AMITY UNIVERSITY

UTTAR PRADESH

Course Title : Spacecraft System Engineering **Credit Units** : 03
Course Level : PG
Course Code : SPAC608

L	T	P/ S	SW/ FW	TOTAL CREDIT UNITS
3	0	0	0	03

Course Objectives: The main objective is to acquaint the students of various subsystems of a satellite and their engineering methodology.

Pre-requisites:

- Satellite Systems , system Simulation & modeling

Course Contents/Syllabus:

	Weightage (%)
Module I Introduction	5
System View of Space craft , space craft environment and its effect on design . Spacecraft subsystems , Mission analysis , Launch Vehicle Interface ,	
Module II Propulsion & Power subsystem	40
Spacecraft Propulsion systems : Ion Thruster, Nuclear propulsion , micro thrusters , orbit parameter and propulsion efforts , Propulsion parameter and small rocket design. Power subsystem : Requirement , Solar arrays , radioisotope thermoelectric generator, Power distribution and control , Battery Packs , Fuel Cells , estimation of Subsystem mass . Thermal control : General approach and design Methodology , Prelim design process and thermal shields.	

Module III Command & Data Processing	25
Requirements , data handling , command processing , space crafts computers , communication Links space craft telemetry and time tagging	
Module IV Spacecraft Attitude control & Reliability	25
Requirements , attitude control techniques , maneuver designs , attitude control sensors and hardware; Spacecraft reliability , assurance , EMI /EMC , its specifications , System Approach to EMI / EMC concept and design	
Module V: Small Satellite engineering & Application	5
System Design , COTS component in Space environment , Micro , Mini And Nano Satellites , Case Study.	

Student Learning Outcomes:

On completion of the course the student will be able to

understand the intricacies in satellite design and also the knowledge of system integration.

Pedagogy for Course Delivery: The course pedagogy will include lectures and tutorials, The course will also include the explanation of the aerospace systems used through videos, PPTs, real life questions with four probable answers

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
100	**Nil**	**100**

Theory Assessment (L&T):

	Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down	**ME**	**Q/S**	**CPA**	**TP**	**A**	**EE**
Weightage (%)	10	5	5	5	5	70

Texts and References:

1. Spacecraft System engineering : Peter Fortescue, John Stark and Graham Swinerd , 3rd Edition , Wiley Publication.
2. The standard Handbook of Aeronautical & astronautical engineers ; McGraw Hills 2004.
3. Atmospheric & Space Flight Dynamics ; Ashish Tewari , Birkhausen Publication Boston.

Lecture notes

Lecture notes given by self in soft (posted on Amizone) and hard copy from time to time