

**DEVELOPMENT AND DESIGN OF A MEASUREMENT DEVICE FOR
CREATININE IN HEMODIALYSIS**

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

DEVELOPMENT AND DESIGN OF A MEASUREMENT DEVICE FOR CREATININE IN HEMODIALYSIS

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Measurement of Creatinine in the blood is necessary to determine the functionality of kidney where Jaffe method is commonly applied. Several measurement methods have been developed, however concentration of creatinine contained in the blood is insufficient to be detected by conventional sensors alone. In this study, another approach is used to develop measurement method of creatinine in the blood as well as the blood separation technique which consist of blood pre-analysis, and blood analysis. The devices required for analysis of creatinine in blood plasma were constructed and tested for the measurement. Centrifugation and magnetic separation device were constructed and evaluated to obtain optimum separation of the blood. It was noticed that the centrifugation and magnetic separation employed could not optimally separate the blood plasma. Furthermore, spectrophotometer was developed and employed for the blood analysis to obtain the concentration of the creatinine. It is found that the result of the creatine concentration from the developed spectrophotometer shows similar trend compare to the given commercial spectrophotometer. The designed spectrophotometer can perform considerable good accuracy with absolute error of 5.7% which is enough

for determination of the end of hemodialysis therapy. *Keywords Creatinine, blood separation, spectrophotometer, hemodialysis, magnetic separation*



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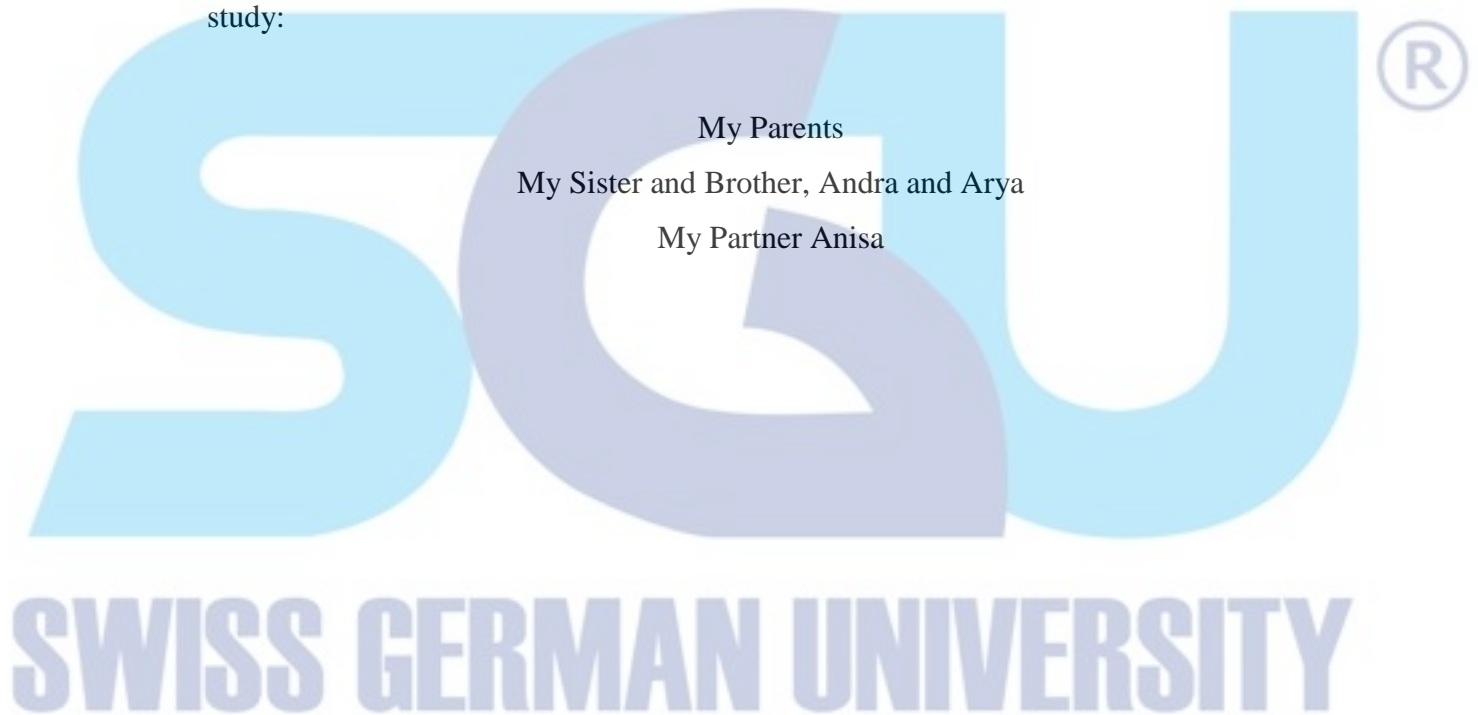
DEDICATION

I dedicate this thesis to my dearly beloved below who always supporting me during my study:

My Parents

My Sister and Brother, Andra and Arya

My Partner Anisa



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