

# NATIONAL DIPLOMA: INFORMATION TECHNOLOGY: MULTIMEDIA (Extended curriculum programme with foundation provision)

Qualification code: NDIUF1 - NQF Level 6

Campus where offered: Soshanguve South Campus

## Important notification to new applicants:

No new applications will be accepted as from 2020. Students who enrolled for this qualification for the first time in 2017 (or thereafter), should note that it will not be possible to continue with any Baccalaureus Technologiae as from 2020, since it is being replaced by qualifications aligned with the newly-implemented Higher Education Qualification Sub-Framework. Potential students are advised to consult the University's website for any new qualifications which might not be published in this Prospectus.

## REMARKS

- a. *Admission requirement(s) and selection criteria:*  
**See qualification NDITF1 listed under the ICT First Years' and Foundation Unit.**
- b. *Minimum duration:*  
Four years, divided as follows:
  - Year one: foundation subjects.
  - Year two: general first-year subjects.
  - Years three and four: specialisation subjects.
- c. *Presentation:*  
Day classes.
- d. *Intake for the qualification:*  
January only.
- e. *Exclusion and readmission:*  
See Chapter 2 of Students' Rules and Regulations.
- f. *Recognition of Prior Learning (RPL), equivalence and status:*  
See Chapter 30 of Students' Rules and Regulations.
- g. *Industry Exposure IIIB (Work-Integrated Learning):*  
Students may register for this subject only with the permission of the Head of Department. See Chapter 5 of Students' Rules and Regulations (paragraphs 5.2 and 5.3).
- h. *Subject credits:*  
Subject credits are shown in brackets after each subject.

## CURRICULUM

Please note that students will register for all first- and second-year subjects under qualification code NDITF1.

### FIRST YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
<b>FIRST SEMESTER</b>			
FPALS01	Foundation Academic and Language Skills	(0,125)	
FPITM01	Foundation ICT Mathematical Skills	(0,125)	
TOTAL CREDITS FOR THE SEMESTER:		0,250	



## SECOND SEMESTER

FPIDS01	Foundation Information and Software Development Skills	(0,125)
FPPRS01	Foundation Presentation and Reporting Skills	(0,125)

TOTAL CREDITS FOR THE SEMESTER: 0,250

TOTAL CREDITS FOR THE FIRST YEAR: **0,500**

## SECOND YEAR

After completion of all first-year subjects.

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
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### FIRST SEMESTER

CFS10AT	Computing Fundamentals IA	(0,062)
CGS10AT	Computing Systems IA	(0,062)
CMK10AT	Computing Skills IA	(0,063)
DSO17AT	Development Software IA	(0,063)

TOTAL CREDITS FOR THE SEMESTER: 0,250

### SECOND SEMESTER

CFS10BT	Computing Fundamentals IB	(0,062)	
CGS10BT	Computing Systems IB	(0,062)	
CMK10BT	Computing Skills IB	(0,063)	
DSO17BT	Development Software IB	(0,063)	Development Software IA

TOTAL CREDITS FOR THE SEMESTER: 0,250

TOTAL CREDITS FOR THE SECOND YEAR: **0,500**

As from the third year, a student will register for the specialisation field: Multimedia (NDIUF1).

## THIRD YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
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### FIRST SEMESTER

GUI10AT	Graphical User-Interface Design IA	(0,125)	
ISY23AT	Information Systems IIA	(0,125)	Computing Fundamentals IB
ITN20AT	Internet Programming IIA	(0,125)	Development Software IB
MMN20AT	Multimedia Technology IIA	(0,125)	Computing Fundamentals IB
TPG12AT	Technical Programming IA	(0,125)	Development Software IB

TOTAL CREDITS FOR THE SEMESTER: 0,625

### SECOND SEMESTER

GUI10BT	Graphical User-Interface Design IB	(0,125)	Graphical User-Interface Design IA
ISY23BT	Information Systems IIB	(0,125)	Information Systems IIA
ITN20BT	Internet Programming IIB	(0,125)	Internet Programming IIA
MMN20BT	Multimedia Technology IIB	(0,125)	Multimedia Technology IIA



TPG12BT	Technical Programming IB	(0,125)	Technical Programming IA
TOTAL CREDITS FOR THE SEMESTER:		0,625	
TOTAL CREDITS FOR THE THIRD YEAR:		<b>1,250</b>	

#### FOURTH YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
<b>FIRST SEMESTER</b>			
IDC30AT	Industry Exposure IIIA	(0,125)	
MMX30AT	Multimedia Programming IIIA	(0,125)	Internet Programming IIB Technical Programming IA
MMX30BT	Multimedia Programming IIIB	(0,125)	Internet Programming IIB Technical Programming IA
MMZ30AT	Multimedia Design IIIA	(0,125)	Multimedia Technology IIA
MMZ30BT	Multimedia Design IIIB	(0,125)	Multimedia Technology IIA
TOTAL CREDITS FOR THE SEMESTER:		0,625	

#### SECOND SEMESTER

**On completion of all the above subjects. Students with only one subject outstanding may be allowed to register for that subject and Industry Exposure IIIB with the approval of the Head of Department.**

IDC30BH	Industry Exposure IIIB	(0,125)	
TOTAL CREDITS FOR THE SEMESTER:		0,125	
TOTAL CREDITS FOR THE FOURTH YEAR:		<b>0,750</b>	
TOTAL CREDITS FOR THE QUALIFICATION:		<b>3,000</b>	

#### SUBJECT INFORMATION (OVERVIEW OF SYLLABUS)

The syllabus content is subject to change to accommodate industry changes. Please note that a more detailed syllabus is available at the Department or in the study guide that is applicable to a particular subject. On 02 August 2018, the syllabus content was defined as follows:

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##### COMPUTING FUNDAMENTALS IA (CFS10AT)

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Computer Science)*

The student is introduced to the fundamentals of computers and information systems, computer organisation and data processing. (Total tuition time: ± 90 hours)

##### COMPUTING FUNDAMENTALS IB (CFS10BT)

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Computer Science)*

The basic concepts of system development, data management, management information systems, ethics, privacy and security, purchasing and maintaining microcomputers, number systems and binary logic. (Total tuition time: ± 54 hours)



**COMPUTING SKILLS IA (CMK10AT)****1 X 3-HOUR PAPER****(Subject custodian: Department of Informatics)**

This subject aims to equip the student with fundamentals of IT Soft skills for both the ICT industry and other working environments upon which a successful career can be built. In addition, it will also improve the student's relation and interaction abilities needed within the dynamic ICT industry. The student who successfully completes this subject must identify and implement various thinking skills and learning styles, state the legal and cultural sensitivity issues of IT, identify and explain the variety of soft skills including study skills and strategies, research, presentation as well as communication skills, and identify and explain interpersonal skills in relation to character, time management and team building dynamics and conflict resolution. (Total tuition time: ± 60 hours)

**COMPUTING SKILLS IB (CMK10BT)****1 X 3-HOUR PAPER****(Subject custodian: Department of Informatics)**

The aim of this subject is to extend the skills in CMK10 AT so as to improve on student's relations and interaction capabilities that will be applicable within the dynamic ICT industry and the external environment. The student who successfully completes this subject must describe, distinguish and portray changes in terms of personality profiles, emotional intelligence, self-management, stress management and relationship management; identify and apply the notion of team dynamics; deal with conflict and understand the dynamics behind change; report on effective correspondence; produce meeting documents; conduct meetings; and demonstrate the required communication skills to develop interpersonal business relationships through by means of group work. (Total tuition time: ± 60 hours)

**COMPUTING SYSTEMS IA (CGS10AT)****1 X 3-HOUR PAPER****(Subject custodian: Department of Computer Systems Engineering)**

Introduction to hardware, operating systems, motherboards, processors, memory, hard drives, installing and supporting I/O devices, multimedia devices and mass storage, PC maintenance and troubleshooting strategies, and installing and maintenance of Windows. (Total tuition time: ± 54 hours)

**COMPUTING SYSTEMS IB (CGS10BT)****1 X 3-HOUR PAPER****(Subject custodian: Department of Information Technology)**

Provides the foundation of data communications and local area management, OSI model and/ or TCP/IP protocol stack model, data transmission principles, media, major protocols, topologies, routing methods, introduction to networking principles and network operating system fundamentals. (Total tuition time: ± 54 hours)

**D****DEVELOPMENT SOFTWARE IA (DSO17AT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

Aim: To learn to solve problems using the basic programming principles, and then practically apply that knowledge in C++. Objectives: To enable the student to understand problems and know how to solve them by using a computer; understand the general concepts and arithmetic used in programming, sequence, selection and iteration control structures and a variety of built-in data types, including strings. The students are exposed to the concept of event-driven programming in a visual programming environment focusing on the development of graphical user interfaces to solve real-life practical programming problems. (Total tuition time: ± 72 hours)

**DEVELOPMENT SOFTWARE IB (DSO17BT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

Aim: To expand on the already mastered knowledge obtained in Development Software IA. Objectives: To broaden the programming skills base of the student by adding the following topics: write an algorithm and applying it in VB.NET/C++ using functions and sub-procedures, and write an algorithm containing one-dimensional arrays. String manipulation will be continued as well as a brief introduction to text file processing. (Total tuition time: ± 72 hours)

**F****FOUNDATION ACADEMIC AND LANGUAGE SKILLS (FPALS01)****1 X 3-HOUR PAPER****(Subject custodian: ICT First Years' and Foundation Unit)**

Aim/Purpose: To provide a sound foundation for, and to enhance basic language proficiency and academic skills necessary for reading, writing and studying in an ICT environment. Objectives: Analyse, adjust and improve study skills. Apply research skills in assignments. Interpret and reflect on all available and relevant resource material in proper English. Communicate in a comprehensible and clear manner in both a general and subject-specific manner showing cultural sensitivity. Demonstrate intermediate-level proficiency in oral and written English. Key topics: Managing adjustment problems: student life, coping with diversity and change, time management, setting goals and note taking, summarising techniques, English vocabulary and grammar, reading and writing skills. (Total tuition time: ± 84 hours)



**FOUNDATIONAL ICT MATHEMATICAL SKILLS (FPITM01)****1 X 3-HOUR PAPER****(Subject custodian: ICT First Years' and Foundation Unit)**

Aim/Purpose: The focus of the subject is to ensure students have the necessary mathematical and numeracy skills needed for ICT. Students will also be introduced to abstract logical reasoning and computational thinking skills. These skills are further developed through practical exercises relating to various day-to-day problem-solving activities. Objectives: To develop the problem solving skills as well as the computational thinking skills of the student and therefore prepare the student for the programming subjects to follow. Key topics: The number system and basic arithmetic; introduction to algebra: expressions and equations; fractions and decimals, algebraic fractions; percentages; ratio and rate; perimeter, area and volume; measuring systems and units; time, distance and speed; Cartesian plane and coordinates; algebraic functions; matrices. (Total tuition time: ± 96 hours)

**FOUNDATION INFORMATION AND SOFTWARE DEVELOPMENT****1 X 3-HOUR PAPER****SKILLS (FPIDS01)****(Subject custodian: ICT First Years' and Foundation Unit)**

Aim/Purpose: To prepare students for computer programming by developing logical, critical and lateral thinking skills. Objectives: To develop the students' logical thinking and problem-solving skills as preparation for programming. Abstract logical reasoning and computational thinking skills will therefore be used to solve problems. Key topics: Brain teasers as introduction to problem-solving; analysis and solving of word problems; solving of various day-to-day problems; introduction to algorithmic problem solving - sequence, basic selection, basic repetition steps; statistics; financial matters. (Total tuition time: ± 96 hours)

**FOUNDATION PRESENTATION AND REPORTING SKILLS (FPPRS01)****1 X 3-HOUR PAPER****(Subject custodian: ICT First Years' and Foundation Unit)**

Aim/Purpose: To provide a sound foundation for, and to enhance basic language proficiency skills necessary for reading and writing in an ICT environment with specific reference to presentations and reports. Objectives: Preparation of effective and professional reports and PowerPoint presentations. Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner specifically when presenting various IT topics, demonstrate intermediate-level proficiency in written English. Key topics: Conflict management; problem solving; interpersonal relationships; stress management; communication theory; listening skills; public speaking and presentation skills; and report writing. (Total tuition time: ± 84 hours)

**G****GRAPHICAL USER-INTERFACE DESIGN IA (GUI10AT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

This subject introduces and teaches students Web design concepts and techniques in a Web authoring course that covers HTML and Adobe Dreamweaver. The objective of this subject is to present a practical approach to Web design using a blend of traditional development with current technologies, giving students an in-depth understanding of Web design concepts and techniques that are essential to planning, creating, testing, publishing, and maintaining Web sites. Contents include introduction to the Web environment and its tools, Web publish fundamentals, successful planning of Web sites, typography and graphics, Multimedia and interactivity on the Web and promoting and maintaining of Web sites. (Total tuition time: ± 80 hours)

**GRAPHICAL USER-INTERFACE DESIGN IB (GUI10BT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

This subject teaches the student the skills and knowledge to facilitate the alignment of IT and business processes using ICT Web solutions. The content offers creative projects, concise instructions, and a complete coverage of basic and advanced Macromedia Flash 8 skills, helping you to create and publish Flash animation. After completion of the subject, students will be able to analyse and design Web solutions to industry related Information Technology problems, utilise the required technical skills to effectively implement the designed solutions in a distributed IT environment. Demonstrate the effective utilisation of business and management skills to bridge the gap between the IT discipline and the business functional areas in industry. (Total tuition time: ± 80 hours)



**INDUSTRY EXPOSURE IIIA (IDC30AT)****1 X 3-HOUR PAPER****(Subject custodian: Department of Informatics)**

This subject enables students to gain insight to organisational characteristics and behaviour, personal and technological entrepreneurship; other issues include ethical and professional conduct in the workplace. The subject will also increase their knowledge of individual behavioural aspects, namely biographical characteristics, values attitudes, job satisfaction and personality and emotions, perceptions and individual decision making; broaden their understanding of the administrative structures of organisations, bureaucratic behaviour in global and diverse context; and develop interpersonal skills in applying and integrating contemporary theories of motivation. (Tuition time: ± 60 hours)

**INDUSTRY EXPOSURE IIIB (IDC30BH)****CONTINUOUS ASSESSMENT****(Subject custodian: Department of Computer Science)**

Industry Exposure IIIB is career-orientated and is aimed at integrating academic training with practical skills, as demanded by industry. Students work in industry for six months. (No formal tuition)

**INFORMATION SYSTEMS IIA (ISY23AT)****1 X 3-HOUR PAPER****(Subject custodian: Department of Computer Science)**

Understanding Systems Analysis fundamentals and the role of information technology in today's dynamic business environment; How to analyse a business case in the systems planning phase and the importance of understanding business operations and requirements and how IT projects support a company's overall strategic plan as well as the importance of conducting a preliminary investigation and a feasibility study; Learn about project management and how to plan, schedule, monitor and report on IT projects; Understand how to gather facts about a systems project, prepare documentation, and how to develop or create graphical models that show how the system transforms data into useful information and these models are used to design and develop systems. (Total tuition time: ± 72 hours)

**INFORMATION SYSTEMS IIB (ISY23BT)****1 X 3-HOUR PAPER****(Subject custodian: Department of Computer Science)**

The subject accommodates students from a broad spectrum of disciplines and interest. It includes a theoretical as well as a practical component. Theoretical component covers the systems design, systems implementation and systems support and security phases. Students choose different programming languages and integrate them to design commercial system. This subject provides the knowledge and practical skills needed to complete the development and design phases of a commercial system. (Total tuition time: ± 72 hours)

**INTERNET PROGRAMMING IIA (ITN20AT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

This subject teaches students how to design and develop websites using client side technologies including XHTML, Cascading Style Sheets, and JavaScript. At the end of this subject, students should show the ability to develop interactive client side websites. Contents include: Basic XHTML, imaging for the web (image basics, raster and vector graphics, common image formats), advanced XHTML (meta elements, span and div elements, image maps, tables, forms, frames), cascading Style Sheets, JavaScript Introduction + Arithmetic, JavaScript Control Structures, JavaScript Functions, JavaScript Arrays, JavaScript Objects, DHTML + DHTML Events model (The on click, on load, on error, mouse and form events, event bubbling, etc.) (Total tuition time: ± 60 hours)

**INTERNET PROGRAMMING IIB (ITN20BT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

This subject teaches students how to design and develop and deploy dynamic web applications using server-side technologies namely ASP.NET, C#, IIS /Tomcat server and Database. At the end of this subject, students should show the ability to develop dynamic and interactive 3-tier client-server-database web applications using C# in an ASP.NET development environment. Contents include reasons for using Server-Side Web scripting, Introduction to C#, Exception handling, object oriented programming in C# and the .NET framework; introduction to the Visual Studio IDE and the basic concepts of ASP.NET. (Total tuition time: ± 60 hours)



**MULTIMEDIA DESIGN IIIA (MMZ30AT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

The purpose of this subject is to provide an overview coverage of advanced design principles and applications. The theory component covers the basic elements and principles of two- and three-dimensional design, cultivate creativity, problem seeking and problem solving and the aspects and elements of time design. The practical component aims to assist in teaching the basics covered in the theory component. Microsoft PowerPoint and Adobe Photoshop will be used as tools. The student should be able to explain and apply design elements and concepts and design and develop multimedia solutions by using various technologies and packages. Content include: design and art theory, design concepts and principles, two-dimensional and three-dimensional design, time design, visual communication, concepts of critical thinking, cultivating creativity and idea forming, presentations skills and design, vector design, script writing, storyboarding and video editing. (Total tuition time: ± 60 hours)

**MULTIMEDIA DESIGN IIIB (MMZ30BT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

The aim of this subject is to teach students the process of creating a video. Qualified students should understand the basics of sound, how to draw sound graphs, how to create a storyboard, and how to edit videos and sounds. Content include: Audacity, Adobe after effects. Advanced content include: Camera skills, storyboarding, use lights in studio, audacity can be used to record sound, modify a sound file which require functions such as cut, copy, paste, and amplify, balancing sound. Adobe after effects allows students to create/modify video files, it requires skills such as importing files, keying, color range, add layers, add text, text effects, fade in/out, and rendering. (Total tuition time: ± 60 hours)

**MULTIMEDIA PROGRAMMING IIIA (MMX30AT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

Students are exposed to solving real-world problems through the creation of interactive objects, basic interactive solutions, or fully developed 3D simulation applications using EON Studio or EON Professional. With background knowledge in 3D design from earlier subjects, students are further introduced to the concept of building low poly models using 3Ds Max, which are then imported into the EON Studio environment to make it functional, real and interactive. When completed, the student should be well equipped to create visually stimulating interactive applications for use in the sciences, medicine, entertainment, engineering and educational fields. These applications, including virtual reality, simulations and games help to bring real or imaginary objects to life. (Total tuition time: ± 60 hours)

**MULTIMEDIA PROGRAMMING IIIB (MMX30BT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

This subject teaches how to design and develop and deploy advanced dynamic web applications using server-side technologies including PHP, IIS/Tomcat server and Database. At the end of this subject, students should show the ability to tie together various aspects previously studied in the National Diploma: Information Technology: Web and Application development; and develop dynamic and interactive 3-tier client-server-database web applications. Contents include overview of: Reasons for using PHP, MySQL and, Server-Side Web scripting, advanced use of functions, security, configuration, exceptions and error handling, debugging; choosing a Database for PHP; SQL; MySQL Database administration; PHP/MySQL functions; displaying queries in tables; building forms from queries; PHP/MySQL efficiency; PostgreSQL; Oracle; PEAR Database functions; E-mail; PHP and JavaScript/Java/XML/Web services; graphics; weblogs; user authentication. (Total tuition time: ± 60 hours)

**MULTIMEDIA TECHNOLOGY IIA (MMN20AT)****1 X 3-HOUR PAPER****(Subject custodian: Department of Computer Science)**

Students are introduced to the various multimedia elements, digital still image photography and digital editing skills. The student will be competent in all multimedia concepts and have a solid foundation in the planning process and design considerations, while covering industry standard applications and emerging technologies. The student will also be competent in digital photography capturing, editing, manipulation and application. This subject consists of two components over one semester. The theory component covers the most essential multimedia concepts for the Web, planning the multimedia Web site, designing the user interface and the five multimedia elements: text, graphics, animation, sound, and video. The practical component consists of basic digital photography and digital editing skills using Adobe Photoshop CS as a tool. (Total tuition time: ± 60 hours)



**MULTIMEDIA TECHNOLOGY IIB (MMN20BT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

Students are introduced to the virtual world. They will create any objects in 3D with 3D's Max, as well as animation. Students should have the ability to create virtual 3D objects as well as animation which can be applied to virtual reality or create a gaming character with animation. Content include: complete coverage of 3Ds' Max, various modeling skills as well as character animation. Advanced content include: model an object, create lights, create background images, apply material to an objects, effects on the material, generate path for an object, creating bone objects to characters, apply animation to character, and render a scene to a video file. (Total tuition time: ± 60 hours)

**T****TECHNICAL PROGRAMMING IA (TPG12AT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

Aim/Purpose: To introduce the student to object-orientated concepts using the Java programming language. Objectives: The student must be able to set up the Java development environment, use the applications coming along with the Java language to compile, bundle together, run and document programs create programs that are in accordance with the Java Naming Convention use pre-defined classes in programs create own classes, use decision statements in a program, use iterative statements in a program manipulate strings and characters in a program, use arrays in a program. Key topics: Java classes, methods, objects, decision making, loops, strings, primitive arrays, reference arrays. (Total tuition time: ± 78 hours)

**TECHNICAL PROGRAMMING IB (TPG12BT)****1 X 4-HOUR COMPUTER-BASED****(Subject custodian: Department of Computer Science)**

Aim/Purpose: To introduce the student to advanced OOP principles, robust programming, files manipulation and advanced graphical user interfaces using the java programming language. Objectives: To introduce the students to advanced concepts of OOP such as inheritance, polymorphism. Exception handling mechanisms, introduction to basic graphic and advanced graphic user interface design. Key topics: File manipulations, inheritance, polymorphism, exception handling, GUI components. (Total tuition time: ± 80 hours)

