AMET

ACADEMY OF MARITIME EDUCATION AND TRAINING
DEEMED TO BE UNIVERSITY
(Under Section 3 of UGC Act 1956)

DEPARTMENT OF NAVAL ARCHITECTURE AND OFFSHORE ENGINEERING

VALUE ADDED COURSE DETAIL

ACADEMIC YEAR-2019-20

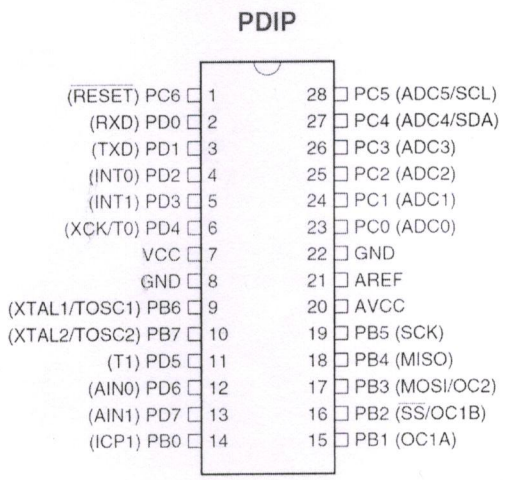
1	Course Name	Robots and its application
2	Course offered by	EPR-Labs, Chennai
3	Co-Ordinator	Mr Himanshu Uppal
4	Instructor	Mr Ganapathy
5	Course	Copies Attached
6	Class	BE (NA&OE)
7	Number of Students per batch	14
8	Duration	15 Days
9	No. of Hrs /Week	2 Hrs /Day
10	Prerequisite	Basics of Programming
11	About the Course	Customized robot development training – A hands on practical research opportunity to explore the product development Life Cycle and technologies which will involve Mechanical, Electronics and Programming to implement your innovative thoughts.
12	Course Objective	To inculcate the basic of robotics – hands on
13	Course Outcome	Students will be able to comprehend basics of robotics and related terms, develop basic fundamental architecture of mini robot.
14	Topics Covered	Syllabus Attached
15	Learning References	NA
16	Assessment Method	Hands-on Training
17	Attendance Sheet	Copies Attached
18	Photograph	NA
19	Certificate Copies	Copies Attached
20	Feedback About The Course	Copies Attached
21	Action Taken Report	Attached herewith

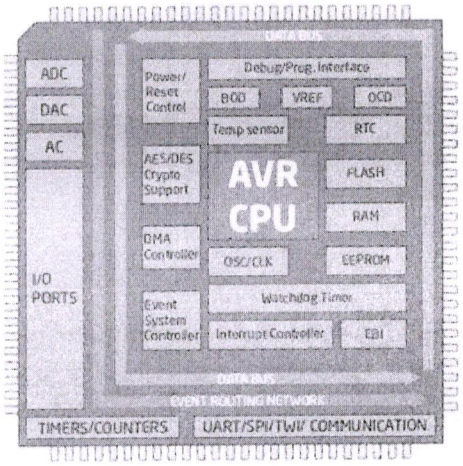
CUSTOMIZED ROBOT DEVELOPMENT TRAINING INCLUDING WALKING and SURVEILLANCE TYPE ROBOTS

OBJECTIVE OF THE TRAINING:

Customized Robot Development Training – A Hands on practical research opportunity to explore the Product Development Life Cycle and technologies which will involve Mechanical, Electronics and Programming to implement your innovative thoughts on your own. This training Program will give exposure to the students with Industrial Protocols Programming and developing innovative products.

TOOLS USED: Atmega Controller, Atmel Studio, Arduino IDE





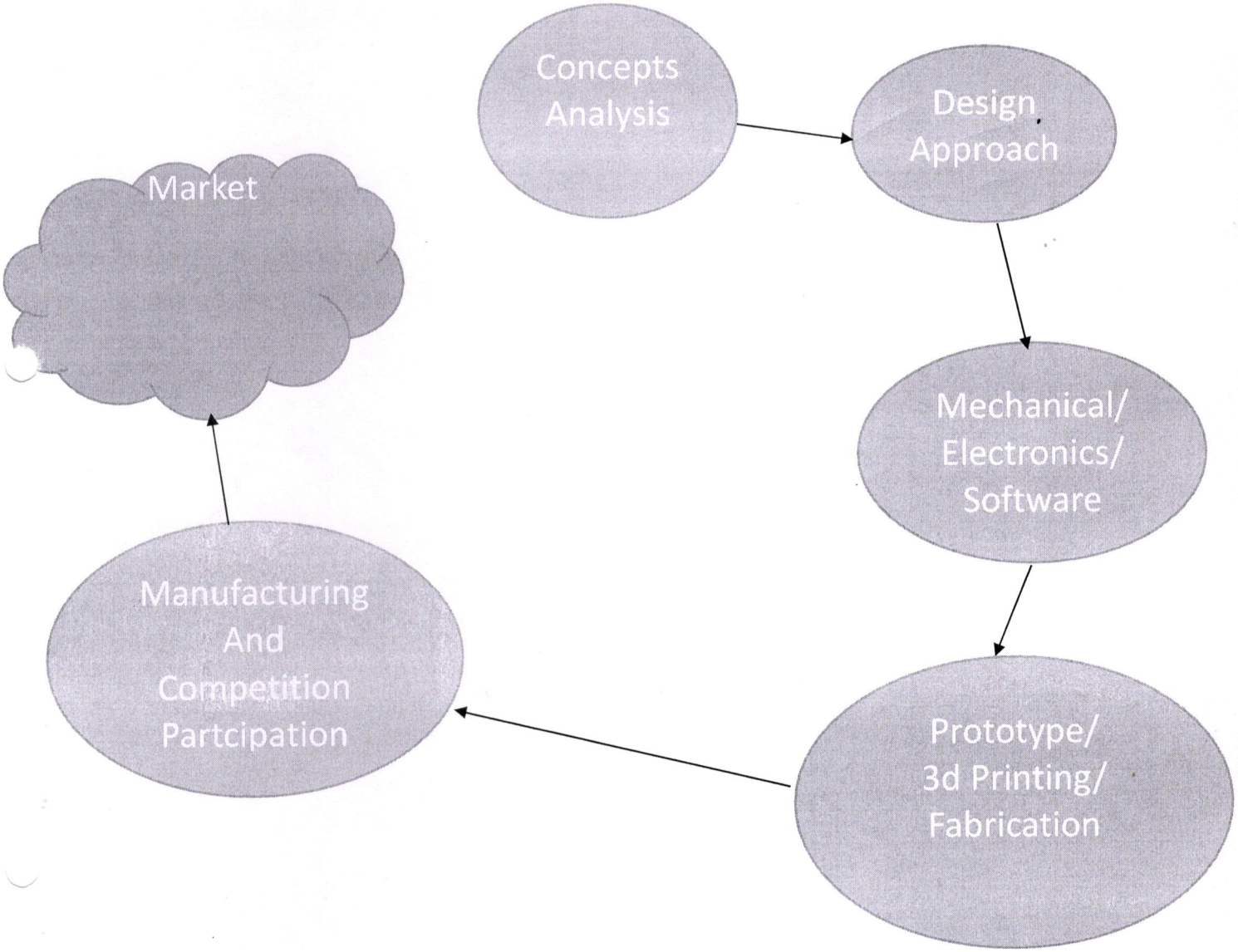
TOPICS COVERED:

MECHANICAL: Robot Anatomy, Mechanism, Drive System and its types, Robot Kinematics, DOF, Grippers

ELECTRONICS: Hardware design (Circuit design) and MCU Architecture, Drive System, Sensors Interrupt, USART, Timer, Hardware PWM, Industrial Communication Protocol (I2C, SPI, etc.,).

PROGRAMMING: Embedded C, IOT, Python, Image Processing and Machine Learning

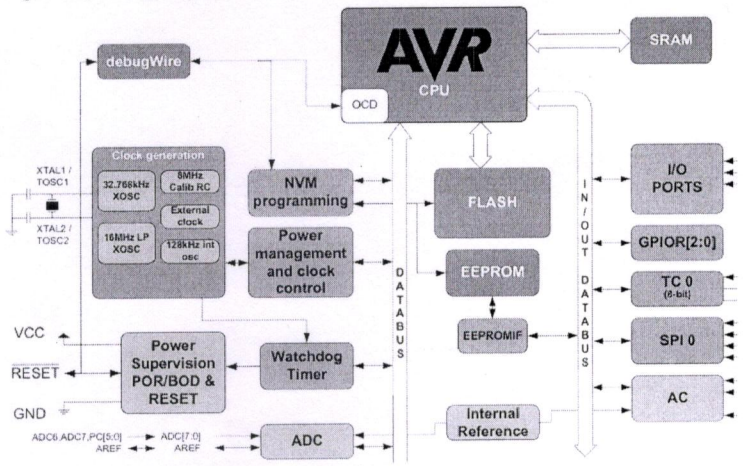
TRAINING PROCESS



Introduction to Product design

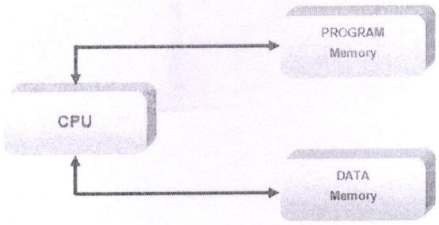
Hardware AVR

Figure 4-1. Block Diagram



Software design – Assembly language and Embedded C language

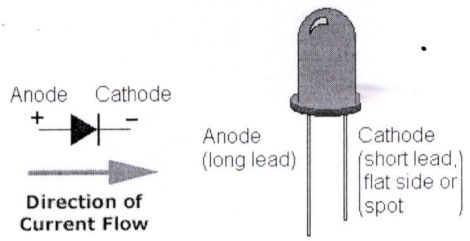
Circuit design session



Introduction to Active and passive components

Pin description of AVR architecture

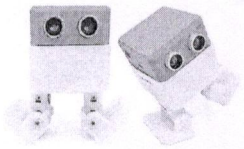
Datasheet inference



LED connection details, Programming, Soldering basics

Buzzer, Source mode & Sink mode etc.,

-10 Hours



Mechanism (Wheeled and Bipedal Robots Design)

Dancing and Walking Robot Design

Machine Building and Gripper Concepts (Pulley Belt, Ball Screw, Vacuum, etc.,)

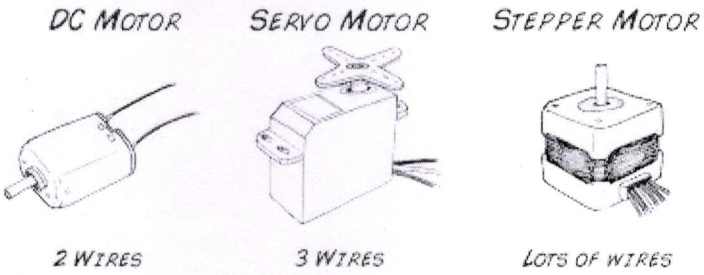
Switch, designing the best switch, Resistor Selection

Configuring the port as input

Drawbacks of Switch, Keypads introduction and keypad de-bouncing

Sensors, Detailed introduction, Drawbacks of connecting the sensor in digital mode

Motors, Introduction to Drivers and Transistors



Applying mathematical concepts to the Robots (Open Loop System)

Integrating Sensors for Precision (Closed Loop System)

ADC solution to Sensors for Accuracy, Application of ADC

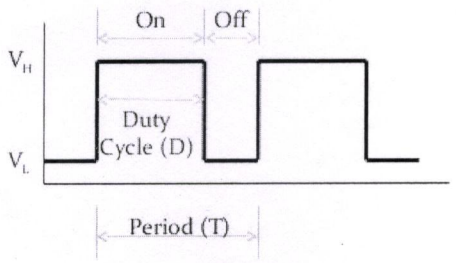
PWM Technique

Interfacing Servomotor

-5 Hours

Introduction to pwm technique

- PWM (Pulse Width Modulation) is an efficient way to vary the speed and power of electric DC motors.



- Duty Cycle is determined by:

$$Duty\ Cycle = \frac{On\ Time}{Period} \times 100\%$$

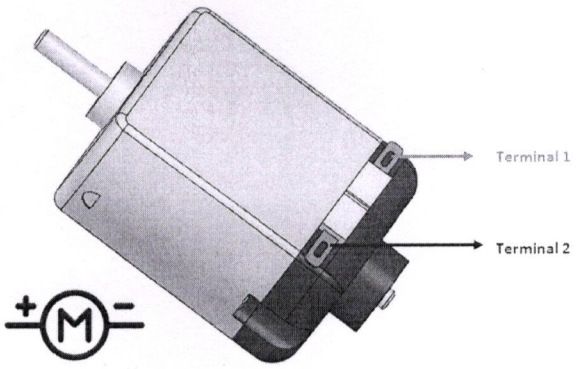
- Average signal can be found as:

$$V_{avg} = D \cdot V_H + (1 - D) \cdot V_L$$

- Usually, V_L is taken as zero volts for simplicity.

Driver Circuit for servo Programming

Servo Designing Walking Robot



-5 Hours

INDUSTRIAL PROTOCOLS, TIMERS, INTERRUPTS:

GSM

GPS

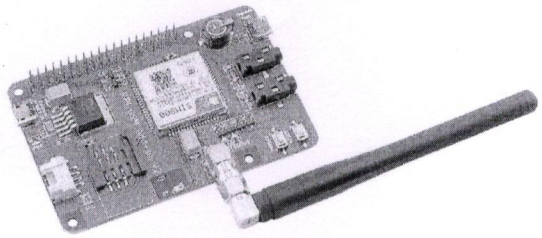
RF

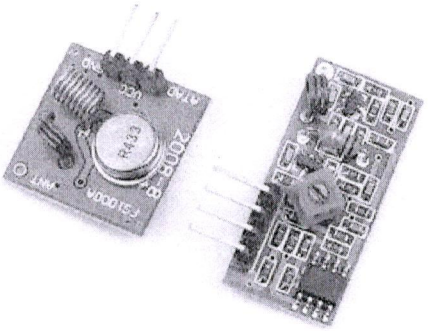
Bluetooth

Multi controller etc

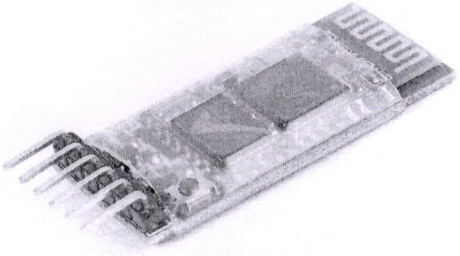
With any one interface will be hands on

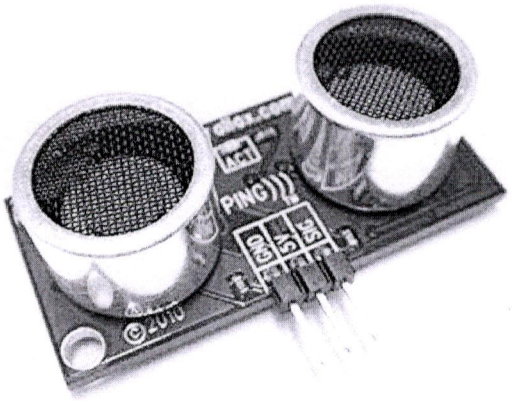
Designing a Complex Systems





-5 Hours





Configuring Camera module with hardware

Programming the camera module

IOT Programming through PHP MAILER Concepts

Master, Slave concepts and Programming

Image Processing

Surveillance Application with IOT

Machine Learning for Artificial Intelligence

-5 Hours

PROJECT and RESEARCH IDEAS:

Cleaning Robots for Domestic and Industrial Purpose

Solar Panel Cleaning Robot

Scrolling Display, Designer Lights, Dancing Lights

In-house Joy stick design

Smart Waste Management System

Self Balancing Robot, Object Finding Robot etc.,

Designing Bipedal Robots with Walking Mechanism

Humanoid Robots

Industrial Pick and Place Robots

Face Recognition and Motion Detection

Surveillance Products using Robots

Character and Handwriting Recognition

Mechanical consideration to design Industrial Robots

Automatic Ticket Vending Machine, IOT products etc.,

OUTCOME:

Be familiar with Product design and technologies involved in it with respect to Mechanical, hardware and software with respect to Microcontrollers and Embedded C programming

Ability to design own projects and involve in research activities which includes industrial sensors and actuator components with tasks involving project specification, algorithm design, software programming, simulation and modeling, Control and obstacle avoidance mechanism in a complex and interactive environment.

Enhancing confidence and communication skills through project report and seminar presentation.

This training program is exclusively designed for AMET UNIVERSITY and we charge Rs. 1500/- per student including GST. Students can bring laptop. Students will be grouped into 3 or 4 per batch depending upon the total strength for the hands on training session and kits will be taken back after the session.

TOTAL No. HOURS FOR TRAINING 30 Hours

What we need?

We need 4 hours of your Valuable time per Week;

Minimum 10 Systems with USB Keyboard and USB Mouse depending upon batch size with Projector and Audio facilities.

Systems or Laptop should have minimum Core2Duo or i3 Processor or equivalent and 4GB RAM, 50 GB memory space for operation with Windows 7 or higher.

For more details, Contact 9486806486/ 9080589766

Certificates will be provided for each student.

Gmail by Google

HimanshuUppal Asst Professor(NA) <uppal.himanshu@ametuniv.ac.in>

EPRLABs PROPOSAL FOR VALUE ADDED PROGRAM ON CUSTOMIZED ROBOTS DESIGN

3 messages

ganapathy@eprlabs.com <ganapathy@eprlabs.com> Fri, Feb 1, 2019 at 7:26 PM
To: uppal.himanshu@ametuniv.ac.in

Hi Sir,

As discussed by us to conduct a Value Added Program on Robots and its applications I have enclosed the syllabus details with this mail. Please find the attachment. Kindly let us know your input on the syllabus in order to Customize it for better training.

Kindly revert back for queries if any at 9486806486 / 9080589766.

Hope to take our interaction to the next level.

With regards,
Ganapathy R
EPRLABs

CUSTOMIZED ROBOT DEVELOPMENT TRAINING AMET.pdf
648K

HimanshuUppal Asst Professor(NA) <uppal.himanshu@ametuniv.ac.in> Thu, Mar 7, 2019 at 5:39 PM
To: ganapathy@eprlabs.com

Hello sir,

pl. forward me a revised syllabus on module basis, as discussed yesterday.

Also mentions,

Course objectives and expected course outcomes.

[Quoted text hidden]
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Best regards,

--

Himanshu Uppal

Asst. Professor.

Department of Naval Architecture & Offshore Engineering

Academy of Maritime Education and Training (AMET)

135 East Coast Road, Kanathur, Chennai 603112, TN, India

ganapathy@eprlabs.com <ganapathy@eprlabs.com> Wed, Mar 13, 2019 at 10:44 AM
To: "HimanshuUppal Asst Professor(NA)" <uppal.himanshu@ametuniv.ac.in>

Hi Sir,
I have attached the Syllabus with this mail as required in the Module Format.

With regards,
Ganapathy R

CUSTOMIZED ROBOT DEVELOPMENT TRAINING and IOT AMET.pdf
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EPRLABs

EPRLABS CHENNAI

ACADEMY COUNCIL OF

ELECTRONICS PLATFORM RESEARCH LABS

Certificate of Excellence

This is to certify that

ARDRA MP

Having successfully completed the prescribed study
Is herby awarded

Two Month certificate in

MASTER PROGRAM IN EMBEDDED SYSTEM

with 'A+' Grade

Sealed with the common seal of the Institute on

04-02-2020

Specialization: IOT using Raspberry Pi

For EPR

Authorised Signature

Authorized Signature

EPRLABS
88/234, 2nd Floor, Rangarajapuram Main Road,
Kodambakkam, Chennai-600024

POWERED BY Raspberry Pi

MSME

EPRLABs

EPRLABS CHENNAI

ACADEMY COUNCIL OF

ELECTRONICS PLATFORM RESEARCH LABS

Certificate of Excellence

This is to certify that

SABEER MOHAMMED

Having successfully completed the prescribed study
Is herby awarded

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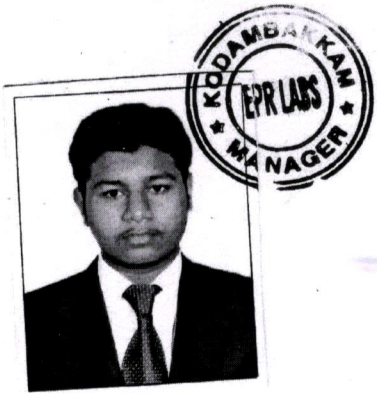

For EPR LABS

Authorised Signature

Authorized Signature

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Kodambakkam,Chennai-600024

POWERED BY Raspberry Pi

GOVERNMENT OF INDIA
MSME
MINISTRY OF MICRO, SMALL & MEDIUM ENTERPRISES

EPRLABs

EPRLABS CHENNAI

ACADEMY COUNCIL OF

ELECTRONICS PLATFORM RESEARCH LABS

Certificate of Excellence

This is to certify that

NITHISH BALAJI J

Having successfully completed the prescribed study
Is herby awarded

Two Month certificate in

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MSME

EPRLABs

EPRLABS CHENNAI

ACADEMY COUNCIL OF

ELECTRONICS PLATFORM RESEARCH LABS

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ABRAHAM NOEL

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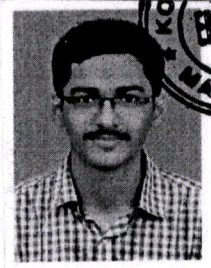

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Authorised Signature

Authorized Signature

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88/234, 2nd Floor, Rangarajapuram Main Road,
Kodambakkam, Chennai-600024

POWERED BY Raspberry Pi

MSME

Robots and its Application – Value-added Training

FEEDBACK FORM

We would like to thank you for your participation in the training programme. The organizing committee would like to invite you to take a moment to complete our training evaluation feedback. Your feedback will enable us to improve our programme and better meet your needs. This evaluation will take no more than 5 minutes of your time. Thanks for your collaboration.

1. **Please indicate your overall satisfaction with this training:**
   - ○ Very Satisfied
   - ✓ Somewhat Satisfied
   - ○ Neither satisfied nor dissatisfied
   - ○ Somewhat Dissatisfied
   - ○ Very Dissatisfied

2. **What was MOST VALUABLE about the training?**

   —

3. **What was LEAST VALUABLE about the training?**

   NIL

4. **How would you rate the following items?**

	Excellent	Very good	Good	Fair	Poor	N/A
- Relevance of contents	○	○	✓	○	○	○
- Opportunity to exchange information with other participants	○	○	✓	○	○	○
- Quality of delivery	○	✓	○	○	○	○
- Registration process	○	○	✓	○	○	○
- Quality of material circulated by the trainers	○	○	✓	○	○	○
- Training venue/facilities	○	✓	○	○	○	○
- Organizational arrangements for and during the event	○	○	✓	○	○	○

5. **What topic(s) or theme(s) you would like to be addressed at next training?**

   Python & Raspberry Pi

6. **We request you to provide the suggestions for improvement.**

   —

Your name (optional):

Robots and its Application – Value-added Training

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   - ○ Somewhat Satisfied
   - ○ Neither satisfied nor dissatisfied
   - ○ Somewhat Dissatisfied
   - ○ Very Dissatisfied

2. **What was MOST VALUABLE about the training?**

   Arduino coding.

3. **What was LEAST VALUABLE about the training?**

   None.

4. **How would you rate the following items?**

	Excellent	Very good	Good	Fair	Poor	N/A
- Relevance of contents	○	✓	○	○	○	○
- Opportunity to exchange information with other participants	○	○	✓	○	○	○
- Quality of delivery	○	○	✓	○	○	○
- Registration process	○	✓	○	○	○	○
- Quality of material circulated by the trainers	○	○	✓	○	○	○
- Training venue/facilities	○	○	✓	○	○	○
- Organizational arrangements for and during the event	○	○	✓	○	○	○

5. **What topic(s) or theme(s) you would like to be addressed at next training?**

   Python and Raspberry Pi.

6. **We request you to provide the suggestions for improvement.**

   —

Your name (optional):

Robots and its Application – Value-added Training

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   - ○ Somewhat Satisfied
   - ○ Neither satisfied nor dissatisfied
   - ○ Somewhat Dissatisfied
   - ○ Very Dissatisfied

2. **What was MOST VALUABLE about the training?**

   Arduino Coding

3. **What was LEAST VALUABLE about the training?**

   —

4. **How would you rate the following items?**

	Excellent	Very good	Good	Fair	Poor	N/A
- Relevance of contents	○	✓	○	○	○	○
- Opportunity to exchange information with other participants	○	✓	○	○	○	○
- Quality of delivery	○	○	✓	○	○	○
- Registration process	○	✓	○	○	○	○
- Quality of material circulated by the trainers	○	○	✓	○	○	○
- Training venue/facilities	○	○	✓	○	○	○
- Organizational arrangements for and during the event	○	○	✓	○	○	○

5. **What topic(s) or theme(s) you would like to be addressed at next training?**

   Python Programming

6. **We request you to provide the suggestions for improvement.**

   —

Your name (optional):

Robots and its Application – Value-added Training

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   - ○ Very Satisfied
   - (○) Somewhat Satisfied
   - ○ Neither satisfied nor dissatisfied
   - ○ Somewhat Dissatisfied
   - ○ Very Dissatisfied

2. **What was MOST VALUABLE about the training?**

   Something know about Robotics.

3. **What was LEAST VALUABLE about the training?**

   Lack of periods.

4. **How would you rate the following items?**

	Excellent	Very good	Good	Fair	Poor	N/A
- Relevance of contents	○	(○)	○	○	○	○
- Opportunity to exchange information with other participants	○	○	(○)	○	○	○
- Quality of delivery	○	(○)	○	○	○	○
- Registration process	(○)	○	○	○	○	○
- Quality of material circulated by the trainers	○	○	(○)	○	○	○
- Training venue/facilities	○	(○)	○	○	○	○
- Organizational arrangements for and during the event	○	○	(○)	○	○	○

5. **What topic(s) or theme(s) you would like to be addressed at next training?**

6. **We request you to provide the suggestions for improvement.**

   Increase the time period

Your name (optional):

Robots and its Application – Value-added Training

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   - ○ Somewhat Satisfied
   - ● Neither satisfied nor dissatisfied
   - ○ Somewhat Dissatisfied
   - ○ Very Dissatisfied

2. **What was MOST VALUABLE about the training?**

   → FIRST THREE WEEKS OF CLASSES.

3. **What was LEAST VALUABLE about the training?**

   → LACK OF PERIODS
   → OVER DELAY.

4. **How would you rate the following items?**

	Excellent	Very good	Good	Fair	Poor	N/A
- Relevance of contents	○	●	○	○	○	○
- Opportunity to exchange information with other participants	○	○	●	○	○	○
- Quality of delivery	○	●	○	○	○	○
- Registration process	○	○	●	○	○	○
- Quality of material circulated by the trainers	○	●	○	○	○	○
- Training venue/facilities	○	●	○	○	○	○
- Organizational arrangements for and during the event	●	○	○	○	○	○

5. **What topic(s) or theme(s) you would like to be addressed at next training?**

   ARTIFICIAL INTELLIGENCE

6. **We request you to provide the suggestions for improvement.**

   ←

Your name (optional):

Robots and its Application – Value-added Training

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   - ○ Somewhat Satisfied
   - ○ Neither satisfied nor dissatisfied
   - (○) Somewhat Dissatisfied
   - ○ Very Dissatisfied

2. **What was MOST VALUABLE about the training?**

   first Three weeks of classes

3. **What was LEAST VALUABLE about the training?**

   Lack of periods
   Over delay

4. **How would you rate the following items?**

	Excellent	Very good	Good	Fair	Poor	N/A
- Relevance of contents	○	(○)	○	○	○	○
- Opportunity to exchange information with other participants	○	○	(○)	○	○	○
- Quality of delivery	○	(○)	○	○	○	○
- Registration process	○	○	(○)	○	○	○
- Quality of material circulated by the trainers	○	○	(○)	○	○	○
- Training venue/facilities	○	(○)	○	○	○	○
- Organizational arrangements for and during the event	○	○	(○)	○	○	○

5. **What topic(s) or theme(s) you would like to be addressed at next training?**

   Artificial Intelligence

6. **We request you to provide the suggestions for improvement.**

Your name (optional):

Robots and its Application – Value-added Training

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   - ○ Very Satisfied
   - ● Somewhat Satisfied
   - ○ Neither satisfied nor dissatisfied
   - ○ Somewhat Dissatisfied
   - ○ Very Dissatisfied

2. **What was MOST VALUABLE about the training?**

   We learned the Adriano to use.

3. **What was LEAST VALUABLE about the training?**

   Laikage of time to learn many things

4. **How would you rate the following items?**

	Excellent	Very good	Good	Fair	Poor	N/A
- Relevance of contents	○	○	●	○	○	○
- Opportunity to exchange information with other participants	○	○	●	○	○	○
- Quality of delivery	○	●	○	○	○	○
- Registration process	○	○	○	○	○	○
- Quality of material circulated by the trainers	●	○	○	○	○	○
- Training venue/facilities	○	●	○	○	○	○
- Organizational arrangements for and during the event	○	○	○	●	○	○

5. **What topic(s) or theme(s) you would like to be addressed at next training?**

   New few ~~Softwares~~ to do construction or creations.

6. **We request you to provide the suggestions for improvement.**

   ~~of Course~~ improve the timing and conduct on schedule.

Your name (optional): Vignesh. R.

Robots and its Application – Value-added Training

FEEDBACK FORM

We would like to thank you for your participation in the training programme. The organizing committee would like to invite you to take a moment to complete our training evaluation feedback. Your feedback will enable us to improve our programme and better meet your needs. This evaluation will take no more than 5 minutes of your time. Thanks for your collaboration.

1. **Please indicate your overall satisfaction with this training:**
   - ○ Very Satisfied
   - ○ Somewhat Satisfied
   - ✓ Neither satisfied nor dissatisfied
   - ○ Somewhat Dissatisfied
   - ○ Very Dissatisfied

2. **What was MOST VALUABLE about the training?**

Had Some Idea about Robotics

3. **What was LEAST VALUABLE about the training?**

Waste of Time

4. **How would you rate the following items?**

	Excellent	Very good	Good	Fair	Poor	N/A
- Relevance of contents	○	○	✓	○	○	○
- Opportunity to exchange information with other participants	○	○	✓	○	○	○
- Quality of delivery	○	○	○	✓	○	○
- Registration process	○	○	✓	○	○	○
- Quality of material circulated by the trainers	○	○	✓	○	○	○
- Training venue/facilities	○	○	✓	○	○	○
- Organizational arrangements for and during the event	○	○	✓	○	○	○

5. **What topic(s) or theme(s) you would like to be addressed at next training?**

←

6. **We request you to provide the suggestions for improvement.**

←

Your name (optional):

Uzma Naeem

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Value-Added Training Feedback Report

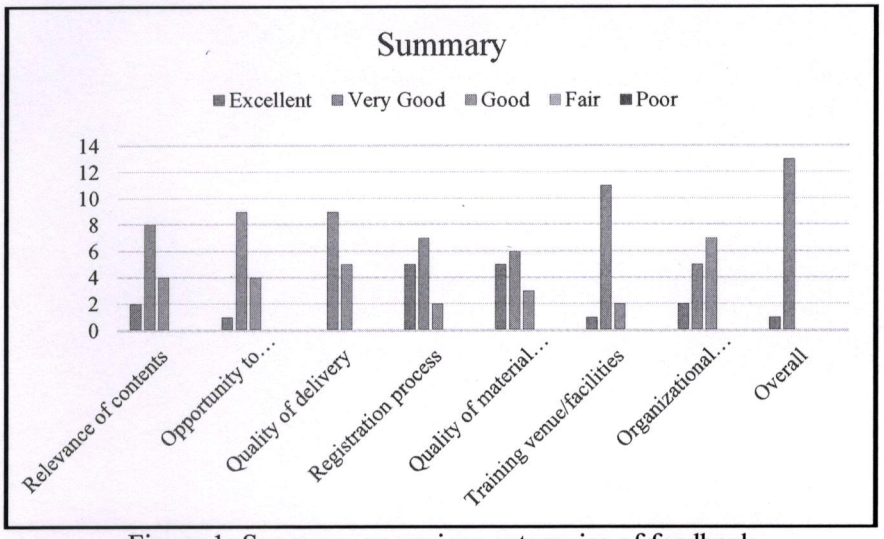

Figure 1: Summary on various categories of feedback

Figure 2: Overall response of the students.

Summary:

As per the feedback given by the students, training venue/facilities found motivating response from stakeholders. Also, other feedback components were satisfactory.

Findings:

Followings were the observed from the feedback report:

- Students requested for extension of such programme for Python programming, robot building (hands-on), and Artificial intelligence.

- Students shown inclination to extend their learning through developing other skills: Python, Raspberry Pi.
- Found classes interesting since they understood fundamentals and programming aspects.
- Overall performance of the students were highly satisfactory, they were satisfied with the course delivery and content.

Attendance Register

Sl.No.	Roll No.	NAME	9/4 1	16/4 2	23/4 3	30/4 4	6/5 5	3/8 6	10/8 7	17/8 8	24/8 9	7/9 10	21/9 11	28/9 12
01.	NA 1048	Ardra M.P	P	P	P	P	P	P	P	P	P	P	A	A
02.	1056	Abraham Noel	P	P	P	P	P	P	P	A	A	A	P	P
03.	1079	Gowtham Sathya Kumar	P	P	P	A	A	P	P	A	P	P	A	A
04.	1088	Nithish balaji. J	P	P	P	A	A	P	P	P	P	P	A	P
05.	1091	Prithiviraj Chauhan	P	P	P	P	A	P	P	P	P	P	P	P
06.	1096	Sabeer M.D	P	P	P	P	P	P	P	A	A	A	P	P
07.	1097	Sachin	P	P	P	P	P	P	P	A	P	P	P	P
08.	1099	Samuel	P	P	P	P	P	P	P	A	P	P	P	P
09.	1111	Vijwal raj	P	P	P	P	P	P	P	A	A	A	P	A
10.	1110	Subham Padhi	P	P	P	P	P	P	P	P	P	A	A	P
11.	1115	Vignesh	P	P	P	P	A	P	P	P	A	P	P	A
12.	1114	Venu Aravindh	P	P	P	P	P	P	P	P	A	A	P	A
13.	1116	Vijay	P	P	P	P	P	P	P	P	P	P	A	A
14.	1121	Karthick. M	P	P	P	P	P	P	P	A	A	P	P	P
		Signature of the Faculty												

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March ....2019.

12/10 13	26/10 14	2/11 15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Remarks
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