2027 CEEA-ACÉG Themes and Descriptions

This document outlines the list of CEEA- ACÉG themes and descriptions that aim to assist authors in describing their work. Each theme in this list is not intended to serve as separate session titles in the conference, necessarily, and is used primarily as a guide to shape the conference program. We suggest authors pick 2-3 themes that best describe their work.

- ***Special 2027 Theme*: Building Bridges between engineering education and practice, policy, and community needs.**
- ***Special 2027 Theme*: Classroom strategies that foster collaboration and develop engaged, responsible, resilient and socially responsive engineers.**
- ***Special 2027 Theme*: Decolonization and incorporation of Indigenous voices and ways of knowing in engineering education.**

- **NEW: AI & Emerging Technologies**
    - Submissions in this category focus on the applications, implications, and impacts of artificial intelligence and other emerging technologies in engineering education. Examples of topics include but are not limited to:
        - Generative AI and large language models
        - AI-supported teaching and learning
        - AI literacy and competencies
        - Human-AI collaboration
        - Academic integrity and assessment in the context of AI
        - Ethical and responsible uses of AI
        - Impacts of AI on student learning and professional identity formation
        - Institutional and curricular responses to technological change
        - Other emerging technologies in engineering practice and their implications for engineering education
- **NEW: Well-being**
    - Submissions in this category focus on student, staff and faculty well-being in the engineering education context, including the factors that shape well-being

and approaches or initiatives designed to support healthier and more sustainable educational experiences. Examples of topics include but are not limited to:

- Resilience, well-being and mental health
- Workload, academic pressures and work-life balance
- Belonging and community
- Experiences of stress and burnout
- Well-being in diverse academic and social experiences
- Support services, advising and mentorship
- Institutional and disciplinary culture intersections with well-being
- Organizational practices and supports that shape student and educator well-being

- **Program Evaluation & Accreditation**
  - Submissions in this category focus on the evaluation, improvement, and accreditation of engineering education programs by examining approaches to program assessment, quality assurance, continuous improvement, and educational change. Examples of topics include but are not limited to:
    - Accreditation processes and outcomes
    - Graduate attributes and competencies
    - Curriculum mapping
    - Program-level assessment and program review
    - Continuous improvement processes and data-informed decision making
    - Implementation of curricular and organizational change and change management
    - Program innovation impact evaluation
- **Instruction & Pedagogy**
  - Submissions in this category focus on approaches to teaching and facilitating learning in engineering education by examining pedagogical practices, learning environments, instructional innovations, and educator development. Examples of topics include but are not limited to:

        - Pedagogical models and teaching strategies
        - Experiential and active learning
        - Lab-based learning
        - Learning environment design
        - Educational technology and open educational resources (OER)
        - Lifelong learning
        - Humanities and arts-based approaches in engineering education
        - Transdisciplinary and interdisciplinary approaches
- **Engineering Design**
    - Submissions in this category focus on the role of engineering design in engineering education by examining pedagogical approaches, curricular innovations, assessment practices, and student learning related to engineering design. Examples of topics include but are not limited to:
        - Problem definition and ideation
        - Creativity and innovation
        - Modeling, prototyping and testing
        - Human- and user-centered design
        - Multidisciplinary and interdisciplinary design
        - Cornerstone and capstone design experiences
        - Design teams and design competitions
- **First Year Programs**
    - Submissions in this category focus on the design, delivery, and evaluation of first year engineering education and the experiences of students transitioning into engineering programs. Examples of topics include but are not limited to:
        - First year curriculum and program design
        - Introductory engineering courses & design experiences
        - Student transition and adjustment
        - Academic and social integration
        - Early development of engineering identity
        - Student success within the first year community
        - Advising and academic supports for first year students

    - Common versus discipline-specific first year models
    - Innovations in first year teaching and learning
- **Student Learning & Development**
    - Submissions in this category focus on how engineering students learn and develop, including the processes, theories, and factors that shape learning and development across their educational journeys, including early undergraduate, senior undergraduate and graduate student experiences. Examples of topics include but are not limited to:
        - Cognitive, behavioural, social, and situated perspectives on learning
        - Adult learning and developmental theories
        - Motivation and self-efficacy
        - Engineering identity development
        - Epistemological development
        - Metacognition and self-regulated learning
        - Development of knowledge, skills, and attitudes
- **Curriculum Design**
    - Submissions in this category focus on the design and organization of engineering curricula at the activity, course, program, or broader curricular level. Examples of topics include but are not limited to:
        - Models and frameworks for curriculum design
        - Selection and sequencing of content and learning experiences
        - Curriculum integration and coherence
        - Interdisciplinary and transdisciplinary curricula
        - Balancing technical and professional learning
        - Curriculum design to meet specific educational or professional needs
- **Recruitment & Retention**
    - Submissions in this category focus on factors, practices, and initiatives that influence recruitment and persistence within engineering education. Examples of topics include but are not limited to:
        - Pathways into engineering
        - Recruitment and admissions practices

        - Student decision-making and choice of engineering programs or disciplines, access and participation
        - Persistence and attrition
        - Retention initiatives
        - Transitions between programs or institutions
        - Institutional strategies for supporting student progression and completion
- **Outreach & Community Engagement**
    - Submissions in this category focus on engagement between engineering education and communities beyond formal engineering programs, emphasizing partnerships and opportunities to connect engineering with the broader public. Examples of topics include but are not limited to:
        - Community-engaged and service learning
        - Community-based engineering projects
        - K-12 engineering initiatives
        - Partnerships with community organizations
        - Public engagement with engineering
        - Informal and extracurricular outreach initiatives
        - Participatory and co-designed approaches
        - Initiatives that broaden awareness of and participation in engineering
- **Social and Environmental Impact & Sustainability**
    - Submissions in this category focus on how social and environmental impacts, sustainability, and related responsibilities are understood and addressed in engineering education. Examples of topics include but are not limited to:
        - Sustainability education and competencies
        - Climate change and climate action
        - Sustainable and regenerative design
        - Lifecycle thinking
        - Social and environmental impacts of engineering decisions
        - Environmental stewardship and impact mitigation
        - Responsible innovation

    - The Sustainable Development Goals

- **Equity, Diversity & Inclusion**
    - Submissions in this category focus on equity, diversity, inclusion, and belonging within engineering education, including the experiences, structures, practices, and cultures that shape participation and opportunity. Examples of topics include but are not limited to:
        - Access, participation and representation
        - Accessibility, inclusion and belonging
        - Identity and intersectionality
        - Systemic barriers within engineering education
        - Inclusive teaching and learning practices
        - Institutional and disciplinary cultures
        - Critical, liberatory, and emancipatory approaches to instruction, assessment, curriculum, and student development
        - Broader policies and initiatives aimed at creating more equitable and inclusive engineering education and work environments
- **Professional Skills**
    - Submissions in this category focus on the development, teaching, and learning of professional skills and capabilities that prepare engineering students for professional practice. Examples of topics include but are not limited to:
        - Communication: developing students' ability to communicate engineering knowledge effectively and credibly across audiences, purposes, and contexts
        - Leadership: developing leadership capabilities across individual, team, organizational, and societal contexts
        - Entrepreneurship: developing students' capacity to recognize opportunities, create value, navigate uncertainty, and engage in innovation

        - Ethics: developing students' capacity for ethical reasoning, decision-making, professional responsibility, and consideration of stakeholder impacts
        - Systems thinking: developing students' capacity to understand complexity, recognize interconnections, and consider the broader contexts and consequences of engineering decisions
- **Professional Practice & Industry Engagement**
    - Submissions in this category focus on professional engineering practice and connections between industry and engineering education. Examples of topics include but are not limited to:
        - Career choices and pathways
        - Engineering workplace culture
        - Employer and professional practices
        - Cooperative education, internships and work-integrated learning
        - Industry-academic partnerships
        - Workplace learning
        - Safety and risk management and quality assurance
        - Project management
        - Intersections between engineering practice, government, and policy
- **History & Philosophy of Engineering Education**
    - Submissions in this category offer historical and philosophical perspectives on engineering and engineering education, including their ontological and epistemological development as disciplines. Examples of topics include but are not limited to:
        - History and evolution of engineering education
        - Historical and philosophical perspectives on engineering practice and the engineering profession
        - Philosophies of engineering and technology
        - Purposes and aims of engineering education
        - The nature of engineering knowledge and ways of knowing
        - Disciplinary values and assumptions

- **Research Methods**
    - Submissions in this category focus on explorations of specific research methods, methodologies, and data collection and analysis approaches and their use in engineering education research. Examples of topics include but are not limited to:
        - Quantitative, qualitative, and mixed-methods approaches
        - Instrument development and validation
        - Approaches to data collection and analysis
        - Participatory and community-engaged methods
        - Methodological adaptations for engineering education contexts
        - Innovative and emerging research methods
        - Critical and reflective examinations of research methods and methodological practices
- **Student Assessment**
    - Submissions in this category focus on the assessment of student learning in engineering education by examining assessment practices, tools, and their relationships to student learning and educational outcomes. Examples of topics include, but are not limited to:
        - Formative and summative assessment
        - Authentic assessment
        - Grading practices and rubrics
        - Feedback
        - Competency-based assessment
        - Peer and self-assessment
        - Academic integrity
        - Use of emerging technologies in assessment