

STADIO

HIGHER EDUCATION

SCHOOL OF INFORMATION TECHNOLOGY

BACHELOR OF BUSINESS INFORMATION SYSTEMS

NQF 7 | 390 CREDITS | SAQA ID: 119542 | MIN. 3 YEARS | MODE: CONTACT LEARNING
CAMPUS: BELLVILLE (CAPE TOWN), CENTURION (PRETORIA) & MUSGRAVE (DURBAN)

DESCRIPTION

An effective information system (IS) must be designed, developed and implemented in such a way as to support the strategic goals of the organisation within which it will be used, while at the same time providing security, maintainability and ease of use. The Bachelor of Business Information Systems programme is designed to equip graduates with the skills necessary to function as a (junior) business analyst, software developer or tester, database manager, or IT risk manager. During the programme students will be expected to apply analytical and logical thinking skills in order to identify and analyse business problems, document business processes, develop creative solutions, manage data and information, and communicate effectively with team members and project stakeholders. They will also gain limited experience in the fields of project management, database management, risk management and network security. A research project accompanied by a related practical systems development project will be undertaken in the final year of the programme, providing students with valuable real-world experience. Throughout the programme, attention will be drawn to legal and ethical issues related to the societal impact of computer technologies.

- In the first year of the programme, students learn basic concepts related to the functioning of hardware, software and networks; gain practical experience in computer programming and database structures; and are exposed to different software development approaches. This technology-focused content is supplemented by modules on information security, business management and accounting, to ensure that students have a good understanding of typical business contexts within which an information system might be implemented.

- In the second year of the programme, students gain experience in web programming and are introduced to the discipline of business analysis. Business analysis principles are then put into practice in related modules that focus on systems analysis and design (using object-oriented techniques) as well as IS project management. Modules in statistics and business law provide students with relevant business knowledge; while case-study based projects help to develop students' analytic and writing skills.
- In the third year of the programme, students undertake a technology-focused research project and a related 'real-world' practical systems development project. They also complete modules on interaction design, e-commerce, business process management, IT governance, risk management and disaster recovery, business intelligence, emerging technologies, and technology start-ups. This final year of the programme provides rich exposure to advanced technologies and key business issues and equips entrepreneurial students to take the first steps towards opening their own businesses. The research report, systems development documentation and module assignments will further develop students' technical writing and presentation abilities.

Students who successfully complete the Bachelor of Business Information Systems programme will demonstrate competence in both theoretical knowledge and practical application, through a combination of case studies and practical software development projects. The qualification will prepare students to embark on a journey towards becoming specialists or leaders in their field, with the expertise needed to ensure that the information systems function is fully integrated into the organisation, and that IS projects are appropriately aligned with the organisation's operational and strategic goals.

MODE OF DELIVERY - CONTACT LEARNING (BLENDED CONTACT)

The programme is offered in STADIO's **Blended Contact** mode of delivery. Contact learning is aimed at students who want to attend venue-based face-to-face classes at one of STADIO's campuses. The Blended Contact mode combines classroom and online learning and teaching in a manner that includes some flexibility, while optimising the time students spend on campus. Based on the nature of the module, each module utilises a unique combination of the following learning settings:

- **Classroom:** Classroom sessions involve learning by doing, debating, arguing, trying, experimenting, practising, analysing, and sharing — all the skills students will need when they enter the world of work. Students will have the opportunity to contribute to the learning process and at the same time they will learn from the contributions of their fellow students. Class attendance of venue-based sessions is compulsory.
- **Synchronous online:** These are live online teaching sessions facilitated by a range of lecturers from different campuses. STADIO believes in encouraging students to think and engage laterally and to consider different perspectives and this is what students will get from having different experts share their knowledge with them. Students will be advised of the date and time of the session at the start of the semester, and they may connect from the comfort of their home, or from any other venue. They may also come to campus to make use of the campus Wi-Fi to join these sessions. Some of the live online sessions may be recorded, while others will not. It depends on the nature of the session and the lecturer will advise students beforehand. The lecturer will also use these sessions for group work and for discussions. These sessions are also compulsory, as they are an integral part of the teaching programme.
- **Asynchronous online:** These are recorded lectures which students will watch in their own time, but within the timelines provided in the course environment. In these short sessions, the lecturers will explain the theoretical concepts and they will work through examples, etc. Students enjoy the benefit of watching these important sessions repeatedly during the semester, as they prepare for their assessments.

Students will find a detailed timetable indicating the combination of sessions on the learning management system (Canvas) at the start of the semester. This will enable them to plan their schedule ahead of time, and to optimise travelling arrangements to and from the campus.

Contact learning is suited to students who are able to attend and are interested in participating in face-to-face classes on a physical campus and who want to become part of a campus community with all the activities that go with being on the campus. It is important to realise that class attendance is compulsory and students must commit to regularly attend classes on campus if they want to be successful and derive the best benefits of contact learning.

OUTCOMES

The qualifying student will be able to:

1. Gather, evaluate and validate information obtained from project stakeholders, in order to determine organisational needs and/or the factors contributing to current problems, so that the organisational context and the project goals can be accurately defined.
2. Conduct research into similar existing systems, to identify factors that are likely to have either a positive or a negative impact on project success.
3. Integrate knowledge of information systems with relevant elements from the fields of management, accounting, law and statistics, in order to analyse a business, identify stakeholder requirements, create a detailed technical specification, and develop and implement an appropriate solution.
4. Manage a systems development project involving multiple stakeholders and project team members, from inception through to the post-implementation review.
5. Demonstrate a variety of communication and documentation skills ranging from individual stakeholder interviews to formal meetings and review sessions, to highly technical specification documents for the system that is to be developed and implemented.
6. Demonstrate accountability for decisions made during the systems development and implementation process and be able to justify the ethical values that underpin them.
7. Apply secure computing principles and techniques to identify and assess potential risks affecting the security of networks, information assets and data communications.
8. Analyse business and operational data to monitor the performance of the system and proactively provide the organisation with insight into potential business problems and/or opportunities.

ADMISSION REQUIREMENTS

The admission criteria for the Bachelor of Business Information Systems are:

- **National Senior Certificate (NSC) with degree endorsement with a minimum of 50% in four 20-credit subjects from the designated list, and a minimum of 40% in either English Home Language or English First Additional Language; and a minimum of at least 50% for either Mathematics or Information Technology, or a minimum of at least 70% for either Mathematical Literacy or Computer Applications Technology; or**
- **a Senior Certificate (SC) with degree endorsement and a minimum of 40% in either English First Language (HG) or English Second Language (HG); and a minimum of at least 50% for either Mathematics (HG) or Computer Studies (HG), or a minimum of at least 70% for either Mathematics (SG) or Computer Studies (SG); or**
- **a Higher Certificate (NQF 5) in Software Development, or an equivalent qualification.**

ADDITIONAL OR SPECIFIC ADMISSION REQUIREMENTS

Other access pathways

STADIO is committed to achieving inclusion and to overcome barriers to access and success in higher education. Applicants who do not meet the stated admission criteria, but who have relevant work experience and/or prior learning may apply for admission under the policy on Recognition of Prior Learning (RPL). STADIO admits a maximum of 10% per cohort via RPL.

The implementation of RPL is context-specific, in terms of discipline, programme and level. Further information may be obtained from your Student Recruitment Advisor.

Mature age exemption

Candidates who do not meet the requirements for degree studies listed above, but who have reached the ages of 23 or 45 respectively, may apply for Mature Age Exemption via the USAF Matriculation Board under the following conditions:

- Candidates who have reached/will reach the age of 23 during the first year of registration and who have achieved a Senior Certificate with a pass in at least four subjects, including one of the official languages experience and including one subject on Higher Grade
- Candidates who have reached the age of 45 before or during the first year of registration.

ARTICULATION POSSIBILITIES

Students who have completed credits at another higher education institution may apply for the transfer of those credits in line with STADIO's CAT Policy. The recognition of credits for the purpose of transfer from one qualification to another is determined by the nature of the qualifications, the relationship between them, the nature, complexity, and extent of the curricula associated with the specific subjects to be recognised for credit and the nature of the assessment used. A maximum of 50% of credits of a completed qualification may be transferred via CAT, while all credits from an incomplete qualification may be transferred, provided that no more than 50% of the credits on the receiving qualification are awarded via CAT.

SPECIFIC REQUIREMENTS

MINIMUM SYSTEM REQUIREMENTS:

- **Reliable broadband Internet Access (Wi-Fi available at all our campuses, but you may prefer access from home as well)**
- **Firefox/Internet Explorer/Chrome web browser**
- **Microsoft Word**
- **PDF Viewer**
- **Ability to scan and upload documents**
- **Email/cellphone for notification and communication**

ACCESS TO TECHNOLOGY:

STADIO provides students with materials, resources, assessments (including online tests and quizzes), as well as discussion opportunities and a number of administrative services via its student administration and learning environments. Having access to the above online facilities is essential for efficient communication, learning and success. You will need continuous access to study, using the resources mentioned above, and to access and submit some assessments.

STUDENT SUPPORT FOR CONTACT LEARNING STUDENTS

C4SS - CENTRE FOR STUDENT SUCCESS

The Centre for Student Success supports students with academic, psychological and financial wellness.

SSS - STUDENT SUPPORT SERVICES

Student Support Services is the first port of call for all student queries and requests, they can channel your requests to the right individuals.

CURRICULUM OUTLINE

YEAR	1st YEAR	2nd YEAR	3rd YEAR
Compulsory Modules			Information Systems Development Project ISDP371 (30 credits) ** Information Systems Project Management (ISPM262)
SEMESTER 1	1st YEAR	2nd YEAR	3rd YEAR
Compulsory Modules	Accounting 1 ACC152 (20 credits)	Information Systems Project Management ISPM262 (20 credits) * Introduction to Business Analysis and Technical Communication (BATC262)	Business Process Management BPM372 (10 credits)
	Computational Thinking and Introduction to Programming CTIP152 (20 credits)	Introduction to Business Analysis and Technical Communication BATC262 (20 credits) ** Introduction to Business Management (MAN152)	Electronic Commerce ECO372 (10 credits) ** Information Security for IS Practitioners (ISP152) & Business Law and Compliance (LAW162)
	Introduction to Business Management MAN152 (20 credits)	Web Systems and Technologies WST262 (20 credits) ** Object Oriented Programming (OOP152)	Human-Centric Design HCD372 (10 credits) ** Object Oriented Design (OOD262)
	Induction to Business Studies IBS152 (10 credits)		Risk Management and Disaster Recovery RMDR372 (10 credits) * IT Governance (ITG372)
SEMESTER 2	1st YEAR	2nd YEAR	3rd YEAR
Compulsory Modules	Fundamentals of Information Technology FIT152 (10 credits)	Business Law and Compliance LAW162 (20 credits)	Business Intelligence BIN372 (10 credits)
	Introduction to Databases IDB152 (10 credits)	Data and Decision-making DDM162 (10 credits) * Statistics (STA162)	Emerging Technologies EMT372 (10 credits)
	Information Security for IS Professionals ISP152 (10 credits)	Object Oriented Analysis OOA262 (10 credits) ** Object Oriented Programming (OOP152) & Introduction to Databases (IDB152)	Introduction to Research RES372 (15 credits)
	Object Oriented Programming OOP152 (15 credits) ** Computational Thinking and Introduction to Programming (CTIP152)	Object Oriented Design OOD262 (20 credits) * Object Oriented Analysis (OOA262) ** Object Oriented Programming (OOP152) & Introduction to Databases (IDB152)	IT Governance ITG372 (10 credits) * Risk Management and Disaster Recovery (RMDR372) ** Business Law and Compliance (LAW162)
	Software Engineering SEN152 (10 credits) * Fundamentals of Information Technology (FIT152)	Statistics STA162 (10 credits) * Data and Decision-Making (DDM162)	Technology Start-Ups TSU372 (10 credits) ** Introduction to Business Management (MAN152)
	Technology and Society TAS152 (10 credits)		
CREDITS P/YEAR	135	130	125

* Corequisite modules must be taken concurrently with another partner module.

** Prerequisite modules must be successfully completed before enrolling in a higher-level or more advanced module.

MODULE DESCRIPTIONS

ACCOUNTING 1

This module introduces students to the basic principles of accounting. The double-entry principle and accounting equation are addressed. In addition, students are introduced to different types of journal entries, ledger accounts and bank reconciliation statements. Different types of financial statements are also introduced.

BUSINESS INTELLIGENCE

In an increasingly digital business environment, 'big data' has become a valuable resource for deriving business insights and supporting strategic decision making. This module introduces students to a variety of analytic techniques ranging from clustering and forecasting to artificial intelligence. It also provides examples of how these techniques can help organisations to achieve competitive advantage through improved decision-making, marketing and relationship-building.

The module opens with a discussion of the basic principles of organisational decision-making and the types of data that are generally available in organisations. This is followed by an overview of data warehousing and basic analytic techniques that are commonly used for data exploration. More advanced topics include cluster identification; principal component analysis; association rules and social network analysis; regression analysis; nearest neighbour and anomaly detection; prediction and forecasting techniques; and neural networks. Students will gain hands-on experience in the application of some of these techniques through a series of practical exercises based on case studies with accompanying datasets. Potential risks associated with the use of big data are also discussed. By the end of the module, students will have acquired a solid understanding of how data science can be used to support the strategic objectives of an organisation.

BUSINESS LAW AND COMPLIANCE

This module introduces students to the basic principles of commercial law, addressing a broad spectrum of content which includes all modern aspects of the field. First, an overview of the South African Legal System is covered. Second, the basic principles of contracts are presented, and then applied to examples of specific business contracts. Students are familiarised with the concept of agency and different legal business entities. Lastly, the module outlines the concepts of business conduct and compliance.

BUSINESS PROCESS MANAGEMENT

The efficiency of an organisation's operations is determined by its underlying business processes. A 'business process' is a chain of events, activities, and decisions that ultimately add value to the organisation and its customers. Business Process Management (BPM) can reduce costs and increase revenue by streamlining business operations, often through the incorporation of digital technologies.

Typical BPM activities include defining an organisation's current process architecture; modelling existing processes and their associated business rules; analysing process strengths and weaknesses and developing appropriate quality assurance criteria; identifying opportunities to add value to and remove bottlenecks from existing processes; redesigning processes for improved efficiency; and implementing business process management and monitoring systems.

Students will submit a number of individual assignments during the module in order to demonstrate their understanding of the principles and processes that underpin BPM. At the end of the module, students will submit a group project integrating different aspects of BPM that were covered in the module.

COMPUTATIONAL THINKING AND INTRODUCTION TO PROGRAMMING

Efficient and effective problem solving is a skill that is of benefit to any individual in his/her everyday life. In the field of computing, problem solving as well as familiarity with computer programming concepts, development of computer programs, and the syntax and semantics of programming languages are fundamental to successful software development.

This module first introduces computational thinking as a systematic approach to problem solving with the solution expressed in such a way that it can be carried out by a computer. Thereafter, all aspects of programming, from designing an algorithm and coding this algorithm to develop a program, to debugging and executing the program, are covered. The main focus of the module is on the coding aspect, where students will be exposed to the Python programming language, from the basic programming constructs (sequencing, decisions and looping) and data structures (such as simple types and lists) to more advanced constructs (such as the use of functions and recursion) and more complex data structures (such as dictionaries).

No prior programming experience is required to complete this module. Students will be taken from first principles to being able to develop a non-trivial Python program. The module will be useful to students from diverse fields by offering a systematic way of approaching problem solving and providing a solid introduction to programming.

Having completed this module, students will have a solid foundation of problem solving and programming experience, thereby facilitating the comprehension of the more advanced aspects of programming, including object-oriented design and the use of abstract data structures as taught in later modules.

MODULE DESCRIPTIONS CONTINUED

DATA AND DECISION-MAKING

In this module students will learn the importance of data in the decision-making process. They will be exposed to the fundamentals of decision making and how to assess risk and uncertainty while supporting this with well formulated and appropriate data. Students will further learn how to apply this knowledge as part of a larger project team for highly complex and more specialised decision-making environments where they act as facilitators rather than the actual analysts or decision makers.

To achieve the module outcomes, students will learn how to separate empirical quantifiable data (known factors) from uncertain and unverifiable assumptions (unknowns) often required in business decision making. With this separation established, students will be guided in how to apply the known and unknown correctly in order to manage risks associated with the degree of uncertainty. Learning how to assess whether the balance between the known and unknown data components will be achieved through the use of sensitivity analysis and the illustration of the relative impact that the various data points can have on the final decision and ultimately how the final decision will impact the venture over time.

ELECTRONIC COMMERCE

Electronic Commerce (e-Commerce) is the process of electronically buying and selling goods and services over computer networks, mostly the Internet. e-Commerce also supports electronic communication and collaboration in areas as diverse as e-Government and social networks. e-Commerce affects businesses and people across the globe, including in developing countries.

This module provides an overview of the drivers and benefits of e-Commerce and describes typical e-Commerce business models. It explores e-Commerce mechanisms, platforms and tools including B2B, B2C and C2C e-commerce, m-commerce and social commerce. Other topics include payment and order fulfilment systems; the use of e-Commerce in government and health systems; security and fraud prevention; web server architectures, hardware and software; legal and tax issues; and the management of e-Commerce implementations.

Students will submit a number of individual assignments during the module in order to demonstrate their understanding of e-Commerce principles. At the end of the module, students will submit a group project integrating different aspects of e-Commerce that were covered in the module.

EMERGING TECHNOLOGIES

Emerging and transformative technologies are reshaping organisations in fundamental ways. Automation will speed business processes, improve quality and reduce costs. Embedded sensors and robotics will increase productivity in the manufacturing sector. Healthcare delivery will be supported by artificial intelligence and virtual/augmented reality. Distributed ledger systems will not only store financial transactions, but also track the movement of physical goods. 5G networks and satellite constellations will allow the interconnection of multiple technology-supported systems.

This module first outlines the principles that underpin emerging technologies such as the Internet of Things, distributed ledgers, augmented reality and 3D printing. It then explores the application of emerging technologies in fields as diverse as manufacturing, healthcare and e-government, and identifies supporting skills that may need to be developed. Finally, it addresses a number of ethical issues related to the social and business impact of the new technologies, including questions of accessibility, the codifying of ethical standards within algorithms and business processes, and the challenges involved in 'digital regulation'.

Students will analyse a number of case studies to investigate how these emerging technologies have been (or could be) applied in different contexts; and assess their potential impact on business and society. In each case, students will be expected to identify any relevant ethical challenges and suggest ways in which those challenges could be addressed.

FUNDAMENTALS OF INFORMATION TECHNOLOGY

The increased importance and global reach of computing technology in today's society was the basis for the emergence of the information technology discipline. Information Technology is the study of systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to enable users to accomplish their personal, organizational and societal goals.

This module provides an overview of the discipline of IT, and how it relates to other computing disciplines. The goal is to help students understand the diverse contexts in which IT is used and the challenges inherent in the diffusion of innovative technology.

MODULE DESCRIPTIONS CONTINUED

HUMAN-CENTRIC DESIGN

Human-centric design provides a bridge between technology-based systems and the users of those systems. It results in software products that are efficient and easy to learn, and that allow users to feel in control of the activity they are engaged in.

This module introduces students to key elements of human-centric design, including the use of personas and scenarios; principles for ensuring usability, acceptability, and engagement; techniques for eliciting, visualising and evaluating application requirements; the role of metaphors in interaction design; and general guidelines for visual interface design. During the module, students will submit a number of assignments that demonstrate their ability to analyse the design context, to generate appropriate artefacts (incorporating metaphors and blends) during the stages of conceptual and physical design, and to conduct ongoing design evaluation. At the end of the module, students will submit a group project integrating the principles, methods and techniques that have been covered during the module.

INFORMATION SECURITY FOR IS PRACTITIONERS

The first part of this module provides students with a basic understanding of computer networking concepts and technologies. Thereafter, potential risks are identified that may affect the security of organisational information. Information security issues that are addressed in this module include security threats targeting human users; network security and intrusion detection; security issues affecting software and databases; vulnerability assessment tools; and preventative measures that can be taken to protect the security of organisational information. At the end of the module, students will complete a group project that integrates the knowledge they have acquired during the course of the module.

INFORMATION SYSTEMS DEVELOPMENT PROJECT

In this module, students will be expected to integrate and apply the knowledge and skills they have acquired during their studies towards the Bachelor of Business Information Systems degree. Teams of at most four students each will analyse, design, test and implement a particular software application. Individual project teams will be allowed to follow their preferred development approach and modelling paradigm, as long as this is consistently applied throughout the project. Although project teams are free to choose the type of application they wish to develop, they will be encouraged to select projects that could potentially have a positive societal impact.

The final project deliverables must include at least a project proposal ('business case'); project management documentation; a requirements specification document; a design specification document; a test plan including test results; an implementation plan; user documentation; and a post-implementation review report. At the end of the module, each team will be expected to demonstrate a working prototype comprising at least three different use cases and including at least two reports. In addition, a complete set of project documentation must be submitted for summative assessment.

INFORMATION SYSTEMS PROJECT MANAGEMENT

Information Systems development projects are initiated for a variety of reasons, e.g. to address an existing problem, leverage a potential opportunity, support a business merger, or achieve regulatory compliance. The project manager plays a critical role in achieving project success, by effectively planning, leading and monitoring a project from inception to delivery.

In this module, students will learn the key responsibilities of a project manager and the scope of activities that are typically performed by project managers during the different stages of an information systems development project. In doing so, they will familiarise themselves with the methods and tools used to plan project activities and to monitor progress and budgets. They will also learn the importance of maintaining accurate project documentation. Role-playing scenarios will be used to practice relevant communication skills including techniques for conflict resolution. During the module, students will submit several individual and group assignments relating to different aspects of the project manager's job.

INTRODUCTION TO BUSINESS ANALYSIS AND TECHNICAL COMMUNICATION

Business analysts investigate the challenges that are being faced by organisations, identify feasible technology-based options for addressing those challenges, specify an appropriate solution, and evaluate the expected impact of that solution. The first half of this module is intended to develop students' understanding of what a business analyst does, the skills that a business analyst requires, and the range of activities that are commonly performed by business analysts. Role-playing scenarios are used to illustrate typical interactions between different project stakeholders.

The second half of the module familiarises students with technical documents that are typically created by business analysts, with a particular focus on project documentation. At the end of the module, teams of 2 or 3 students each will be required to write a simple project proposal for a mobile app. Each team will also deliver a short presentation describing the app they selected and reflecting on their experience of the analysis and documentation processes.

MODULE DESCRIPTIONS CONTINUED

INTRODUCTION TO BUSINESS MANAGEMENT

This module Introduction to Business Management introduces the student to the fundamental principles of management and the essential skills and competencies for effective management. The student will be exposed to the primary management tasks: planning, organising, leading and controlling. Supporting management tasks, such as communication, motivation and delegation, are also covered. The student is introduced to how these management competencies and tasks are applied across management functions; notably, operations, financial, marketing and human resources management. The focus of assessment will be on practical application of tasks such as planning and organising.

INDUCTION TO BUSINESS STUDIES

In this induction module, students are provided with the skills and knowledge required to be successful in entry-level business degree studies. Making the most of the online learning environment is central to success in degree studies and students are exposed to the requirements, practices and techniques that will help them to succeed.

The Preparing for studying online component is aimed at introducing the student to STADIO and the BCom degree, the online learning environment and assisting the student to plan his/her studies and time effectively to ensure successful completion of his/her studies.

The Academic reading and writing component expose students to good reading techniques, guides them through the writing process, and helps them to write effective academic essays. The Study skills component is aimed at providing students with basic information and techniques on how to improve their study skills from preparation to the exams.

The module concludes with the Numeracy component that focuses on essential business numeracy skills required for business studies.

INTRODUCTION TO DATABASES

Information and raw data are the life blood of the various computing disciplines, either for their use in creating a solution to a given problem, or for storing after having been generated by information systems and other computational applications. As such algorithms for the efficient and effective collection, transformation, storage, access and updating of data, as well as for the representation, organization and presentation of the resulting information, constitute vital knowledge for computing professionals.

Relational databases, which rely on the use of structured tables to store data, have traditionally been used for data storage. However, with the ever-increasing volume of data needed to be processed and stored by information systems, non-traditional, unstructured alternatives have recently become more popular. The main aim of this module is to introduce students to the theoretical concepts of databases as well as provide practical experience in designing and extracting information from both relational and semi-structured databases.

This module introduces fundamental database concepts related to the design and creation of relational databases, as well as the extraction of information in the form of query building using SQL (structured query language). Also covered in the module are considerations of transactional processing and security of databases as well as an introduction to non-relational database models using XML to apply the theoretical concepts in semi-structured databases.

Having completed this module, students will be able to manipulate a variety of databases, as well as design, implement and manage a database system.

INTRODUCTION TO RESEARCH

It covers principles, concepts and processes pertaining to academic scientific research. Aspects covered include the features of scientific research, types of research, as well as common aspects in the execution of a research assignment, such as problem identification, motivation of the study, formulating a hypothesis, research objectives, selecting suitable methods, planning and preparing the research action, as well as the gathering of data, and performing analysis and interpretation of results leading to a research report.

IT GOVERNANCE

IT governance provides a structure for aligning IT strategy with business strategy. It ensures that the senior management of an organisation retains control of, and responsibility for, its IT operation. It also directs the planning and management of IT investments so as to achieve organisational objectives by generating value, optimising resources, and mitigating IT-related risks.

The module opens by reviewing the principles and practices contained in the Technology and Information Governance section of the King IV report, and the ISO/IEC 38500 standard for IT governance. Students are then introduced to relevant frameworks that support IT Governance implementation and management, including the Control Objectives for Information and Related Technology framework (COBIT), the Open Group Architecture Framework (TOGAF), Capability Maturity Model Integration (CMMI), and the IT Infrastructure Library (ITIL). Thereafter, the module explores key challenges and success factors related to IT governance, presents a set of criteria that can be used to evaluate information technology governance within an organisation, and provides examples of best practices in the governance of digital transformation initiatives.

MODULE DESCRIPTIONS CONTINUED

OBJECT-ORIENTED ANALYSIS

This module will develop students' understanding of the object-oriented approach to information systems development, as well as their ability to apply a variety of object-oriented techniques that are commonly used during the systems analysis phase of a project.

The underlying concept of object-oriented analysis is that software systems are modelled as collections of cooperating objects. This approach supports the reuse of common objects, reduces system complexity, and facilitates future maintenance of the developed system. The Unified Modelling Language (UML) will be used to create appropriate visual models (diagrams) that support and enhance communication between analysts, developers and other stakeholders. Students will submit a number of individual assignments during the module to demonstrate their ability to apply object-oriented principles and UML modelling techniques. At the end of the module, students will submit a group project integrating the principles and methods that have been covered.

OBJECT-ORIENTED DESIGN

This module builds on the Object-Oriented Analysis module. In the Object-Oriented Design module, students will develop the knowledge and skills needed to create a detailed and unambiguous design specification for the system components, processes and interactions that together will deliver the functionality required within the final software product. Students will construct a variety of conceptual, logical and physical models as well as supporting text-based artefacts, that together define the architecture of the system, the associations between entities within the system, and the technology-specific composition of the system. Students will also be expected to understand and apply basic principles of good object-oriented design. Students will submit a number of individual practical assignments during the module in order to develop competence in the use of relevant UML modelling techniques. At the end of the module, students will submit a group project integrating the principles and methods that have been covered.

OBJECT-ORIENTED PROGRAMMING

One of the main competences required for employment in any of the computing disciplines is good programming skills. The object-oriented paradigm is extensively used in industry for developing large information systems. This module aims to impart both the theory and practice of this paradigm and further develop the overall programming skills of the students by introducing a second programming language, Java.

Students must have completed the "Computational Thinking and Introduction to Programming" module as prerequisite before attempting this module, which builds on the first principles of programming already covered and focuses on the design and implementation of larger more complex programs through a widely used industry language. In addition to providing the corresponding Java syntax for the constructs previously covered in the Python programming language, this module introduces object-oriented programming concepts, such as encapsulation and information hiding, data objects and inheritance, as well as additional imperative programming concepts and constructs, such as garbage collection and reference types. Practical experience using an object-oriented language is included by way of computer-based programming assignments.

RISK MANAGEMENT AND DISASTER RECOVERY

Business continuity planning (BCP) is intended to limit an organisation's exposure to risks that could disrupt normal business operations and put plans in place to minimise the extent and duration of business interruption if a disaster should occur. An accompanying disaster recovery plan (DRP) provides guidelines that assist business management and technical staff to manage the impact of a disaster and restore normal operations as quickly and effectively as possible.

Business continuity planning encompasses the identification and documentation of critical business functions; the evaluation and ranking of internal and external risks based on their likelihood of occurrence and severity of impact; evacuation and communication plans; and the implementation of measures intended to limit the impact of a disaster (including regular backups of software and data). The disaster recovery plan includes issues such as ensuring the safety of buildings and the provision of utility services, but with a key focus on the restoration of IT systems and software, data recovery procedures, and system testing. This module also considers the role of the planning team; relevant business policies and manuals; and business insurance options.

Students will submit a number of individual assignments during the module in order to demonstrate their understanding of principles and processes that are relevant to business continuity and disaster recovery planning. At the end of the module, students will submit a group project integrating different aspects of risk management and disaster recovery that were covered in the module.

SOFTWARE ENGINEERING

Software engineering is the use of an organized and regulated approach for the design, development, testing, documentation and maintenance of software by applying principles from engineering, project management, computer science, programming, cost management and other areas.

The Software Engineering module specifically aims to lay a solid foundation in the discipline of developing and maintaining software systems that behave reliably and efficiently, are affordable to develop and maintain, and satisfy all the requirements that customers have defined for them. The student will acquire broad knowledge about the Software Engineering process and the range of methods, tools, and techniques utilised, illustrated by means of a variety of case studies.

MODULE DESCRIPTIONS CONTINUED

STATISTICS

In this module, students will gain a good theoretical and practical understanding of statistical techniques and experimental design as applied to commercial problems. The topics covered in this module address the full breadth of the components of statistics, consisting of descriptive statistics, inferential statistics and statistical modelling.

TECHNOLOGY AND SOCIETY

The cyber world is a world with countless interactions in different forms. Online interaction has become part of our daily routine and it presents a number of challenges to both developers, owners and users. Given the different types of personal and corporate data that can be generated, it is important to establish awareness of possible ethical contraventions in which we can unintentionally participate. The development of new technologies also potentially poses threats to the livelihoods of many. Ethical behaviour by all stakeholders is crucial in sustaining the fair development and implementation of technologies. It is also important to ensure fair online interaction and the sharing of information. This module aims to establish an initial awareness of ethical issues in students as they start their studies in technology. It will assist with understanding the rights of people in the world of technology.

TECHNOLOGY START-UPS

Approximately 70% of technology start-ups fail within two years after receiving their first funding. This module prepares students to participate in the entrepreneurial economy of technology start-ups. It begins with an overview of lean start-up principles, including the production of a minimum viable product (MVP) that can be used for market validation. Assuming that the MVP is well-received, an initial start-up team will be assembled, based on the skills that will be needed to manage the business and to build, market and distribute the initial product(s). Subsequent topics focus on financing options, registering the business, selecting a law firm and an accountant, and assembling a board of directors. Additional financial and legal issues that are specific to the South African context are discussed, including taxation, labour law and the Consumer Protection Act. Guidelines are provided for selecting hardware, software and operating platforms. Final topics focus on establishing brand awareness, evaluating business value, managing staff and maintaining investor relationships. By the end of this module, students will have acquired a realistic understanding of the challenges associated with technology start-ups and will be equipped with a set of tools to help them address those challenges.

WEB SYSTEMS AND TECHNOLOGIES

With the ever-growing demand for availability of application programmes on the web, and on mobile devices such as smartphones, the inclusion of a module on the development of these applications is essential in an IT programme.

The aim of this module is to lay a solid foundation in the discipline of developing application software for the web and for mobile devices. The student will gain a breadth of knowledge about the development platforms and underlying technology, as well as the range of methods, tools, and techniques utilized in developing web applications. The student will also gain experience in developing applications for the web and mobile devices.

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BACHELOR OF BUSINESS INFORMATION SYSTEMS

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