

## **TRAJECTORY ANALYSIS OF THE MISSION APOLLO XI**

The Apollo mission group aimed to explore the Moon within the framework of the Cold War. It was undoubtedly a milestone for humanity, demonstrating the capabilities of all the people who participated in this program. For the current space exploration, it has been demonstrated that a station in the lunar orbit would facilitate space exploration, being a starting point for manned and unmanned missions oriented towards other destinations in the solar system. It is therefore proposed to study the orbital mechanics calculations of the first Apollo mission to land on the moon, considering the high availability of data for comparison and correction during the study.

The Work Plan is presented below:

- Definition of mathematical concepts and operations applicable to orbit around the earth, transfer maneuvers, translunar trajectory, and circumlunar orbit.
- Determination of the basic maneuvers to be carried out during the mission, according to official documentation.
- Writing of pseudocode and equations to use.
- Realization of calculations in Excel or other software.
- Verification of the data obtained by means of a spreadsheet with the actual data, according to official documentation and subject to the availability of some data.
- Transfer of the calculations to the selected programming language.
- Software testing and re-verification of the data obtained.
- Preparation of the written report.
- Integration of software operations to Visual Interface (Optional).
- Export module of calculations to Excel or Data file (Optional).