



# JEPPIAAR INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Self-Belief | Self Discipline | Self Respect

Kunnam, Sunguvarchatram, Sriperumbudur-631604



**Name of the course: Cansat Design & Development**

**code: IVA087**

**Course Duration: 30 hours**

**Academic Year: 2023 -2024**

**Coordinator: Ms. Benisha M. AP/ ECE**

## CURRICULUM FOR CANSAT DESIGN AND DEVELOPMENT

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**1 0 2 2**

### COURSE OBJECTIVES:

- To enable students to customize design and print their own PCBs
- To enable students to model 3D components and print them using 3D printer
- To introduce students, the concept of LORA and Embedded C programming using Arduino
- To make the students tune their ground station antennas
- To enable the students to build their own CANSAT

### **Unit 1 – PCB Designing**

**6**

Introduction to PCB – Components & Sensors – Breadboard testing -Autodesk eagle software- Digital PCB designing – EPS module – GPS module – Communication module – OBC module – Payload module – Antenna module – Auto routing – Design error checking – Gerber files – PCB printing

### **Unit 2 – 3D Modeling**

**6**

Introduction – CAD software – Autodesk -Design navigation & display – Quick shape creation - Drawing 2D shapes – Introduction to sketch work flow – Dimensions – Extruding a sketch – Editing tools -Rectangular Sketch pattern – Circular sketch pattern – Design error checking - Visualizing the results – Generate a .STL file-3D printing the structure

### **Unit 3 - Embedded C programming**

**6**

Basics of OBC- Introduction to Embedded C- Variables - Functions - Libraries - Introduction to arduino IDE - Blink program - Serial monitor -GPS module - LORA module - BME module - dumping code via TTL

### **Unit 4 – Communication and Navigation**

**6**

Introduction - Basics of antenna physics - Different types of antennas - Antenna used in the CANSAT - Antenna used in the ground station -

### **Unit 5 - Component assembling**

**6**

Introduction – Multi meter - Soldering iron - Soldering lead and paste - Blower - Perfect solder - Function of a solder - Stacking the modules - Debugging - Antenna mounting- Signal strength

evaluation metrics - Reading TLE data - Exporting TLE to excel file

**Total Hours: 15T +15P**

**COURSE OUTCOME:**

- Capable of designing and printing their own PCBs
- Understand 3D modeling and printing the models using 3D printers
- Design and assemble any CANSAT applications
- Understand LORA system and Embedded C programming

**Reference Book:**

**CANSAT:** Design of a Small Autonomous Sounding Rocket Payload, Joshua Berman, January 2009.

**Course Name** : **CANSAT DESIGN AND DEVELOPMENT**  
**Branch** : **Common to ALL Branches**

**Trainers Details**

S.No	Name of the Trainer	Designation	Company
1	Mr.Denzel George	Trainer	TSC Technologies, Bangalore
2	Mr.Sanketh S Huddar	Trainer	TSC Technologies, Bangalore
3	Mrs.M.Benisha	Assistant Professor	Jeppiaar Institute of Technology

**SCHEDULE OF TRAINING PROGRAM**

Day	12.45 pm to 1.45 pm	1.45 pm to 2.45 pm
Day 1	Introduction- Basic Electronics	PCB Designing Using Autodesk EAGLE
Day 2	PCB Designing Module 1	PCB Designing Module 2
Day 3	PCB Hands on Training	PCB Printing
Day 4	3D modelling Introduction	Autodesk Fusion 360-Software Installation
Day 5	Autodesk - Design Navigation	3D Designing Using Autodesk Fusion 360
Day 6	3D Design Error Checking	3D model Creation
Day 7	Basics of OBC	Introduction to Embedded C
Day 8	Introduction to Arduino	Arduino Programming
Day 9	GPS and BME Module	LORA Module
Day 10	Introduction - Basics of antenna physics	Types of Antenna
Day 11	Introduction to Communication System & Navigation	Payload types and applications
Day 12	HAM Radio Basic Introduction & Antenna Design	Antenna design for CANSAT
Day 13	Introduction to Component assembling	Components Soldering
Day 14	Soldering –Hands on	Module Assembling and Antenna Mounting
Day 15	CANSAT stacking and Testing, Reading TLE Data	

### ENROLLED LIST OF STUDENTS

S.NO	REGISTER NO.	NAME
1	210621106001	AASHIKA.P.S
2	210621106002	ABISHEK.S
3	210621106003	AJAI.M
4	210621106004	AKASH.R
5	210621106005	ANTONY STYRIS.R
6	210621106006	ARAVINDAN.P
7	210621106007	ARULMOZHI.P
8	210621106008	AVINASH.K
9	210621106009	BATHMANBAN.V
10	210621106010	BAVITHRA.P
11	210621106011	BHUVANASRLS
12	210621106013	CHARULATHA.R
13	210621106014	DAVINS RANITH.J
14	210621106015	DEEPIKA.C
15	210621106016	DEEPIKA.M
16	210621106017	DEEPIKA.P
17	210621106018	DHARANI.S
18	210621106019	EDWIN INBARAJ.V
19	210621106020	GIRIDHARAN.P
20	210621106021	GOKULNATH.R
21	210621106023	GOWTHAM.K.S
22	210621106024	HARISH.S
23	210621106025	HEMALATHA.M
24	210621106026	JACKULINE VALENTINA.S
25	210621106027	JEDANCE.S
26	210621106028	KIRUTHIKA.K
27	210621106029	KISHORE M
28	210621106030	KISHORE KUMAR K
29	210621106031	LATHESH.M
30	210621106033	MADHAN.S
31	210621106034	MADHUBALA.S
32	210621106035	MOKSHITHA.S.V
33	210621106036	NATHANIAL.V
34	210621106038	NIVETHA.K
35	210621106039	POOJA SRI .B
36	210621106040	PRITHIVIRAJ.T.K
37	210621106041	PRIYADHARSHINI.R
38	210621106042	RENITHA.A
39	210621106043	SAHAYA SWEETNE.J
40	210621106044	SANGEETHA.A
41	210621106045	SANTHIYA.M
42	210621106046	SANTHOSH KUMAR.V
43	210621106047	SELVAMEENA.N
44	210621106048	SHOFIYA.M
45	210621106049	SRIRAM .R
46	210621106050	SRUTHIKDHAYA

47	210621106052	SURIYA.K
48	210621106053	SURIYA.M
49	210621106054	TAMILKUDIMAGAN.M
50	210621106055	VARSHINI.A
51	210621106301	ANTONY JEFFREY
52	210621106302	ANTONY SIMSON

### **SUMMARY REPORT WITH COURSE OUTCOME**

Department of Electronics and Communication Engineering has organized Anna University Approved Value- added Course on “Cansat Design & Development” from 01-08-2023 to October 2023 in online mode for all second years for a duration of 30 Hrs. Evaluation process is carried out through internal assessment and the same was reported to the Anna University. The Students were graded based on the internal assessment and all the enrolled students completed the course successfully. The Course has enabled the students to get trained on Design and development of each and every subsystems of a CANSAT and the related software tools, which enable them to proceed research & projects in core domain.

#### **Course Outcomes:**

- Capable of designing and printing their own PCBs
- Understand 3D modeling and printing the models using 3D printers
- Design and assemble any CANSAT applications
- Understand LORA system and Embedded C programming