

## Development of a Matlab® Program for the Bi-Dimensional Truss Analysis Using the Stiffness Matrix Method

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**Abstract :** A structure is defined as a physical system or, in certain cases, an arrangement of connected elements, capable of bearing certain loads. The structures are presented in every part of the daily life, e.g., in the designing of buildings, vehicles and mechanisms. The main goal of a structure designer is to develop a secure, aesthetic and maintainable system, considering the constraint imposed to every case. With the advances in the technology during the last decades, the capabilities of solving engineering problems have increased enormously. Nowadays the computers, play a critical roll in the structural analysis, pitifully, for university students the vast majority of these software are inaccessible due to the high complexity and cost they represent, even when the software manufacturers offer student versions. This is exactly the reason why the idea of developing a more reachable and easy-to-use computing tool. This program is designed as a tool for the university students enrolled in courser related to the structures analysis and designs, as a complementary instrument to achieve a better understanding of this area and to avoid all the tedious calculations. Also, the program can be useful for graduated engineers in the field of structural design and analysis. A graphical user interphase is included in the program to make it even simpler to operate it and understand the information requested and the obtained results. In the present document are included the theoretical basics in which the program is based to solve the structural analysis, the logical path followed in order to develop the program, the theoretical results, a discussion about the results and the validation of those results.

**Keywords :** stiffness matrix method, structural analysis, Matlab® applications, programming

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