ADVANCE AUTOMOTIVE MECHANICS

Workshop Date: 5th – 6th March 2018 (2 days)
Fees: 650/- per participant (Non Refundable)
Venue: G.C.O.E., Jalgaon
Certificate of Participation will be given to all participants.
(Only if participant is present on both days)

Session-1

1. Basic Information & Automotive Engine Systems
   - Introduction
   - History and Indian Automotive Industry
   - Industry's Demand
   - Automotive Engine Fuels
   - Engine Fuel & Exhaust Systems
   - Superchargers
   - Turbochargers
   - Electronic-Fuel-Injection Systems
   - Diesel Fuel-Injection Systems
   - Engine Lubricating Systems
   - Engine Cooling Systems

Session-2

2. Engine Performance and Driveability
   - Automotive Emission-Control Systems
   - Servicing Emission-Control Systems
   - Engine Test Equipment
   - Tune-up
   - Engine Performance
   - Drive ability Diagnosis

Session-3

3. Automotive Drive Trains

- Automotive Clutches: Operation & Service
- Manual Transmissions & Transaxles
- Driveshaft,
- Universal Joints,
- Differentials,
- Drive axles
- Four-Wheel Drive,
- Transfer Cases
- Viscous Couplings
- Automatic Transmissions
- Transaxles

Session-4

4. Automotive Chassis

- Automotive Suspension Systems
- Automotive Steering Systems
- Wheel-Alignment,
- Steering,
- Suspension
- Automotive Brakes
- Antilock Braking System
- Electronic Stability Program
- Antilock Braking,
- Traction Control,
- Brake Diagnosis
- Tires & Wheels : Construction

5. Automotive Heating & Air Conditioning

- Ventilation,
- Heating,
- Air Conditioning

Session-5

6. Four-Stroke Engine Assemble and Disassemble

- Engine Disassemble/Assemble by student themselves, trainer will guide and explain each part in detail.
- Quiz Competition

For any further info: Coordinator: Sachchak Waghmare (7620558850)
Co-coordiantor: Akash Bhosale - Automotive Mechanics (7798679796)
Website: https://technoarena.gcoej.ac.in/workshop

MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

- **Workshop Date: 5th – 6th March 2018 (2 days)**
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- **Participant should bring their own LAPTOP. Charging points will be provided.**

Prerequisites: Participants must have basic knowledge of any programming language C ++, R Programming or Python

You Will Learn How To

- A way to determine and measure problem complexity
- Python Programming
- ML Library Scikit , NumPy, Matplotlib, Pandas, Theano, TensorFlow
- Learning to solve statistics and mathematical concepts
- Supervised and unsupervised learning
- Classification and Regression
- ML Algorithms
- Machine Learning Programming & Use Cases
- Artificial Neural Network(ANN) Programming

DAY1:

- **Python Basics: Introduction to Python Programming**
  - What is Python
  - Understanding the IDLE
  - Python basics and string manipulation
  - lists, tuples, dictionaries, variables
  - Control Structure – If loop, For loop and while Loop
  - Single line loops
  - Writing user-defined functions
  - Working with Class & Inheritance

➢ **Data Structure & Data Manipulation in Python**

- Intro to Numpy Arrays
- Creating arrays
- Indexing, Data Processing using Arrays
- Mathematical computing basics
- Basic statistics
- File Input and Output
- Getting Started with Pandas
- Data Acquisition (Import & Export)
- Selection and Filtering
- Combining and Merging Data Frames
- Removing Duplicates & String Manipulation

➢ **Understanding the Tools**

- Numpy, Pandas, Theano

➢ **Visualization in Python**

- Introduction to Visualization
- Visualization Importance
- Working with Python visualization libraries
- Matplotlib
- Creating Line Plots, Bar Charts, Pie Charts, Histograms, Scatter Plots

➢ **Artificial Intelligence & Machine Learning**

- Artificial Intelligence
- Environmental Constraints
- Various Agent Types
- PEAS Analysis of Problem
- Process flow for an AI agent

- Machine Learning Introduction
- Supervised & Unsupervised Learning
- Regression & Classification Problems
- What makes a Machine Learning Expert?

➢ **Linear Regression**

- Regression Problem Analysis
- Mathematical modelling of Regression Model
- Gradient Descent Algorithm
- Use cases
- Regression Table
- Model Specification
- L1 & L2 Regularization

➢ **Linear Regression – Case Study & Project**

- Programming Using Python
- Building simple Univariate Linear Regression Model
- Multivariate Regression Model
- Apply Data Transformations
- Identify Multicollinearity in Data Treatment on Data
- Identify Heteroscedasticity
- Modelling of Data
- Variable Significance Identification
- Model Significance Test
- Bifurcate Data into Training / Testing Dataset
- Build Model of Training Data Set
- Predict using Testing Data Set
- Validate the Model Performance
- Best Fit Line and Linear Regression

DAY2:

- **Logistic Regression**
  - Introduction
  - Assumptions
  - Where you apply Logistic Regression
  - Reason for the Logit Transform
  - Logit Transformation
  - Hypothesis
  - Variable and Model Significance
  - Maximum Likelihood Concept
  - Log Odds and Interpretation
  - Null Vs Residual Deviance
  - Chi-Square Test
  - ROC Curve
  - Model Specification
  - Case for Prediction Probe
  - Model Parameter Significance Evaluation
  - Drawing the ROC Curve
  - Estimating the Classification Model Hit Ratio
  - Isolating the Classifier for Optimum Results

- **Artificial Neural Networks with Case Study**
  - Neurons, ANN & Working
  - Single Layer Perceptron Model
  - Multilayer Neural Network
  - Feed Forward Neural Network
  - Cost Function Formation
  - Applying Gradient Descent Algorithm
  - Backpropagation Algorithm & Mathematical Modelling
  - Programming Flow for backpropagation algorithm
  - Use Cases of ANN

- Programming SLNN using Python
- Programming MLNN using Python
- Digit Recognition using MLNN
- XOR Logic using MLNN & Backpropagation

For any further info:
Coordinator: Sachchak Waghmare (7620558850)
Co-coordiantor: Aditya Rokade - M/C Learning & AI (7767023353)
Website: https://technoarena.gcoej.ac.in/workshop

Internet of Things with Rasberry_Pi

- **Workshop Date: 5th – 6th March 2018 (2 days)**
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- **Certificate of Participation will be given to all participants.**

(Only if participant is present on both days)

- **Team of 4 student required.**

(It is advised that student form their own team, or else organizer will randomly form team of 4 students.**)**

- **Kits will be provided in group of four students. Kits will be taken back after workshop.**
- **Interested participant/group can buys kit by paying on spot.**
- **Each Team should bring their own LAPTOP. Charging points will be provided.**

- **Introduction to IoT & Raspberry_Pi**
  - What is Raspberry_Pi?
  - Historical Background, Features, Applications &Scope
  - Raspberry_Pi & its Various OS
  - Introduction to Raspbian
  - Distributing Software and student material

- **Basics of Python Programming**
  - Features of Command Window & Script Window
  - Basic Python Commands & Keyboard Shortcuts
  - Defining Editing and Clearing Variables & Checking for Existence
  - My First Python Program

- **High Level Programming and its Easy Interaction**
  - Introduction to Arrays
  - Python Data Types and Basic I/O operations
  - Various Python Functions & their use
  - Creating & running User defined Functions

- Conditional Statements and Looping
- Project :- ATM Machine Prototype

➢ **Getting Started with Raspberry_Pi**
- Raspbian – A Debian Derivative
- The Concept of Open Source
- Disk Fragmentation
- Installing & Starting Raspberry_Pi
- Understanding the Raspberry_Pi Desktop Layout
- Command Window (Terminal), Editor Window, Workspace, Command History, Graphic Window

➢ **IoT & Its Implementation**
- Introducing IOT
- What is IOT?
- What are the features & scope of using IOT?
- Uses of IOT
- CLI and GUI format of interaction
- Application Area / Companies promoting/working in IoT
- Controlling I/O's
- Accessing GPIO Pins

➢ **Programming on Raspberry_Pi**
- Glowing multiple different pattern LED
- Interfacing Relays with Raspberry_Pi
- Local time frame based automation

➢ Project: IoT Based Secure Home/Office Automation
➢ Project: IoT Controlling through Smart Phone over Wifi
➢ Worldwide Accessing and controlling of IoT over Internet
➢ Concept and scope of IoT hacking
➢ Demonstration/ Explanation of IoT hacking

For any further info:
Coordinator: Sachchak Waghmare (7620558850)
Co-coordinator: Uday Devikar - IOT & RasPi(80874 36966)

Website: https://technoarena.gcoej.ac.in/workshop

WORKSHOP RULEBOOK

1. Fees for each workshop is **650/- INR** per participant, which once paid is non-refundable.
2. It is compulsory for all participants to bring their college ID card during workshop.
3. For **AI & Machine learning** workshop participant must bring his own laptop. College will NOT provide any computer system. Only charging points will be provided.
4. For **IoT workshop** kits will be provided in group of 4 participant. It is advised that participant form their own group, if not organizers will form group at random. Kits will only be provided for duration of workshop and taken back after workshop. Interested group/participant can buy kit on spot.
5. For **IoT workshop** each group must have atleast one laptop in their group. College will not provide any computer system. Only charging points will be provided.
6. Participants will have to report at sharp 7.30 am on 5th March 2018 for workshop registration. Workshop will start from 8:00 am.
7. Snacks & Tea will be provided during break.
8. Hospitality (accommodation + dinner) will be provided to participant in college student's hostel on payment of nominal fees. For more details contact Hospitality Team.
9. Certificate will be provided to only those candidates who will attend the workshop for complete two days.
10. Organizers reserve the right to cancel any workshop at any moment and modify any rule without prior notice. Organizers decision will be final and binding to all participants.

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