



(Core + Advanced + Data Science & Analytics + Django + Pandas)

- **3 Month Project Internship Letter from our associated software company "Smart Consultant" ([www.smarthumanoid.com](http://www.smarthumanoid.com))**
- **Course Completion Certificate**
- **Practicals on Laptop**

**1) MULUND** - Every Sunday – 8 to 11 AM starting on 5<sup>th</sup> or 12<sup>th</sup> January 2020.

**2) VASHI** - Every Wednesday – 6.30 to 9.30 PM starting on 8<sup>th</sup> or 15<sup>th</sup> January 2020.

**3) BORIVALI** - Every Sunday – 4.30 to 7.30 PM starting on 5<sup>th</sup> or 12<sup>th</sup> January 2020.

**Python Fees:** 7750. **Early Bird Discount:** 1000 if admission is taken till 5<sup>th</sup> November

### About **Analysis of Algorithms**

1. The subject **AOA** deals with designing efficient algorithms (or programs). By efficient, I mean those programs which take relatively lesser time to execute.
2. In the real world, there are often many programs which give the same output given the same input. For example Bubble sort and Quick sort both do the work of sorting. But did you know that Bubble sort is never used in real world since it is highly inefficient? Hence, the real challenge lies in using that program which produces the required output in **minimum** time.
3. This subject is a combination of Mathematics and Programming. For every topic in this subject, we will first study a program, then its working and finally we will apply some mathematical concepts to find **complexity** of the program. Complexity of a program is defined as its execution time.

### Importance of this Subject

1. If you aspire working for **dream** companies (Google, Amazon, J.P. Morgan, Facebook, Tibco, PlayGames24x7, IndusValley) after you B.E. then it is very essential that you have sound knowledge of this subject. Good knowledge of this subject will also help you in your M.S., M.E. or M. Tech. If you plan to give GATE after you B.E. then your concepts of AoA should be very clear.
2. There are certain sites where you can find **placement questions** of different companies. For eg. <http://placement.freshersworld.com/placement-papers/Google/Placement-Paper-Question-Paper-43997>
3. If you ever go through questions of companies like Google or the ones mentioned above, you will see that the **first set of questions** are always on topics like "complexity", "Big-Oh" "O()", "Big Omega", "Recurrence Relationship", "Efficiency" , "Spanning Trees" , "Graphs", "Dynamic Programming", "Greedy Method", "Divide and Conquer" etc. All these topics are part of AOA syllabus.
4. And do you know why these concepts are so important for these companies? That's because these dream companies don't simply want engineers who can code. They want engineers who can code **efficient programs** i.e. the ones which take minimum time to execute.

5. Take Google's example. If you search Google for a query, Google's concern is not only to give you right answer but also to give you that answer **as fast as possible**. If Google uses an inefficient searching algorithm like "Linear Search", you would get your results may be after 15 minutes. Would you wait that much? Would you then ever use Google? Definitely not !!
6. Similarly, take example of e-commerce sites like **Flipkart** or **Amazon** which offer sale on their websites almost every day. Take example of Flipkart's "**Big Billion Day**" sale. On such a day, with millions of customers searching Flipkart's site for various products, Flipkart would want to give you your desired result in shortest possible time. And if it does not do that, you will most likely switch Amazon. After all, who has time ??

### Misconception

1. The first few topics of this subject are Quick Sort, Merge Sort, Selection Sort, Insertion sort and Binary Search. These topics were there in semester 3 also and that's why many students have a misconception that this subject is almost same as Data Structures.
2. However, these topics constitute hardly 5% of AOA syllabus. And in this 5% also, importance is given to "Analysis" which you have never done in semester 3.

**AOA** is for 4<sup>th</sup> Semester COMP students of MU and for COMP & I.T. students of S.P.I.T, K.J.Somaiya Vidyavihar & some other Autonomous colleges.

**1) MULUND** - Every Thursday – 6.30 to 9.45 PM starting on 9<sup>th</sup> or 16<sup>th</sup> January 2020.

**2) VASHI** - Every Sunday – 12 to 3.15 PM starting on 5<sup>th</sup> or 12<sup>th</sup> January 2020.

**3) BORIVALI** - Every Tuesday – 6.30 to 9.45 PM starting on 7<sup>th</sup> or 14<sup>th</sup> January 2020.

**4) Video Lecture Course** –Can be taken in any of the above 3 centers. Call us to know more.

**AOA Fees:** 9750. **Early Bird Discount:** 1000 if admission is taken till 5<sup>th</sup> November.

### AUTOMATA THEORY – by Ganesh Sir – Sem 4 – I.T.

**MULUND** - Every Saturday – 6.30 to 9.30 PM starting on 11<sup>th</sup> January 2020.

**Fees:** 7750. **Early Bird Discount:** 1000 if admission is taken till 5<sup>th</sup> November.

### COMBO OFFER (till 5<sup>th</sup> November)

**4000/- discount on joining both Python & AOA or Python & AT**

### Subjects taken by Sandeep Sir in Semester 5

<b>Internet Programming or Web Development</b>	This is probably one of the best subjects which MU has kept in semester 5. In this subject, you will be learning technologies like Javascript (which has nothing to do with java), PHP, MySQL, AJAX, JSON, XML, HTML5, CSS etc. Knowing this subject very well will not only help you in your exam but will also make you <b>JOB-READY</b> .
<b>Advanced Data Structures</b>	This subject is only for IT students in Sem 5 & is exactly same as AOA of Sem 4 COMP. IT students have this subject as an elective. Although an elective, <b>IT students must opt for this subject since it is very important for getting placed in DREAM companies &amp; for MS in US</b> . Read its advantages on previous page.