RED Capabilities List for Engineering Education

The RED Team has settled on twelve core capabilities that are essential for well-being in engineering education. These capabilities are also adaptable to other higher education contexts.

Core Capabilities	
A. Physical, Mental & Spiritual Well-Being	This capability refers to the overall well-being of individuals that is the foundation for human thriving. It includes the ability to be in good physical and mental health and/or pursue activities that improve physical, mental and spiritual wellbeing. It also encompasses freedom from disturbances or structural factors that undermine physical, mental, and spiritual wellbeing.
B. Security, Shelter & Space	The ability of individuals to access shelter and spaces that are secure and safe, and freedom from fear in one's living and learning environment. It also includes the ability to have influence on potential changes to shelter and space situations, including seasonal housing policies.
C. Professional and Life Skills	The ability to acquire the knowledge and experiences that enable students to participate fully in society. Higher education creates opportunities for students to obtain and sustain a vocation or meaningful employment that supports themselves and their families. This capability includes continuously acquiring and refining skills, knowledge, and experiences essential for professional growth including leadership, and communication skills. It also includes skills that enable their personal growth in other areas of life, such as financial management, housing, etc.
D. Control Over One's Resources	This capability refers to the ability to control one's own personal resources, including time, money, and information. This capability is foundational to other capabilities, including the development of knowledge and skills and participation in political and governance processes.
E. Participate in Political and Governance Processes	The ability to have a voice in higher education institutions. This includes the ability to provide input into campus-wide policies and departmental curricula. It may also refer to having a voice in larger political movements. The capability approach emphasizes self-determination as a key functioning that is central to freedoms in other areas of life.
F. Relationships & Belonging	The ability to sustain meaningful social relationships on campus with peers, professors, and staff, in addition to off-campus relationships, such as family and friends. The ability to experience respect from others on campus, give respect in return, and be treated with dignity. The ability to find belonging amongst ones peers. Belonging and dignity are foundational to human flourishing.
G. Emotional Integrity & Security	The freedom to engage with emotions and express them in a genuine, vulnerable way both inside and outside the classroom. Emotional integrity and security is essential to human wellbeing and supports emotional self-expression, allowing individuals to develop a sense of integrity and authentic selfhood.
H. Judgment, Ethics & Wisdom	The ability to exercise good judgment over the ethics of a given scenario. The ability to understand the appropriateness of a particular solution or intervention for a given context. The ability to develop wisdom, which is a sense of discernment that is developed over time and experience.
I. Knowledge & Skill	The ability to develop and practice disciplinary and interdisciplinary knowledge and skills. The ability to access necessary information and resources. Developing a theoretical understanding and/or implement a practical application of a particular knowledge area. The ability to choose how to deploy knowledge in different contexts.
J. Imagination & Creativity	The ability to express your own ideas and explore beyond what you currently know. The ability to apply knowledge in new and different ways or contexts. The ability to create something new.
K. Adaptability, Vulnerability & Thriving	The ability to be adaptable and thrive in uncertain conditions. In a rapidly changing world, navigating uncertain futures requires adaptability. Opportunities for students to thrive requires a balance between vulnerability (which creates the conditions for change) and structural support (which provides safety). The experience of overcoming obstacles or setbacks increases one's confidence in future adaptability.
L. Engagement with Society and the World	The ability to apply knowledge in real world contexts, understand social, cultural, political contexts of one's work, and develop knowledge and skills related to sustainable practices. The ability to make an impact with one's contributions.

Capability Statements

The core capabilities can be tailored for different contexts by adding specific “capability statements”. This is an example of a set of capability statements we used in a focus group with students to explore what capabilities they value most in engineering education.

A. Physical, Mental, and Spiritual Wellbeing	1. In work or play Bucknell students should be able to stay free from physical injury or illness.
	2. It is important for Bucknell students to be able to be healthy, exercise regularly, and eat nutritious foods.
	3. It should be a priority that Bucknell students do not experience bullying, harassment, sexual harassment and/or assault.
B. Security, Shelter and Space	4. Bucknell facilities should be open enough that students can access them at convenient times.
	5. All spaces and buildings on Bucknell's campus should be inclusive and welcoming to students.
	6. Bucknell students need to have ready access to safe, affordable housing.
C Professional and Life Skills	7. Bucknell should provide students the opportunity to learn how to communicate effectively and persuasively.
	8. A priority of Bucknell should be that students obtain a meaningful career after graduation.
	9. Bucknell students should be able to obtain relevant, employer-recognized credentials in college (i.e. internships, P.E. licenses, etc.).
	38. Bucknell students should have the opportunity to manage a project.
D. Control One’s Resources	10. Bucknell should be affordable enough that students can avoid long-term indebtedness in pursuing their education.
	11. There should be enough flexibility that all Bucknell students can select a course schedule that meets their personal needs.
	12. Bucknell students should have the time and resources to engage in leisure activities.
E. Participate in Political and Governance Processes	13. Each student should be able to give meaningful feedback about their curriculum and degree program at Bucknell.
	14. Bucknell should provide students the freedom to engage in political activism without restrictive repercussions.
	15. Bucknell students need to have the opportunity to be informed about and provide input into campus policies.
F. Relationships & Belonging	16. Bucknell students need opportunities and support to build friendships, trust, and belonging amongst their peers on campus.
	17. Bucknell engineering students need regular access to mentoring from engineering faculty and practitioners.
	18. Bucknell students need sufficient time and resources to maintain connections with family and close friends.
G. Emotional Integrity and Security	19. Bucknell students' lives should be as free as possible from emotional disturbance and dysfunction.
	20. Bucknell students need space, time, and support to manage and work through emotional issues.
	21. Bucknell should offer students opportunities to bring their personal passions into study and work.
	22. Bucknell students should learn about engineering's cultural values and learn their limitations and blind spots.

H. Judgement, Ethics, and Wisdom	23. It is not just enough to have a class, students need regular opportunities to learn and practice engineering ethics.
	24. It is important that Bucknell's curriculum teach students how to learn, access, and evaluate information (information literacy).
I. Knowledge and Skill	25. Bucknell courses should provide students regular opportunities to practice engineering reasoning: mathematical, spatial, temporal, logical, qualitative.
	26. Bucknell students should learn about other disciplines during their time in college.
	27. All Bucknell students need opportunities to develop and use technical skills such as programming.
	37. Bucknell's classes and activities should provide students the opportunity to work effectively in a group to accomplish goals.
J. Imagination and Creativity	28. Bucknell courses should give students multiple opportunities to transfer learning to different contexts and situations.
	29. Bucknell students need opportunities to be creative, both within and outside of educational contexts.
	30. Bucknell engineering students need to be able to regularly access and receive training on tools and technology (e.g., test equipment, maker spaces).
K. Adaptability, Vulnerability, and Thriving	31. Bucknell students should be given flexibility to accommodate life circumstances outside of the university (i.e. family emergencies, etc.).
	32. Bucknell should help students manage the transition from college to adulthood (i.e. learning about personal finances, housing, insurance, etc.)
	33. Bucknell should focus on helping students develop the mindset to continue learning throughout their life.
L. Engagement with Society and the World	34. Every Bucknell engineering student needs a chance to work on a "real world" project that is grounded in a relevant social and political context.
	35. All Bucknell students should have an opportunity to learn sustainable practices.
	36. Bucknell engineering students need to be able to take advantage of study abroad, service learning, or community development opportunities.