1. Assessment

1.a. Organizational assessment
1.b. Professional licensure
   1.b.i. Chartered engineer
   1.b.ii. Professional engineer
       1. Fundamentals of Engineering exam
1.c. Program evaluation
   1.c.i. Accreditation
       1. ABET
       2. Criteria
   1.c.ii. Advisory boards
   1.c.iii. Course assessment
   1.c.iv. External evaluation
   1.c.v. Multilevel program assessment
1.d. Student assessment
   1.d.i. Assessment tools
       1. Feedback
           a. 360 degree
       2. Grades
           a. Automated grading
           b. Grading systems
           c. Inflation
       3. Concept Inventory
   4. Portfolios
   5. Rubric
   6. Test format [syn: Exam format]
       a. Multiple choice
       b. Open ended tests
       c. Practical examinations [syn: Clinical examinations]
       d. Standardized
   1.d.ii. Knowledge gain
   1.d.iii. Knowledge retention
   1.d.iv. Performance
   1.d.v. Method
       1. Continuous
       2. Diagnostic
       3. Formative
       4. Peer review
       5. Outcomes based assessment
       6. Self assessment
       7. Summative
   1.d.vi. Setting
       1. Individual
       2. Group
       3. Online
       4. Workplace

2. Design

2.a. Design practice
   2.a.i. Ideation
   2.a.ii. Information gathering
   2.a.iii. Modeling
       1. Physical modeling
           a. 3D modeling
           b. Computer-aided design
           c. Prototyping
               i. Rapid prototyping
       2. Process modeling
           a. Flowcharting
   2.a.iv. Needs analysis
   2.a.v. Problem definition
   2.a.vi. Product testing
2.b. Design projects
   2.b.i. Capstone projects [syn: Senior projects, Senior design]
   2.b.ii. Design competitions
   2.b.iii. Multidisciplinary design
2.c. Design process
   2.c.i. Human centered design [syn: User centered design]
   2.c.ii. Product archaeology [syn: Product dissection, Reverse engineering]
   2.c.iii. Product development
2.d. Design thinking
3. Diversity

3.a. Diversity concerns
   3.a.i. Bias
   3.a.ii. Discrimination
   3.a.iii. Equity
   3.a.iv. Inclusivity
   3.a.v. Multiculturalism
   3.a.vi. Student diversity
   3.a.vii. Underrepresentation [syn: Underrepresented students]
   3.a.viii. Workplace diversity

3.b. Types of diversity
   3.b.i. Gender
      1. Female [syn: Women, Girls]
      2. Male
      3. Transgender
   3.b.ii. Individual differences
      1. Learning styles
      2. Personality types
   3.b.iii. Nontraditional students
      1. Commuter students
      2. Part time students
      3. Transfer students
      4. Veterans
   3.b.iv. Race/Ethnicity
   3.b.v. Sexual orientation
   3.b.vi. Student background
      1. First generation
      2. International students
      3. Socioeconomic status
   3.b.vii. Students with disabilities

4. Educational level

4.a. Continuing education
4.b. Graduate education [syn: Postgraduate]
   4.b.i. Graduate
      1. Master's students
      2. PhD students [syn: Doctoral students]
   4.b.ii. Supervision
4.c. Higher education [syn: College, University]
4.d. P-12 [syn: P12, K-12]
   4.d.i. Elementary school [syn: Primary school]
   4.d.ii. High school
      1. Advanced Placement courses
      2. Pre college preparation
   4.d.iii. Middle school
   4.d.iv. Preschool
   4.d.v. Pre-engineering
4.e. Postdoctoral studies
4.f. Undergraduate
   4.f.i. First year [syn: Freshmen, Freshman]
      1. First year curriculum
      2. First year experience
   4.f.ii. Junior
   4.f.iii. Senior
   4.f.iv. Sophomore
5. Educational setting

5.a. Engineering curriculum

5.b. Engineering fields
   5.b.i. Aerospace engineering
   5.b.ii. Architectural engineering
   5.b.iii. Biomedical engineering
   5.b.iv. Chemical engineering
   5.b.v. Civil engineering
   5.b.vi. Computer engineering
   5.b.vii. Computer science
   5.b.viii. Construction engineering
   5.b.ix. Electrical engineering
   5.b.x. Engineering technology
   5.b.xi. Environmental engineering
   5.b.xii. Information technology
      1. Green engineering
      2. Sustainability
   5.b.xiii. Industrial engineering
   5.b.xiv. Manufacturing
   5.b.xv. Materials science and engineering
   5.b.xvi. Mechanical engineering
   5.b.xvii. Ocean engineering [syn: Marine engineering]
   5.b.xviii. Nuclear engineering

5.c. Informal learning [syn: Outreach]

5.d. Institution type
   5.d.i. Baccalaureate institutions
   5.d.ii. Community colleges
   5.d.iii. Doctoral institutions
   5.d.iv. Hispanic serving institutions (HSIs)
   5.d.v. Historically black colleges/universities (HBCUs)
   5.d.vi. Master's institutions
   5.d.vii. Single gender campuses
   5.d.viii. Technical colleges
   5.d.ix. Tribal colleges

5.e. Learning environment
   5.e.i. Classroom
   5.e.ii. Co-curricular
   5.e.iii. Extracurricular
   5.e.iv. Honors programs
   5.e.v. International programs
   5.e.vi. Laboratory
   5.e.vii. Learning communities
   5.e.viii. Studio
   5.e.ix. Undergraduate research

6. Educational technology [syn: E-learning]

   6.a.i. Games
   6.a.ii. Educational software

6.b. Electronic communication
   6.b.i. Blog
   6.b.ii. Email
   6.b.iii. Groupware
   6.b.iv. Instant messaging
   6.b.v. Online discussions
      1. Web discussions [syn: Chat]
      2. Wikis
   6.b.vi. Online repositories
   6.b.vii. Social media
   6.b.viii. Streaming Media
      1. Streaming audio [syn: Podcast]
      2. Streaming video

6.c. Learning technology
   6.c.i. Adaptive computer learning
   6.c.ii. Learning management systems
   6.c.iii. Personal response system [syn: Clicker]
   6.c.iv. Simulation
   6.c.v. Mobile applications
   6.c.vi. Pen and touch devices
   6.c.vii. Virtual reality

6.d. Learning modality
   6.d.i. Blended learning
   6.d.ii. Distance learning
      1. Asynchronous
      2. Massive Open Online Classes (MOOCs)
      3. Synchronous
   6.d.iii. Remote laboratory [syn: Virtual laboratory]
7. Instruction

7.a. Conceptual learning [syn: Conceptual change]
   7.a.i. Concept inventories
   7.a.ii. Concept maps
   7.a.iii. Misconceptions
   7.a.iv. Preconceptions
   7.a.v. Threshold concepts

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7.a.v. Threshold concepts

7.b. Faculty [syn: Instructors]
   7.b.i. Faculty attitudes
   7.b.ii. Faculty development [syn: Educational development]
      1. Pedagogical content knowledge
      2. Reflective practice
      3. Teaching skills
   7.b.iii. Instructional role
      1. Adjunct
      2. Advisor
      3. Graduate teaching assistant
      4. Instructor
      5. Peer teaching assistant
   7.b.iv. Teaching philosophies
   7.b.v. Team teaching

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   7.b.v. Team teaching

7.b.v. Team teaching

7.c. Institutional change [syn: Institutional transformation, Organizational change]
   7.c.i. Evidence-based practice
   7.c.ii. Institutional culture
   7.c.iii. Instructional change
   7.c.iv. Research to practice
      1. Adoption
      2. Diffusion
      3. Dissemination
   7.c.v. Theories of change

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7.c.v. Theories of change

7.d. Instructional design
   7.d.i. Alignment
   7.d.ii. Bloom’s taxonomy
   7.d.iii. Course design
   7.d.iv. Backwards design
   7.d.v. Learning objectives

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   7.d.iii. Course design
   7.d.iv. Backwards design
   7.d.v. Learning objectives

7.d.v. Learning objectives

7.e. Instructional methods [syn: Pedagogy]
   7.e.i. Active learning
      1. Experiential learning
      2. Inquiry based learning
      3. Peer instruction
      4. Challenge based instruction
   7.e.ii. Critical pedagogy
   7.e.iii. Flipped classroom
   7.e.iv. Lecture
   7.e.v. Model-eliciting activities
   7.e.vi. Mutual learning models
      1. Collaborative learning
      2. Cooperative learning
      3. Team based learning
   7.e.vii. Problem based learning
   7.e.viii. Project based learning
   7.e.ix. Service learning

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   7.e.ix. Service learning

7.f. Teaching evaluations

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8. Outcomes

8.a. Communication
   8.a.i. Audiences
   8.a.ii. Communication skills
      1. Nonverbal
      2. Verbal
         a. Listening
         b. Oral presentations
         c. Speaking
   3. Visual communication
      a. Engineering graphics
      b. Illustrations
   4. Visualization [syn: Spatial skills]
   5. Written communication
      a. Argumentation
      b. Reading
      c. Writing
   8.a.iii. Foreign languages
   8.a.iv. Technical communication

8.b. Competence

8.c. Computing skills [syn: Computing knowledge]

8.d. Creativity

8.e. Critical thinking

8.f. Engagement

8.g. Engineering standards

8.h. Entrepreneurship

8.i. Ethics
   8.i.i. Academic dishonesty [syn: Academic integrity]
      1. Plagiarism
   8.i.ii. Social justice
   8.i.iii. Social responsibility

8.j. Information literacy [syn: Information fluency]

8.k. Innovation

8.l. Intercultural competence [syn: Global]
   8.l.i. Cultural schemas

8.m. Leadership

8.n. Lifelong learning

8.o. Problem solving

8.p. Professional skills [syn: Soft skills]

8.q. Scientific literacy

8.r. Student perception

8.s. Student experience

8.t. Teamwork [syn: Team skills]

8.u. Reflection
   8.u.i. Critical reflection

8.v. Systems thinking

9. Professional practice

9.a. Careers
   9.a.i. Career choice
   9.a.ii. Career paths

9.b. Engineering profession
   9.b.i. Employers
   9.b.ii. Employment
   9.b.iii. Workplace culture

9.c. Engineering management

9.d. Industry involvement
   9.d.i. Cooperative education
   9.d.ii. Industry sponsorship
   9.d.iii. Internships
10. Recruitment and retention

10.a. Academic support
   10.a.i. Supplemental instruction
   10.a.ii. Tutoring

10.b. Achievement

10.c. Advising
   10.c.i. Academic advising
   10.c.ii. Coaching
   10.c.iii. Mentoring
      1. Peer mentoring

10.d. Preparation

10.e. Recruitment
   10.e.i. Engineering recruitment
      1. Engineering pathways [syn: Engineering pipeline]
   10.e.ii. Matriculation
   10.e.iii. Enrollment

10.f. Retention
   10.f.i. Attrition
   10.f.ii. Persistence
   10.f.iii. Retention rate
   10.f.iv. Scholarships
   10.f.v. Time to degree

10.g. Study behaviors
   10.g.i. Study groups
   10.g.ii. Time management

10.h. Student development
   10.h.i. Absenteeism
   10.h.ii. Mental health
      1. Test anxiety
      2. Depression
      3. Stress
   10.h.iii. Physical health

11. Related fields

11.a. Engineering economics
   11.a.i. Employability
      1. Industry demand

11.b. Education policy
   11.b.i. Bologna process
   11.b.ii. Common core state standards

11.c. Mathematics
   11.c.i. Calculus
   11.c.ii. Complex numbers
   11.c.iii. Differential equations
   11.c.iv. Engineering mathematics
   11.c.v. Graphing
   11.c.vi. Linear algebra
   11.c.vii. Pre-calculus
   11.c.viii. Probability theory
   11.c.ix. Statistics

11.d. Philosophy of engineering education

11.e. Science
   11.e.i. Biology
   11.e.ii. Chemistry
   11.e.iii. Geoscience
   11.e.iv. Life science
   11.e.v. Physical science
   11.e.vi. Physics
   11.e.vii. Technology applications

11.f. STEM

11.g. Technology studies
12. Research approaches

12.a. Data collection
   12.a.i. Analytics
   12.a.ii. Focus groups
   12.a.iii. Interviews
   12.a.iv. Observations
   12.a.v. Multi-institution
   12.a.vi. Survey

12.b. Research ethics
   12.b.i. Ethical treatment of subjects
   12.b.ii. Professional research ethics

12.c. Research evaluation criteria
   12.c.i. Credibility
   12.c.ii. Dependability
   12.c.iii. Generalizability
   12.c.iv. Reliability
   12.c.v. Transferability
   12.c.vi. Trustworthiness
   12.c.vii. Validity

12.d. Research methods
   12.d.i. Action research
   12.d.ii. Design-based research
   12.d.iii. Mixed methods research
   12.d.iv. Qualitative
      1. Case Study
      2. Content analysis
         a. Discourse analysis
         b. Document analysis
      3. Ethnography
      4. Grounded theory
      5. Narrative inquiry
      6. Phenomenology
      7. Phenomenography
      8. Photoelicitation
   12.d.v. Quantitative
      1. Data correlation
      2. Descriptive statistics
      3. Experimental research
      4. Factor analysis
      5. Inferential statistics
      6. Psychometric analysis
      7. Regression
      8. Structural equation modeling
   12.d.vi. Systematic review
      1. Meta-analysis

13. Theoretical frameworks

13.a. Affective theories
   13.a.i. Emotional learning
   13.a.ii. Motivation
      1. Achievement goal orientation theory [syn: Deep learning, Mastery learning]
      2. Attribution theory
      3. Behavior theory [syn: Behaviorism]
      4. Expectancy Value theory
      5. Self-determination theory
   13.a.iii. Self efficacy

13.b. Cognitive theories
   13.b.i. Constructivist
      1. Expert-novice
   13.b.ii. Knowledge transfer
   13.b.iii. Self regulated learning
      1. Metacognition

13.c. Critical theory

13.d. Developmental theory
   13.d.i. Adult learning theory
   13.d.ii. Agency
   13.d.iii. Model of domain learning
   13.d.iv. Identity
   13.d.v. Perry’s model of intellectual development
   13.d.vi. Piaget’s theory of cognitive development

13.e. Epistemology

13.f. Social cognitive theories [syn: Social learning theory]
   13.f.i. Activity theory
   13.f.ii. Cognitive apprenticeship
   13.f.iii. Community of practice
   13.f.iv. Social cognitive career theory
14. Teams [syn: Groups]

14.a. Interdisciplinary
14.b. Mental models
14.c. Multidisciplinary
14.d. Self managing work teams
14.e. Team dynamics
  14.e.i. Nominal group technique
  14.e.ii. Team development [syn: Group development]
  14.e.iii. Team formation
  14.e.iv. Team performance
  14.e.v. Team roles
14.f. Teamwork training
14.g. Transdisciplinary
14.h. Virtual teams [syn: Distributed]