HIGHER CERTIFICATE IN INDUSTRIAL ENGINEERING

HCert (Industrial Engineering) - NQF Level 5 (140 credits)

Qualification code: HCIE18

SAQA ID: 99013, CHE NUMBER: H/H16/E030CAN

Campus where offered: Pretoria Campus

REMARKS

a. *Admission requirement(s) and selection criteria:*

- **APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

  Admission requirement(s):
  A Senior Certificate or an equivalent qualification, with C symbols at Standard or D symbols at Higher Grade for English and Mathematics, and a D symbol at Standard Grade or an E symbol at Higher Grade for Physical Science.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **20**.

  Recommended subject(s):
  None.

- **APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

  Admission requirement(s):
  A National Senior Certificate with a bachelor's degree, or a diploma, or a higher certificate endorsement or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language) and Mathematics or Technical Mathematics, and at least a 3 for Physical Sciences or Technical Sciences.

  Applicants who do not meet the requirements for Mathematics, Physical Sciences, or any of the two additional subjects may enroll for these subjects at any Technical and Vocational Education and Training (TVET) College (see National N Certificate requirements), and if these are successfully passed at a performance level of at least 50%, they may re-apply for admission to the University.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **20** (excluding Life Orientation).

  Recommended subject(s):
  Mechanical Technology.

- **APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

  Admission requirement(s):
  A National Certificate (Vocational) at NQF Level 4, with a bachelor's degree or a diploma, or a higher certificate endorsement, issued by the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% (APS of 4) for English and Mathematics, and 50% for Life Orientation (excluded for APS calculation) and 40% (APS of 3) for Science, and any other three compulsory vocational subjects.

Selection criteria:
To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **20** (excluding Life Orientation).

Recommended subject(s):
None.

- **APPLICANTS WITH A NATIONAL N CERTIFICATE/NATIONAL SENIOR CERTIFICATE AS PUBLISHED IN REPORT 191: N3 (NQF LEVEL 4):**

  Admission requirement(s):
  A National Senior Certificate or a National N Certificate with languages as published in Report 191: N3 (NQF Level 4) issued by both the Department of Higher Education and Training (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English, Mathematics N3, Engineering Sciences N3 and any other two additional subjects.

  Selection criteria:
  To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **20** (excluding Life Orientation).

  Recommended subject(s):
  None.

- **APPLICANTS WITH A N4 CERTIFICATE IN A RELATED ENGINEERING FIELD AS PUBLISHED IN REPORT 191: N4:**

  Admission requirement(s):
  A N4 Certificate in a related Engineering field as published in Report 191: N4 issued by both the Department of Higher Education and Training (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least an average of 50% for the qualification, and successful completion of an English Language Proficiency Assessment (done by the University).

b. *Assessment procedure(s):*
No further assessment will be done (except for candidates with a N4 Certificate). Applicants who achieve the minimum APS will be considered until the programme complement is full. All completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.

d. *Intake for the qualification:*
January only.

e. *Presentation:*
Day classes. Classes and assessments may take place on Friday afternoons and/or Saturdays.

f. *Minimum duration:*
One year.

g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations.

CURRICULUM

ATTENDANCE

CODE	MODULE	NQF-L	CREDIT
CML105X	Computer Literacy	(5)	(10)
COM105X	Communication Skills	(5)	(8)
EPH105C	Engineering Physics	(5)	(14)
IEP105C	Industrial Engineering Practice	(5)	(28)
INL125C	Information Literacy (block module)	(5)	(1)
LFS125X	Life Skills (block module)	(5)	(2)
TMA105C	Technical Mathematics	(5)	(21)
FIRST SEMESTER			
EGR115C	Engineering Graphics	(5)	(14)
SECOND SEMESTER			
EWP115C	Engineering Work Systems for Process Planning	(5)	(14)
QSP115C	Quality Systems and Process Improvements	(5)	(14)
SAT115C	Statistics	(5)	(14)
TOTAL CREDITS FOR THE QUALIFICATION:			**140**

MODULE 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 module. At time of publication, the syllabus content was defined as follows:

C

COMMUNICATION SKILLS (COM105X) **1 X 2-HOUR PAPER**

(Module custodian: Department of Industrial Engineering)

To identify and apply basic competencies related to communicating in a technical or engineering environment. These competencies include presenting technical information to a variety of audiences, preparing technical reports, participating constructively in formal meetings and preparing a variety of business and technical documents. (Total notional time: 80 hours)

COMPUTER LITERACY (CML105X) **CONTINUOUS ASSESSMENT**

(Module custodian: End User Computing Unit)

This module provides foundational knowledge in computing fundamentals, essential digital skills in key applications based on MS Office Suite and network basics (i.e. MS Outlook and Internet). Online exams are mapped with End-User Computing: SAQA 49077 (61591) Core Element as well as Internet and Computing Core Certification. (IC3). (Total notional time: 100 hours)

E

ENGINEERING GRAPHICS (EGR115C) **CONTINUOUS ASSESSMENT**

(Module custodian: Department of Mechanical and Mechatronics Engineering)

Introduction to graphics communication. Dimensioning and tolerance practices. Geometrical construction. Orthographic projections. Machine drawing and introduction to computer aided design and Assemblies. (Total notional time: 140 hours)

ENGINEERING PHYSICS (EPH105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Physics)

Basic mathematics and vectors. Measurements. Kinematics in 1 dimension. Forces and Newton's laws of motion. Work energy and power. Elasticity. Static and dynamic fluids. Temperature and heat. Wave properites. Reflection of light and mirrors; refraction of light and lenses and optical instruments. (Total notional time: 140 hours)

ENGINEERING WORK SYSTEMS FOR PROCESS PLANNING (EWP115C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Industrial Engineering)

Various planning methodologies, which are relevant to different processes and/or volume requirements are considered. Further work-study techniques relevant to planning are presented. A buildup on the knowledge accumulated in the module Facility Planning methodologies. The module orientates the student with the software utilised in the industry used for planning like SAP, Cispro. This module builds the knowledge of the student in production philosophies like Just in Time and Theory of Constraints. (Total notional time: 140 hours)

I

INDUSTRIAL ENGINEERING PRACTICE (IEP105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Industrial Engineering)

Provide an understanding and hands-on experience that will introduce the candidate to skills as an Industrial Engineer Technician Assistant. Teaching focuses on the integration of the engineering work systems for process planning, the process improvement and the engineering science in the daily work of an Industrial Engineer Technician Assistant. (Total notional time: 280 hours)

INFORMATION LITERACY (INL125C) **CONTINUOUS ASSESSMENT**

(Module custodian: Directorate of Library and Information Services)

Introduction of information literacy. Development of a search strategy and application of a search string to search engines and academic databases. Evaluation of information sources. Ethical and legal use of information. (Total notional time: 10 hours)

L

LIFE SKILLS (LFS125X) **CONTINUOUS ASSESSMENT**

(Module custodian: Directorate of Student Development and Support)

Personal, socio-emotional and academic skills development for students in higher education. This module includes 1. Intra- and interpersonal skills (e.g. emotional intelligence, relationships, and conflict management); 2. General study skills (e.g. time management, goal setting, learning styles); 3. Health and wellness (e.g. HIV/AIDS, GBV issues, substance abuse); 4. Student life and adjustment (e.g. identity development, adjusting to a higher education environment); and 5. Financial management. (Total notional time: 20 hours)

Q

QUALITY SYSTEMS AND PROCESS IMPROVEMENTS (QSP115C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Industrial Engineering)

Application of quality techniques and methods in different manufacturing and service processes. Contribute towards the continual quality improvement in manufacturing and services processes. Develop the student in self-study and problem solving methods. Personal and professional ethics are addressed during the course of learning. (Total notional time: 140 hours)

S

STATISTICS (SAT115C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Industrial Engineering)

Introduction to statistics. Descriptive statistics: graphical representation of data, measurements of central position, measures of dispersion. Basic probability concepts. Hypothesis testing: one, mean, percentages (proportions), variances. Linear regressions and correlation. (Total notional time: 140 hours)

T

TECHNICAL MATHEMATICS (TMA105C) **1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

Matrices, engineering calculations, functions for engineers, trigonometry, geometry, vectors, Introduction to differentiation and integration, applications of differentiation and integration, data handling. (Total notional time: 210 hours)