GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM

BASIC AVIONICS
(Code :3360103)

Diploma program in which this course is offered	Semester in which offered
Aeronautical Engineering	SIXTH

1. RATIONALE

The main objective of this course is to understand the basic of aircraft avionics, electric & electronic system, and different type of display, and basic circuit diagram of avionics system, different type of avionics architecture, electronic warfare and basic of UAV.

2. LIST OF COMPETENCIES

The course content should be taught and implemented with an aim to develop different types of skills leading to the achievement of the following competencies:

→ **To know about basic aircraft avionics systems.**
→ **To study about basic UAV electric connection and diagram.**

3. TEACHING AND EXAMINATION SCHEME.

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	100
04	00	00	04	70	30	00	00	

Legends: **L**-Lecture; **T** – Tutorial/Teacher Guided Theory Practice; **P** -Practical; **C** – Credit, **ESE** -End Semester Examination; **PA** - Progressive Assessment.

4. DETAILED COURSE CONTENTS

Unit	Major Learning Topics and Sub-topics	Outcomes (in cognitive domain)
UNIT– I **BASICS OF AVIONICS**	• Principles of Avionics • List of avionics equipments • Navigation	1.1 Principles, applications, equipments, and errors of • VOR, NDB-ADF, ILS

UNIT– II **RADARS**	• To study about Primary radar • To study about Secondary radar	2.1 Primary ground radar 2.2 Secondary surveillance radar (SSR) 2.3 Radar display & data processing systems 2.4 Radar altimeter 2.5 Radar Ground Proximity Warning System (GPWS) 2.6 Doppler radar 2.7 Airborne Weather Radar (AWR) 2.8 Traffic Collision Avoidance System (TCAS)
UNIT– III **DISPLAYS**	• To study about HUD • To study about HMD • To study about EFIS (G-1000 Avionics Display)	3.1 HUD Fundamentals 3.2 Reflective Optical System 3.3 HUD Mechanical Installation 3.4 Symbology Sets And Modes 3.5 HMD Introduction 3.6 Image Sources for HMDS 3.7 Optical Design Of HMD
UNIT– IV **INTRODUCTION TO ELECTRONIC WARFARE**	• To study about ECM • To study about ECCM • To study about electronic support measure	4.1 Noise Jamming 4.2 Deception Jamming 4.3 Defensive Aids 4.4 Key Players In Warfare 4.5 Small Arms Fire 4.6 Anti-Aircraft Artillery
UNIT– V **UAV**	• To study about types of UAVs • To study about different components of UAVs .	5.1 Fixed Wing And Rotary Wing 5.2 Electric Connections 5.3 Transmitter And Receiver

5. SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY).

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	BASICS OF AVIONICS	4	5	4	2	11
II	RADARS	4	6	2	2	10
III	DISPLAYS	10	5	8	4	17
IV	INTRODUCTION TO ELECTRONIC WARFARE	8	10	4	2	16
V	UAV	8	5	5	6	16
Total		**34**	**31**	**23**	**16**	**70**

Legends: R = Remember **U**= Understand; **A**= Apply and above levels (Bloom's revised taxonomy).

6. SUGGESTED LIST OF STUDENT ACTIVITIES.

Following is the list of proposed student activities like:

SR.NO.	ACTIVITY
1	Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory.
2	Prepare a model of avionics architecture

7. SUGGESTED LEARNING RESOURCES.

A. List of Books:

SR. NO.	TITLE OF BOOK	AUTHOR	PUBLICATION
1.	Avionics Handbook	Edited by CARY R. SPITZER	AvioniCon, Inc.
2.	Military Avionics Systems	Ian Moir and Allan G. Seabridge	John wiley & sons, ltd.

B. List of Software/Learning Websites

1. http://www.airborne-aviation.com.au/resources/kb-articles/files/avionics-basics.pdf
2. https://en.wikipedia.org/wiki/Avionics
3. http://drmoe.org/research/avionics_made_simple.pdf
4. Aircraft Avionics Basic Introduction - https://www.youtube.com/watch?v=7JowiXwzBvk
5. https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/advanced_avionics_handbook/media/FAA-H-8083-6.pdf

8. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnic.

- **Mr.Dipesh Khunt,** Lecturer, Aeronautical Dept. Parul institute of Engg. & tech-Diploma studies
- **Prof.Ankitkumar Patel**, H.O.D., Aeronautical Dept. Parul institute of Engg. & tech-Diploma studies

Faculty Members from Engineering.

- **Capt. Umang Jani,** Asst. Professor, Aeronautical Dept. SVIT, Vasad.
- **Ms. Dimpal Parmar,** Asst. Professor, Aeronautical Dept. SVIT, Vasad