Bachelor of Science Honours in Information Technology (Security and Network Engineering)

SAQA ID 120723 NQF Level 8

Mode and duration

Contact
Full-Time (Online)
- Minimum: 1 years
- Maximum: 2 years

Classes are mainly offered on Saturdays and some consultations may run during the week.

Qualification description

Stay at the forefront of digital advancement with the Bachelor of Science Honours in Information Technology, specialising in Security and Network Engineering, a broad and rigorous postgraduate qualification designed to equip students with the critical knowledge and skills necessary to work in the field of information technology, with a specific focus on security and network engineering.

The BSc Honours IT (Security and Network Engineering) is a specialised postgraduate degree programme that combines critical knowledge and skills in information technology, cybersecurity, and network engineering. It is structured to prepare students for careers in the rapidly evolving field of information technology, with a particular emphasis on the security and reliability of computer networks and systems.

The qualification's notable achievements can be largely attributed to its unique instructional methodology, characterised by a blended approach that encompasses interactive lecture-based instruction, smaller class sizes, and the integration of technology. In addition, our institution boasts a faculty of exceptionally committed educators who possess esteemed professional accreditations. Moreover, our curriculum remains both pertinent and progressive, consistently staying ahead of emerging trends in the field. The primary emphasis lies in the practical implementation of concepts, encompassing project completion, workshop participation, and the cultivation of critical information technology proficiencies.

Upon successful completion of the BSc Honours IT (Security and Network Engineering), graduates are well-prepared to tackle the evolving challenges of securing digital information and managing complex network infrastructures in various industries. They may also pursue advanced degrees, such as an MSc in Computing, for further specialisation and research opportunities.

Entry requirements

1. A recognised undergraduate degree or equivalent for the specific honours degree.
2. Or an equivalent foreign undergraduate qualification on NQF level 7 approved by SAQA.
3. And the specific undergraduate qualification should preferentially include, but not limited to, these modules or their equivalence:
   - Network Security
   - Advanced Networking
   - Database Systems Design, Implementation, and Management
4. And a minimum of 60% average during the exit year of the applicable undergraduate qualification.
5. Relevancy in - line with the stream being applied for at the discretional approval of the faculty where applicable.
6. Submission of the module outlines of the completed subjects might be required.

Possible career options

Graduates of a BSc Honours IT (Software Engineering) programme are well-prepared for a variety of roles in the Software Engineering field, such as:

- Cloud Computing Architecture, Cybersecurity Analyst
- Cybersecurity Consultant, Information Security Specialist
- Data Miner, Security Architect, Penetration Tester
- DevOps Engineer
- Entrepreneur/Startup Founder
- IT Consultant, Researcher/Academic
- Network Administrator/Engineer, Systems Administrator
- Network Security Engineer, Database Administrator
- Microservices Developer, Microservices Architect

Qualification accreditation

- Accredited by the Higher Education Quality Committee (HEQC) of the Council on Higher Education (CHE)
- Registered with the South African Qualifications Authority (SAQA)

This qualification is offered at the following campuses:

- Midrand

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Qualification structure

Year 1

Students develop a high level of competence and specialised knowledge in the discipline of BSc Honours IT (Security and Network Engineering).

- Cloud Computing Architecture
- Data Mining and Data Administration
- Network Design, Implementation, and Management
- Offensive and Defensive Technologies
- Research Methodologies in IT Research
- Research Project
- Security of Systems and Networks
- Service-oriented and Microservices Architectures

Eduvos
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Module Descriptors

Cloud Computing Architecture

This module is designed to enable students to become proficient AWS Solutions Architects by providing them with thorough knowledge and practical cloud computing architecture skills. It focuses on AWS-specific concepts, design patterns, and best practices for constructing scalable, secure, and highly available cloud-based systems. This module provides a comprehensive guide to the architecture of cloud computing using Amazon Web Services (AWS). It covers various aspects of cloud design patterns and real-world solutions, making it appropriate for both novices and experts. The module will cover AWS services, cloud migration strategies, networking, storage, compute, databases, security, automation, big data processing, machine learning, IoT, blockchain, containers, microservices, event-driven architectures, and data lake patterns. The emphasis of the module is on hands-on labs and use cases to reinforce learning and application.

Data Mining and Data Administration

The aim of this module is to showcase an in-depth understanding and utilisation of databases within decision support systems while also acquiring knowledge in databases and data mining techniques, along with practical aspects of databases. This module aims to enhance your understanding of data mining techniques using Python, specifically focusing on the extraction, cleansing, and transportation of data in a format that is more conducive to decision-making and data administration. The acquisition of knowledge in the module on data administration and data mining enables students to make well-informed decisions pertaining to the data within a given system. This module aims to equip students with the skills necessary to discern and analyse trends and patterns within datasets, thereby facilitating informed decision-making.

Network Design, Implementation, and Management

This module is intended to provide students with a thorough understanding of 5G network design, implementation, and management. This course equips students with the knowledge and skills required to comprehend the fundamental components and principles of 5G networks, including architecture, protocols, and advanced use cases. Students will gain an understanding of the most recent technologies and concepts that are driving the evolution of 5G networks and their applications. This module explores the complexities of 5G network design, deployment, and management. From the fundamental building blocks of 5G technology to its advanced applications in autonomous vehicles, network slicing, fixed-mobile convergence, and satellite communications, a wide range of topics are covered. Students will investigate the architecture, components, and protocols of 5G networks in order to effectively design, deploy, and manage them.

Offensive and Defensive Technologies

The aim of this module is to provide students with critical knowledge and skills in offensive and defensive cybersecurity technologies. It is designed to provide students with an in-depth understanding of security architecture, security operations, security engineering, cryptography, governance, risk, and compliance in the context of advanced security practices. This module covers both offensive and defensive cybersecurity technologies, ensuring that students are well-versed in diverse facets of cybersecurity. The module covers security architecture, operations, engineering, cryptography, governance, risk management, and compliance, providing students with a holistic view of cybersecurity practices.

Research Methodologies in IT Research

This module is designed to equip students with the essential research skills required in the field of Information Technology (IT). Students will learn about various research methodologies, including quantitative and qualitative approaches, experimental design, survey methods, and case studies. They will develop critical thinking and analytical skills necessary for designing, conducting, and evaluating IT research projects. This module will also cover ethical considerations in IT research.

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Research Project

The research project module serves as the capstone of the programme, allowing students to apply their knowledge and skills to a substantial research or development project in the field of IT security and network engineering. Under the guidance of a faculty advisor, students will choose a project topic aligned with their interests and industry relevance. They will conduct extensive research, design and execute experiments or prototypes, collect and analyse data, and present their findings through a comprehensive report and presentation. This module prepares students to make significant contributions to the ever-evolving field of IT security and network engineering.

Security of Systems and Networks

This module offers an in-depth examination of security concepts and practices for both IT systems and networks. Students will learn to assess, plan, and implement security measures to protect data, applications, and infrastructure. Topics include cryptography, access control, threat modelling, and security policy development. Practical exercises will simulate real-world scenarios, ensuring students are well-prepared to defend against evolving cyber threats.

Service-oriented and Microservices Architectures

In today's IT landscape, service-oriented and microservices architectures have become central to the development of scalable and maintainable software systems. This module will provide an in-depth understanding of these architectural paradigms. Students will explore the principles of designing and implementing services, containerization, and orchestration. Practical aspects such as RESTful APIs, service discovery, and scaling microservices will also be covered. Students will gain hands-on experience in building and deploying microservices-based applications.