

GREENER SOLUTIONS – A SAFER DESIGN PARTNERSHIP

Greener Solutions is a project-based, experiential learning course that pairs interdisciplinary student teams with a partner organization in a search for safer alternatives to hazardous chemicals or materials in a product or manufacturing process.

We assemble interdisciplinary teams of UC Berkeley graduate students and advanced undergraduates from chemistry, environmental health sciences, toxicology, and engineering. Working with their partner organization, the student teams identify alternative chemistries or materials through a bio-inspired design process. They conduct a comparative hazard assessment of the relative safety of their proposed solutions, and they evaluate their solutions according to technical performance, hazard, exposure potential, and feasibility. At the end of the semester, student teams present their findings in a final report and presentation that together create an “opportunity map” for their partner organization.

Project design

Project challenges are designed around a hazardous chemical ingredient or process, the current "bad-actor" that you are seeking to eliminate from a specific application. The challenge should be scoped to fit a 14-week academic semester and should not require laboratory work. Greener Solutions faculty will work with you to refine a challenge to match it with the structure and format of the course. We select new challenges each year. Past challenges include:

Challenge	Partner(s)
Alternatives to formaldehyde in permanent press fabric	Levi Strauss & Co.
Safer preservatives for personal care products	Seventh Generation, Method
Alternatives to spray polyurethane foam insulation	General Coatings, DTSC
Inherently safer cross-linkers for 3D printing resins	Autodesk
Safer colorants for polymer furniture	Steelcase
Inherently mosquito-repellent clothing	Patagonia
Biodegradable pigments for marine coatings	Mango Materials
Durable water-repellent coating for outerwear	W. L. Gore
Biobased treatments for mycelium “leather”	MycoWorks
Safer UV blockers for sunscreen and roofing materials	Method, Oakland Ecoblock
Bio-based packaging to prevent ocean contamination	Method
Safer solvents in synthetic leather production	Nike
Removing PFAS from carpet during recycling	DTSC
Replacing PFAS in food and product packaging	Method
Safer alternatives for after-market stain-repellent treatments	DTSC

Partner time and effort

Partner organizations typically spend ~1 hour/week on the project, distributed over the 14-week semester. We ask you to be available for the following:

- Initial 30-min presentation of the challenge, in-person or remotely (Tues, 9/2/25)
- Consultation with student team by phone or on Zoom approximately 2x/month
- Occasional interim email correspondence with student team
- Review of student deliverables (e.g., scope of work, initial strategy list, hazard assessment, single strategy presentation), including providing targeted feedback as needed
- Attendance at the final student presentations, in-person or remotely (Tues 12/9/25)

Financial commitment

Financial contribution is not required for participation as a partner organization, however Greener Solutions is fully funded by grants and by donations from partner organizations. We ask companies to contribute \$10,000 - \$30,000 depending on company size. Non-profit organizations are not expected to provide financial support to the program.

Non-disclosure agreements

As a public university, we design only pre-competitive challenges so that students can present and publish their work, and so that their solutions can be used to improve the chemical safety and sustainability across many different companies in an industry sector. For these reasons, challenges for the Greener Solutions course are designed to be conducted without non-disclosure agreements.

However, the work completed during the semester often generates subsequent projects, which our students have continued to pursue through our Greener Partnerships intern program, or other paid internships and collaborations with partner organizations. Those follow-on projects may include the use of non-disclosure agreements.

More information

- See past projects: <https://bcgc.berkeley.edu/greener-solutions/>
- Propose a challenge: <https://forms.gle/M8Wi6dh5yBDhCZ4i6>
- Contact: Megan Arnett marnett@berkeley.edu, Meg Schwarzman mschwarzman@berkeley.edu, or Billy Hart-Cooper hartcoop@gmail.com