

# الآية

﴿هل جزاء الإحسان إلا  
الإحسان﴾

سورة الرحمن الآية رقم : ( 60 )

## **DEDICATION**

*First a lot of thanks to Allah to make it possible, also to my awesome mother you are the best mother a daughter could have, also to my father, to my family, to my teachers who set out away to get to my goals, to my friends who showed a lot of love and support to everybody who was a part of this .research*

## **ACNOWLEDGEMENT**

*To all whom I Love after my love the prophet*

*.(Mohamed be (peace be upon him*

*.To Prof: Osman Mohamed Elmekki -*

*.To all the members of my family -*

*.To all my brothers and sisters -*

*.To all my friends -*

*All thanks to everybody help me to do -*

*.this research*

## **Abstract**

First in this research I study's about (subsonic and hypersonic flows on an airfoil) which consists of three Chapters; Chapter one by the title: (Compressible Potential Flow) contains: Introduction, Speed of sound, Irrotational flow, :Linearized potential equation which includes

Applications, Perturbation potentials), Pressure coefficient of small perturbations, Relation for subsonic compressible flow including (Airfoils (2-D flow), Boundary conditions, Pressure coefficients), .Critical Mach number and Supercritical airfoils

However, in Chapter two (Two-Dimensional subsonic and supersonic solution of the linearized equation) which includes: Effects of .compressibility, Linearized theory

In the Chapter three with the title: (Small Disturbance Theory) includes: Centered Prandtl-Meyer reflection, Wave Interactions, including: (Oblique shock reflected from a wall, Oblique shock intersection), Shock strengthening, .Supersonic flow over airfoils

## الخلاصة

بداية في هذا البحث درسنا (دراسة الجريان تحت الصوتي وفوق الصوتي علي الجناح) والذي يحتوي على ثلاثة ابواب الباب الأول بعنوان تدفق أو سريان الجهد للموائع القابلة للإنضغاط وقد جاء في هذا الباب: (التطرق لمفهومه ومنثم تحدثنا عن مفهوم سرعة الصوت، ومعاملات الجهد الخطية، إضطرابات معاملات الضغط، علاقة السرعة الفوق الصوتية لجناح الطائرة، الشرط المحدود، معاملات الضغط).

الباب الثاني: طول المعادلة الخطية في بعدين للسريان فوق الصوتية وتحت الصوتية.

وجاء فيه حقيقة الموائع القابلة للإنضغاط، والنظرية الخطية، سرعة الجهد.

وكان عنوان الباب الثالث: (نظرية الإقلاق الصغرى) وجاء فيه التطرق للمفهومين ومن ثم اصطدام وإرتداد موجة الصدمة المائلة المرتدة، والصدمة المائلة المصطدمة.

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