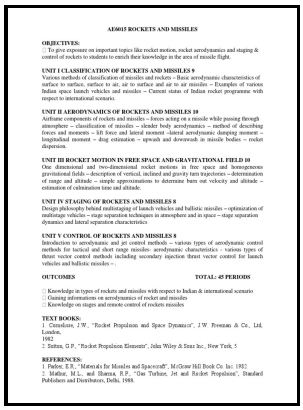
# Materials for missiles and spacecraft

## McGraw-Hill - MISSILE AND SPACECRAFT STRUCTURAL DESIGN AND ANALYSIS



AE6015 ROCKETS AND MISSILES

OBJECTIVES:

To give exposure on important topics like rocket motion, rocket aerodynamics and staging & control of rockets to students to enrich their knowledge in the area of missile flight.

UNIT I CLASSIFICATION OF ROCKETS AND MISSILES 9

Various methods of classification of missiles and rockets – Basic aerodynamic characteristics of surface to surface, surface to air, air to surface and air to air missiles – Examples of various Indian space launch vehicles and missiles – Current status of Indian rocket programme with respect to international scenario.

UNIT II AERODYNAMICS OF ROCKETS AND MISSILES 10

Airframe components of rockets and missiles – forces acting on a missile while passing through atmosphere – classification of missiles – slender body aerodynamics – method of describing forces and moments – lift force and lateral moment –lateral aerodynamic damping moment – longitudinal moment – drag estimation – upwash and downwash in missile bodies – rocket dispersion.

UNIT III ROCKET MOTION IN FREE SPACE AND GRAVITATIONAL FIELD 10

One dimensional and two-dimensional rocket motions in free space and homogeneous gravitational fields – description of vertical, inclined and gravity turn trajectories – determination of range and altitude – simple approximations to determine burn out velocity and altitude – estimation of culmination time and altitude.

UNIT IV STAGING OF ROCKETS AND MISSILES 8

Design philosophy behind multistaging of launch vehicles and ballistic missiles – optimization of multistage vehicles – stage separation techniques in atmosphere and in space – stage separation dynamics and lateral separation characteristics

UNIT V CONTROL OF ROCKETS AND MISSILES 8

Introduction to aerodynamic and jet control methods – various types of aerodynamic control methods for tactical and short range missiles- aerodynamic characteristics – various types of thrust vector control methods including secondary injection thrust vector control for launch vehicles and ballistic missiles –.

OUTCOMES TOTAL: 45 PERIODS

Knowledge in types of rockets and missiles with respect to Indian & international scenario

Gaining informations on aerodynamics of rocket and missiles

Knowledge on stages and remote control of rockets missiles

TEXT BOOKS:

1. Cornelisse, J.W., "Rocket Propulsion and Space Dynamics", J.W. Freeman & Co., Ltd, London, 1962.
2. Sutton, G.P., "Rocket Propulsion Elements", John Wiley & Sons Inc., New York, 5

REFERENCES:

1. Parker, E.R., "Materials for Missiles and Spacecraft", McGraw Hill Book Co. Inc. 1932.
2. Mathur, M.L. and Sharma, R.P., "Gas Turbine, Jet and Rocket Propulsion", Standard Publishers and Distributors, Delhi, 1988.

Description: -
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Guided missiles -- Materials.
Space vehicles -- Materials.Materials for missiles and spacecraft
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University of California engineering and sciences extension series.
University of California. Engineering and sciences extension seriesMaterials for missiles and spacecraft
Notes: Includes bibliography.
This edition was published in 1963



Tags: #MISSILE #AND #SPACECRAFT #STRUCTURAL #DESIGN #AND #ANALYSIS

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