



University of Pretoria Yearbook 2023

Formal aspects of computing (II) 741 (COS 741)

Qualification	Postgraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	15.00
NQF Level	08
Programmes	BSchHons (Computer Science)
Prerequisites	No prerequisites.
Contact time	2 lectures per week
Language of tuition	Module is presented in English
Department	Computer Science
Period of presentation	Semester 1 or Semester 2

Module content

Model Checking is a technique for automatically verifying whether a software program satisfies correctness requirements such as mutual exclusion, deadlock-freedom or starvation-freedom. In contrast to testing, model checking is not only capable of detecting bugs but also of proving their absence. This is of particular importance for safety-critical software used in cars, planes, power plants etc. This module focuses on the theoretical foundations of model checking: modelling the state space of software as an automaton, formal specification of correctness requirements in temporal logic, and algorithms for systematically exploring the state space of software. The practical aspect of this module, includes how to write parallel programs composed of communicating processes. Existing model checking tools will be used to verify the correctness of the programs written.

Regulations and rules

The regulations and rules for the degrees published here are subject to change and may be amended after the publication of this information.

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations applicable to their registration, as well as the relevant faculty-specific and programme-specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression, or basis for an exception to any of



the aforementioned regulations.

University of Pretoria Programme Qualification Mix (PQM) verification project

The higher education sector has undergone an extensive alignment to the Higher Education Qualification Sub-Framework (HEQF) across all institutions in South Africa. In order to comply with the HEQSF, all institutions are legally required to participate in a national initiative led by regulatory bodies such as the Department of Higher Education and Training (DHET), the Council on Higher Education (CHE), and the South African Qualifications Authority (SAQA). The University of Pretoria is presently engaged in an ongoing effort to align its qualifications and programmes with the HEQSF criteria. Current and prospective students should take note that changes to UP qualification and programme names, may occur as a result of the HEQSF initiative. Students are advised to contact their faculties if they have any questions.