Learning Outcomes for the BSc in Discrete Mathematics and Computer Science

National Qualification Framework for Iceland	BSc in Discrete Mathematics and Computer Science at Reykjavik University
Bachelor´s degree Cycle 1.2 180 – 240 ECTS A Bachelor´s degree provides access to further studies at cycles 2.1 and 2.2. Higher education institutions or individual faculties may require a minimum grade for admission to studies at cycles 2.1 and 2.2.	The BSc in Discrete Mathematics and Computer Science at the RU is organised as a three - year programme (six semesters). To finish the programme, students need to complete 180 ECTS. On completing the Bachelor of Science in Discrete Mathematics and Computer Science, students have achieved the learning outcomes shown below..

KNOWLEDGE

The National Qualification Framework states that degree holders possess knowledge of the relevant field or profession, such that holders:

1. have acquired general understanding and insight into main theories and concepts
2. are aware of the latest knowledge in the relevant field
3. can apply the basic elements of information technology

The learning outcomes for the BSc in Discrete Mathematics and Computer Science state that degree holders possess knowledge of:

1	A number of recurring themes, and a set of general principles that have broad application to the field of computer science and discrete mathematics
1	The social, legal, ethical, and cultural issues inherent in the discipline of computing
1, 2	That software systems are used in many different domains. This requires both computing skills and domain knowledge
1, 2, 3	Software development fundamentals, including programming, data structures, algorithms and complexity
1, 2, 3	Systems fundamentals, including architectures and organization, parallel and distributed computation, security and at least one of operating systems and computer networks
1, 2, 3	Discrete mathematics, including group theory, combinatorics, number theory and mathematical cryptography
1, 2, 3 1 ,2, 3	Continuous mathematics, including calculus in one and several variables, linear algebra, and statistics Theoretical computer science, including the design and analysis of algorithms, the basic notions of computability and complexity, logic in computer science and its applications, and modelling and verification of computing systems.
1, 2, 3	Application fundamentals, including information management and intelligent applications
1, 2, 3	Multiple programming languages, paradigms, and technologies

SKILLS

The National Qualification Framework states that degree holders can apply the methods and procedures of the field or profession, such that holders:

1. can use the relevant equipment, technology and software
2. can apply critical analytic methods
3. can rationalise their decisions
4. can evaluate critically the methods applied
5. recognise when further data is needed and have the ability to retrieve it, assess its reliability and apply it in an appropriate manner
6. can use reliable data- and information-resources in the relevant scientific field
7. have acquired an open-minded and innovative way of thinking

The learning outcomes for the BSc in Discrete Mathematics and Computer Science state that degree holders can apply the methods and procedures as follows::

1, 4, 6	Know how to apply the knowledge they have gained to solve real problems
3	Realize that there are multiple solutions to a given problem and these solutions will have a real impact on people's lives
3	Communicate their solutions to others, including why and how a solution solves the problem and what assumptions were made
2, 3, 4	Successfully apply the knowledge they have gained through project experience
3, 7	Encompass an appreciation for the structure of computer systems and the processes involved in their construction and analysis
3, 4, 5, 7	Understand individual and collective responsibility and individual limitations as well as the limitations of technical tools
7	Understand the range of opportunities and limitations of computing
7	Know how to apply tools and ideas from mathematics and theoretical computer science to structure and solve complex problems

COMPETENCES

The National Qualification Framework states that degree holders can apply their knowledge and skills in a practical way in their profession and/or further studies, such that holders:

1. have developed the competences and independence needed for further studies within the field
2. can work in an independent and organised manner, set goals for their work, devise a work schedule and follow it
3. can participate actively and lead work groups
4. are capable of interpreting and presenting scientific issues and research findings

The learning outcomes for the BSc in Discrete Mathematics and Computer Science state that degree holders can apply their knowledge and skills, as follows:

1	Be able to reason at multiple levels of detail and abstraction, being aware, in particular, of the applicability and limitations of tools from mathematics and theoretical computer science
1	Recognize the context in which a computer system may function, including its interactions with people and the physical world.
1	Able to communicate with, and learn from, experts from different domains throughout their careers
1, 2	Possess a solid foundation that allows and encourages them to maintain relevant skills as the field evolves
1, 4	To be able to manage their own career development and advancement
2	Manage their own learning and development, including managing time, priorities, and progress
3	Have developed interpersonal communication skills as part of their project experience
3	Work effectively both individually and as members of teams
3, 4	Make effective presentations to a wide range of audiences about technical problems and their solutions
4	Encompass an appreciation of the interplay between theory and practice

*The numbers in the column below refer to respective numbered knowledge, skills, and competencies as defined in the National Qualification Framework (shown in the column to the left).


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