A simple ODE mathematical model to assess the effectiveness of facemask wearing in COVID-19 pandemic

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I am teaching ODE and PDE to Engineering, Mathematics and Computer Science undergraduate students since 1990, see for example the textbooks [1], [2].

One of my first attempts when I start the ODE course (and later, the PDE course) is to try to persuade my students on how important are for science and technology the mathematical models builded by means of differential equations.

Usually, I present a simple population model, in the case of ODE, while for the course of PDE I just anticipate the importance of heat equation in modelling the weather forecast [5].

Starting from this background, the main aim of this presentation is to show, by means of a simple ODE mathematical model, how are differential equations used in studying various aspects of the COVID-19 pandemic, which, in the last 9 months or so has changed dramatically our lives, our professional activity as well as our view and perception of the microscopic world [3], [4], [6].

We present a simple modelling process able to examine the dynamics of COVID-19 epidemics when facemask is worn by the population members, with or without imposed lock-down periods.

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