INTERNATIONAL UNIVERSITY OF SARAJEVO

FENS
Faculty of Engineering and Natural Sciences
International University of Sarajevo

Bachelor of Science (B.Sc.) in

SOFTWARE ENGINEERING

Info Catalogue

Academic Year 2025-2026

FENS
Faculty of Engineering and Natural Sciences

ABOUT THE SOFTWARE ENGINEERING STUDY PROGRAM

4 years, 8 semesters

Full-time, in person

Software engineering (SE) is a form of engineering that applies the principles of computer science and mathematics in achieving **economically effective solutions for software problems.** The primary aim of SE study program is to equip students with general and specialised competences in software engineering, focusing on the knowledge, skills, methods, tools and procedures required to design, develop, test and maintain reliable software solutions. Most courses include practical work, weekly hands-on labs and project-based assignments, through which students **strengthen technical and research skills as well as teamwork, written and oral communication, and project responsibility.**

240 ETCS

Bachelor of Science (B.Sc.) in Software Engineering

Language: English

A distinctive feature of the SE program is that it is organised around the complete software life cycle, **emphasising requirements and architecture, implementation, verification and validation, maintenance, configuration management, teamwork, project planning, and product quality.** This integrated focus equips students not only with strong technical skills, but also with the practical, process-oriented mindset needed to deliver reliable, maintainable, and industry-ready software systems. SE graduates work across the private and public sectors, including **IT and software companies, telecommunications, finance, healthcare, manufacturing, start-ups and public administration.** They can work as software developer, systems analyst, quality-assurance engineer, software architect, IT consultant, and project or process manager.

Graduates may also progress to research and academic careers or continue to postgraduate programs at IUS and internationally.
Students can participate in **Erasmus+ and bilateral mobility programs.**
To strengthen practical learning and professional readiness, the program also offers **extracurricular activities such as workshops, tech talks, guest lectures, outreach events, and hackathons.**

These activities connect students with industry experts, introduce emerging technologies, and develop teamwork, creativity, and problem-solving skills.

VISION AND PEDAGOGICAL APPROACH

The SE program aims to educate software engineers who can:

- Apply systematic, engineering-based approaches to the design, development, and maintenance of high-quality software systems.
- Engage in lifelong learning and advanced studies, staying current with modern software engineering methods, tools, and technologies.Lead and contribute to multidisciplinary teams.
- Contribute effectively to complex software projects by applying engineering principles, scientific methods, and quality practices across all stages of the software life cycle.
- Take on leadership, research, or entrepreneurial roles in software-driven industries, academia, and innovation-oriented organizations.
- Act with professional integrity and responsibility, remaining aware of the ethical and societal impacts of software engineering practice.

Teaching is student-centred, emphasizing active learning, critical thinking, and problem-solving. Methods include lectures, tutorials with hands-on labs, course projects, and industry-based projects. Continuous feedback from students, alumni, and industry partners informs regular updates, keeping the curriculum current and forward-looking.

Study program
EDUCATIONAL OBJECTIVES (EO)

Educational Objectives of the Software Engineering Study Program – First cycle are:

EO1	Seek professional and academic opportunities in software engineering and related fields, applying systematic approaches to the design, development, and maintenance of high-quality software systems.
EO2	Pursue lifelong learning and advanced studies to deepen their expertise in modern software engineering methods, tools, and technologies
EO3	Contribute to complex software projects by applying engineering principles, scientific methods, and quality practices across all stages of the software life cycle.
EO4	Assume leadership, research, or entrepreneurial roles in software-driven industries, academia, and innovation-oriented organizations.
EO5	Demonstrate professional integrity, responsibility, and awareness of ethical and societal impacts in the practice of software engineering

Study program
LEARNING OUTCOMES (LO)

Program Learning Outcomes of the Software Engineering Study Program – First cycle are:

LO1	Demonstrate understanding of fundamental knowledge in software engineering through a systematic approach to the development, deployment, and maintenance of software across its life cycle stages.
LO2	Apply systematic methods and tools to design, implement, and evaluate software systems across their life cycle.
LO3	Apply necessary and systematic methods prescribed for executing specific software engineering tasks under certain assumptions.
LO4	Perform a wide spectrum of tasks including project planning and estimation, system and software requirements analysis, data structure design, program architecture definition, coding, testing, and maintenance.
LO5	Explain and apply the scientific method, research approaches, and modelling techniques in software engineering.
LO6	Utilize modern tools and methods to automate and optimize software development activities, including project management and CI/CD pipelines
LO7	Analyse and critically evaluate all phases of software design with a systematic approach to testing, quality assessment, maintenance, and the software product's life cycle.
LO8	Communicate effectively, work collaboratively in diverse teams, and apply ethical and professional standards in software engineering practice.

PROGRAM STRUCTURE

The structure of the regular Software Engineering Study Program in the first cycle is organized as follows:

1. **28 mandatory courses (165 ECTS)**
Providing a broad foundation in mathematics, core software engineering principles, laboratory work, and professional practice.

2. **4 University Elective courses (15 ECTS)**
Including 2 foreign-language electives and 2 university electives.

3. **3 Faculty Elective courses (18 ECTS)**
Selected from a pool of courses within the student's faculty, providing specialised knowledge outside the core SE area.

4. **6 Program Elective courses (36 ECTS)**
Enabling advanced study in specific areas of software engineering.

1 Free Elective course (6 ECTS)
Allowing students to explore any course offered at the university.

A detailed overview of the **curricula for the SE Study Program**, are available at **se.ius.edu.ba**

CURRICULUM HIGHLIGHTS

The curriculum begins with foundation courses in **mathematics and programming in the early semesters.** In the first year, students also develop **effective communication skills**, are introduced to the **fundamental principles of engineering, and take foreign-language electives**. The middle semesters focus on **core software engineering**. In the later semesters, students complete the **Work Placement/ Internship and program electives**, and the sequence culminates in the **Graduation Project.**

In the later semesters, students take program elective courses that provide focused study in advanced areas of software engineering. During this stage, students also complete the mandatory Work placement/Internship and conclude their studies with the Graduation Project, where they **analyze requirements and design, implement, and validate a software solution under academic supervision.**

PRACTICAL TEACHING AND LEARNING

The SE study program implements practical teaching through the following approaches:

- **Hands-on Labs**
- **Project-Based Components**
- **Internship/Work Placement (Mandatory Course)**
- **Graduation Projects**

Most courses in the SE program follow a consistent structure that combines lectures with mandatory tutorials (hands-on lab sessions). These tutorials allow students to apply **theoretical concepts in practical settings, experiment with tools and technologies, and develop essential technical skills.** In addition to tutorials, many courses incorporate **project-based learning**, where students collaborate to solve real-world problems using the knowledge gained in lectures and tutorials.

The Graduation Project provides a structured, practice-oriented experience where students apply their knowledge to real problems and defend their solutions. In addition, through collaboration with industry, students may undertake industrial graduation projects that allow students to tackle practical challenges aligned with real-world business needs.

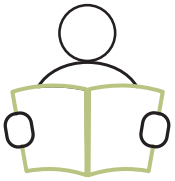
To further strengthen practical learning, the SE program also offers a range of **extracurricular activities** designed to inspire innovation, connect students with industry leaders, and build essential professional skills. These activities provide hands-on opportunities for students to apply their knowledge, explore emerging technologies, and prepare for their careers. Events are organized as **workshops, tech talks and guest lectures, outreach events, and hackathons**, each contributing uniquely to students' learning.

Special Opportunities:

The SE program strengthens academic and professional development through special opportunities that broaden students' experiences and prepare them for global, industry-oriented careers. All SE courses are delivered in English, aligning with international study environments and enabling study abroad without language barriers. Academic staff with international backgrounds bring diverse perspectives into the classroom, and the curriculum follows global standards with materials from Pearson, McGraw-Hill, Cisco Networking Academy, AWS Academy, and Fortinet Network Security Academy. Additional opportunities are:

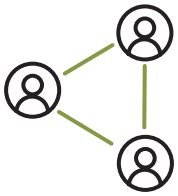
Exchange Abroad (Erasmus+ Mobility)

Students may spend one or two semesters at partner universities worldwide through funded Erasmus+ mobility, exploring different educational systems and cultures while progressing toward the SE degree.



Interdisciplinary Learning and Minor Degree Options

Students may broaden their academic profile by completing a minor in another discipline. Minors appear in the diploma supplement. For SE students, popular options include fields such as Management and Psychology.



Industry Links and Practice-Oriented Engagement

Through strong industry collaboration, students secure internship positions and work on company-led, real-life projects. This direct experience bridges classroom and workplace, supports entry into professional roles, and strengthens employability.

Research Opportunities

Students participate in faculty-led and international research projects. They may co-author academic papers and present at international conferences, building a verifiable portfolio and strong professional references. These experiences strengthen applications for Research and Development roles, internships, and competitive master's and PhD.

LABORATORY & RESEARCH FACILITIES

Modern computer laboratories

193 desktop computers running Windows, Linux, and macOS, with a wide range of licensed and open-source software installed.

Free-access course software

Anaconda, Code: Blocks, Cisco Packet Tracer 8.2.2, Java 8, Microsoft Visual Studio Code, Visual Studio Community 2022, NetBeans IDE 8.2, GNU Octave 7.2.0, PyCharm Community Edition 2022.3.1, RStudio, Scilab 6.1.1, and Power BI.

High-performance computing

A Dell PowerEdge R7615 server for compute-intensive tasks such as AI model training, simulations, and optimization problems.

Specialized teaching equipment

Physical equipment for specific courses includes Cisco switches, routers, firewalls, and 10 Raspberry Pi boards with LEDs, jumper wires, and various sensors.

RDC project spaces

Dedicated spaces for collaborative student–faculty research activities.

ADMISSION REQUIREMENTS:

Applicants must hold a recognized high school diploma, and admission is subject to entrance evaluation as per IUS regulations. For more information, please visit **ius.edu.ba.**

TEACHING AND ASSESSMENT:

- Lectures and mandatory tutorials (Hands-on Labs)
- Project-based assignments and design challenges
- Continuous assessment (quizzes, projects, presentations)
- Written examinations
- Assessment criteria are transparent and available via e-Campus. Students may appeal grades according to IUS regulations.

STUDENT SUPPORT

Each student is assigned an **academic advisor** who provides guidance on course selection, study progress, and academic requirements throughout the program. At the program level, the **Program Coordinator** serves as the primary point of contact for students, ensuring timely resolution of student concerns. The **Internship Coordinator** facilitates Work Placement/Internship arrangements, approves learning agreements, and monitors progress with host organizations, so students gain relevant experience. The **Graduation Project Coordinator** oversees the preparation, submission, and evaluation of bachelor projects, while assigned academic mentors provide continuous supervision during the implementation of the Graduation Project. For international mobility, the **Exchange Coordinator** advises on opportunities, manages partner university processes and learning agreements, and ensures academic recognition upon return. Additionally, continuous learning support is available through tutoring, remedial sessions, and regular faculty office hours. IUS supports students with disabilities through its **Support Office**, whose aim is to foster an inclusive environment. The office provides guidance and assistance to students with disabilities and works closely with staff to ensure their full participation in university life.

STUDENT VOICE MATTERS
QUALITY ASSURANCE

At IUS, we are committed to continuously improving student academic experience. That's why we've built a strong **Internal Quality Assurance System**—and students play a key role in it! Our quality assurance system ensures that everything we do—from teaching and research to administration and community engagement—is constantly evolving for the better.

Every semester, we invite students to participate in the **Student Survey**. This is students' chance to share honest feedback about:

- Learning and Teaching effectiveness
- Course content
- Learning resources
- Overall satisfaction

Students' input is carefully analyzed and used to:

- Improve course design and delivery
- Support and develop our academic staff
- Inform strategic planning and decision-making

By participating, students help us build a more s**tudent-centered learning environment**—where their needs, ideas, and experiences truly shape the University's growth.

CAREER OPPORTUNITIES AND FURTHER STUDIES

SE Graduates are well-prepared for diverse professional roles across the IT sector and related domains such as:

- Software engineer / Software developer
- Business analyst
- Software architect
- Quality assurance and test engineer
- DevOps engineer
- Project manager or technical team lead in software projects
- Entrepreneur / Start-up founder in the digital and software industry

They are also qualified to pursue master's and PhD programs in Software Engineering and related fields, locally and abroad.

APPLY TODAY!

Visit **apply.ius.edu.ba** or
call **00 387 957 110**

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