



## ***BSc in Engineering Management***

The programme leading to a BSc degree in Engineering Management is 180 ECTS credits. Students take 84 ECTS credits in fundamental courses that are the same for all three-year BSc engineering programmes, 66 ECTS credits in courses that are specific to their chosen discipline (Engineering Management) and 30 ECTS credits in elective courses. The main aim of the programme is to prepare students for studies in engineering at the MSc level.

The programme in engineering management draws on natural science, engineering and social sciences to create a knowledge-base that equips students to deal with a range of problems and challenges characterized by increasing interdisciplinary, international and cross-cultural activities. The students must be able to combine knowledge with a deep understanding of the core discipline of engineering management. The knowledge imparted to the students is transferable across many types of projects, organizations and environment.

Upon the completion of the BSc programme, the following criteria shall be fulfilled:

## 1. KNOWLEDGE

Upon completion of the programme, the student should have gained general knowledge and understanding of basic principles of the following:

- 1.1. Mathematical analysis common to most engineering disciplines, multivariable calculus, including differentiation and integrals, and differential equations.
- 1.2. Principles of linear algebra, vectors, matrices, determinants, eigenvalues and eigenvectors, and of solving systems of linear equations.
- 1.3. Complex numbers and exponentials, Laplace and Fourier transforms.
- 1.4. Numerical methods to solve problems in calculus, differential equations and linear algebra.
- 1.5. Basic probability theory and statistics including data analysis, error analysis, hypothesis testing and linear regression.
- 1.6. Calculus based physics common to most engineering disciplines, including a practical foundation in classical dynamics, electromagnetism, thermodynamics and fluids dynamics.
- 1.7. Main areas of applied chemistry, including atomic structure, phases of matter, reactions and equilibrium, and introduction to bio- and organic chemistry.
- 1.8. Basic understanding of engineering programming in common languages, such as Matlab and C++, and spreadsheet applications.
- 1.9. Basic project management methods, how projects arise and the different stages in the life-cycle of a project.
- 1.10. Basic understanding of innovation and entrepreneurship, techniques of idea generation, launching a new company and business plans.
- 1.11. Insight into some of the subjects fundamental to classical engineering.
- 1.12. Basic principles, theories and applications in the field of operations management.

<b>SKILLS</b>	
Upon completion of the programme, the student should have gained the skills to:	
<b>2. Disciplinary skills</b>	<ul style="list-style-type: none"> <li>2.1. Design mathematical models of the functions of companies and organizations and solve problems by applying systems thinking and methods of optimisation and simulation.</li> <li>2.2. Plan, manage and analyse projects, also large and complicated projects, using recognized conventions as well as current best-practice methods.</li> <li>2.3. Define and discuss corporate finance, asset management, book-keeping principles and cost management.</li> <li>2.4. Describe and interpret the main principles of micro and macroeconomics.</li> <li>2.5. Apply statistical methods in order to analyse and interpret statistical data.</li> <li>2.6. Apply methods of production and inventory management, supply chain management and logistics, and lean manufacturing.</li> <li>2.7. Create a relational database schema in SQL and retrieve information from a database using SQL.</li> <li>2.8. Identify the process of innovation and the main factors of entrepreneurship and creative thinking and apply methods of product development.</li> <li>2.9. Describe the nature of sustainability and the principles of environmental protection and can apply these to the solutions of technical problems.</li> </ul>
<b>3. Personal skills</b>	<ul style="list-style-type: none"> <li>3.1. Apply engineering methods to projects, i.e. have the ability to assess engineering projects, identify the key factors in a given situation, and develop an approach to solution.</li> <li>3.2. Formulate and work on open-ended problems, including creative thinking.</li> <li>3.3. Apply research methodology, including the fundamentals of technical writing and information finding, including literature search.</li> <li>3.4. Apply standard scientific principles to develop engineering solutions to a range of practical problems.</li> <li>3.5. Realize the limits of his/her expertise and know when it is necessary and appropriate to seek specialist advice.</li> </ul>

<b>4. Interpersonal skills</b>	<p>4.1. Read and write in English and in Icelandic if a native student.</p> <p>4.2. Communicate effectively and professionally and formulate sound arguments, both in writing and by means of presentations, using appropriate professional language, including figures, illustrations, equations, tables and video.</p> <p>4.3. Use time management and work planning related to the organization, implementation and successful completion and reporting of a project.</p> <p>4.4. Be an effective team member and contribute to the management of team projects.</p>
<p><b>5. COMPETENCE</b></p> <p>Upon completion of the programme, the student should be able to utilize the knowledge and skills he/she has acquired to:</p>	
	<p>5.1. Apply analytical skills and modelling methodologies to recognise, analyse, synthesise and implement operational solutions to engineering problems.</p> <p>5.2. Apply standard scientific principles to develop engineering solutions to a range of practical problems.</p> <p>5.3. Appreciate the importance of keeping up with evolving technologies and research, and of lifelong learning to maintain and expand professional competence.</p> <p>5.4. Use design standards and safety codes as an integral part of the design and the implementation process.</p> <p>5.5. Undertake further study towards a graduate level degree.</p>