FUNDAMENTALS OF AVIONICS

OPEN ELECTIVE - I

V Semester

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5AE62	OEC	3	0	0	3	30	70	100

COURSE OBJECTIVES

The purpose of this subject is to provide the students with the theoretical background and engineering applications.

1. Overview on Aviation using Electronics
2. Basic understanding about major electronics systems used for communication
3. Basic understanding about major devices, display and flight controls used in aircraft

UNIT-I BASICS & FLIGHT DECK AND DISPLAY SYSTEMS

BASICS: Basic principles of Avionics, Typical avionics sub system in civil/ military aircraft and space vehicles.
FLIGHT DECK AND DISPLAY SYSTEMS: Flight deck display technologies, CRT, LED, LCD, Touch screen, Head up display, electronic instrumentation systems.

UNIT-II COMMUNICATION SYSTEMS

AUDIO AND COMMUNICATION SYSTEMS: Aircraft audio systems, basic audio transmitter and receiver principles, VHF communication system, UHF communication systems.

UNIT-III FREQUENCY RANGING SYSTEM

RANGING AND LANDING SYSTEMS: VHF Omnirange, VOR receiver principles, distance maturity equipment, principles of operation, Instrument landing system, and localizer and glide slope.
POSITIONG SYSTEM: Global positioning system principles, triangulation, position accuracy, applications in aviation

UNIT-IV NAVIGATION SYSTEM

INERTIAL NAVIGATION SYSTEM: Principle of Operation of INS, navigation over earth, components of inertial Navigation systems, accelerometers, gyros and stabilized platform.
SURVELLIENCE SYSTEM: ATC surveillance systems principles and operation interrogation and replay standards, Collision avoidance system, ground proximity warning system

UNIT-V AUTO FLIGHT SYSTEM

AUTO FLIGHT SYSTEM: Automatic flight control systems fly by wire and fly by light technologies, flight director systems, flight management systems.

Text Books:

1. N. S. Nagaraja(1996),Elements of electronic navigation, 2nd edition, Tata McGraw Hill, New Delhi.
2. Janes W. Wasson, Jeppesen Sandersen(1994), Avionic systems Operation and maintenance,

Reference Books:

1. Albert Hel Frick (2010), Principle of Avionics, 6th edition, Avionics Communications Inc, India.
2. H. J. Pallet (2010), Aircraft Instrumentation and Integrated systems, Pearson Education, New Delhi.
3. J. Powell (1998), Aircraft Radio Systems, Pitman publishers, London

COURSE OUTCOMES:

At the end of the course the students are able to:

1 To explain the instrumentation used in avionics.
2 To classify various ranges of the communication techniques used in aircraft.
3 To distinguish between network systems, controlling parts & surfaces
4 To compare various principles of navigation systems
5 To build phenomena of auto pilot control system