

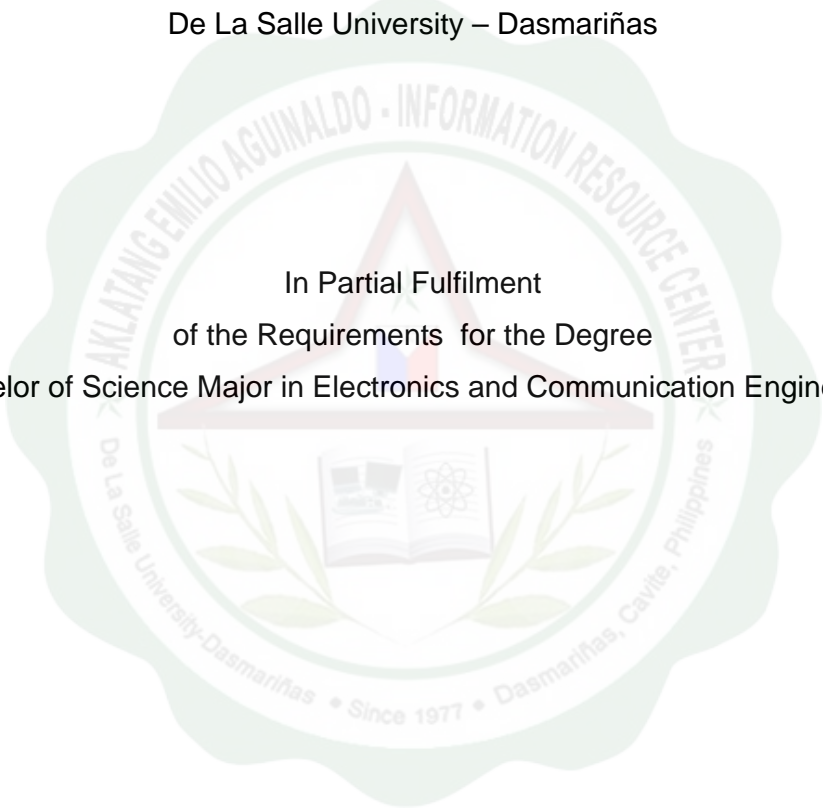
**DEVELOPMENT OF CLOCK SYNCHRONIZATION FOR  
DE LA SALLE UNIVERSITY DASMARIÑAS  
THROUGH INTERNET TIME SERVICE**

A Project Study

Presented to the Faculty of

College of Engineering, Architecture and Technology

De La Salle University – Dasmariñas



In Partial Fulfilment  
of the Requirements for the Degree  
Bachelor of Science Major in Electronics and Communication Engineering

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## **Abstract**

An abstract of the thesis of Peter Paul Carada, Dalton Dela Paz, Junzen Denuyo and Roland Joseph Legaspi for the Bachelor of Science in Electronics and Communication Engineering presented October 14, 2009.

Title: Development of Clock Synchronization for De La Salle University  
Dasmariñas using Internet Time Service

Time has been an important variable for humans in their everyday lives. Humans developed things called clocks in order to determine the current time, from sundials to digital clocks; various developments were done in order to predict time accurately. Accuracy in time is very important in our world today. Some analog clocks in De La Salle University do not display time accurately and some does not even function anymore.

The purpose of the present study is to solve the problem of inconsistent time from different clocks in the university by developing a system that will synchronize a clock with the NTP server through the internet.

Three digital clocks were built wherein one clock functions as a master and other two as slave clocks. It synchronizes with an NTP server using Network Time Protocol, uses static IP address assigned by the Information Technology Center. The clocks' displays were built using four 4-inch 7-segments that displays the time in 24-hour format.

On the initial test using the DLSU-D network, a problem was encountered. To solve this problem, all the three clocks were converted to stand-alone clocks. The system was then subjected to two sets of tests. The first test measures the discrepancy between a reference clock and the three digital clocks for 8 hours using a 1 megabit per second internet connection. A similar test was done on a 384kbps connection now with the duration of 3 hours to compare the effect of the internet speed on the discrepancy between the reference clock and the 3 devices. The second set of test was the measurement of the time it takes for the clocks to synchronize with the NTP server and like the first test, two different internet connection speed was used.

The data from the first set of test showed an average of below 1 second offset on both connections. On the 1Mbps connection, the average was below 0.3 seconds while the average for the 384kbps connection was below 0.7 seconds. On the second test, the average times measured was approximately 21 seconds. The third test shows that for every 4 hours, the clock which offset is increased 1 second.

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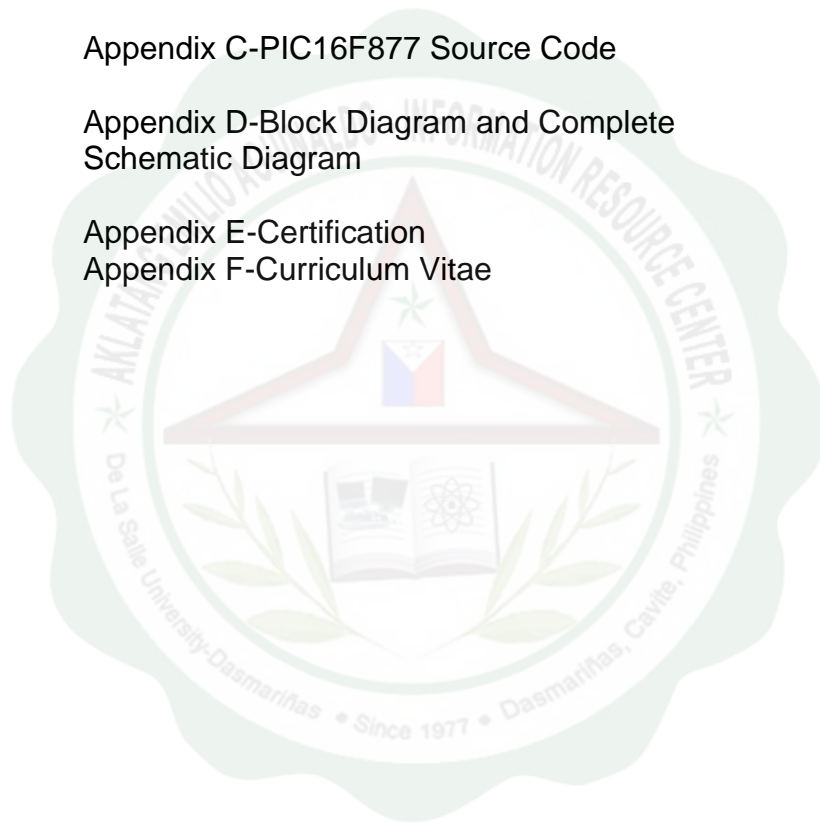
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