# NATIONAL DIPLOMA: BUILDING

**Qualification code:** NDBU04 - NQF Level 6

- Campus where offered: Pretoria Campus (day classes)
- Last year of new intake: 2016
- Teach-out (phase-out) date: 31 December 2021

Students registered for this qualification should complete their studies according to the teach-out date prescribed for the qualification, subject to the stipulations of Regulation 3.1.11 and 3.1.13 in the Students' Rules and Regulations.

Information on phased-out programmes can be obtained from the TUT website, www.tut.ac.za.

Key to asterisks:
* Information does not correspond to information in Report 151.
  (Deviations approved by the Senate in August 2005.)

## CURRICULUM
Consult the 2016 Faculty Prospectus for the full contents of the qualification.

### FIRST YEAR

Subjects printed in bold are not for registration purposes. Please note that no registration will take place after December 2017 for first semester- and December 2018 for second-semester subjects.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC101T</td>
<td>Applied Building Science I</td>
<td>(0,166)*</td>
<td></td>
</tr>
<tr>
<td>CMN101T</td>
<td>Construction Management I</td>
<td>(0,167)</td>
<td></td>
</tr>
<tr>
<td>COM151T</td>
<td>Communication I</td>
<td>(0,083)</td>
<td></td>
</tr>
</tbody>
</table>

**SUBJECT GROUP A: MANAGEMENT, APPLIED AND COMMUNICATION (MAC):**
A student may not register for a total number of subjects exceeding 0,584 credits.

**SUBJECT GROUP B: TECHNOLOGY, SITE SURVEYING, QUANTITY SURVEYING (TSQ):**
A student may not register for a total number of subjects exceeding 0,584 credits.

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<tbody>
<tr>
<td>COA111C</td>
<td>Computer Applications I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>CTY111T</td>
<td>Construction Technology I</td>
<td>(0,167)</td>
<td></td>
</tr>
<tr>
<td>QSU101T</td>
<td>Quantity Surveying I</td>
<td>(0,167)</td>
<td></td>
</tr>
<tr>
<td>SSU101T</td>
<td>Site Surveying I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSU10XT</td>
<td>Site Surveying: Applications I</td>
<td>(0,084)</td>
<td></td>
</tr>
<tr>
<td>SSU10YT</td>
<td>Site Surveying: Practical I</td>
<td>(0,083)</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE FIRST YEAR:** 1,000

### SECOND YEAR

Please note that no registration will take place after December 2019 for first semester- and December 2020 for second-semester subjects. During this practical year, students must submit a report, in the form of an assignment, on actual experience which must be verified by supervisors in each of the following subjects:

**RE-REGISTRATION SUBJECTS ARE OFFERED IN BOTH SEMESTERS.**

<table>
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<tbody>
<tr>
<td>CMN200T</td>
<td>Construction Management II</td>
<td>(0,166)*</td>
<td>Construction Management I</td>
</tr>
<tr>
<td>CMN201R</td>
<td>Construction Management II</td>
<td>(0,000)</td>
<td>Construction Management I</td>
</tr>
<tr>
<td>CTY210T</td>
<td>Construction Technology II (year subject)</td>
<td>(0,167)</td>
<td>Construction Technology I</td>
</tr>
</tbody>
</table>
CTY211R  Construction Technology II (re-registration)  (0,000)
QSU210T  Quantity Surveying II (year subject)  (0,167)  Quantity Surveying I
QSU211R  Quantity Surveying II (re-registration)  (0,000)

The following must be completed (students must compile and maintain a logbook of work completed, which must be certified by the supervisor at the place of employment):

EXP1BDG  Work-Integrated Learning I  (0,250)
EXP2BDG  Work-Integrated Learning II  (0,250)  Work-Integrated Learning I

TOTAL CREDITS FOR THE SECOND YEAR:  1,000

THIRD YEAR

Subjects are offered in both semesters. Subjects printed in bold are not for registration purposes.

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<thead>
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<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMN301T</td>
<td>Construction Management III</td>
<td>(0,166)*</td>
<td>Construction Management II</td>
</tr>
<tr>
<td>CSA311T</td>
<td>Construction Accounting III</td>
<td>(0,166)*</td>
<td>Construction Management II</td>
</tr>
<tr>
<td>SEK301T</td>
<td>Structures and Concrete III</td>
<td>(0,083)</td>
<td>Applied Building Science I</td>
</tr>
<tr>
<td>SEK30XT</td>
<td>Structures and Concrete: Structures III</td>
<td>(0,084)</td>
<td>Applied Building Science I</td>
</tr>
</tbody>
</table>

SUBJECT GROUP B: TECHNOLOGY, QUANTITY SURVEYING AND PRICE ANALYSIS AND ESTIMATING (TSQ):

A student may not register for a total number of subjects exceeding 0,584 credits.

CTY311T  Construction Technology III  (0,167)  Construction Technology II
PAY311T  Price Analysis and Estimating III  (0,167)  Quantity Surveying II
QSU311T  Quantity Surveying III  (0,167)  Quantity Surveying II

TOTAL CREDITS FOR THE THIRD YEAR:  1,000
TOTAL CREDITS FOR THE QUALIFICATION:  3,000

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 8 August 2018, the syllabus content was defined as follows:

A

APPLIED BUILDING SCIENCE I (ABC101T)  1 X 3-HOUR PAPER
(Subject custodian: Department of Physics)

COMMUNICATION I (COM151T)
(Subject custodian: Department of Applied Languages)
Communication theory, non-verbal communication (body language). Oral presentations, interviews, developing
leadership and participation skills. Technical reports and correspondence. (Total tuition time: ± 180 hours)

COMPUTER APPLICATIONS I (COA111C)
(Subject/Module custodian: Department of End User Computing Unit)
Components of a microcomputer system, engineering applications of software. Managing personal computers.
Introduction to computers. Basics of operating systems. Application programs, such as word-processing and
spreadsheet programs. (Total tuition time: ± 180 hours)

CONSTRUCTION ACCOUNTING III (CSA311T)
(Subject custodian: Department of Accounting)
The purpose of accounting. Records and first entries. Transactions up to trial balance of business and banking
transactions. Closing entries up to balance sheet. Contract, sole owners, partnership, limited company and
close corporation accounts. Application of a construction accounting computer program. (Total tuition time:
± 180 hours)

CONSTRUCTION MANAGEMENT I (CMN101T)
(Subject/Module custodian: Department of Building Sciences)
Organisations involved in the building industry. Parties involved in the construction process. Construction
 undertakings and their organisational structures. Obtaining contracts. Introduction to site administration and
cost control. Site meetings. Management functions and components: productivity and work study. Introduction
to project planning. Introduction to personnel management. Subcontractors. Principles and applications of
microeconomics. Scarcity, choice, elasticity utility and demand efficiency and equity, production and costs,
price determination under different market structures: perfect competition, imperfect competition as well as
monopoly. (Total tuition time: ± 180 hours)

CONSTRUCTION MANAGEMENT II (CMN200T, CMN201R)
PROJECT ASSESSMENT
(Subject custodian: Department of Building Sciences)
Introduction to Contract Law and the JBCC Minor Works contract. Projects based on relevant and appropriate
site operations, which cover as many of the following topics as possible: legislation and company policy,
communication in the micro-environment on the site, coordination of subcontractors, application of management
functions and procedures, collection and application of information on plant, drawing up applications of bar
charts, labour schedules, material schedules, plant-use schedules, plant maintenance schedules, networks,
simple work study exercises. Application of the procurement and completion of materials for a building site.
Application of the procurement and completion of materials for a building site. Principles and applications of
macroeconomics. Measuring macroeconomic performance, simple Keynesian model, money and banking,
fiscal and monetary policy, exchange rates and the balance of payments and introduction to international trade.
Introduction to Building Information Modeling (BIM). BIM and the client. BIM in project management. Construction
sequencing. Conflict, interference and collision detection. Facilities management. Faster and more effective
processes. Controlled whole-life costs and environmental data. Lifecycle data. (Total tuition time: not available)

CONSTRUCTION MANAGEMENT III (CMN301T)
(Subject custodian: Department of Building Sciences)
Planning techniques. Network techniques, resource scheduling and optimum cost analysis. Bar charts. Line of
balance techniques. Financial reporting and control. Perspectives on estimating, valuations, cost assessment,
cost control and production control. Office and site administration and documentation. Applicable clauses from the
standard contract for private work. Quality control. Labour relations and labour legislation. Industrial psychology.
Human resource management. Occupational safety, health and welfare. Public relations. Introduction to law of
law. Dispute resolution. Tender conditions and adjudications. (Total tuition time: ± 180 hours)
CONSTRUCTION TECHNOLOGY I (CTY111T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Building Sciences)  
Draughtsmanship and interpretation of drawings. Substructure and setting out of different types of foundations.  
Superstructure, i.e. walls, windows, doors. Concrete and timber suspension floors with stairs and railing. Roof  
construction and coverings. Electrical and plumbing services. Carpentry items, i.e. built-in cupboards, skirtings  
and ironmongery on fillings. Finishes on walls, floors and ceilings. Materials and properties in the building  
industry. (Total tuition time: ± 180 hours)

CONSTRUCTION TECHNOLOGY II (CTY210T, CTY211R) PROJECT ASSESSMENT  
(Subject custodian: Department of Building Sciences)  
Projects based on form-work materials and re-use factors. Precast concrete beams and floors. Metal doors and  
windows. Timber doors and windows. Glass properties. Prefabricated timber trusses. Roof coverings, eaves,  
flashings and rainwater goods. Dormer windows and use of attic space in roofs. Fireplaces. Fixing methods,  
fastenings and adhesives. Floor, wall and ceiling finishes. Drainage and plumbing detail. Paint to metal, plaster  
and timber. Industrial buildings. (Total tuition time: not available)

CONSTRUCTION TECHNOLOGY III (CTY311T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Building Sciences)  
Framed and load-bearing, multi-floor concepts. Use of shoring and strutting for lateral support of adjacent  
property. Types of soils. Testing of ground pressure resistance. Types of excavations. Keeping excavations  
Steel structures. Cladding of buildings. Installation of services such as air-conditioning, lifts, escalators, fire  
fittings and inspection trap doors. Special finishes on walls, ceilings and floors. (Total tuition time: ± 180 hours)

PRICE ANALYSIS AND ESTIMATING III (PAY311T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Building Sciences)  
Specification of items for analysis of unit rates in bills of quantities. Different methods of estimating. Factors  
which could influence the estimate. Cost calculation. Compiling unit rates. Material, labour, overheads and  
Analysis of unit rates. Pricing of specialist items. Provisional sums and prime cost items. Pricing of model  
preliminaries according to a standard system. Drawing up of unit rates for composite items such as additions  
and renovations. (Total tuition time: ± 180 hours)

QUANTITY SURVEYING I (QSU101T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Building Sciences)  
Introduction to the principles, processes and methods of measurement and documentation of builders' work.  
Drawing up of bills of quantities. Drawing up a list of dimensions. Calculation of quantities. Measurement and  
description of the following elements of a single-storey building: foundations, including site clearance and  
simple demolitions, superstructure brickwork, solid floor construction, roofs, finishes, comprising plaster, paint  
and tiling on walls, conventional floors and plastered and boarded ceilings on brandering. Stock steel, timber  
and aluminium windows. Stock flush and hard-wood doors, including timber and metal frames. Adjustments  
for windows, doors and plain openings. Working up by squaring, abstracting and billing. (Total tuition time:  
± 180 hours)

QUANTITY SURVEYING II (QSU210T, QSU211R) PROJECT ASSESSMENT  
(Subject custodian: Department of Building Sciences)  
Projects based on load-bearing structures, including measuring, abstracting and billing with full descriptions and  
specifications. Reference to manufacturer catalogues and the ASAQS Model Preambles regarding the following:  
precast and pre-stressed concrete beams and floors, standard metal doors and windows, standard timber doors  
and windows, glass, prefabricated timber trusses, roof coverings, eaves, flashing and rainwater goods, floor,  
wall and ceiling finishes, drainage and plumbing detail, paint. The above projects should be augmented with  
the following systems when compiling a bill of quantities: traditional method x, computerised method, the use of  
the model preambles and x preliminaries. The appointment of the members of the professional team and their  
fee scales. The use of standard forms for certificates. BIM in quantity surveying. BIM and cost estimating. (Total  
tuition time: not available)
QUANTITY SURVEYING III (QSU311T) 1 X 3-HOUR PAPER

(Subject custodian: Department of Building Sciences)
Measurement and description of the following elements of multi-storey buildings: bulk earthworks and site clearance, load-bearing and framed concrete and brick structures, flat roofs, waterproofing to concrete roofs, sheet-metal covering and boarded roofs. Staircases, including balustrade walls, balustrading and finishes. Structural steelwork. Finishes, comprising facings, in-situ terrazzo, patent plaster finishes, more complex tiling, panelling, other non-standard finishes and suspended ceilings. Purpose-made timber and aluminium windows and doors, including sidelights, fanlights and adjustments. Joinery fittings. Plumbing and drainage complete. Prime cost and provisional sums, payment certificates, including final account adjustments and builders’ work regarding specialist installations. Practical working up and drawing up of bills of quantities, complete with trade preambles. (Total tuition time: ± 180 hours)

SITE SURVEYING: APPLICATIONS I (SSU10XT) 1 X 3-HOUR PAPER

(Subject custodian: Department of Geomatics)
Linear surveying. Methods of measuring with a tape. Interpretation and layout of scale model drawings. Contouring and the use of laser equipment. Surveys of existing buildings. (Total tuition time: ± 100 hours)

SITE SURVEYING: PRACTICAL I (SSU10YT) CONTINUOUS ASSESSMENT

(Subject custodian: Department of Geomatics)
Setting out sites and buildings by means of levelling and elementary tacheometry. Setting out and determining contours. Determining of heights of benchmarks by means of levelling instruments. (Total tuition time: ± 100 hours)

STRUCTURES AND CONCRETE: CONCRETE III (SEK30YT) CONTINUOUS ASSESSMENT

(Subject custodian: Department of Civil Engineering)
Reinforced concrete column design, steel columns. Earth pressures and foundations. Concrete: properties of concrete, mix design, batching, mixing, transporting, placing, compaction and curing of concrete, ready-mixed concrete, concrete pumping, quality control, special techniques, repair of concrete and cost analysis. (Total tuition time: ± 180 hours)

STRUCTURES AND CONCRETE: STRUCTURES III (SEK30XT) CONTINUOUS ASSESSMENT

(Subject custodian: Department of Civil Engineering)
Structures: elementary structural analysis, calculation of sectional properties, shear force and bending moment diagrams of simple supported beams with dead loads, as well as the design of beams in timber and steel. Deflection of simple beams. (Total tuition time: ± 180 hours)

WORK-INTEGRATED LEARNING I (EXP1BDG) WORK-INTEGRATED LEARNING
WORK-INTEGRATED LEARNING II (EXP2BDG) WORK-INTEGRATED LEARNING

(Subject custodian: Department of Building Sciences)
Students are required to work for six months with approved employers who are –
• building contractors (preferably with MBA or BIA);
• registered quantity surveyors; or
• other employers approved by the Department of Building Sciences as being able to provide students with suitable Work-Integrated Learning.

Students should be given a broad introduction to the building industry and gain as much experience in the Build Industry as possible. (Total tuition time: six months)