University of Pretoria Yearbook 2022

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	BScHons *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.