearing to read "D Breslau".

On behalf of the STS Department, I approve of the Department's proposal for a new undergraduate degree, with Bachelor of Arts and Bachelor of Science options. Initiation of the program will not require additional department resources.

*Invent the Future*

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY  
*An equal opportunity, affirmative action institution*

**Virginia Tech Degree Proposal**  
**Bachelor of Arts/Bachelor of Science in Science, Technology, and Society**  
**(CIP: 30.1501)**

**Type of degree action: New**

**Program Description**

The Department of Science, Technology, and Society is proposing a new Undergraduate Degree Program in Science, Technology, and Society. The program will offer both a Bachelor of Arts and a Bachelor of Science. The program anticipates admitting its first students in spring of 2019, and will begin awarding degrees in 2021.

The field of Science, Technology, and Society studies the relationship of science and technology to their social, political, and cultural contexts. It examines the ways that the development of technologies and the course of scientific research are shaped by their social settings, and in turn, the ways that scientific and technological developments impact society.

As an interdisciplinary field, Science, Technology, and Society draws from the social sciences and humanities, particularly from Anthropology, Sociology, History, and Philosophy. The field has also developed its own concepts and frameworks, which have proven particularly revealing in the study of the social dimensions of technical fields. Central concerns of the field include the politics of expertise, public deliberation on science and technology policy, the social consequences of molecular biology and associated technologies, innovation as a social process, information technologies and social change.

In addition to advancing knowledge of this subject area, the field of STS has a strong tradition of practical involvement in the interface between society and the technical fields of science and technology. STS scholars and practitioners work with scientists and engineers to incorporate a greater awareness of the social and ethical consequences of their work into their professional work itself. And STS-trained professionals work with citizens' groups and other stakeholders to translate and interpret scientific and technological developments in terms of their risks, benefits, and other social consequences. They can often facilitate informed public involvement in deliberation over policy responses. Faculty in STS at Virginia Tech are already working on projects involving reshaping the training of engineers, developing strategies for disaster response, and involving citizens in research on environmental health risks.

The program will build on existing strengths of faculty in the Department of Science, Technology, and Society and the graduate program in Science and Technology Studies. Active scholarship of faculty, with strengths in science and technology policy, energy and environmental issues, engineering studies, biomedicine and society, will expose undergraduates to the state of the art in STS research and public outreach.

The Undergraduate Degree Program in STS has six emphases:

1. The study of STS as a set of perspectives, concepts, and methods that apply across a broad range of issues for research and active intervention involving science and technology.
2. A focus on contemporary problems involving science and technology, developing approaches to those problems that take into account their social dimensions and social consequences.
3. Real-world engagement through experiential and collaborative learning.

4. Acquisition of a set of transdisciplinary skills, including technological literacy, professional presentations, research design, critical thinking, and managing collaborative projects.
5. **For the Bachelor of Arts degree**, advanced knowledge in humanistic and social science perspectives on science and technology.
6. **For the Bachelor of Science degree**, technical literacy at an advanced undergraduate level, in a specialized area of science and technology.

In the degree's core, students will learn general conceptual tools and perspectives of STS. But beyond the introductory course (STS 1504), these are taught in conjunction with specific contemporary problem areas: environment, biomedicine and the life sciences, global science and technology policy, and innovation.

The core includes an innovative course on the practice of collaborative research (STS 3504 Collaborative Research in Science, Technology, and Society). The course combines research methods with hands-on experience in collaborative work on a social problem involving science and/or technology. During alternate years, the collaborative methods course will be coupled with the STS Department's Choices and Challenges Forum. This is a public forum on an area of science and technology that is of pressing public concern. Students in the STS Collaborative Methods course will participate in developing information materials for the forum, designing background sessions, and will interact with invited panelists in a closed workshop setting.

Furthermore, all students in the program will specialize in a focus area, where they will take 9 credit hours to acquire technical literacy and deeper knowledge of one area. The focus areas will initially consist of Energy and Environment, Medicine and Life Sciences, and Engineering and Innovation, with a fourth option consisting of a custom focus area that students design in consultation with their advisor.

The capstone, STS 4304, will provide an opportunity to pursue supervised individual research related to the student's focus area, while gaining experience in presentation and critique in a seminar setting. Students in the STS program will compile a research portfolio based on their projects in the Collaborative Methods course and the STS Capstone.

Students will complete the program with either a Bachelor of Arts or a Bachelor of Science degree. The BA is appropriate for students seeking a broad liberal arts degree, requiring additional upper-level courses in perspectives on science and technology from the humanities, social science and arts. The Bachelor of Science allows students to combine the STS requirements with a more advanced program of study in a scientific or technological area that is linked to their STS focus area.

## **Curriculum Summary**

### **I. Pathways to General Education (45 credits)**

Distributive Pathway:

- Discourse (9 credits)
- Quantitative and Computational Thinking (9 credits)
- Reasoning in the Natural Sciences (6 credits)
- Critique and Practice in Design and the Arts (6 credits)
- Reasoning in the Social Sciences (6 credits)

Critical Thinking in the Humanities (6 credits)  
Critical Analysis of Identity and Equity in the United States (3 credits)  
Pathways requirements may also be fulfilled through a Pathways Minor or Alternative Pathway.

## **II. STS Degree Core Requirement (21 credit hours)**

### **STS Core Sequence**

- STS 1504: Introduction to Science, Technology, and Society (3 cr)
- STS 3504: The Practice of Collaborative Research in STS (3 cr)
- STS 4304: Contemporary Issues in Science, Technology, and Society (3 cr)

### **Core area requirements**

- STS 2154: Humanities, Technology and the Life Sciences (3 cr)
- STS 2254: Innovation in Context (3 cr)
- STS 2454: Science, Technology, and the Environment (3 cr)
- STS 2444: Global Science and Technology Policy (3 cr)

## **III. Focus Area Restricted Electives (9 credit hours)**

### **Nine credit hours in one of the following focus areas**

#### **Energy and Environment (three of the following):**

- ENGL 3534: Literature and Ecology (3 cr)
- GEOG/NR 1115-1116: Seeking Sustainability<sup>1</sup> (3 cr)
- GEOG 3104: Environmental Problems, Population, and Development (3 cr)
- HIST 3144: American Environmental History (3 cr)
- PHIL 2304: Global Ethics (3 cr)
- STS 3334: Energy and Society (3 cr)
- UAP/PSCI 3344: Global Environmental Issues: Interdisciplinary Perspectives (3 cr)
- UAP 3354: Introduction to Environmental Policy and Planning (3 cr)

#### **Engineering and Innovation (three of the following):**

- ENGE 2004: Citizen Engineering (3 cr)
- ENGL 3844: Writing and Digital Media (3 cr)
- HIST/SOC/STS 2604: Introduction to Data in Social Context (3 cr)
- HIST/STS 2715, 2716: History of Technology (3 cr)
- HIST 3114: United States Business History (3 cr)
- MGT 3064: Cornerstones of Entrepreneurship and Innovation (3 cr)
- STS/HIST 2054: Engineering Cultures (3 cr)

#### **Life Sciences and Biomedicine (three of the following):**

- ENGL 3154: Literature, Medicine, and Culture (3 cr)
- ENGL/STS 4314: Narrative Medicine (3 cr)
- HIST 3624: Health and Illness in African History (3 cr)
- HIST 3714: War and Medicine (3 cr)
- HIST 3724: History of Disease, Medicine, and Health (3 cr)
- HIST/STS 3734: History of Modern Biology (3 cr)
- PHIL 3324: Biomedical Ethics (3 cr)

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<sup>1</sup> Only one course of the two-course sequence can be counted toward the STS focus area requirement.

PHIL 4604: Philosophy of Biology (3 cr)  
SOC 3714: Sociology of Aging (3 cr)  
SOC 4704 Medical Sociology (3 cr)  
STS 3284: Technology and Disability (3 cr)  
STS 3314: Medical Dilemmas and Human Experience (3 cr)  
WGS/SOC/STS 3324: Perspectives on the Biology of Women (3 cr)  
WGS/SOC/STS 4334: Sexual Medicine (3 cr)  
WGS/STS 4704: Gender and Science (3 cr)

Custom Focus Area, designed with academic advisor (9 credits)

**IV. For the Bachelor of Arts Degree: Advanced perspectives from the humanities and social sciences (6 credit hours)**

Two additional courses at the 3000-level or higher, and approved by the academic advisor, related to science and technology from the perspective of humanities, social sciences, or the arts. For example, a student in the Engineering and Innovation focus area might fulfill this requirement with CINE 3224 Documentary Cinema Production and CINE 3184 Cinema Production Topics.

**For the Bachelor of Science Degree: Specialized study in science and technology (6 credits)**

Two additional courses at the 3000-level or higher in a technical area outside of social sciences and humanities related to the student's focus area, and approved by the academic advisor. These must be courses with subject matter in science, mathematics, technology, or engineering. For example, a student in the Energy and Environment focus area pursuing the Bachelor of Science Degree might fulfill this requirement with BIOL 3114: Field and Laboratory Ecology (3), and BIOL 4004: Freshwater Ecology (3).

**V. Free electives (39 credits)**

**Relevance to university mission and strategic planning**

The BA/BS in Science, Technology, and Society is designed to harmonize with the university's goals of developing "VT-shaped individuals." First, it will provide disciplinary knowledge in the form of STS as a comprehensive way of thinking about the relationship of science and technology to society. This involves a set of specialized concepts and frameworks developed expressly for studying and understanding technical fields as thoroughly intertwined with social, cultural, and political realities.

Second, the curriculum will provide cross-cutting skills such as research design, managing collaborative projects, policy development and evaluation, writing and speaking skills for public engagement. Focus areas and specialization requirements will provide students with literacy in a specific problem area. Students in the Bachelor of Science option will undertake further study in a technical area.

Third, the program will provide guided experiential learning in the 3000-level core course on the practice of collaborative research and in the STS capstone. Students will be encouraged to pursue internships related to their STS studies. The STS Department has piloted a summer course for students pursuing internships in the National Capital Region.

Finally, the program will promote informal communal learning through co-curricular activities using existing departmental resources: undergraduate research symposia, guest speakers, presentations of student work in the ST Global student meeting held annually in the National Capital Region.

**Destination areas:** Students in the STS program will be able to combine their degree requirements in STS with a major in any of the planned Destination Areas. The STS program will complement work in a Destination Area by providing social science and humanities perspectives on the area's subject matter. The major will also include courses that fit within specific destination areas, allowing students to count STS courses toward a Destination Area major. For instance, our courses in Engineering and Innovation might count toward a major in Intelligent Infrastructures and Human-Centered Design.

Other planned features of the program that relate directly to the VT mission and strategic plan:

- With our department's presence in the National Capitol Region, we will initiate undergraduate activities there, offering summer courses that will provide an opportunity to combine internships with classroom study and research.
- The program combines transdisciplinary competence with specialization. It pursues general learning outcomes, with regard to interdisciplinary and transdisciplinary perspectives and methods of STS, and specialized learning outcomes, requiring the application of those tools in the process of developing deep knowledge of a particular focus area.

### **Justification**

The establishment of a Bachelor of Arts/Bachelor of Science in Science, Technology, and Society at Virginia Tech will answer two related and growing demands. On one hand, Virginia Tech attracts many students with strong interests in science and technology, but who are not interested in majoring in engineering or in specializing solely in a scientific field. They are drawn to science and technology through personal interest and an awareness of the pervasive influence of science and technology in modern life. They will be seeking the range of skills typically acquired in a liberal arts degree, such as writing, public speaking, research, but coupled with technological literacy and a focus on specific areas of science and technology.

On the other hand, employers and graduate programs are increasingly placing a high value on college graduates who are neither engineers nor science majors, but who are effective problem solvers due to their understanding of the ways that science and technology interact with social life, culture, and politics.

Science, Technology, and Society (STS) bridges these two growing demands. It provides students with an understanding of the ways that science and technology are embedded in social life, as well as practical conceptual frameworks and methods for pursuing interdisciplinary solutions to contemporary problems. Combined with literacy in one or more areas of science and technology, analytic and writing abilities, and experience in collaborative work, these students will acquire a highly valued and marketable set of competencies.

An undergraduate STS degree is excellent preparation for any career that calls for a liberal arts degree, but with special relevance to science and technology-rich fields, such as science communication, technology marketing and management, environmental organizations, research

administration, science policy, military careers, and museum work. And it prepares students for graduate and professional study in areas such as Business, Law, Health Professions, Information Science, and Environmental Policy.

### **Student demand**

Science, Technology, and Society is a growing field, nationally and internationally. The College Board lists STS undergraduate programs at 68 higher education institutions in the U.S., including public land-grant schools such as Penn State, University of California at Davis, and North Carolina State University. Ohio State University has recently added a concentration in STS within its Comparative Studies major. In our region, at North Carolina State University, the STS undergraduate degree program has over 110 students currently enrolled. There are no undergraduate degree programs in Science, Technology, and Society in public higher education institutions in Virginia.

The department's undergraduate courses have experienced consistently high enrollment. The introductory course in STS has filled to its capacity of 120 students for the past two years. Other courses that will be included in the degree program indicate a strong student interest in the subject matter.

We recently surveyed students enrolled in STS 1504, Introduction to Science, Technology, and Society. Out of 67 responses, 30, or 45% indicated that they were "extremely interested" or "somewhat interested" in the degree program in STS. Of the 25 students who had not yet declared a major 12, or 48% indicated that they were either "extremely interested" or "somewhat interested" in the STS degree program.

### **Market demand**

The STS degree program combines instruction and real-world application of communication skills, both written and oral; powerful conceptual frameworks for understanding the social and cultural dimensions of science and technology; and focused knowledge of a particular problem domain. Graduates of the program will be well prepared for positions that require writing, speaking, research, and analytic skills in science- and technology-rich settings.

A growing body of knowledge suggests that pay is not only growing for graduates of liberal arts programs, but that their long-term earning potential is comparable to, or outpacing that of graduates of STEM programs. The *Wall Street Journal* writes, "When asked to define the résumé traits that matter most, however, the NACE-surveyed employers rated technical skills 10th. Four of the top five traits were hallmarks of a traditional liberal-arts education: teamwork, clear writing, problem-solving aptitude and strong oral communications. Mindful of those longer-term needs, some employers end up hiring humanities and social-sciences graduates, even if such majors aren't explicitly singled out when recruiting."<sup>2</sup> The *World Economic Forum* report, 'The Future of Jobs,' confirms the importance of these skills. The top five desired traits for employees in 2020 include complex problem solving, critical thinking, creativity, people management, and coordinating with others – all trademarks of degree programs emerging from the liberal arts.

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<sup>2</sup> "Good News Liberal-Arts Majors: Your Peers Probably Won't Outearn You Forever." *Wall Street Journal*, Sept. 11, 2016. <https://www.wsj.com/articles/good-news-liberal-arts-majors-your-peers-probably-wont-outearn-you-forever-1473645902>

Yet these traits must be tailored for a rapidly changing and evolving world marketplace. The same report from which the above skills are derived notes that technological developments are driving commerce, development, and production in disruptive ways. “Developments in previously disjointed fields such as artificial intelligence and machine learning, robotics, nanotechnology, 3D printing and genetics and biotechnology are all building on and amplifying one another. Smart systems—homes, factories, farms, grids or entire cities—will help tackle problems ranging from supply chain management to climate change. Concurrent to this technological revolution are a set of broader socioeconomic, geopolitical and demographic developments.” Thus, not only do graduates need to build desirable traits, they must be familiar with new and emerging scientific and technological environments.

### **Required resources**

The program can be implemented with existing departmental resources. As enrollment reaches our five-year target, it may require a half-time academic advisor and an additional graduate teaching assistantship. A future faculty position in STS approaches to information technology would allow us to add an additional focus area, but is not necessary for initiating the program.

RESOURCE	ESTIMATED COSTS
Faculty	\$0
Administrative Staff	\$15000/yr., starting in year 5
Graduate Teaching/ Graduate Research Assistant	\$32000/yr., starting in year 5 (includes tuition and stipend)
Space	\$0
Library	\$0
Equipment	\$0
Other	\$1000 (printing, web design, publicity, information events)

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BACHELOR OF ARTS IN SCIENCE, TECHNOLOGY, AND SOCIETY  
DEPARTMENT OF SCIENCE, TECHNOLOGY, AND SOCIETY  
FOR STUDENTS GRADUATING IN THE 2021 CALENDAR YEAR

**I. STS Degree Core Requirements (21 credit hours)**

STS 1504 Introduction to Science, Technology, and Society	3 cr _____
STS 3504 The Practice of Collaborative Research for Science, Technology, and Society (Pre: 1504, and one of 2154 or 2444 or 2454 or 2254)	3 cr _____
STS 4304 Contemporary Issues in Science, Technology, and Society (Pre: 1504)	3 cr _____
STS 2154 Humanities, Technology, and the Life Sciences	3 cr _____
STS 2254 Innovation in Context	3 cr _____
STS 2444 Global Science and Technology Policy	3 cr _____
STS 2454 Science, Technology, and the Environment	3 cr _____

**II. STS Focus Area Restricted Electives (9 credit hours)**

Complete 9 hours of courses in **one** of the following areas

<b>1. Engineering and Innovation</b>	3 cr _____
ENGE 2004: Citizen Engineering	3 cr _____
ENGL 3844: Writing and Digital Media (Pre: ENGL 1106 or 1204H or COMM 1016)	3 cr _____
HIST/SOC/STS 2604: Introduction to Data in Social Context	3 cr _____
HIST/STS 2715, 2716: History of Technology	
HIST 3114: United States Business History	
MGT 3064: Cornerstones of Entrepreneurship and Innovation	
STS/HIST 2054: Engineering Cultures	
 <b>2. Energy and Environment</b>	3 cr _____
ENGL 3534: Literature and Ecology (Pre: ENGL 1106 or 1204H or COMM 1016)	3 cr _____
GEOG/NR 1115-1116: Seeking Sustainability <sup>1</sup> (Pre: 1115 for 1116)	3 cr _____

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<sup>1</sup> Only one course of the two-course sequence can be counted toward the STS focus area requirement.

GEOG 3104: Environmental Problems, Population, and Development

HIST 3144: American Environmental History

PHIL 2304: Global Ethics

STS 3334: Energy and Society

UAP/PSCI 3344: Global Environmental Issues: Interdisciplinary Perspectives

UAP 3354: Introduction to Environmental Policy and Planning

**3. Life Sciences and Biomedicine**

ENGL 3154: Literature, Medicine, and Culture (Pre: ENGL 1106 or 1204H or COMM 1016)

3 cr \_\_\_\_\_

ENGL/STS 4314: Narrative Medicine (Pre: ENGL 3154 or 3324)

3 cr \_\_\_\_\_

HIST 3624: Health and Illness in African History

3 cr \_\_\_\_\_

HIST 3714: War and Medicine

HIST 3724: History of Disease, Medicine, and Health

HIST/STS 3734: History of Modern Biology

PHIL 3324: Biomedical Ethics

PHIL 4604: Philosophy of Biology

SOC 3714: Sociology of Aging (Pre: 1004)

SOC 4704 Medical Sociology (Pre: 1004)

STS 3284: Technology and Disability

STS 3314: Medical Dilemmas and Human Experience

WGS/SOC/STS 3324: Perspectives on the Biology of Women  
(Pre: WGS 1824)

WGS/SOC/STS 4334 Sexual Medicine (Pre: WGS 1824)

WGS/STS 4704: Gender and Science (Pre: WGS 2244 or STS  
1504)

**4. Custom Focus Area**

Nine credit hours in a selected specialty of Science, Technology, and Society, approved by academic advisor

3 cr \_\_\_\_\_

3 cr \_\_\_\_\_

3 cr \_\_\_\_\_

**III. Advanced Perspectives in the Humanities and Social Sciences (6 credit hours)**

Two additional courses at the 3000-level or higher, and approved by the academic advisor, related to science and technology from the perspective of humanities, social sciences, or the arts. Please refer to the Prerequisites section, below.

3 cr \_\_\_\_\_

3 cr \_\_\_\_\_

**IV. Pathways to General Education (45 credit hours)**

STS courses outside of the 21-credit core may be counted toward the Pathways requirements.

Discourse (9 credit hours)	3 cr _____
	3 cr _____
	3 cr _____
Quantitative and Computational Thinking (9 credit hours)	3 cr _____
	3 cr _____
	3 cr _____
Reasoning in the Natural Sciences (6 credit hours)	3 cr _____
	3 cr _____
Critique and Practice in Design and the Arts (6 credit hours)	3 cr _____
	3 cr _____
Reasoning in the Social Sciences (6 credit hours)	3 cr _____
	3 cr _____
Critical Thinking in the Humanities (6 credit hours)	3 cr _____
	3 cr _____
Critical Analysis of Identity and Equity in the United States (3 credit hours)	3 cr _____
Pathways to General Education Credits can also be fulfilled through a Pathways Minor or Alternative Pathway	

**V. Free electives (39 credit hours)**

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**VI. Foreign Language**

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six semester hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement

do not count toward the hours required for graduation. Please consult the Undergraduate Catalog for details.

## **Prerequisites**

Some courses listed on this checksheet have prerequisites, please consult the University Course Catalog, or check with your advisor.

## **Graduation Requirements**

- Minimum of 120 credit hours for the degree
- In-major GPA (courses in sections I, II, III, above) must be 2.0 or higher.
- Minimum overall GPA of 2.0.

## **Satisfactory Progress Policy**

In addition to the satisfactory progress toward a degree policy required by the University, satisfactory progress toward a B.A. in STS requires that upon having attempted 72 semester hours (including transfer, AP, advanced standing, and credit by exam) an STS student must have:

- Completed at least 9 credits of the STS core requirements (Section I, above)
- At least a 2.0 overall GPA
- At least a 2.0 in-major GPA.

In-major courses include all STS core courses (Section I), Focus Area requirements (II), and Advanced Perspectives in the Humanities and Social Sciences requirements (III).

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**I. STS Degree Core Requirements (21 credit hours)**

STS 1504 Introduction to Science, Technology, and Society	3 cr _____
STS 3504 The Practice of Collaborative Research for Science, Technology, and Society (Pre: 1504, and one of 2154 or 2444 or 2454 or 2254)	3 cr _____
STS 4304 Contemporary Issues in Science, Technology, and Society (Pre: 1504)	3 cr _____
STS 2154 Humanities, Technology, and the Life Sciences	3 cr _____
STS 2254 Innovation in Context	3 cr _____
STS 2444 Global Science and Technology Policy	3 cr _____
STS 2454 Science, Technology, and the Environment	3 cr _____

**II. STS Focus Area Restricted Electives (9 credit hours)**

Complete 9 hours of courses in **one** of the following areas

<b>1. Engineering and Innovation</b>	3 cr _____
ENGE 2004: Citizen Engineering	3 cr _____
ENGL 3844: Writing and Digital Media (Pre: ENGL 1106 or 1204H or COMM 1016)	3 cr _____
HIST/SOC/STS 2604: Introduction to Data in Social Context	3 cr _____
HIST/STS 2715, 2716: History of Technology	3 cr _____
HIST 3114: United States Business History	3 cr _____
MGT 3064: Cornerstones of Entrepreneurship and Innovation	3 cr _____
STS/HIST 2054: Engineering Cultures	3 cr _____
<b>2. Energy and Environment</b>	3 cr _____
ENGL 3534: Literature and Ecology (Pre: ENGL 1106 or 1204H or COMM 1016)	3 cr _____
GEOG/NR 1115-1116: Seeking Sustainability <sup>1</sup> (Pre: 1115 for 1116)	3 cr _____

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<sup>1</sup> Only one course of the two-course sequence can be counted toward the STS focus area requirement.

GEOG 3104: Environmental Problems, Population, and Development  
HIST 3144: American Environmental History  
PHIL 2304: Global Ethics  
STS 3334: Energy and Society  
UAP/PSCI 3344: Global Environmental Issues: Interdisciplinary Perspectives  
UAP 3354: Introduction to Environmental Policy and Planning

<b>3. Life Sciences and Biomedicine</b>	3 cr _____
ENGL 3154: Literature, Medicine, and Culture (Pre: ENGL 1106 or 1204H or COMM 1016)	3 cr _____
ENGL/STS 4314: Narrative Medicine (Pre: ENGL 3154 or 3324)	3 cr _____
HIST 3624: Health and Illness in African History	
HIST 3714: War and Medicine	
HIST 3724: History of Disease, Medicine, and Health	
HIST/STS 3734: History of Modern Biology	
PHIL 3324: Biomedical Ethics	
PHIL 4604: Philosophy of Biology	
SOC 3714: Sociology of Aging (Pre: 1004)	
SOC 4704 Medical Sociology (Pre: 1004)	
STS 3284: Technology and Disability	
STS 3314: Medical Dilemmas and Human Experience	
WGS/SOC/STS 3324: Perspectives on the Biology of Women (Pre: WGS 1824)	
WGS/SOC/STS 4334 Sexual Medicine (Pre: WGS 1824)	
WGS/STS 4704: Gender and Science (Pre: WGS 2244 or STS 1504)	

<b>4. Custom Focus Area</b>	3 cr _____
Nine credit hours in a selected specialty of Science, Technology, and Society, approved by academic advisor	3 cr _____
	3 cr _____

<b>III. Specialized Study in Science and Technology (6 credit hours)</b>	
Two additional courses at the 3000-level or higher in a technical area outside of social sciences and humanities related to the student's focus area, and approved by the academic advisor. These must be courses with subject matter in science, mathematics, technology, or engineering. Please refer to the Prerequisites section, below.	3 cr _____
	3 cr _____

**IV. Pathways to General Education (45 credit hours)**

STS courses outside of the 21-credit core may be counted toward the Pathways requirements.

Discourse (9 credit hours)	3 cr _____
	3 cr _____
	3 cr _____
Quantitative and Computational Thinking (9 credit hours)	3 cr _____
	3 cr _____
	3 cr _____
Reasoning in the Natural Sciences (6 credit hours)	3 cr _____
	3 cr _____
Critique and Practice in Design and the Arts (6 credit hours)	3 cr _____
	3 cr _____
Reasoning in the Social Sciences (6 credit hours)	3 cr _____
	3 cr _____
Critical Thinking in the Humanities (6 credit hours)	3 cr _____
	3 cr _____
Critical Analysis of Identity and Equity in the United States	3 cr _____
Pathways to General Education Credits can also be fulfilled through a Pathways Minor or Alternative Pathway	

**V. Free electives (39 credit hours)**

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## **Prerequisites**

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## **Graduation Requirements**

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In addition to the satisfactory progress toward a degree policy required by the University, satisfactory progress toward a B.S. in STS requires that upon having attempted 72 semester hours (including transfer, AP, advanced standing, and credit by exam) an STS student must have:

- Completed at least 9 credits of the STS core requirements (Section I, above)
- At least a 2.0 overall GPA
- At least a 2.0 in-major GPA.

In-major courses include all STS core courses (Section I), Focus Area requirements (II), and Specialized Study in Science and Technology (III).

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## approval for English courses on STS check sheet

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Bernice Hausman <bhausman@vt.edu>

Mon, Jan 30, 2017 at 11:17 AM

To: Daniel Breslau <dbreslau@vt.edu>, Virginia C Fowler <vfowler@vt.edu>

Dear Daniel:

The Department of English endorses the undergraduate degree program in Science, Technology, and Society and supports the inclusion of the ENGL courses listed below as electives. The English Department will be able to support the additional student enrollment up to existing capacity, and welcomes the opportunity to teach students in the STS undergraduate major:

ENGL 3154 Literature, Medicine, and Culture

ENGL 4314: Narrative Medicine

ENGL 3844: Writing and Digital Media

ENGL 3534 Literature and Ecology

ENGL 4874: Issues in Professional and Public Discourse

Sincerely,

BH

Bernice L. Hausman

Chair, Department of English, Virginia Tech

Edward S. Diggs Professor in the Humanities

Professor, Virginia Tech Carilion School of Medicine

[540-231-8466](#)

[bhausman@vt.edu](mailto:bhausman@vt.edu)

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**ENGE 2004 Citizen Engineering**

2 messages

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**Donna Riley** <dmriley@vt.edu>  
To: Daniel Breslau <dbreslau@vt.edu>

Wed, Feb 1, 2017 at 5:33 PM

The Department of Engineering Education endorses the proposed undergraduate degree program in Science, Technology, and Society, and supports the inclusion of ENGE 2004 Citizen Engineering. The Department welcomes the enrollment of additional students in these courses, and we acknowledge no additional resources are needed.

Thanks,

Donna

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Donna Riley, Ph.D.  
Professor and Interim Head  
Department of Engineering Education  
Affiliate Faculty, Science, Technology, & Society  
Affiliate Faculty, Women's & Gender Studies  
Virginia Polytechnic Institute and State University  
*Gender pronouns: she/her, they/them*

349 Goodwin Hall  
635 Prices Fork Rd.  
Blacksburg, VA, USA 24061  
[dmriley@vt.edu](mailto:dmriley@vt.edu)

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**Daniel Breslau** <dbreslau@vt.edu>  
To: me@onenote.com

Wed, Feb 1, 2017 at 11:47 PM

[Quoted text hidden]  
--  
Daniel Breslau  
Associate Professor and Chair  
Department of Science and Technology in Society  
Virginia Tech  
133 Lane Hall  
Blacksburg, VA 24061-0247  
[\(540\) 231-8472](tel:(540)231-8472) (work)  
[\(540\) 449-9791](tel:(540)449-9791) (mobile)

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## approval for listing HIST courses in new STS major

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**Mark Barrow** <[mabarro2@vt.edu](mailto:mabarro2@vt.edu)>  
To: Daniel Breslau <[dbreslau@vt.edu](mailto:dbreslau@vt.edu)>  
Cc: Heather Gumbert <[hgumbert@vt.edu](mailto:hgumbert@vt.edu)>

Wed, Feb 1, 2017 at 7:35 PM

Dear Daniel,

By this note I am granting permission for the following HIST course to be added to the new STS major:

HIST 3144 American Environmental History  
HIST 3724 Disease, Medicine, and Health  
HIST 3624 Health and Illness in African History  
HIST 3714 War and Medicine  
HIST 3734 History of Modern Biology  
HIST 3114 History of Capitalism  
HIST 3715, 3716: History of Technology (changing to 2715-16 by fall 2017)  
HIST 2604 Introduction to Data in Social Context (when approved)

We plan to offer these courses regularly, and adding them to your checksheet will require no additional resources.

Please let me know if you need anything else.

Best,  
Mark Barrow

Mark V. Barrow, Jr.  
Professor and Chair  
Department of History (0117)  
Virginia Tech  
Blacksburg, VA 24060  
[540-231-4099](tel:540-231-4099)

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## inclusion of MGT courses as electives in new STS degree program

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Gnyawali, Devi <[devi@vt.edu](mailto:devi@vt.edu)>  
To: "Breslau, Daniel" <[dbreslau@vt.edu](mailto:dbreslau@vt.edu)>  
Cc: "Gautier, Cindy" <[cindyg@vt.edu](mailto:cindyg@vt.edu)>

Thu, Feb 2, 2017 at 12:45 PM

The Department of Management endorses the proposed undergraduate degree program in Science, Technology, and Society, and supports the inclusion of the MGT 3064 Cornerstones of Entrepreneurship and Innovation. The department welcomes the enrollment of additional students in this course, and we acknowledge no additional resources are needed.

Best regards,

Devi

Devi R. Gnyawali, Ph.D.

R. B. Pamplin Professor and Department Head

Department of Management (mail code 0233), 2007 Pamplin Hall

880 West Campus Drive, Blacksburg, VA 24061

Email: [devi@vt.edu](mailto:devi@vt.edu)

Phone: [540-231-6353](tel:540-231-6353)

Associate Editor, Journal of Management

<http://www.management.pamplin.vt.edu/devi-r-gnyawali/>

**From:** Daniel Breslau [mailto:[dbreslau@vt.edu](mailto:dbreslau@vt.edu)]  
**Sent:** Wednesday, February 1, 2017 11:18 PM  
**To:** Gnyawali, Devi <[devi@vt.edu](mailto:devi@vt.edu)>  
**Cc:** Gautier, Cindy <[cindyg@vt.edu](mailto:cindyg@vt.edu)>  
**Subject:** Re: inclusion of MGT courses as electives in new STS degree program

[Quoted text hidden]



College of Liberal Arts  
and Human Sciences

**John Ryan, Chair, Department of Sociology**

560 McBryde Hall MC 0137  
225 Stanger Street  
Blacksburg, Virginia 24061  
540/231-8971 Fax: 540/231-3860  
E-mail: johnryan@vt.edu  
[www.sociology.vt.edu](http://www.sociology.vt.edu)

February 3, 2017

Dear Curriculum Committee:

The Department of Sociology endorses the undergraduate degree program in Science, Technology, and Society and supports the inclusion of the SOC courses listed below as electives. The department welcomes the enrollment of additional students in these courses, and we acknowledge no additional resources are needed.

SOC 3714 Sociology of Aging  
SOC 4704 Medical Sociology

Sincerely,

John Ryan  
Professor and Chair

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College of Architecture  
and Urban Studies

**Urban Affairs and Planning MC 0113**  
160 Otey Street / Room 204  
Blacksburg, Virginia 24061  
Voice: 540/231-5485  
Fax: 540/231-3367  
E-mail: uapvt@vt.edu

February 1, 2017

RE: Letter of Support for UAP Courses for New Undergraduate Degree in Science, Technology, and Society

The Urban Affairs and Planning Program (UAP) endorses the undergraduate degree program in Science, Technology, and Society and supports the inclusion of the UAP courses listed below as electives. We welcome the enrollment of additional students in this course, and we expect that no additional resources will be needed.

UAP 3344 (PSCI 3344): Global Environmental Issues: Interdisciplinary Perspectives

UAP 3354: Introduction to Environmental and Policy Planning

UAP 4214: WOMEN, ENVIRONMENT AND DEVELOPMENT IN A GLOBAL PERSPECTIVE

UAP 4264: ENVIRONMENTAL ETHICS AND POLICY

UAP 4394: COMMUNITY RENEWABLE ENERGY SYSTEMS

Please contact me if you have any questions or comments.

Sincerely,

A handwritten signature in blue ink that reads "Thomas W. Sanchez".

Thomas W. Sanchez, PhD  
Chair & Professor, Urban Affairs and Planning  
tom.sanchez@vt.edu

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**Department Of Sociology**  
**Women's and Gender Studies Program**  
560 McBryde Hall (0137)  
225 Stanger Street  
Blacksburg, Virginia 24061  
540-231-8971 Fax: 540-231-3860  
[www.sociology.vt.edu](http://www.sociology.vt.edu)

Monday, February 13, 2017

The Program of Women's and Gender Studies (WGS) in the Department of Sociology endorses the undergraduate degree program in Science, Technology, and Society and supports the inclusion of the WGS courses listed below as electives. The Program welcomes the enrollment of additional students in this course, and we acknowledge no additional resources are needed:

**WGS 4704 Gender and Science**  
**WGS 3324 Perspectives on the Biology of Women**  
**WGS 4334 Sexual Medicine**

We are very excited to have these doubly listed options for STS and WGS.

My very best,

A handwritten signature in blue ink, appearing to read "Sharon P. Johnson".

Sharon P. Johnson

Director of WGS

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**Virginia Tech**  
College of Liberal Arts  
and Human Sciences

**Philosophy Department**  
229B Major Williams (0126)  
220 Stanger Street  
Blacksburg, Virginia 24061  
540/231-0639 Fax: 540/231-6367  
E-mail: douglas.lind@vt.edu  
<http://www.phil.vt.edu>

## Memorandum

TO: CLAHS Undergraduate Curriculum Committee  
FROM: Douglas Lind  
Head, Department of Philosophy  
RE: Proposed undergraduate degree program in STS  
DATE: March 21, 2017

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The Department of Philosophy endorses the proposed undergraduate degree program in Science, Technology, and Society (STS) and supports the inclusion of the Philosophy courses listed below as electives. The Philosophy Department welcomes the enrollment of additional students in these courses, and we acknowledge no additional resources are needed.

PHIL 2304: Global Ethics  
PHIL 3324: Biomedical Ethics  
PHIL 4604: Philosophy of Biology

*Douglas Lind*

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VIRGINIA POLYTECHNIC INSTITUTE  
AND STATE UNIVERSITY

**Department of Geography**

College of Natural Resources  
115 Major Williams Hall, Blacksburg, Virginia 24061-0115  
(540) 231-7557 Fax: (540) 231-2089

April 19, 2017

Daniel Breslau  
Science and Technology in Society, 0247  
Virginia Tech

Dear Dr. Breslau,

The Department of Geography is pleased to endorse the undergraduate degree program in Science, Technology, and Society and supports the inclusion of the GEOG courses listed below as electives. The Department welcomes the enrollment of additional students in these courses, and we acknowledge that no additional resources are needed. Specifically, we grant permission to include the following Geography courses as electives:

GEOG 1115-1116 (NR 1115-1116): Seeking Sustainability  
GEOG 3104 Environmental Problems, Population, & Development

Sincerely,

Korine Kolivras  
Associate Professor and Co-Chair