ARIAIANTS OF ARTIFICIAL BEE COLONY IN SOLVING UNIVERSITY 
TIMETABLING PROBLEM

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ABSTRACT
Studies in educational timetabling have been increased and attracted large number 
of researches in addressing this problems. Due to the existences of various 
constraints and demands that different across institutions in the world, searching a 
high quality timetable has becomes a time consuming and challenging task. Various 
researches have been carried out in the literature in solving this problem. 
Therefore, this research work that conducted in this thesis intends to develop 
valuable methods to address university timetabling problems, which are 
examination and course timetabling problems. Towards this intend, three hybrid 
methods which are global best concept artificial bee colony (GBABC), neldermead 
great deluge artificial bee colony algorithm (NMGD-ABC) and imperialist 
great deluge artificial bee colony algorithm (IGD-ABC) are introduced in order to 
enhance the global exploration and local exploitation abilities of basic artificial bee 
colony algorithm in searching solution. The research first highlights hybridization of 
artificial bee colony algorithm with global best concept inspired from particle 
swarm optimization to improve global exploration ability and a simple local search 
method to enhance local exploitation ability in solving examination timetabling 
problem. Next, the research investigates another hybridization method i.e. a more 
sophisticated local search method, which is hybridization of great deluge algorithm 
with nelder-mead simplex search method and applied to examination and course 
timetabling problem. The aim is to hybridize a more powerful local search method 
to enhance the local exploitation ability. Then, the research proposes another 
hybridization method known as imperialist great deluge artificial bee colony 
algorith which integrate concept of imperialisms competitive algorithm into 
artificial bee colony algorithm. It has been applied in both examination and course 
timetabling problems with the assumption that hybridization of different methods 
capable to enhance exploration and exploitation abilities of basic artificial bee 
colony algorithm. Experimental results illustrate that nelder-mead great deluge 
artificial bee colony algorithm outperforms global best concept artificial bee colony 
algorith. This is due to the method capable to efficiently explore and exploits the 
solution search region. Indeed, nelder-mead great deluge outperform methods 
currently published in the literature.

KEYWORD 
artificial bee colony, university timetabling