Welcome to STS 1500! This semester we’ll be exploring the idea that, in designing and building technologies, engineers build societies. This means that engineers share responsibility for the character of the world they are building through their technological designs. To elaborate this idea, we’ll consider social and ethical aspects of engineering design oriented around the theme of “Designing for a Sustainable World”

The major project you’ll work on in the course is a Provisional Patent Application that describes a technological innovation that could help the University community make progress toward one of the United Nations Sustainable Development Goals (SDGs) in accord with UVa’s Sustainability Plan and Goals. The UN SDGs focus on root causes of global humanitarian and environmental crises. They are part of a broad and ambitious plan undertaken by all UN member states to end poverty, protect the planet, promote prosperity, and ensure peace and justice for all. The UN
SDGs provide a common set of human values that will inform your work in the course. Inspired by the UN SDGs, your technological innovations will help facilitate socially responsible and sustainable practices among the University community.

To equip you for this task, the course lectures and readings will offer scholarly resources for understanding the intersection of technology, society, and ethics. Meanwhile, the class projects and assignments will give you an opportunity to develop proficiency in the kinds of technical and persuasive communication that professional engineers regularly use.

What knowledge, skills, and values will you develop?

As a result of your work in the course, you will be able to do the following:

- Assess complex engineering problems in terms of their technical, social, and ethical dimensions.
- Recognize the contributions of diverse engineering innovators as well as the capacity of engineering design to express cultural values and influence systems of power and privilege.
- Design innovative technologies that facilitate socially responsible practices that promote aspects of environmental, economic, and social sustainability.
- Implement various processes and practices of technological design and innovation, including iterative design generation, technical description, intellectual property and customer discovery research, and persuasive argumentation.
- Engage in project-oriented teamwork as well as in verbal, visual, and written communication in an engineering context.
- Cultivate an ethical commitment to justice, care, and inclusivity in engineering design and practice.
- Take personal responsibility for managing a weekly learning and work schedule that requires reflection, planning, discipline, self-care, leadership, and accountability.

How will you know you’re making good progress?

You’ll have the opportunity to work on several projects and assignments throughout the semester that give you experience in aspects of engineering design and communication. To pass the course, you are required to complete each assignment satisfactorily. Listed below are the projects and assignments and a breakdown of how each contributes to your course grade.

*Design Notebook (10%) – Record your ideas for 15 new technologies that could help the University community make progress toward the UN SDGs.

*Technical Description (15%) – Choose a simple mechanical device you have at hand, and describe it using text and pictures.

*Design Pitch (5%) – Select a compelling design from your Notebook, and pitch it to a small group of your classmates. Then choose one design to use in the Provisional Patent Application together.

*Provisional Patent Application (25%) – Work with your group to describe what your design looks like, how it functions, and how it improves on prior art.

*Patent Cover Letter (10%) – Persuade the Jefferson Trust that your patent design relates to a particular UN SDG in accord with UVa’s Sustainability Plan and Goals and that it could be implemented at UVa.

Patent Presentation (5%) – Share your patent design with the class, and learn about the designs your classmates have been developing.

*Discussions Posts (10%) – Share your ideas about course materials each week with your classmates.

*Reading Quizzes (15%) – Demonstrate how well you’ve prepared course materials each week so you can get the most out of class lectures and labs.

*Participation (5%) – Assess how consistently and professionally you attend, prepare for, and contribute to class meetings, discussions, workshops, and activities.

Please turn in all written work as a PDF to the appropriate folder under the Assignments tab of your lab (discussion) section Collab site. Both your instructors and peers in the class will be evaluating your work. Here is the grading scale we’ll use for each assignment:
What policies guide our work together?

ATTENDANCE: You should plan to attend every class. If you know you will have to miss a class, send your lab instructor an e-mail before class. If we don’t hear from you within 24 hours of an absence, the missed class will count as unexcused. Each unexcused absence will deduct 5 points from your Participation grade. Please make every effort to schedule job interviews and professional development events for times that do not conflict with class meetings.

ELECTRONICS: You will need a laptop to access course resources and materials and to complete class projects. During lecture meetings, please keep your laptop and phone put away and muted so you are not distracted and don’t distract others. Please plan to take notes by hand. During lab meetings, bring your laptop but keep your phone off and put away. If you are responsible for someone else’s care or are experiencing a family emergency, you may keep your phone on vibrate during class. Unprofessional and/or unethical conduct during class meetings will not be tolerated and will lower your participation grade.

LATE WORK: Ten points per 24-hour period will be deducted for all late work. Work that is more than five days late will not be accepted. If extenuating circumstances prevent you from completing an assignment on time, please speak to lab instructor as soon as possible (ideally in advance) about arranging an extension. Forgetting a due date, writer’s block, poor task/time management, lack of motivation, or falling behind are not valid excuses. Be advised that we may ask you to revise, with a penalty, any work that does not demonstrate professional standards of excellence (including the grammatical accuracy and clarity of your prose); in such cases work will not earn credit until it is revised appropriately.

HONOR CODE: Unless otherwise stated, all the work you submit for this course should be undertaken as an individual. Although we will have group discussions in class, and we encourage you to confer with your colleagues about the readings and your paper topics outside of class, all written assignments should be a product of your own thinking. We trust you to comply fully with all the provisions of the University’s Honor Code. Please pledge all graded assignments. Additionally, please consult the Honor Guidelines for STS Papers on the Library’s STS Thesis Guide Page (https://guides.lib.virginia.edu/ststhesis). Please be aware that we will forward all suspected violations of the Honor Code to the Honor Committee without question and that you may, at our discretion, receive an immediate zero on any assignment we suspect violates the Honor Code regardless of any action taken by the Honor Committee. Let’s work together to uphold the community of trust.
LIBRARY ORIENTATION
UVa has an exceptional library system, including the Brown Library dedicated to science and engineering in Clark Hall. Throughout your four years in the School of Engineering, you will need to use the Science and Engineering Library extensively in order to complete research projects (such as the Patent Application for this course). To help you become familiar with the library system, you will need to complete a required virtual library orientation organized by the STS librarian, Maggie Nunley. We will provide a link to the virtual library tour soon; you will have two weeks to complete it once the link is available. If you already completed a tour of UVa library resources, there will be a place for you to indicate this in the virtual your link. The library tour is a pass/fail course requirement; if you do not complete the library orientation within the allotted two-week period, your course grade may be negatively affected.

LEARNING ACCOMMODATIONS: The University of Virginia strives to provide accessibility to all students. If you require an accommodation to fully access this course, please contact the Student Disability Access Center (SDAC) at (434)243-5180 or sdac@virginia.edu. If you are unsure whether you require an accommodation, or to learn more about their services, you may contact the SDAC at the number above or by visiting their website at https://www.studenthealth.virginia.edu/sdac. If you have been authorized to receive special accommodations by the SDAC, or have any other special needs, please let us know, and provide the appropriate documentation as early as you can.

RELIGIOUS ACCOMMODATIONS: The University of Virginia is committed to providing reasonable accommodations for sincerely held religious beliefs, practices, and observances for students as well as faculty and staff members. If you would like consideration for a religious accommodation on class attendance or academic work, please submit your request in writing to your instructors at least a week in advance. For more information, consult: https://eocr.virginia.edu/religious-accommodations.

SAFETY AND WELLBEING: The University of Virginia is dedicated to providing a safe and equitable learning environment for all students. To that end, it is vital that you know two values that the University and your instructors hold as critically important:

1. Power-based personal violence will not be tolerated.
2. We are all responsible to do our part to maintain a safe learning community on Grounds.

As a result, the School of Engineering and Applied Science proudly serves as a safe space for its students and aims to promote their safety and wellbeing. If you are feeling overwhelmed, stressed, or isolated, there are many people here who are ready and wanting to help. If you wish, you can make an appointment with any of your SEAS faculty, and go to their office to talk in private.

As your instructors, know that we care about you and your wellbeing and stand ready to provide support and resources as we can. You should also be aware that as faculty members,
we are responsible employees, which means that we are required by University policy and federal law to report what you tell us to the University’s Title IX Coordinator.

The Title IX Coordinator’s job is to ensure that reporting students receive the resources and support that they need, while also reviewing the information presented to determine whether further action is necessary to ensure survivor safety and the safety of the University community. If you would rather keep this information confidential, there are Confidential Employees you can talk to on Grounds. The worst possible situation would be for you or your friend to remain silent when there are so many here willing and able to help. ([https://justreportit.virginia.edu/](https://justreportit.virginia.edu/))

If you or someone you know is struggling with gender, sexual, or domestic violence, there are many community and University of Virginia resources available. The Office of the Dean of Students, Sexual Assault Resource Agency (SARA), Shelter for Help in Emergency (SHE), and UVa Women’s Center are ready and eager to help. Contact the Director of Sexual and Domestic Violence Services at 434-982-2774 as necessary.

Alternatively, there are also other University of Virginia resources available. The Student Health Center offers Counseling and Psychological Services (CAPS) for its students ([https://www.studenthealth.virginia.edu/caps](https://www.studenthealth.virginia.edu/caps)). Call 434-243-5150 (or 434-972-7004 for after hours and weekend crisis assistance) to get started and schedule an appointment. If you prefer to speak anonymously and confidentially over the phone, call Madison House’s HELP Line at any hour of any day: 434-295-8255.

What will we be doing in class, and how can you prepare well?

Below is the class schedule, which lists lecture and lab topics, assigned reading, and assignment due dates. Check the class schedule on the Collab syllabus frequently as there may be changes and updates as the semester progresses. *Note that readings in green will NOT be covered on quizzes but will be discussed in class meetings.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Readings</th>
<th>Assignments</th>
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<tbody>
<tr>
<td><strong>Week 1: Aug 23-27</strong></td>
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<tr>
<td>No classes</td>
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2. “Rainergy”  
3. Designing for a Sustainable World RFP (STS 1500 Collab site – Resources – Assignments)  
4. Design Notebook assignment (STS 1500 Collab site – | *Reading Quiz due by 5:00 PM Friday  
*Discussions Post due by 5:00 PM |
<table>
<thead>
<tr>
<th><strong>Design Notebook assigned</strong></th>
<th><strong>Resources – Assignments)</strong></th>
<th><strong>Friday</strong></th>
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<tr>
<td><strong>Week 3: Sept 6-10</strong></td>
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</table>
4. Technical Description assignment (STS 1500 Collab site – Resources – Assignments)  
5. Eisenberg, “Technical Description” | *Reading Quiz due by 5:00 PM Friday*  
*Discussions Post due by 5:00 PM Friday* |
| Lab: Technical Description assigned |                            |           |
| **Week 4: Sept 13-17**     |                            |           |
2. Tatterhall, McMurran, “Hertha Ayrton: A Persistent Experimenter”  
3. “The Fight for Fellowship (Hertha Marks Ayrton) – Objectivity #56:” [https://www.youtube.com/watch?v=Y175lZlYmYU](https://www.youtube.com/watch?v=Y175lZlYmYU)  
*Discussions Post due by 5:00 PM Friday* |
2. The Mandate of Heaven and Confucianism  
4. Design Pitch assignment (STS 1500 Collab site – Resources – Assignments) | *TD Draft due in class for Workshop*  
*Technical Description due (PDF to Collab) by 5:00 PM Sunday 9.26* |
| **Week 5: Sept 20-24**     |                            |           |
2. The Mandate of Heaven and Confucianism  
4. Design Pitch assignment (STS 1500 Collab site – Resources – Assignments) | *Reading Quiz due by 5:00 PM Friday*  
*Discussions Post due by 5:00 PM Friday* |
| Lab: TD Workshop; Design Pitch assigned |                            |           |
| **Week 6: Sept 27-Oct 1**  |                            |           |
| Sustainable 1. Rawls, “Theory of Justice” (summary) | | *Reading Quiz due* |
**Design and Ethics – Justice, Care, and Power**

Lab: Design Pitch; PPA assigned

| 2. van de Poel and Royakkers, “Care Ethics,” pp. 102-105 |
| 3. Fadulu, “The Problem Sunscreen Poses for Dark Skin” |
| 4. PPA assignment (STS 1500 Collab site – Resources – Assignments) |

by 5:00 PM Friday

*Discussions Post due by 5:00 PM Friday

*Design Pitch Form, Design Notebook, and Participation 1 Form due (PDF to Collab) by 5:00 PM Friday, 10.1

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**Week 7: Oct 4-8**

**Sustainable Design and Ethics – Social Responsibility**

Lab: Patent Searching

| 2. Tromp, Hekkert, Verbeek, “Design for Socially Responsible Behavior,” pp. 3-7 only |
| 4. Stim and Pressman, “Describing Your Invention” (chapter 5) |

*Reading Quiz due by 5:00 PM Friday

*Discussions Post due by 5:00 PM Friday

**Week 8: Oct 11-15**

**Sustainable Design and Social Responsibility – Making a Small Dent in the Universe (video)**

Lab: No Classes (Reading Days)

| 1. Saving Lives at Birth – Pumani bCPAP: [https://www.youtube.com/watch?v=b0htibKOxgg](https://www.youtube.com/watch?v=b0htibKOxgg) |

*Watch the video lecture: STS 1500 Collab site – Lecture Capture – Panopto

*View the lecture slides while watching the video lecture: STS 1500 Collab site – Resources – Slides

*Reading Quiz due by 5:00 PM Friday

*Discussions Post due by 5:00 PM Friday

**Week 9: Oct 18-22**

**Sustainable Design and Social Responsibility – Microplastics**

Lab: Customer Discovery

| 1. Holland, “How Laundry is Spilling Plastics into the Ocean” |
| 2. Cernansky, “Fashion’s Dirty Microplastics Secret” |
| 3. United Nations Resolution on Marine Litter and Microplastics |
| 4. Watch Van Jones’s TED Talk on The Economic Injustice of Plastic: [https://www.youtube.com/watch?v=FjvjSlpJoqo](https://www.youtube.com/watch?v=FjvjSlpJoqo) |
| 5. Watch Haaziq Kazi’s TEDx Talk on his innovation to curb marine pollution: [https://www.youtube.com/watch?v=XR3ILQ3y25k](https://www.youtube.com/watch?v=XR3ILQ3y25k) |

*Reading Quiz due by 5:00 PM Friday

*Discussions Post due by 5:00 PM Friday
<p>| Week 10: Oct 25-29 | 1. Hughes, “Second Creation,” pp. 10-11, and “Emerson: Value-Laden Technology,” pp. 37-38 in Human-Built World&lt;br&gt;2. Flanagan, “Embodying Values in Technology,” pp. 322-327 only&lt;br&gt;3. Watch Jeanne Gang’s TED Talk about Polis Station: <a href="https://www.youtube.com/watch?v=E_fB_s_TCSk">https://www.youtube.com/watch?v=E_fB_s_TCSk</a> (start at 7:00) If the link doesn’t work, type “Jeannie Gang Buildings that blend nature and city” into the YouTube Search field&lt;br&gt;4. Read about Polis Station: <a href="https://studiogang.com/project/polis-station">https://studiogang.com/project/polis-station</a> | *Reading Quiz due by 5:00 PM Friday&lt;br&gt;*Discussions Post due by 5:00 PM Friday |
| Sustainable Design and Values – Ancient Pagodas | <strong>Lab:</strong> UVa Chapel&lt;br&gt;1. Hughes, “Second Creation,” pp. 10-11, and “Emerson: Value-Laden Technology,” pp. 37-38 in Human-Built World&lt;br&gt;2. Flanagan, “Embodying Values in Technology,” pp. 322-327 only&lt;br&gt;3. Watch Jeanne Gang’s TED Talk about Polis Station: <a href="https://www.youtube.com/watch?v=E_fB_s_TCSk">https://www.youtube.com/watch?v=E_fB_s_TCSk</a> (start at 7:00) If the link doesn’t work, type “Jeannie Gang Buildings that blend nature and city” into the YouTube Search field&lt;br&gt;4. Read about Polis Station: <a href="https://studiogang.com/project/polis-station">https://studiogang.com/project/polis-station</a> | *Reading Quiz due by 5:00 PM Friday&lt;br&gt;*Discussions Post due by 5:00 PM Friday |
| Sustainable Design and Social Responsibility – Social Justice / Social Media | 1. Ramirez, The Alchemy of Us, “Captured,” pp. 108-119 only&lt;br&gt;2. Polaroid Revolutionary Workers Movement&lt;br&gt;3. Blaise, “Lina Ben Mhenni”&lt;br&gt;4. PPA Cover Letter assignment (STS 1500 Collab site – Resources – Assignments)&lt;br&gt;5. PPA Presentation assignment (STS 1500 Collab site – Resources – Assignments) | *Reading Quiz due by 5:00 PM Friday&lt;br&gt;*Discussions Post due by 5:00 PM Friday |</p>
<table>
<thead>
<tr>
<th>Lab: Presentations</th>
<th>Scenes” <a href="https://www.youtube.com/watch?v=ChZotngQ3_8&amp;feature=youtu.be">https://www.youtube.com/watch?v=ChZotngQ3_8&amp;feature=youtu.be</a></th>
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<tbody>
<tr>
<td>5. Watch the “Everything is Awesome” clip from <em>The LEGO Movie</em> (2014): <a href="https://www.youtube.com/watch?v=9cQgQlMlwWw">https://www.youtube.com/watch?v=9cQgQlMlwWw</a></td>
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**Friday**

- **PPA Presentation** Form due (PDF to Collab) by 5:00 PM Friday, 11.19

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**Week 14: Nov 22-26**

- **No classes** – Thanksgiving

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**Week 15: Nov 29-Dec 3**

- **Sustainable Design and Engineering Leadership**

- **Lab: Presentations**

- 1. Pritchard, “Responsible Engineering: The Importance of Character and Imagination

- **Friday**

  - *Reading Quiz due by 5:00 PM Friday*
  - *Discussions Post due by 5:00 PM Friday*
  - **PPA Presentation** Form, **Participation 2 Form**, and **PPA + Cover Letter** due (PDF to Collab) by 5:00 PM Friday, 12.3

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**Week 16: Dec 6-10**

- **No classes**

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**Who are your instructors?**

The course is team-taught and has two primary instructors and two teaching associates. We are all here to help you succeed in the course and are eager to get to know you. So please reach out, and feel free to talk anytime.

**Instructor**

W. Bernard Carlson, PhD
Joseph L. Vaughan Professor of Humanities
wc4p@virginia.edu
Office Hours: Thornton A220, Wed 11:00 AM-12:00 PM, and by Zoom appointment: [https://virginia.zoom.us/j/96533206322?pwd=YWVwMXEyQU45TTlqMUY2OGZ5aEMyQT09](https://virginia.zoom.us/j/96533206322?pwd=YWVwMXEyQU45TTlqMUY2OGZ5aEMyQT09)
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https://virginia.zoom.us/j/96572689858?pwd=Z1I3Yj90U3VjdjFaVDN6N3I3WE1hdz09

Teaching Associates
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Lecturer
pgw3j@virginia.edu
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https://virginia.zoom.us/j/95131856864?pwd=TDFiY1pKYy8rUE43Tyt6d3VmaGQ0UT09

Matt Henderson
Lecturer
mwh3x@virginia.edu
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https://virginia.zoom.us/j/95054674569?pwd=UUYxNzZIc29uZWlrdDNnNTJnWmc4dz09