

Learning Goals and Objectives

1. *Learning Goal:* Prepare graduates, who are entering immediately into professions upon graduation, to be capable of performing duties on an entry-level computing-related position.

Objectives: Students will:

- a. acquire the computer science knowledge required for graduate studies;
- b. understand the architecture, organization and programming of modern computing systems; and
- c. understand the mathematical foundations of computer science, algorithm efficiency and computational complexity.

2. *Learning Goal:* Enable graduates to pursue graduate studies to successfully complete an advanced degree.

Objectives: Students will:

- a. acquire the skills to design, evaluate, and/or implement research or scholarly projects;
- b. learn how to carry out research effectively; and
- c. enable to conduct advanced and creative research themselves

3. *Learning Goal:* Enhance graduates to work as individuals with minimum guidance and as leaders or members of a team.

Objectives: Students will:

- a. Communicate effectively with a range of audiences; and
- b. Function effectively on multidisciplinary teams to accomplish a common goal.

4. *Learning Goal:* Encourage graduates to follow appropriate practices within a professional, legal, and ethical framework.

Objectives: Students will:

- a. be able to evaluate potential ethical dilemmas and apply decision-making techniques to resolve them; and
- b. Understand the professional, ethical, legal, security and social issues and responsibilities;

5. *Learning Goal:* Prepare graduates to recognize the need for and be capable of pursuing life-long learning.

Objectives: Students will:

- a. be aware of the rapid rate of change of technology and methodologies in computer science;
- b. be familiar with ways to gain knowledge and understanding of new developments in computer science and technology; and
- c. be aware of alternatives for continuing education in computer science.

Requirements for Bachelor's Degree of Computer Science

Graduates have the ability to contribute on their own responsibility in cooperation with appropriate specialists to the adequate solution of problems in nearly all fields of application. They contribute to the solution of complex problems. They are able to build on the concepts, methods, procedures, techniques and tools of informatics.

On the basis of their Bachelor degree studies, graduates will have learned to react to the dynamically evolving challenges which result from technological development or from problems in the field of application. Computer scientists with a Bachelor's degree are able to widen and deepen their competences by further training in their job or through academic studies such as consecutive Master degree programs or by additional studies in other fields.

Learning Outcomes

Computer scientists with a Bachelor's degree have acquired a fundamental understanding of central concepts and methods of their discipline; they are informed about important current developments of their field of study; they are able to integrate their knowledge and competences in a wider context.

A) Specialist Competences

*The following learning outcomes (knowledge, skills or competences) are typical of a **Bachelor's degree in computer science**:*

- a. Computer scientists with a Bachelor's degree have acquired a fundamental understanding of central concepts and methods of their discipline; they are informed about important current developments of their field of study; they are able to integrate their knowledge and competences in a wider context.

- b. They command the scientific foundations necessary for informatics, in particular the mathematical, logical, statistical, and physical tools.
- c. They understand central notions and conceptions of informatics, such as "algorithm" and "data processor", in an abstract form which is not dependent on actual technical realization.
- d. They are able to assess the possibilities and constraints of algorithmic operations.
- e. They are in a position to think in abstract models, and they have mastered constructive approaches.
- f. They are thoroughly familiar with the most important algorithms, data structures and problem-solving patterns, including central paradigms of programming. They possess a basic understanding of the composition and functioning of computers and key informatics systems such as operating systems, database systems, and communication systems.
- g. They understand the basic principles of complex informatics systems consistent with state-of-the-art technique, and they have first-hand experience of handling them adequately.
- h. They have mastered the methods of modeling, construction, verifying and testing typically used in informatics; they are able to apply these methods to solving problems.
- i. Graduates are familiar with important applications of informatics. They are able to develop solutions for practical problems using informatics techniques and evaluate them, having due regard to technical, ergonomic, economic, juridical, and social constraints.

B) Social Competences

Graduates know the history of informatics:

1. They are aware of juridical aspects of informatics and its effects on society.
2. They are aware of ethical questions and security problems connected with the application of information processing systems.
3. They possess key skills such as e.g. techniques of learning and working, the capacity for team-work and communicating, the ability to undertake literature research and to apply new media.
4. They are able to independently complement and deepen the knowledge acquired during their studies and to adapt to developments in the field.
5. They have experience of solving application problems in teams covering all phases of system development, from analysis of requirements, specification and implementation to testing.
6. They are able to reflect critically on their own contributions and explain them both to experts and to persons not acquainted with informatics, using sound arguments.
7. They are prepared to take on responsibility in technical as well as management roles. In particular, periods of practical training as an integral part of the curriculum help to develop the professional skills of graduates.
8. Ideally, they will have broadened their horizons by taking advantage of offers of mobility integrated in their study programs; they will have made use of opportunities to extend their language skills; they will be aware of and understand international and global developments in information technology and their possible effects on business and society.

