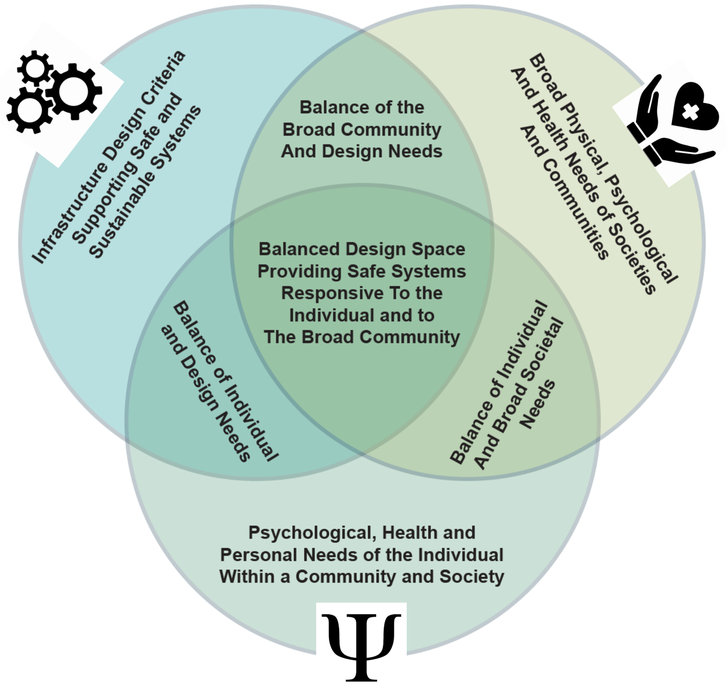
Intersection of Design and Society

Andrew Crawford (Tarleton State student, Mechanical Engineering/Eng. Technology
London Knight (West Texas A&M student, Health Science)
Jeff Hatala, PhD (West Texas A&M University, Health Science)
Celeste Riley, PhD (Texas A&M University-Kingsville, Psychology)
James Nelson, PhD, PE (Texas A&M University System)

Course Goal

To develop an interdisciplinary understanding of the necessary balance between the needs of society, individual psychological needs, and design through a problem-based project to improve intrastate mobility and healthcare access in a sustainable manner.



Course Project

Design a rapid rail system connecting proposed health resources in South Texas, develop stations using Restorative Design elements, and demos sustainability with positive ROI.

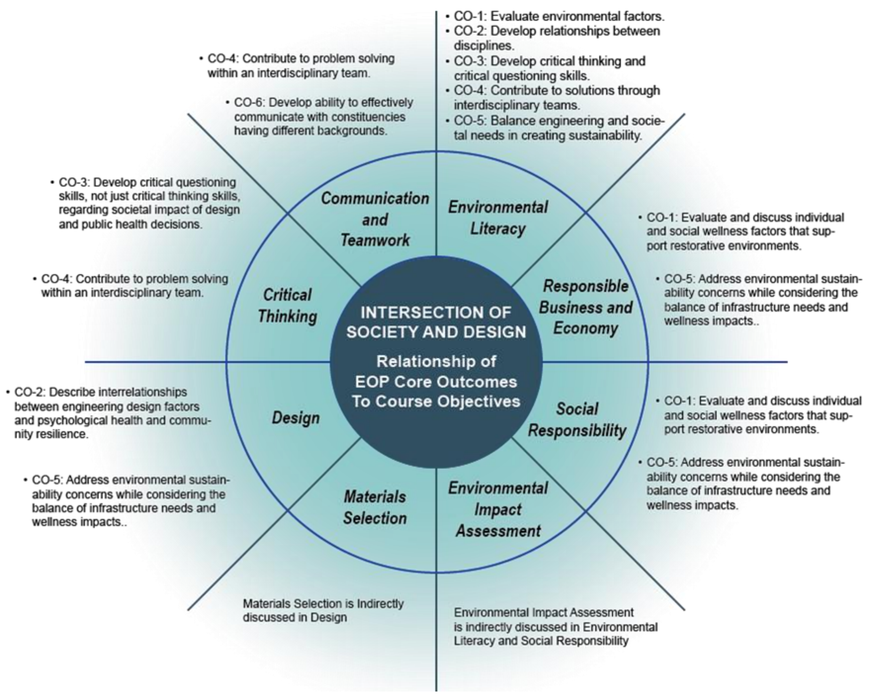
Engineering students enhance understanding of societal and wellness perspectives that impact sustainable design decisions

Non-engineering students develop a perspective of the technical issues involved in advancing society

All students:

- Enhance cross-disciplinary communication skills
- Manage team culture and workflow
- Balance economic, wellness, and sustainability goals in design decisions

EOP Outcomes and Course Objectives



Course Flow

Introductory Scaffolding

Restorative Cities Model [2]

Teaming and Project Planning

Level	Task	Owner	Dependencies	Start Date	Finish Date
1	Framework				
1.1	Project Charter	All		8-Sep-24	24-Sep-24
1.1.1	*Project Charter Revisions*	London, Tori	task 1.1	1-Oct-24	17-Oct-24
1.2	Proposed Route	Garrett, Yadira	task 1.4	1-Oct-24	8-Oct-24
1.3	Population Research	Garrett		1-Oct-24	8-Oct-24
1.4	RFP First Draft	All	tasks 1.1-1.5	1-Oct	10-Oct
1.4.1	*Essay*	Yadira	tasks 1.1-1.5	1-Oct	10-Oct
1.4.2	*Presentation*	London	tasks 1.1-1.5	1-Oct	10-Oct
1.5	Final Proposal	All	All tasks	1-Oct	3-Dec
1.5.1	*Essay*	Yadira, Garrett	All tasks	1-Oct	3-Dec
1.5.2	*Presentation*	Tori, London	All tasks	1-Oct	3-Dec

WEEK 1 (October 7-13): M T W Th F S Su
WEEK 2 (October 14-20): M T W Th F S Su

Phase I: Preliminary Concept Development

- RFP introduction
- Quantification of community impact and economic benefit
- Concept presentation emphasizing restorative design

Phase II: Refine Preliminary Concept and Project Schedule

- Stakeholder identification and participatory design
- Identification of public health needs
- Refinement of community impact and economic estimates
- Oral presentation and justification of concepts

Progress and Continued Development

Summer and Fall 2024

- The course was developed and offered with three interdisciplinary teams and an “engineering consulting team” supporting the teams.
- An interdisciplinary symposium was conducted to generate awareness of and interest in sustainability
- Student learning outcomes were assessed via retrospective pre-post survey

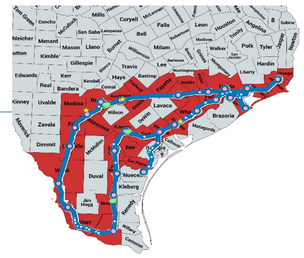
Future Semesters

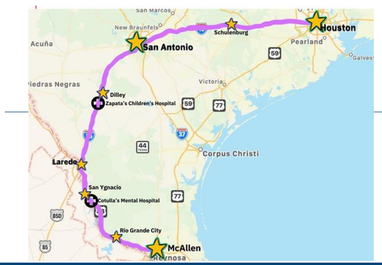
- Ongoing communication with academic advisors to increase enrollment across all engineering sub-disciplines
- Add Political Science into the course to highlight interplay of social justice, policy, sustainable design, and health factors

Evaluation and Impact

End of course survey highlights

- 58% of students agreed or strongly agreed that the course project increased appreciation for interdisciplinary collaboration in sustainable design projects
- Of the three majors represented, engineering students most strongly agreed that the course improved interdisciplinary communication skills.





References

[1] ASEE, "Engineering One Planet," 2024. [Online]. Available: https://engineeringforoneplanet.org/. [Accessed September 2024].
[2] J. Roe and L. McCay, Restorative Cities: Urban Design for Mental Health and Wellbeing, London: Bloomsbury Publishing PLC, 2021

Acknowledgements

The authors gratefully acknowledge the ASEE EOP Initiative and The Texas A&M University System for their support of this effort.