

DSN AEROSPACE CONSULTANTS PVT. LTD.

**HD PAL STREET, ICHAPUR NAWABGANJ, DIST-24 PGS (N)
WEST BENGAL 743144**

One year PG Diploma in Aerospace Engineering

Course Objective:

Aerospace is an interdisciplinary field pertaining to any flying machines (Launch vehicles, Aircrafts, Helicopters, and Drones etc.). Aerospace is a booming sector in India with OEM's (Original equipment manufacturers) and service industries driving the high boom job market for engineers. Not many institutions provide courses on Aerospace in our country and that too, the major concentration of institutions offering Aerospace courses are largely limited in the southern part of the country. Industries like Aerospace are penetrating deep into Indian market and promises great opportunity for engineers at large. The course structure designed for Aerospace is not limited only to Aerospace but also caters to mechanical, automobile and Electronic discipline at large.

DSN Aerospace consultants Pvt. Ltd., established in 2013 in Bangalore, offers state of the art courses in the field of Aerospace Engineering to prepare an engineer to face modern day challenges in the field of Aero structures and Aeronautics. DSN Aerospace is having an MOU with **MSME Tool Room Kolkata** to carry out the experimentation part in their premises. The faculty members of the company have more than 12 year's expertise in ISRO and HAL in the post of scientist. DSN Aerospace would like to bridge the gap between industry and academia and would cater towards the overall development and value addition of a student of any discipline.

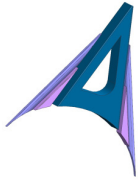
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Module wise course curriculum:

Module 1: (Aircraft Structural Design)

- Structural Design and Hand calculation of Structures of Passenger Aircraft, Fighter Aircraft and Launch vehicles

Module 2: (Aerodynamics, CFD , Aerospace composites, Aerospace Fatigue analysis)

- CFD Analysis in ANSYS ICEM and CFX Software
- Glass Fiber and Carbon Fiber Composite Design Technology
- Fatigue Failure analysis of Aircraft and Automobile Structure under Cyclic loading

Module 3: (Design and analysis of Quad Copter Design)

- Learning to build a Four rotor quad copter/ Drone
- Introduction to Python for operating Raspberry Pi systems
- An introduction to IOT (Internet of things) and its application in Aerospace domain
- Machine Learning and its applications in Aerospace domain

Module 4:

- Kit to display the working principle of electric motors: Servo and stepper motors
- 3D printing Demonstration with training on 3D modeling
- Arduino based live demonstration of scientific projects
- Understanding Zigbee based secured communication system
- Learning to Build a robotic Arm

Module 5:

Personality development skills

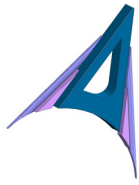
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Detailed Course Curriculum for the one year program.

Week 1.			
SL No.	Subject	Contact Hours	Credit Points
1.	Theoretical hand calculations of Aircraft and Launch vehicle structures (Day 1)	3	2
2.	Theoretical hand calculations of Aircraft and Launch vehicle structures (Day 2)	3	2
3.	3D modeling of Aircraft Wing structure in UG NX software (Day 1)	3	2
4.	3D modeling of Aircraft Wing structure in UG NX software (Day 2)	3	2
5.	Personality development	3	2
Week 2.			
6.	3D modeling of Aircraft Empennage structure in UG NX software (Day 1)	3	2
7.	3D modeling of Aircraft Empennage structure in UG NX software (Day 2)	3	2
8.	3D modeling of Aircraft Fuselage structure in UG NX software (Day 1)	3	2
9.	3D modeling of Aircraft Fuselage structure in UG NX software (Day 2)	3	2
10.	Personality development	3	2
Week 3.			
11.	3D modeling of Aircraft Landing Gear structure in UG NX software (Day 1)	3	2
12.	3D modeling of Aircraft Landing Gear structure in UG NX software (Day 2)	3	2
13.	MSC Nastran based FEM analysis of Aircraft Wing structure (Day 1)	3	2

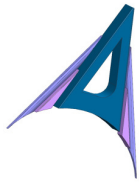
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14.	MSC Nastran based FEM analysis of Aircraft Wing structure (Day 2)	3	2
15.	MSC Nastran based FEM analysis of Aircraft Wing structure (Day 3)	3	2
Week 4.			
SL No.	Subject	Contact Hours	Credit Points
16.	MSC Nastran based FEM analysis of Aircraft Fuselage structure (Day 1)	3	2
17.	MSC Nastran based FEM analysis of Aircraft Fuselage structure (Day 2)	3	2
18.	MSC Nastran based FEM analysis of Aircraft Landing Gear structure (Day 1)	3	2
19.	Aerodynamics (Day1)	3	2
20.	Aerodynamics (Day2)	3	2
Week 5.			
21.	Aerodynamics (Day3)	3	2
22.	Basics of CFD (Computational Fluid Dynamics)	3	2
23.	CFD Analysis of Aircraft Wing Airfoil (External Air Flow)	3	2
24.	CFD Analysis of Aircraft Fuselage (External Air Flow)	3	2
25.	Personality development	3	2
Week 6.			
26.	CFD Analysis of Aircraft Engines with Thrust reversals (Internal Air Flow)	3	2
27.	CFD Analysis of water flow through pipes (Internal Air Flow)	3	2
28.	CFD Case study 1	3	2
29.	CFD Case study 2	3	2

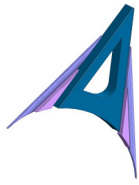
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30.	Personality development	3	2
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Week 7.			
SL No.	Subject	Contact Hours	Credit Points
31.	Introduction to Aerospace Composites	3	2
32.	Composite design engineering with hand calculation	3	2
33.	Composite modeling of Carbon Fiber Aircraft wing structure	3	2
34.	Composite modeling of Glass Fiber Automobile Structure	3	2
35.	Personality development	3	2
Week 8.			
36.	Training to build a 3D model using Nx UG 3D modeling software	3	2
37.	Live demonstration of 3D printing (day 1)	3	2
38.	Live demonstration of 3D printing (day 2)	3	2
39.	Live demonstration of 3D printing (day 3)	3	2
40.	Personality development	3	2
Week 9.			
41.	Fatigue damage tolerance analysis (life cycle analysis), Hand calculation (Day 1)	3	2
42.	Fatigue damage tolerance analysis (life cycle analysis), Hand calculation (Day 2)	3	2
43.	Building a fatigue damage tolerance model based on Stress life method	3	2

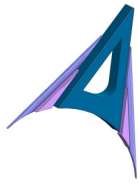
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44.	Building a fatigue damage tolerance model based on Strain life method	3	2
45.	Building a fatigue failure model based on Fracture mechanics method	3	2
Week 10.			
SL No.	Subject	Contact Hours	Credit Points
46.	Introduction to <i>Raspberry Pi 3</i>	3	2
47.	Setting up the device, Powering and running	3	2
48.	<i>Raspberry Pi</i> programming with Python	3	2
49.	Connecting to a network	3	2
50.	Personality development	3	2
Week 11.			
51.	Operating a Robot with <i>Raspberry Pi</i>	3	2
52.	Connecting a camera module and Image processing with <i>Raspberry Pi</i>	3	2
53.	Case Study 1	3	2
54.	Case Study 2	3	2
55.	Personality development	3	2
Week 12.			
56.	Raspberry Pi based Lab test 1	3	2
57.	Raspberry Pi based Lab test 2	3	2
58.	Raspberry Pi based Lab test 3	3	2
59.	Raspberry Pi based Lab test 4	3	2

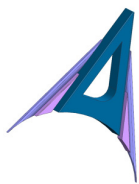
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60.	Personality development	3	2
Week 13.			
SL No.	Subject	Contact Hours	Credit Points
61.	Introduction to Internet of things (<i>IOT</i>)	3	2
62.	Basics of <i>IOT</i> networking	3	2
63.	Machine to machine communication	3	2
64.	Introduction to <i>Arduino</i> controller	3	2
65.	Personality development	3	2
Week 14.			
66.	Integration of sensors and actuators with <i>Arduino</i>	3	2
67.	Case: Building an <i>IOT</i> network with <i>Arduino</i>	3	2
68.	Building an <i>IOT</i> network with <i>Raspberry Pi</i> (Day 1)	3	2
69.	Building an <i>IOT</i> network with <i>Raspberry Pi</i> (Day 2)	3	2
70.	Personality development	3	2
Week 15.			
71.	Cloud computing fundamentals	3	2
72.	Cloud computing service models	3	2
73.	Case Study: Building a home automation network with <i>IOT</i> (<i>Day1</i>)	3	2
74.	Case Study: Building a home automation network with <i>IOT</i> (<i>Day2</i>)	3	2
75.	Personality development	3	2

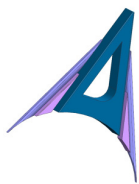
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Week 16.			
SL No.	Subject	Contact Hours	Credit Points
76.	Introduction to machine Learning	3	2
77.	Different types of learning: Supervised and unsupervised learning	3	2
78.	Evaluation and cross validation	3	2
79.	Linear Regression	3	2
80.	Personality development	3	2
Week 17.			
81.	Multiple linear Regression	3	2
82.	Hand calculation on Linear and multiple Linear Regression with small data sets	3	2
83.	Python based tutorials on Linear and multiple linear Regression	3	2
84.	K-nearest neighbor (KNN) algorithms	3	2
85.	Personality development	3	2
Week 18.			
86.	Microsoft excel based hand calculation of KNN algorithm	3	2
87.	Python based tutorial on K-nearest neighbor	3	2
88.	Introduction to Decision trees	3	2
89.	Python based tutorial on Decision trees with various data sets	3	2
90.	Personality development	3	2

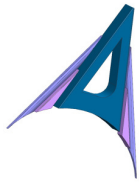
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SL No.	Subject	Contact Hours	Credit Points
91.	Overfitting	3	2
92.	<i>Naïve Bayes</i> algorithm	3	2
93.	Hand calculation on <i>Naïve bayes</i> with small data sets	3	2
94.	Python based tutorial on <i>Naïve bayes</i> algorithm	3	2
95.	Personality development	3	2
Week 20.			
96.	Introduction to support vector machine (<i>SVM</i>)	3	2
97.	Introduction with nonlinear <i>SVM</i> and kernel function	3	2
98.	Hand calculation support vector machine (<i>SVM</i>) with small data sets	3	2
99.	Python based tutorial on support vector machine (<i>SVM</i>)	3	2
100.	Personality development	3	2
Week 21.			
101.	Introduction to Artificial Neural network (<i>ANN</i>)	3	2
102.	Neural network and back propagation algorithm	3	2
103.	Python based tutorial on Artificial Neural network (<i>ANN</i>)	3	2
104.	Learning Image analysis with neural networks	3	2
105.	Personality development	3	2

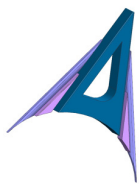
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Week 22.			
SL No.	Subject	Contact Hours	Credit Points
106.	Python based tutorial on Image analysis with neural networks	3	2
107.	Introduction to clustering	3	2
108.	Deep Learning models (Day 1)	3	2
109.	Deep Learning models (Day 2)	3	2
110.	Personality development	3	2
Week 23.			
111.	ML Practice session 1	3	2
112.	ML Practice session 2	3	2
113.	ML Practice session 3	3	2
114.	ML Practice session 4	3	2
115.	Personality development	3	2
Week 24.			
116.	Aerospace surface modeling with CATIA (Day 1)	3	2
117.	Aerospace surface modeling with CATIA (Day 2)	3	2
118.	Aerospace surface modeling with CATIA (Day 3)	3	2
119.	Aerospace surface modeling with CATIA (Day 4)	3	2
120.	Personality development	3	2
Week 25.			
SL No.	Subject	Contact Hours	Credit Points
121.	Aerospace surface modeling with CATIA (Day 5)	3	2
122.	Aerospace surface modeling with CATIA (Day 6)	3	2

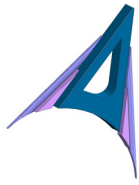
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123.	Aerospace surface modeling with CATIA (Day 7)	3	2
124.	Aerospace surface modeling with CATIA (Day 8)	3	2
125.	Aerospace surface modeling with CATIA (Day 9)	3	2
Week 26.			
126.	Aircraft structural analysis with ANSYS (Day1)	3	2
127.	Aircraft structural analysis with ANSYS (Day2)	3	2
128.	Aircraft structural analysis with ANSYS (Day3)	3	2
129.	Aircraft structural analysis with ANSYS (Day4)	3	2
130.	Aircraft structural analysis with ANSYS (Day5)	3	2
Week 27.			
131.	Aircraft structural analysis with ANSYS (Day6)	3	2
132.	Aircraft structural analysis with ANSYS (Day7)	3	2
133.	Aircraft structural analysis with ANSYS (Day8)	3	2
134.	Aircraft structural analysis with ANSYS (Day9)	3	2
135.	Aircraft structural analysis with ANSYS (Day10)	3	2
Week 28.			
SL No.	Subject	Contact Hours	Credit Points
136.	Aerospace manufacturing and Programming in CNC Machines (Day 1)	3	2
137.	Aerospace manufacturing and Programming in CNC Machines (Day 2)	3	2
138.	Aerospace manufacturing and Programming in CNC Machines (Day 3)	3	2

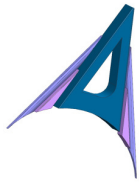
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139.	Aerospace manufacturing and Programming in CNC Machines (Day 4)	3	2
140.	Personality development	3	2
Week 29.			
141.	Aerospace manufacturing and Programming in CNC Machines (Day 5)	3	2
142.	Aerospace manufacturing and Programming in CNC Machines (Day 6)	3	2
143.	Aerospace manufacturing and Programming in CNC Machines (Day 7)	3	2
144.	Aerospace manufacturing and Programming in CNC Machines (Day 8)	3	2
145.	Personality development	3	2
Week 30.			
146.	Stress measurement upon mounting strain gauges on Cantilever beam (experiment)	3	2
147.	Introduction to UAV Aerodynamics	3	2
148.	Making a drone structure and understanding flight operations	3	2
149.	Making a drone (Lab 1)	3	2
150.	Assembling and Flying a drone	3	2

List of companies in which a student can find employment after attending the above courses:

1. Axis Cades India Ltd.
2. Cyient India Ltd.
3. Tata Aerospace and TATA advanced laboratories
4. Collins Aerospace

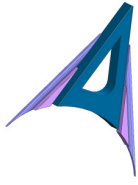
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5. Mahindra Aerospace
6. Reliance Aerospace
7. TCS
8. Boeing India Ltd.
9. Airbus India Ltd.

DSN Aerospace along with MSME Kolkata can accommodate a maximum of **75 students** for Aerospace Programs. Enrollment for two year Mtech can be limited to a maximum of **75 students per batch.**