INSTITUTE OF AERONAUTICAL ENGINEERING

Dundigal- 500 043, Hyderabad.

DEPARTMENT OF AERONAUTICAL ENGINEERING

ASSIGNMENT

Course Name	**INTRODUCTION TO SPACE TECHNOLOGY**
Course Code	A42106
Class	II B.Tech II semester
Branch	Aeronautical engineering
Year	2016-2017
Course Faculty	C.Satya Sandeep

OBJECTIVE

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process

S.NO	QUESTION	BLOOMS TAXANOMY LEVEL	COURSE OUTCOME
	ASSIGNMENT 1		
	UNIT I		
1	A rocket of total mass 100 tonnes carrying a spacecraft of 5 tonne and engine develop a Constant exhaust velocity of 3500m/s. The Structural mass is assumed to be 15% of the total mass. Calculate final velocity of rocket.	Apply	1
2	Explain Injection process and types of injectors used in Liquid propellant rocket system.	Apply	2
3	Explain about space environment and also describe Van Allen belt with neat sketch	Apply	3
4	Sketch and explain a solid rocket motor	Analyze	4
5	Explain about sounding rockets and gravity turned trajectories	Apply	3
	UNIT 2		
1	Derive an expression for Double-dip Re-entry.	Apply	3
2	Derive an expression for Skip Re-entry.	Apply	4
3	Derive an expression for Steep re-entry.	Apply	5
4	Write a short notes on Aero-braking and Aero-capture.	Apply	3
5	What are the trade-off of reentry vehicle design?	Apply	3
	ASSIGNMENT 2		
	UNIT 3		
1	Calculate the velocity of the space shuttle in a 250-nmile circular orbit? (For earth R0=6378.14km, μ=398,600km3/s^2).	Apply	3
2	Design a Hohman transfer from a circular mars orbit of radius 8000km to a circular mars orbit of a radius	Apply	4

	15000 km (for mars μ=42,828.3 km3/sec^2 and calculate the period of transfer.		
3	Derive the expressions related to circular and Elliptical orbits.	Apply	3
4	Derive the expressions related to parabolic and hyperbolic orbits.	Apply	4
5	Explain about Bi Elliptical Transfer and Propulsion For Maneuvers.	Knowledge	3
UNIT 4			
1	Demonstrate about attitude control for gravity gradient stabilization and spin stabilization of a spacecraft of a spacecraft.	Apply	4
2	Classify how spacecraft attitude sensors used in attitude determination.	Apply	4
3	Explain Yo-Yo Mechanism	Apply	5
4	Explain about the torque free axis symmetric rigid body	Knowledge	5
5	Explain about the Attitude control for Non-Spinning and spinning spacecraft's	Apply	6
UNIT 5			
1	Demonstrate the Operational engineering support in ground system	Apply	7
2	Explain about Operational engineering support	Apply	6
3	Explain mission Diversity	Apply	7
4	Examine high level space mission operations Architecture using a neat sketch.	Knowledge	7
5	Classify space mission types and objectives in Mission diversity.	Apply	9

Prepared by

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