

University Northern Technical

الجامعة التقنية الشمالية



First Cycle – Bachelor's degree (B.Tec.) – Statistics Information Technology

بكالوريوس تقنيات الإحصاء والمعلوماتية



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1. **Mission & Vision Statement**

Vision Statement

The department's vision is centered around establishing a robust and qualitative structure that actively enriches and supports diverse fields, encompassing both academic pursuits and the labor market. This vision underscores the vital integration of statistical and informational components to facilitate the creation and dissemination of knowledge. By doing so, the department aims to significantly contribute to the development of a knowledge society, ultimately paving the way for a brighter and more informed future. The commitment to fostering such an environment ensures that both individuals and organizations can thrive in a landscape defined by rapid change and innovation, empowering them to meet the challenges of tomorrow with confidence and competence.

Mission Statement

The academic staff of the Statistics and Information Technology department at Northern Technical University is dedicated to a comprehensive mission that prioritizes student success in an evolving field. The program is designed to equip all students with essential skills and fundamental knowledge in Statistics and Information Technology, while also offering in-depth exploration of specialized areas within the discipline. The curriculum is thoughtfully structured to prepare graduates for various professional pathways. Students are trained not only to become IT professionals in statistics and data analysts but also to pursue further academic endeavors in Statistics and Information Technology. This alignment with professional and advanced study opportunities ensures that graduates are well-

equipped to meet industry demands. Moreover, the program lays an essential foundation that supports degrees in IT in Statistics Science and the Associate of Science degree in Mathematical Sciences. The courses offered are tailored to provide critical technical experiences, necessary for those students aiming to fulfill their general education requirements while gaining significant insights into the fields of statistics and information technology. Overall, the Statistics and Information Technology program at Northern Technical University aims to foster a rich learning environment that empowers students with the skills and knowledge needed to excel in their careers or higher education pursuits.

2. **Program Specification**

Program code:	B.Tech-SIT	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

Statistical Techniques is a dynamic and comprehensive field designed to prepare students for a wide range of careers in statistics. The program emphasizes the practical application of statistical concepts and techniques to solve real-world problems, whether it involves data analysis, statistical modeling, or quantitative research. The degree is popular – for some, the appeal lies in the diversity of the subjects covered, while others see it as a path to specialization in specific areas.

Level 1: This foundational year introduces students to the basics of Statistical Techniques, providing a strong foundation for progression into all programs within this specialization. Core program-specific topics are covered, preparing students for more advanced, research-led modules in the following years.

Levels 2, 3, and 4: At these levels, students have the flexibility to choose core and elective modules, ensuring a wide range of statistical methods and applications are covered. This flexibility guarantees that graduates gain the breadth of knowledge expected in the field of Statistical Techniques. Students can explore their own interests in areas such as regression analysis, time series analysis, and experimental design. Module decisions are made in consultation with personal tutors.

Research Ethos and Practical Skills: The research ethos is developed from the beginning, with practical sessions embedded in lecture modules or delivered through dedicated practical units, research seminars, and tutorials. There is a compulsory project in Level 1 that students must pass to progress to Level 2, and optional projects in Levels 2, 3, and 4. At Level 4, all students undertake an independent research project, which may be a credit-based library or data analysis project, or a field or lab-based project.

Academic Tutorials: Held in Levels 1 and 2 with the same tutor, who also serves as a personal tutor, offering continuity and ongoing guidance. Tutorials at Levels 1 and 2 include workshops that teach essential skills like data management and the use of statistical software, followed by assessed exercises such as reports and presentations, giving students opportunities to practice these skills within a subject-specific context.

Field Experience and Practical Application: A compulsory practical project is required at Level 1 for progression to Level 2, with optional field projects available at Levels 2, 3, and 4. At Level

4, all students undertake an independent research project, which could be a credit-based library or data analysis project, or a field-based statistical investigation.

International Years and Industrial Placements: The program offers opportunities for international study years and industrial placements. Individual student needs are discussed with the appropriate tutor and accommodated wherever possible.

Graduates of Statistical Techniques are trained to appreciate how research informs teaching, aligning with the University and School mission statements. This comprehensive approach ensures that graduates are well-prepared for professional careers and advanced studies in the field of statistics.

3. Program Objectives: using Bloom Theory

Bloom's Taxonomy provides a structured framework for developing educational objectives. Here's how it can be applied specifically to the fields of statistics and information technology:

1. Knowledge Level

- **Objective:** Acquire foundational knowledge in statistics and information technology.
- **Examples:**
 - Define fundamental concepts such as population, sample, variance, database, and programming languages.
- Identify various types of data (e.g., nominal, ordinal, interval, ratio).

2. Comprehension Level

- **Objective:** Understand and articulate key principles in statistics and IT.
- **Examples:**
 - Explain the significance of statistical measures in summarizing data.
 - Describe the basic functions of databases and how they support data management.

3. Application Level

- **Objective:** Utilize statistical methods and IT tools to solve practical problems.
- **Examples:**
 - Apply statistical tests (e.g., t-tests, chi-square tests) using software tools like Excel or SPSS.
 - Use programming languages (e.g., Python, R) to manipulate and analyze datasets.

4. Analysis Level

- **Objective:** Critically evaluate data and IT systems.
- **Examples:**
 - Analyze the results of statistical analyses to draw meaningful conclusions.
 - Compare different software tools for data visualization and their effectiveness.

5. Synthesis Level

- **Objective:** Integrate knowledge to create innovative solutions.
- **Examples:**
 - Design a data-driven project that combines statistical analysis with IT frameworks.

- **Develop a prototype of an application that uses statistical algorithms for predictive modeling.**

6. Evaluation Level

- **Objective:** Assess the effectiveness of statistical and IT applications.
- **Examples:**
- **Critique a statistical report and its implications for business strategy.**
- **Evaluate user satisfaction and performance metrics of an IT system to recommend improvements.**

4. Student Learning Outcomes

When defining student learning outcomes (SLOs) for a program in statistics and information technology, it's essential to articulate what students should be able to know, do, and demonstrate upon completion. Here's a structured outline based on Bloom's Taxonomy:

1. Knowledge Outcomes

- **Outcome:** Students will be able to identify and define key concepts in statistics and information technology.
- **Examples:**
- Define statistical terms such as mean, median, mode, standard deviation, and correlation.
- Identify various types of information systems and their components (e.g., databases, networks).

2. Comprehension Outcomes

- **Outcome:** Students will be able to explain fundamental principles and theories in statistics and IT.
- **Examples:**
- Describe the importance of data integrity and security in information systems.
- Explain how statistical methods are used to interpret data and inform decision-making.

3. Application Outcomes

- **Outcome:** Students will be able to apply statistical techniques and IT tools to solve real-world problems.
- **Examples:**
- Utilize statistical software (e.g., R, Python, SPSS) to conduct data analyses and interpret results.
- Implement basic IT solutions, such as creating databases or developing simple applications.

4. Analysis Outcomes

- **Outcome:** Students will be able to analyze data and evaluate IT systems critically.
- **Examples:**
- Analyze datasets to identify trends and patterns using statistical methods.

- Evaluate the efficiency and effectiveness of different information systems in various contexts.

5. Synthesis Outcomes

- **Outcome:** Students will be able to create new solutions by integrating statistical knowledge with information technology.
- **Examples:**
 - Develop a comprehensive data analysis project that employs both statistical methods and IT tools.
 - Design an innovative IT application that incorporates statistical modeling for predictive analytics.

6. Evaluation Outcomes

- **Outcome:** Students will be able to assess and critique statistical analyses and IT applications.
- **Examples:**
 - Critique statistical reports, discussing their implications and limitations.
 - Evaluate the performance of IT systems based on user feedback, data metrics, and best practices.

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6. Credits, Grading and GPA

Credits

(Northern Technical University) is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$\text{CGPA} = [(1\text{st module score} \times \text{ECTS}) + (2\text{nd module score} \times \text{ECTS}) + \dots] / 240$$

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
		hr/sem	hr/sem	hr/sem			
TCMM107	Principles of Economics	78	72	150	6.00	B	
SIT108	Principles of Mathematics	93	107	200	8.00	S	
NTU100	Democracy and Human Rights	33	17	50	2.00	B	
NTU101	English Language	33	17	50	2.00	B	
TCMM105	Principles of Statistics	78	72	150	6.00	B	
SIT110	Index Numbers	63	37	100	4.00	C	
SIT109	SPSS Applications	33	17	50	2.00	E	
SIT114	Minitab Applications	33	17	50	2.00	E	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
		hr/sem	hr/sem	hr/sem			
SIT111	Statistical Applications	93	132	225	9.00	C	
TCMM106	Accounting Principles	78	72	150	6.00	B	
SIT112	Mathematical Applications	108	117	225	9.00	S	
TCMM104	Principles of Management	78	72	150	6.00	B	
NTU102	Computer	62	13	75	3.00	B	
NTU103	Arabic Language	18	32	50	2.00	B	
SIT113	Introduction in R	108	117	225	9.00	S	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
		hr/sem	hr/sem	hr/sem			
SIT205	Linear Algebra	78	72	150	6.00	S	
SIT206	Numerical Analysis	63	62	125	5.00	S	
NTU200	Crimes of the Baath Regime in Iraq	33	17	50	2.00	B	
SIT207	Principles of Time Series	63	62	125	5.00	C	
SIT208	Principles of Probability	93	57	150	6.00	C	
NTU201	English Language	33	17	50	2.00	B	
SIT209	Matlab Applications	63	37	100	4.00	E	
SIT210	Python Programming	63	37	100	4.00	E	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
		hr/sem	hr/sem	hr/sem			
SIT211	Deferential Equations	63	62	125	5.00	S	
SIT212	Sampling Theory	78	47	125	5.00	C	
SIT213	Hypotheses Testing	78	47	125	5.00	C	
NTU202	Computer	62	13	75	3.00	B	
SIT215	Time Series	63	37	100	4.00	C	
SIT214	Probability	93	57	150	6.00	C	
NTU203	Arabic Language	33	17	50	2.00	B	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite
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		hr/se m	hr/sem	hr/se m			Module(s) Code
SIT301	Operations Research	63	62	125	5.00	C	
SIT302	Principles of Biostatistics	78	72	150	6.00	C	
SIT303	Analysis of Linear Regression	93	82	175	7.00	C	
SIT304	Principles of Mathematical Statistics	78	72	150	6.00	C	
SIT305	Computer Applications(R) Language	78	72	150	6.00	C	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL	USSW L	SWL	ECTS	Modul e Type	Prerequisite Module(s) Code
		hr/se m	hr/sem	hr/se m			
SIT306	Mathematical Statistics	78	72	150	6.00	C	
SIT307	Biostatistics	78	72	150	6.00	C	
SIT308	Reliability	78	72	150	6.00	C	
SIT309	Non-Linear Regression	93	82	175	7.00	C	
SIT310	Queue theory	63	62	125	5.00	E	
SIT311	Data Mining	63	62	125	5.00	E	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL	USSW L	SWL	ECT S	Modul e Type	Prerequisite Module(s) Code
		hr/se m	hr/sem	hr/se m			
SIT401	Principles of Multivariate	78	47	125	5.00	C	
SIT402	Principles of Statistical Inference	78	47	125	5.00	C	
SIT403	Principles of Experimental Design	78	72	150	6.00	C	
NTU400	Scientific Research	48	52	100	4.00	B	
SIT404	Non-Parametric Methods	78	47	125	5.00	C	
SIT405	Machine Learning	78	47	125	5.00	E	
SIT406	Information Theory	78	47	125	5.00	E	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Module Code	Module Name in English	SSWL	USSW L	SWL	ECTS	Modul e Type	Prerequisite Module(s)
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		hr/se m	hr/sem	hr/se m			Code
SIT407	Statistical Inferences	78	72	150	6.00	C	
SIT408	Experimental Design	78	72	150	6.00	C	
SIT409	Multivariate	78	47	125	5.00	C	
SIT410	Artificial Intelligence	78	47	125	5.00	S	
SIT411	Stochastic Processes	78	72	150	6.00	C	
SIT412	Graduation Project	33	17	50	2.00	C	

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