

Participatory Exploration for Inspiration and Education (12)
Educating the Next Generation (2)

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ORBIT DESIGN AND TRAJECTORY ANALYSIS FOR UNIVERSITY CUBE-SATELLITE PROJECT
FOR REMOTE SENSING AND FOR EDUCATIONAL APPLICATIONS

Abstract

With the advent of the first satellite Sputnik, a new era for mankind has opened. With this new era, the concepts of satellites have become more important than ever for the amenities of the modern civilization that we enjoy today. However, there is still a great need for improvement in satellite technology and this can be best achieved by various Nanosatellite research and deployment programs. Due to its specific nature and its operational dynamics related to its vast application, a Nanosatellite programme can be very efficiently and effectively implemented under a University's RD programme. Until today, many nanosatellites have been successfully developed, launched and used by various Universities all across the world and many useful information and experience have come out of these activities. In this particular paper, a case study analysis of an ideal Nanosatellite research and deployment program for universities will be shown. This paper can serve as a fundamental case study of a Nanosatellite program and academic and research organizations can use this as a guideline for their programs. An optimal near polar, low earth orbit is calculated for this Nanosatellite along with its structural configurations. The orbit is calculated keeping in mind certain geographical constraints which defines the basic objectives of the mission. Moreover, different attitude adjustments systems are explored in order to create the most stable configuration in orbit. In addition, possible payload configurations for this particular case study will be analyzed and the corresponding launch systems along with its costs will be explored. The main focus will be on creating the most optimal configuration with the minimum of production and launching costs for the Nanosatellite. Thus, the payload capability as well as the launch configuration along with the orbit will be calculated accordingly. This paper hopes to demonstrate the technical aspects as well as the educational aspects of a University cubesat project