

DSN AEROSPACE CONSULTANTS PVT. LTD.

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

One year PG Diploma in Artificial Intelligence and Robotics

Course Objective:

The world is fast embracing the Industry 4.0 guidelines and protocols. "Industry 4.0" refers to the concept of factories in which machines are augmented with wireless connectivity and sensors, connected to a system that can visualize the entire production line and make decisions on its own. The job industry is also getting increasingly inclined towards the knowhow of technologies relevant to Industry 4.0. In view of this, we have designed the course to offer adequate exposure to graduate students of any discipline with state of the art technologies, grooming them to embrace the world of Industry 4.0 and become employable in one year time. The course curriculum covers all subjects required as part of Industry 4.0 objective for meeting present job requirements.

DSN Aerospace in collaboration with MSME Technology centre, Kolkata is imparting quality education to graduate students in post-graduation level since 2013. We have developed state of the art laboratory with nine projects in the field of advanced robotics. We have also developed a robust industry partnership for providing training and internship facility to students. DSN Aerospace has a strong placement team along with the placement agency of MSME Kolkata for providing placement assistance to companies.

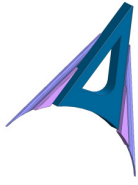
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Module wise course curriculum:

Module1:

Basics of 'C' Programming Language + Laboratory

Module2:

Basics of **Python** Programming Language + Laboratory

Module3:

Introduction to **Arduino Uno** + Laboratory

Module4:

Introduction to **Raspberry Pi** + Laboratory

Module5:

Internet of Things (**IOT**) + Laboratory

Module6:

Machine Learning (**ML**) and Artificial Intelligence (**AI**) + Laboratory

Module7:

Robotics + Laboratory

Module8:

Personality development skills

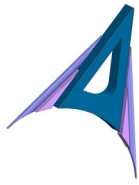
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Detailed Course Curriculum for the one year program.

Week 1.			
SL No.	Subject	Contact Hours	Credit Points
1.	Introduction to 'C'	3	2
2.	Operators and expressions	3	2
3.	Input-Output Library functions (Day 1)	3	2
4.	Input-Output Library functions (Day 2)	3	2
5.	Personality development	3	2
Week 2.			
6.	Pointer (Day 1)	3	2
7.	Pointer (Day 2)	3	2
8.	Array	3	2
9.	Strings	3	2
10.	Personality development	3	2
Week 3.			
11.	Structure	3	2
12.	File Handling (Day 1)	3	2
13.	Industrial Case studies	3	2
14.	Online exam based on question bank prepared previous years company online tests	3	2
15.	Personality development	3	2

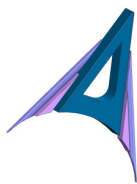
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Week 4.			
SL No.	Subject	Contact Hours	Credit Points
16.	Introduction to Python	3	2
17.	Installation of Anaconda Package	3	2
18.	Getting started with Spyder (<i>Python IDE</i>)	3	2
19.	Values, types and variables	3	2
20.	Personality development	3	2
Week 5.			
21.	Operands and Expressions (Day 1)	3	2
22.	Operands and Expressions (Day 2)	3	2
23.	Conditional statements (Demonstrating conditional statements)	3	2
24.	Loops (Demonstrating Loops)	3	2
25.	Personality development	3	2
Week 6.			
26.	Introduction to lists	3	2
27.	Command line arguments	3	2
28.	Case study 3	3	2
29.	Online exam based on question bank prepared previous years company online tests	3	2
30.	Personality development	3	2

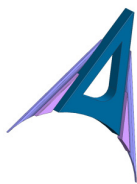
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Week 7.			
SL No.	Subject	Contact Hours	Credit Points
31.	Introduction to Arduino IDE, writing, saving, compiling and uploading sketches.	3	2
32.	Interfacing discrete LEDs, Binary counter, Seven Segment LEDs.	3	2
33.	Interfacing LCD, switch Interface.	3	2
34.	Interfacing with different type of sensors and communication modules.	3	2
35.	Personality development	3	2
Week 8.			
36.	Controlling DC motors and Servomotors with Arduino	3	2
37.	Arduino Based Project 2	3	2
38.	Arduino Based Project 3	3	2
39.	Arduino Based Project 4	3	2
40.	Personality development	3	2
Week 9.			
41.	Arduino Lab test 1	3	2
42.	Arduino Lab test 2	3	2
43.	Arduino Lab test 3	3	2
44.	Arduino Lab test 4	3	2
45.	Personality development	3	2

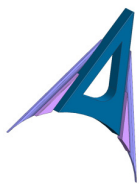
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Week 10.			
SL No.	Subject	Contact Hours	Credit Points
46.	Introduction to <i>Raspberry Pi 3</i>	3	2
47.	Setting up the device, Powering and running	3	2
48.	<i>Raspberry Pi</i> programming with Python	3	2
49.	Connecting to a network	3	2
50.	Personality 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
60.	Personality development	3	2

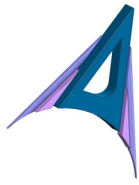
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Week 13.			
SL No.	Subject	Contact Hours	Credit Points
61.	Introduction to Internet of things (<i>IOT</i>)	3	2
62.	Basics of <i>IOT</i> networking	3	2
63.	Machine to machine communication	3	2
64.	Introduction to <i>Arduino</i> controller	3	2
65.	Personality 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

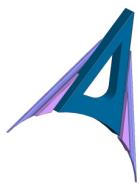
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Week 16.			
SL No.	Subject	Contact Hours	Credit Points
76.	Introduction to machine Learning	3	2
77.	Different types of learning: Supervised and unsupervised learning	3	2
78.	Evaluation and cross validation	3	2
79.	Linear Regression	3	2
80.	Personality 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

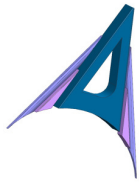
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Week 19.			
SL No.	Subject	Contact Hours	Credit Points
91.	Overfitting	3	2
92.	<i>Naïve Bayes</i> algorithm	3	2
93.	Hand calculation on <i>Naïve bayes</i> with small data sets	3	2
94.	Python based tutorial on <i>Naïve bayes</i> algorithm	3	2
95.	Personality 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

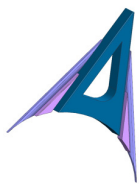
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Week 22.			
SL No.	Subject	Contact Hours	Credit Points
106.	Python based tutorial on Image analysis with neural networks	3	2
107.	Introduction to clustering	3	2
108.	Deep Learning models (Day 1)	3	2
109.	Deep Learning models (Day 2)	3	2
110.	Personality 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.	ML Practice session 5	3	2
117.	ML Practice session 6	3	2
118.	ML Practice session 7	3	2
119.	ML Practice session 8	3	2
120.	Personality development	3	2

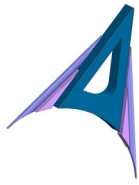
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Week 25.			
SL No.	Subject	Contact Hours	Credit Points
121.	Introduction to Robotics	3	2
122.	Technologies in Robots	3	2
123.	Elements of Robots: Joints, Links, Actuators and Sensors	3	2
124.	Industrial Robots and Industrial automation	3	2
125.	Personality development	3	2
Week 26.			
126.	Parallel manipulators	3	2
127.	Gripper manipulators	3	2
128.	Actuators : Electrical, Hydraulic and pneumatic (Day 1)	3	2
129.	Actuators : Electrical, Hydraulic and pneumatic (Day 2)	3	2
130.	Personality development	3	2
Week 27.			
131.	Trajectory Planning	3	2
132.	Velocity analysis of robot movement	3	2
133.	Dynamic analysis of robot movement	3	2
134.	Image processing in robotics	3	2
135.	Personality development	3	2

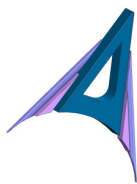
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Week 28.			
SL No.	Subject	Contact Hours	Credit Points
136.	Image processing in robotics Lab 1	3	2
137.	Image processing in robotics Lab 2	3	2
138.	Image processing in robotics Lab 3	3	2
139.	Image processing in robotics Lab 4	3	2
140.	Personality development	3	2
Week 29.			
141.	Voice based robotic control	3	2
142.	Voice based robotic control Lab 1	3	2
143.	Voice based robotic control Lab 2	3	2
144.	Voice based robotic control Lab 3	3	2
145.	Personality development	3	2
Week 30.			
146.	Modeling and analysis of wheeled robots	3	2
147.	Modeling and analysis of Robotic arm	3	2
148.	Making a drone structure and understanding flight operations	3	2
149.	Making a drone (Lab 1)	3	2
150.	Learning to build a 6 Degree of Freedom Robotic Arm	3	2

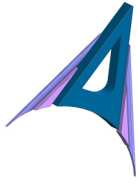
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**List of companies in which a student can find employment after attending the
above courses:**

1. Axis Cades India Ltd.
2. Cyient India Ltd.
3. Tata Aerospace and TATA advanced laboratories
4. Collins Aerospace
5. Mahindra Aerospace
6. Reliance Aerospace
7. TCS
8. Maruti Udyog limited
9. Tata motors

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.**