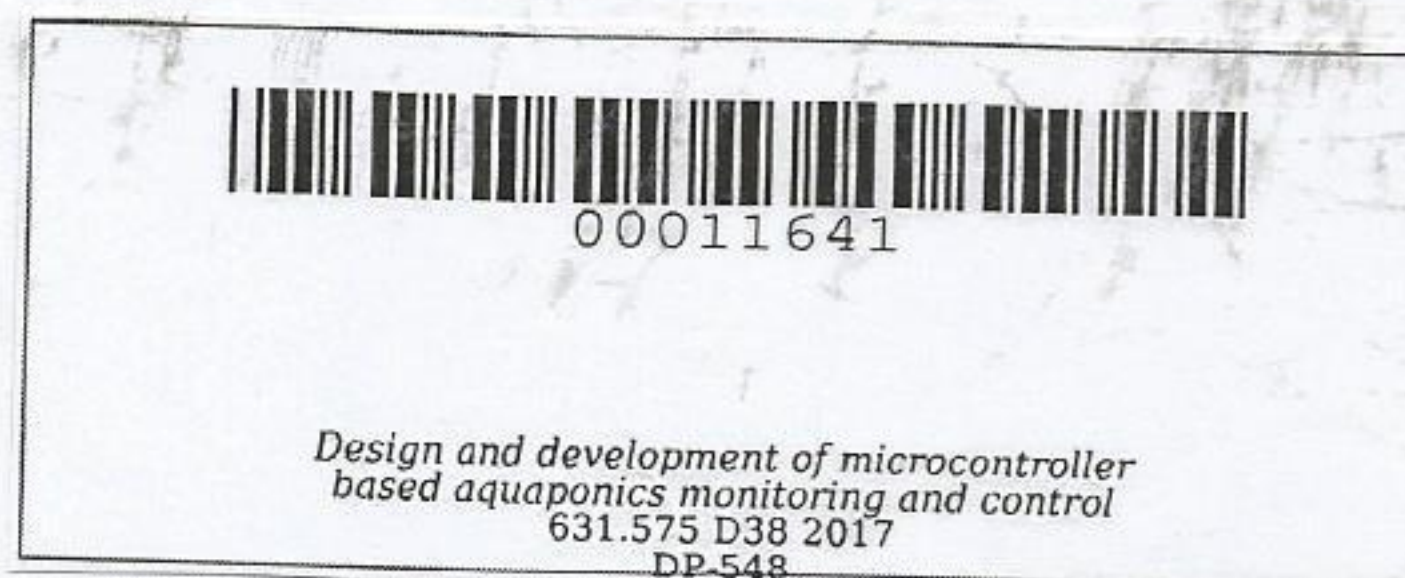


**DESIGN AND DEVELOPMENT OF A MICROCONTROLLER BASED  
AQUAPONICS MONITORING AND CONTROL SYSTEM  
WITH ANDROID APPLICATION**

Undergraduate Design Project  
Submitted to the Faculty of the  
College of Engineering and Information Technology  
Cavite State University  
Indang, Cavite

In partial fulfillment  
of the requirements for the degree  
Bachelor of Science in Computer Engineering



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## ABSTRACT

**DEL MUDO, GIDEON T. and RODIL, RENZON M., Design and Development of a Microcontroller Based Aquaponics Monitoring and Control System with Android Application.** Undergraduate Design Project. Bachelor of Science in Computer Engineering. Cavite State University, Indang, Cavite. June 2017. Adviser: Prof. Bienvenido C. Sarmiento Jr.

A study was conducted to design and develop a microcontroller based aquaponics monitoring and control system with android application. The project aimed to help aquaponics system owners monitor their system through their android application connected to the internet without difficulties. The general objective of the study was to develop a microcontroller-based aquaponics monitoring and control system. The study specifically aimed to design and construct a microcontroller circuit; develop and design the arduino program and android application program for the system; design and construct the monitoring and controlling system using application in android; design and fabricate the aquaponics system; interface the microcontroller circuit and the aquaponics system; test and evaluate the performance of the system; and conduct a cost computation for the system.

The materials that were used in the study were: microcontroller unit, wemos d1 r2, air pump, t5 lamp, water pump, servo motor, aquarium heater, relay, aquaponics set, pH sensor, water temperature sensor, water flow sensor, lux sensor, grow media and android phone of the researchers. Aquaponics monitoring and control system with android application can be able to maintain the required parameters in the system and control it than in the manual process. Monitoring the water flow, lux, water temperature and pH are the major process developed for the system.



Result of the evaluation showed that based from the evaluated accuracy of the feedback and quality of the outputs, the aquaponics monitoring and control system was considered desirable and effective compared to manual process of the aquaponics system.

The study was proven effective on its capability to meet its objectives. Thus, it helps to present the advantages in performance of the aquaponics monitoring and control system with android application and make it a more reasonable choice for monitoring and controlling the parameters in the system. The aquaponics monitoring and control system with android application had a total cost of P 30, 476.00.



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