

A Project Report

on

“Applications of Differential Equations”

Submitted by

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Under the guidance

Of

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(Affiliated to Satavahana University)

Academic year (2021-22)

DECLARATION

I hereby declare that the project report titled " **Applications of Differential Equations**" have completed successfully towards the partial fulfilment for the award of the degree "BACHELOR OF SCIENCE from "TELANGANA TRIBAL WELFARE RESIDENTIAL DEGREE COLLEGE FOR WOMEN, RAJANNA SIRICILLA .This is the bonafide work undertaken by me which is not submitted to any other university or institution for the award of any degree / diploma.

Date: 12-4-2022

Y. Vinika(H.T.No:210771044681018)

Place: Thangallapally

**Tribal Welfare Residential Degree College for Women, Thangallapally, Rajanna Sircilla
(Affiliated to Satavahana University)**

CERTIFICATE

This is to certify that the project report title " **Applications of Differential Equations**" submitted in partial fulfillment for the award of degree of B.SC programme of Department of Mathematics was carried out by Y. Vinika (H.T.No:210771044681018) . This has not been submitted to any other institute or university for the award of any degree.



Signature of the guide
(N.Shailaja)



Principal
(K.Rajani)

Principal
TTWRDC(W)SIRCILLA
Dist: Rajanna Sircilla

Project Report on Application of Differential Equations

Aim:

To know the applications of Differential Equations in various fields

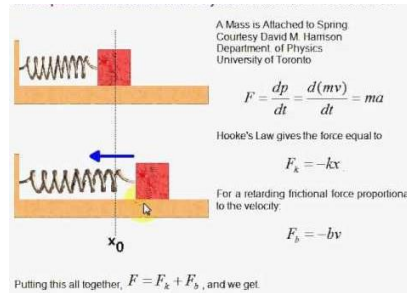
Objective of the project:

The objective of a project on the applications of differential equations is to explore and demonstrate how differential equations are used to model, analyze, and solve real-world problems in various fields. This project aims to Show how differential equations are applied in diverse areas such as physics, engineering, biology, economics, and environmental science.

Project Overview:

- Differential equations are normally derived on the basis of a rate of change (velocity) or a 2nd derivative (acceleration) that give a relation based on a physical law such as $F=m*a$.

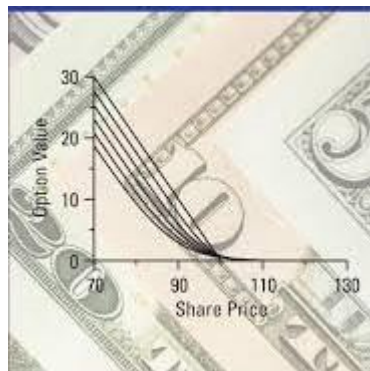
Expressing the force as a function of time allows one to solve for the acceleration, integrate that to get velocity, and integrate that to get position.



➤ Healing wounds with differential equations



➤ Differential equations are one of the protagonists in physical sciences, with vast applications in engineering, biology, economy, and even social sciences. Roughly speaking, they tell us how a quantity varies in time (or some other parameter, but usually we are interested in time variations). We can understand how a population, or a stock price, or even how the opinion of some society towards certain themes changes over time.

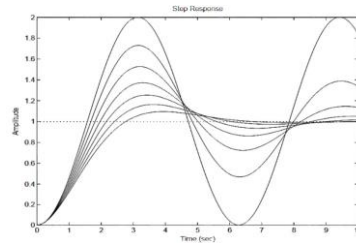


➤ This article will showcase how a Neural Network can be a valuable ally to solve a differential equation, and how we can borrow concepts from Physics-Informed Neural Networks to tackle the question: can we use a machine learning approach to solve a DE?





- Differential equations are also used in the analysis of various types of vibrations caused by natural and abnormal phenomena



Conclusion:

I am very glad that I had an opportunity to do an independent paper in differential equation & their application. In the short span of time I have done best of my level. This paper is mainly concerned with many interesting chapters such as basic concepts of differential equation, variation of parameter & etc.

