

2022



TECHANALOGY

Inspiration | Ideation | Innovation

presents



ROBONETICS

VOL 2.0

ORGANISED BY:
Tech Analogy



<https://events.techanalogy.org/>



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ABOUT ROBONETICS 2.0

In this era of mechanisation, where human work involvement in the manufacturing process is being reduced by introducing machines, knowledge in field of robotics is need of the hour. Robotics will help taking one step closer to technology advancement. Already 6 percent of jobs in UD has been replaced by robots. The next generation of robots utilising artificial intelligence and automation will help to streamline processes that are currently handled with the assistance of human workers. This installment of robonectics shall bring in twice the excitement and help mentees inculcate twice the learning.





WHY ROBONETICS 2.0?

Robotics has the potential to positively transform lives and work practices, raise efficiency and safety levels and provide enhanced levels of service. Industrial robots have helped to boost productivity, safety, and time savings. Robots are able to produce incredibly accurate, consistent, and high quality results. Thus, Robotics and automation go hand in hand making robotics important component of “Industrial Revolution”. Robonectics 2.0 will help mentees understand the nuances of robotics and quench the thirst for robotics specific knowledge amongst the mentees.





WORKFLOW DESIGN





DAY 1

(DURATION: 60-80 mins)

INTRODUCTION TO SOLIDWORKS

- Introduction and features of Solidworks
- User interface- Keyboard shortcuts, mouse buttons, etc.
- 2D Sketching (Entities, Tools, Relations).
- Dimensioning (Smart, Fully Define Sketch)
- Basic Part Modelling (Extrude Feature Preview)





DAY 2

(DURATION: 60-80 mins)

UNDERSTANDING FEATURES AND PLANES

- Extrude Feature (Directions 1&2, Selecting Contours, Thin Feature)
- Revolve Feature (Creating and Selecting Axis, Selecting Contours, Thin Feature)
- Creating Reference Planes (Offset Plane, Angular Plane, Mid Plane, Cylindrical Plane)
- Swept Feature (Creating and Selecting Path, Selecting Profile, Thin Feature)
- Loft Feature (Creating and Selecting Guide lines, Selecting Profiles).
- Cut Features (Extrude Cut, Revolve Cut, Swept Cut, Loft Cut)





DAY 3

(DURATION: 60-80 mins)

FEATURE TOOLS, PATTERN, WELDMENTS

- Fillet Feature (Constant Size, Variable Size, Face and Full Fillet).
- Chamfer Feature
- Shell Feature
- Patterns (Mirror Feature, Circular Pattern, Linear Pattern)
- 3D Sketching and Weldments (Structural Member).

DAY 4

(DURATION: 60-80 mins)

BASIC SURFACE MODELLING

- Boundary Surface
- Surface Extrude
- Surface Revolve
- Surface Swept
- Surface Loft (Along with guide lines)
- Knitting and Thickening a Surface
- Trimming Surface





DAY 5

(DURATION: 60-80 mins)

ASSEMBLY

- Inserting Parts (with Alignments) and Design Tree Tools.
- Standard (Parallel, Perpendicular, Coincident, Concentric, Tangential, Lock, Angular, Distance).
- Other Mates. (Advanced and Mechanical)
- Mate Limits, Rotating and Moving Components.
- Exploded Views.
- Editing Parts in Assembly File. (Using Features Such as Extrude, Swept, Revolve)

DAY 6

(DURATION: 60-80 mins)

CONTINUATION OF ASSEMBLY

- Using Standard Mates on the Parts made. (Parts are made on the theme of the Workshop).
- Basic Analysis using Solidworks. (Defining Materials, Specifying Loads, Creating Mesh)





DAY 1

(DURATION: 60-80 mins)

DRAWINGS AND RENDERINGS

- 2D Drawing (Generating Drawing View, Detail and Section View).
- Model Rendering (Appearance, Background, other Render Options).





WORKFLOW IOT





DAY 8

(DURATION: 60-80 mins)

INTRODUCTION TO ARDUINO

- Embedded Systems & its Scope in Different Fields
- MicroControllers and MicroProcessors
- Introduction to Development Boards (Examples - Uses)
- Arduino - Origin, Types
- Arduino UNO - Structure, Components, IO, Shields, Power
- Arduino IDE
- Introduction to TinkerCAD - Alternative to Hardware and IDE (LED On/Off using Arduino)

DAY 9

(DURATION: 60-80 mins)

PROGRAMMING - PART 1

- Tokens (5 Types), Variables (int, float, string), Functions, Comments
- Arduino Programming Language (APL) Syntax
- Variable, Data Types





DAY 10

(DURATION: 60-80 mins)

PROGRAMMING - PART 2

- Operators (Arithmetic, Increment/Decrement, Assignment, Relational)
- Programming Concepts: - (Arduino Programming Language)
- Basic Elements (Bread Board, Resistors)

DAY 11

(DURATION: 60-80 mins)

DIGITAL SENSORS

- Conditional Statements (IF, ELSE, ELSEIF)
- Implementation of Conditional Statement using TinkerCAD (LED on/off using Push Button)
- Digital and Analog Overview, Digital Sensors
- Infrared Sensor (IR)
- HC04 Ultrasonic Sensor





DAY 12

(DURATION: 60-80 mins)

DISPLAYS

- Seven Segment Display
- Liquid Crystal Display (4bit only)

DAY 13

(DURATION: 60-80 mins)

ANALOG SENSORS

- Analog Sensors
- Analog to Digital Conversions (0 - 5V, 0 - 1024)
- Light Decreasing Resistance (LDR) - [Using Analog to control LED ON/OFF]
- Temperature Sensor - Types, LM35
- Piezo Buzzer





DAY 14

(DURATION: 60-80 mins)

PWM AND IT'S APPLICATIONS

- Pulse Width Modulation (PWM), Duty Cycle
- PWM using Arduino
- Servo Motor
- Control LED Brightness using PWM
- RGB





BONUS DAY

DURATION: 1hr :30mins - 2hrs

BONUS: CAREER GUIDANCE

he session will be dealt in regards with
the resume building and the future
prospects related to further studies and
internship opportunities in an
individual's career





INDUSTRIAL PARTNERS

- Chirpal Poly Films
- Bosch Rexroth
- Geeks for Geeks
- Euclid Labs
- Give My Certificate
- Mercedes AMG

AND MANY MORE.....





COLLEGE PARTNERS

- ROBOTICS CLUB IIT DELHI
- Microsoft Learn Student Chapter - TIET
- ASME - KIIT B
- ROBOTICS CLUB - NIT AGARTALA
- CODING CLUB - IIT JAMMU
- ROBOTICS CLUB -NIT PATNA
- IEEE - SIES
- CYBORG -NIT ROURKELA
- ROBOMANIPAL - MIT
- Alexa SRMIST - SRMIST
- CSI - SRM NCR
- ASME - SRMIST
- TEAM X-TREME -SSGMCE
- SRM ROBOCON - SRMIST
- CLAP (Coding like a pro)
- ROBOCON -CRCE
- PROJECT TEAM SRMIST
- CSI CLUB GLA
- ROBOTICS CLUB -SKIT JAIPUR
- DATA SCIENCE COMMUNITY -SRMIST
- ROBOYANTRIKI - SNU
- CSI BARTON HILLS
- SYNERGY - DON BOSCO





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