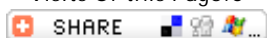




- > MainPage
- > About College
- > Files
- > Researches
- > Courses
- > Favorite Links
- > Our Contacts

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Research Details :

Research Title	: <u>Qualitative study for solutions of a certain non-linear differential equation of the fourth-order</u> <i>دراسة كيفية لحلول معادلة تفاضلية غير خطية من الرتبة الرابعة</i>
Descriptipn	: This thesis is devoted to the study of stability, boundedness and periodicity of solutions for the non-linear differential equation of the fourth-order: $X(4) + 11(X,X,X)x + 12(X,X) + 13(X,X) + 14(X) = p(t,x,x,x,x), (*)$. where $11, /2, la, .f4$ and p are real and continuous functions, which satisfy certen conditions. These functions are more general, than those considered by Bereketoglu in 1990. The thesis consists of four chapters. Chapter 1 contains necessary preliminaries. Chapter 2 studies the global asymptotic stability of the trivial solution of equation (*) when $p = 0$ using the method of Lyapunov function. Chapter 3 investigates the ultimate boundedness of solutions of non-autonomous: differential equation of (*), by constructing Yoshizawa function. . Finally Chapter 4 deals with the problem of the existence of periodic solutions of (*), by applying Schiiffers theorem. The above mentioned results are generalizations of the results obtained by Abou-El-Ela and Bereketoglu in 1990
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