LiTH Syllabus in English Ver 1.0

1. Disciplinary knowledge and reasoning

1.1. Knowledge of underlying mathematics and science (courses on G1X-level)
1.2. Fundamental engineering knowledge (courses on G1X-level)
1.3. Further knowledge, methods, and tools in one or several subjects in engineering or natural science (courses on G2X-level)
1.4. Advanced knowledge, methods, and tools in one or several subjects in engineering or natural sciences (courses on A1X-level)
1.5. Insight into current research and development work

2. Personal and professional skills and attributes

2.1. Analytical reasoning and problem solving
   2.1.1. Problem identification and formulation
   2.1.2. Modelling
   2.1.3. Estimation and qualitative analysis
   2.1.4. Analysis with uncertainty
   2.1.5. Solution and recommendations

2.2. Experimentation, investigation, and knowledge discovery
   2.2.1. Hypothesis formulation
   2.2.2. Survey of print and electronic literature
   2.2.3. Experimental inquiry
   2.2.4. Hypothesis test and defence

2.3. System thinking
   2.3.1. Thinking holistically
   2.3.2. Emergence and interactions in systems
   2.3.3. Prioritization and focus
   2.3.4. Trade-offs, judgements and balance in resolution

2.4. Attitudes, thought, and learning
   2.4.1. Initiative and willingness to make decisions in the face of uncertainty
   2.4.2. Perseverance, urgency and will to deliver, resourcefulness and flexibility
   2.4.3. Creative thinking
   2.4.4. Critical thinking
   2.4.5. Self-awareness, metacognition and knowledge interaction
   2.4.6. Lifelong learning and educating
   2.4.7. Time and resource management

2.5. Ethics, equity, and other responsibilities
   2.5.1. Ethics, integrity and social responsibility
   2.5.2. Professional behaviour
   2.5.3. Proactive vision and intention in life
   2.5.4. Staying current on the world of engineering
   2.5.5. Equity and diversity
   2.5.6. Trust and loyalty

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1 The document is based on LiTH Syllabus 3.0 in Swedish with sections 1 and 5 translated to English.
3. Interpersonal skills: Teamwork and communication

3.1. Teamwork
   3.1.1. Forming effective teams
   3.1.2. Team operation
   3.1.3. Team growth and evolution
   3.1.4. Team leadership
   3.1.5. Technical and multidisciplinary teaming

3.2. Communications
   3.2.1. Communications strategy
   3.2.2. Communications structure
   3.2.3. Written communication
   3.2.4. Electronic/multimedia communication
   3.2.5. Graphical communications
   3.2.6. Oral presentation
   3.2.7. Inquiry, listening and dialog
   3.2.8. Negotiation, compromise and conflict resolution
   3.2.9. Advocacy
   3.2.10. Establishing diverse connections and networking

3.3. Communication in foreign languages
   3.3.1. Communications in English
   3.3.2. Communications in languages of regional commerce and industry
   3.3.3. Communications in other languages
4. Conceiving, designing, implementing, and operating systems in the enterprise, societal and environmental context

4.1. External, societal, and environmental context
   4.1.1. Roles and responsibility of engineers
   4.1.2. The impact of engineering on society and the environment
   4.1.3. Society’s regulation of engineering
   4.1.4. The historical and cultural context
   4.1.5. Contemporary issues and values
   4.1.6. Developing a global perspective
   4.1.7. Sustainability and the need for sustainable development

4.2. Enterprise and business context
   4.2.1. Appreciating different enterprise cultures
   4.2.2. Enterprise stakeholders, strategy and goals
   4.2.3. Technical entrepreneurship
   4.2.4. Working in organizations
   4.2.5. Working in international organizations
   4.2.6. New technology development and assessment
   4.2.7. Engineering project finance and economics

4.3. Conceiving, system engineering and management
   4.3.1. Understanding needs and setting goals
   4.3.2. Defining function, concept and architecture
   4.3.3. System engineering, modelling and interfaces
   4.3.4. Development project management

4.4. Designing
   4.4.1. The design process
   4.4.2. The design process phasing and approaches
   4.4.3. Utilization of knowledge in design
   4.4.4. Disciplinary design
   4.4.5. Multidisciplinary design
   4.4.6. Design for sustainability, safety, aesthetics, operability and other objectives

4.5. Implementing
   4.5.1. Designing a sustainable implementation process
   4.5.2. Hardware manufacturing process
   4.5.3. Software implementing process
   4.5.4. Hardware software integration
   4.5.5. Test, verification and certification
   4.5.6. Implementation management

4.6. Operating
   4.6.1. Designing and optimizing sustainable and safe operations
   4.6.2. Training and operations
   4.6.3. Supporting and system life cycle
   4.6.4. System improvement and evolution
   4.6.5. Disposal and life-end issues
   4.6.6. Operations management
5. Planning, execution, and presentation of research or development projects with respect to scientific and societal needs and requirements

5.1. Societal conditions, including economic, social, and ecological aspects of sustainable development for knowledge development
   5.1.1. Roles and responsibility of the individual
   5.1.2. The impact of the subject on society and environment
   5.1.3. Rules and regulations
   5.1.4. Historical and cultural context
   5.1.5. Contemporary issues and values
   5.1.6. Developing a global perspective
   5.1.7. Sustainability and the need for sustainable development

5.2. Economic conditions for knowledge development
   5.2.1. Understanding of different models for financing and management control
   5.2.2. Planning, strategies, and goals for knowledge development
   5.2.3. Knowledge-based entrepreneurship
   5.2.4 Working in organizations
   5.2.5 Working in international organizations
   5.2.6 Knowledge development and evaluation

5.3. Identification of needs, structuring and planning of research or development projects
   5.3.1. Specifying the project’s purpose and goal with respect to sustainability and other needs
   5.3.2. Defining function, concept, and limitations
   5.3.3. Structuring the components and ensuring the fulfillment of goals
   5.3.4. Managing projects in the planning phase

5.4. Execution of research or development projects
   5.4.1. Phases and methodology of the development project
   5.4.2. Disciplinary projects
   5.4.3. Multidisciplinary projects
   5.4.4. Design of a sustainable execution phase
   5.4.5. Design and planning of experiments
   5.4.6. Interaction between theoretical and experimental work
   5.4.7. Test and verification of new results
   5.4.8. Management and assessment of development projects in the execution phase

5.5. Presentation and evaluation of research or development projects
   5.5.1. Presentation of new knowledge in a scientific context
   5.5.2. Presentation of new knowledge in a wider context
   5.5.3. Transfer of new knowledge for use in the enterprise context
   5.5.4. Evaluation of the work process in the project