ARC EDUCATORS – *Observe Make Learn*

Proposal for D.G Ruparel College Robotics Program.

OBJECTIVE:

- To groom, empower, budding students to make them self-sufficient in the field of robotics and automation by giving them real time hands on exposure to build robots.
- To motivate, inspire and encourage young students to begin R&D work in the field of robotics to make India recognized in the world.
- To appreciate the role of robotics in today's industry and making a career out of it.

OUTPUT OF WORKSHOP:

- Students will be confident and capable to build their own robot and can participate Robotics competitions at IIT's and premier institutes.
- Attendee will be capable of designing any application by integrating multidisciplinary concepts and can understand all the process of an automation industry.
- Students will be ready for the 21'st century's workshop.
- To work in group as well as individual basis & presentation of work.

BENEFITS OF PARTICIPANTS:

- Well Trained Faculties from Arc Educators.
- Individual kit for each student.
- Focus on creativity and imagination of Participants and recognize.
- 100% hands on experience in building, circuit designing as well as programming.
- Hands on circuit making experience
- Study Material on soft copy.

ABOUT WORKSHOP:

- Arc Educators Robotics workshops are 100% hands on experience based.
- The workshop will be completely application development based.
- Competitive oriented learning methodology will help the attendee to think innovative.

Projects	Description
Manual Robot	Manual remote control robot designing (group activity)
Sensor design	To design a Sensor by help of components, hands on soldering and testing the circuit.
Light follower robot	Designing a robot which will move /stop depending to the source of light.
Line Tracing with Dual Sensor	Designing a robot to follow a black/white line with dual sensor module.
Obstacle sensing & avoidance	Obstacle avoidance algorithm.
Advanced line tracing Algorithm	Black Line in white surface and white line in black surfaces tracing.
Wall Follower	Wall follower algorithm.
Clap sensing	Clap sensing on/off robot.

REQUIREMENT FROM ORGANISING INSTITUTE:

Sl no	Name	Description
1	Lab	Place to conduct workshop & Projector
2	Practical Arena	Open space / corridor
3*	Computer lab	To learn programming
4	Power supply	DC-variable supply

Course content and schedule:

Day-1	**Max time**	**Topics**	**Content**
Introduction to Robotics	60 min	1) What is Robotics 2) Applications 3) Why important 4) How to go for it	1) Ppt 2) Video 3) Discussion
Electronics	90 min	1) Passive components 2) Active components 3) Explanation of components of pcb	1) Ppt 2) Live demo
Electronics	75 min	Building circuits on breadboard	Hands on activity.
Skills	75 min	Soldering and building circuits.	Hands on activity.
Revision	60 min	Including of adjusting the time of above topics	Tutorial
Day-2	**Max time**	**Topics**	**Content**
Motors, switches , gears & pulleys	75 min	1) Types of motors and uses 2) Important types of switches and uses 3) Basics of gears and pulleys	1) Ppt 2) Live demo
skills	75 min	Making remote control car. Group activity.	Hands on Activity
Sensors	75 min	Explanation, working and parts 1) Infrared sensor 2) Sound sensor 3) LDR 4) Ultrasonic	1) Ppt 2) Live demo 3) Discussion about the possible sensors that are available.
Skills	75 min	Making sensors on breadboard.	Hands on activity.
Revision	60 min	Motors ,switches, gears, pulleys	Tutorial

Day-3	**Max time**	**Topics**	**Content**
Boolean algebra	75 min	1) Why Important 2) Use as computer language 3) Dec, bi, hex systems 4) Mathematic calculations	1) Ppt 2) Black board
Boolean algebra	75 min	Problem solving	Activity
Ic's	75 min	1) What are ic's? 2) What is the use 3) Applications 4) Miniaturization 5) microcontroller	1) ppt 2) live demo
Microcontrollers	75 min	Basics and fundamentals of microcontroller.	1) PPT
Skills	60 min	Making circuits on breadboard	Hands on activity.
Day 4	**Max time**	**Topics**	**Contents**
Programming	120 min	Basics and fundamentals of c++	Ppt Blackboard
Skills	120 min	Building and testing of basic c++ codes	Hand on activity.
Team activity	60 min	Developing C++ code for given task.	Group activity.
Revision	60 min	C++	Tutorial

Day-5	**Max time**	**topics**	**content**
Programming	60 min	Introduction to embedded C	PPT
Software	90 min	1) how to use software 2) how to download the program	PPT Demo
First project	120 min	Line follower	Demo/activity
Second project	90 min	Simple edge avoider program and testing.	Demo/ Activity
Day -6			
Third project	120 min	Wall follower	Demo/ Activity
Fourth project	120 min	Clap and move, clap and stop	Demo/ Activity
Fifth project	120 min	Obstacle avoider	Demo/ Activity
Day-7	Max time	topics	content
Assessment	120 min	Exam and skill test	Assessment
Revision	60 min	All the five projects.	Discussion
Discussion on what next. Home work projects.	60 min	What next?	Discussions
Certificate Distribution	30 min	Vote of thank and feedbacks.	---

Total hours = 40 hrs.

Total days = 7 days

Total projects = 5 Nos.

Possible dates: January – 20th, 26th& 27th Feb – 16th, 17th, 23rd & 24th.

Min no of participants: 20.