

A. FOUNDATION - ARTIFICIAL INTELLIGENCE

SSC FOUNDATION ARTIFICIAL INTELLIGENCE MODEL CURRICULUM

Target Audience:

- University students/ Freshers enrolled in streams such as Engineering, Computer Science, Statistics, Sciences or Mathematics
- Employed professionals who wish to explore their career options and interests with regards to AI
- Enthusiasts curious about understanding the hype behind AI

- **Pre Requisites** -Understanding of the fundamentals of programming
- **Indicative Duration**- 45 hours (30 hours theory + 15 hours practical)

Learning Outcomes:

- Evaluate the technological trends which have led to AI
- Appreciate the potential of AI in transforming businesses and customer use cases
- Explain the various and diverse applications of data science
- Define common data science terminologies
- Evaluate the fundamentals of databases, Object-Oriented Programming and data structures
- Write programs in Python or R
- Evaluate the fundamentals of statistics
- Perform basic analytical techniques such as regressions
- Evaluate the fundamentals of different forms of graphs
- Evaluate the characteristics and uses of various popular tools used for data science and visualizations

- Module 1 -Overview of AI
- Module 2- Refresher to Programming
- Module 3-Module 3- Fundamentals of Statistics

SSC CURRICULUM ALIGNED COURSES

[A1.Artificial Intelligence Foundation](#)

[A2.Artificial Intelligence Foundation](#)

[A3.AI Foundation pathway](#)

[A4.AI Foundation](#)

B. FOUNDATION - BIG DATA ANALYTICS

SSC FOUNDATION BIG DATA ANALYTICS MODEL CURRICULUM

Target Audience:

- University students / Freshers enrolled in streams such as Engineering, Computer Science, Statistics, Sciences or Mathematics
- Employed professionals who wish to explore their career options in Big Data Analytics
- Enthusiasts curious about understanding the hype behind Big Data Analytics

• **Pre Requisites** -Understanding of the fundamentals of programming

• **Indicative Duration**- 55 hours (35 hours theory + 20 hours practical)

Learning Outcomes:

- Evaluate trends in Big Data and discuss how Big Data is transforming businesses
- Evaluate the different platforms used for processing Big Data
- Develop the fundamentals of data structures and algorithms that form the basis of Big Data systems
- Evaluate the features of databases
- Write Map and Reduce codes for distributed processing of data
- Understand key concepts behind Big Data modelling and management and gain practical skills needed for modelling Big Data projects
- Select appropriate data models that suit the requirements of data
- Differentiate between a traditional Database Management System and a Big Data Management System
- Retrieve data from Big Data management systems
- Execute simple Big Data integration and processing operations

- Module 1 –Introduction to Big Data Analytics
- Module 2- Big Data Fundamentals ,Platform
- Module 3- Big Data Processing, Management & Analytics

SSC CURRICULUM ALIGNED COURSES

[B1.Big Data Analytics by](#)

[B2.BDA Foundation pathway](#)

B3.Foundation BDA

C. FOUNDATION – CYBER SECURITY

SSC FOUNDATION CYBER SECURITY MODEL CURRICULUM

Target Audience:

- University students/ Freshers enrolled in streams such as Engineering, Computer Science, Statistics, Physical Sciences or Mathematics
- Employed professionals who wish to explore their career options and interests with regards to Cyber Security
- Enthusiasts curious about understanding the hype behind Cyber Security

• **Pre Requisites** -Familiarity with writing code using at least one programming language, or a basic understanding of information technologies

• **Indicative Duration**- 45 hours (30 hours theory + 15 hours practical)

Key Learning Outcomes:

- Explain the fundamentals of Cyber Security and different disciplines covered under Cyber Security
- Discuss different types of cyber security threats & malwares
- Explain different types of Cyber Security Attacks and their applications
- Explain enterprise architecture and different components of enterprise architecture
- Explain the basic concepts of Networking and types of devices that constitute a network
- Explain common terminologies related to networking
- Explain different types of networks (such as LAN, WAN, VPN)
- Explain fundamentals of network models such as OSI and TCP/IP
- Explain different types of internet protocols (such as IPv4, IPv6 etc.)
- Explain the fundamentals of network firewall & security testing and the different types of security tests
- Explain the fundamentals of Identity and Access Management (IAM)
- Discuss common user Identification and Access Management policies
- Discuss different types of security controls, user authorization and encryptions and their applications
- Discuss the fundamentals of incident management, incident response, disaster mitigation and containment

Course Outline:

- Module 1 -Fundamental of Cyber Security
- Module 2- Fundamentals of Networking
- Module 3-Basics of Security testing
- Module 4- Fundamentals of Access Management
- Module 5- Fundamentals of Incident Management and Response
- Module 6 - Fundamentals of security operations

D. FOUNDATION – CLOUD COMPUTING

SSC FOUNDATION CLOUD COMPUTING MODEL CURRICULUM

Target Audience:

- University students/ Freshers enrolled in streams such as Engineering, Computer Science, Statistics, Physical Sciences or Mathematics
- Employed professionals who wish to explore their career options and interests with regards to Cloud Computing
- Enthusiasts curious about understanding the hype behind Cloud Computing

- **Pre Requisites** -Familiarity with writing code using at least one programming language, or a basic understanding of information technologies

- **Indicative Duration** - 40 hours (28 hours theory + 12 hours practical)

Key Learning Outcomes:

- Explain the fundamentals of Cloud Computing and discuss the advantages and disadvantages of CC technologies
- Discuss different ways to deploy Cloud Computing platforms and services
- Explain how platforms and services are billed in Cloud Computing
- Explain the fundamentals of solution architecture in CC and key components of solution architecture
- Explain different types of solution architectures and evaluate their advantages and disadvantages
- Discuss different types of cloud data storage solution available for enterprises and their advantages and disadvantages
- Explain different types of storage classes and databases used in Cloud Computing and their characteristics
- Discuss different types of cloud data storage services and how to maintain and secure data in transit and data at rest
- Explain different types of cloud network technologies and basic concepts of software defined networks
- Discuss the fundamentals of VPN) Load Balancing & DNS services and their applications in managing network on cloud
- Explain the fundamentals of Identity and Access Management (IAM)
- Fundamentals of cloud security & diff types of security risks and threats associated with cloud platforms and services
- Discuss the basics of cloud monitoring and operations and ow to set up cloud monitoring processes
- Provide an overview of cloud governance and governance monitoring

- Module 1 -Fundamental of Cloud Computing
- Module 2- Fundamentals of Solution Architecture
- Module 3- Cloud Data Storage
- Module 4- Cloud Networking
- Module 5 - Cloud Security
- Module 6 - Cloud Migration
- Module 7- Cloud Monitoring and Operations

E. FOUNDATION – INTERNET OF THINGS

SSC FOUNDATION INTERNET OF THINGS (IOT) MODEL CURRICULUM

Target Audience:

- University students/ Freshers enrolled in streams such as Engineering, Computer Science, Statistics, Sciences or Mathematics
- Employed professionals who wish to explore their career options and interests with regards to IoT
- Enthusiasts curious about understanding the hype behind IoT

- **Pre Requisites** -Familiarity with writing code using at least one programming language, or a basic understanding of sensors and microcontrollers.
- **Indicative Duration**- 45 hours (39 hours theory + 6 hours practical)

Learning Outcomes:

- Explain the role of IoT in transforming businesses and customer use cases
- Discuss key application areas of IoT such as remote monitoring, asset tracking, production optimization, predictive maintenance and the development of new products and services
- Explain the various layers of the IoT stack and explain what constitutes an IoT architecture
- Discuss the applications of various components used in IoT solutions (such as sensors, actuators, microcontrollers)
- Understand the applications of embedded systems and appreciate the importance of embedded devices as data acquisition devices
- Discuss various IoT communications protocols and determine best fit for different IoT applications
- Discuss the different models of cloud computing (i.e., IaaS, PaaS, SaaS)
- Discuss the possible uses of analytics solutions to leverage data generated by IoT
- Evaluate the basic principles of security design and architecture and the commonly used methods to mitigate security risks to IoT solutions

- Module 1 -Introduction to IoT
- Module 2- IoT Devices
- Module 3- IoT Networking and Communications
- Module 4- IoT Data Storage and Analysis
- Module 5 - IoT Security and Privacy

F. FOUNDATION – BLOCKCHAIN

SSC FOUNDATION BLOCKCHAIN MODEL CURRICULUM

Target Audience:

- University students/ Freshers enrolled in streams such as Engineering, Computer Science, IT, Sciences or
- Employed professionals who wish to explore their career options and interests with regards to Blockchain
- Enthusiasts curious about understanding the hype behind Blockchain

- **Pre Requisites** -Familiarity with writing code using at least one programming language like Java or C++
- **Indicative Duration**- 45 hours (39 hours theory + 6 hours practical)

Learning Outcomes:

- Understand block chain technology.
- Develop block chain based solutions and write smart contract using Hyperledger Fabric and Ethereum frameworks.
- Build and deploy block chain application for on premise and cloud based architecture.
- Integrate ideas from various domains and implement them using block chain technology in different perspectives.

- Module 1 – Course overview & Objectives
- Module 2- Understanding Block chain with Crypto currency
- Module 3- Understanding Block chain for Enterprises
- Module 4- Block chain application development

G. FOUNDATION – 3D PRINTING

SSC FOUNDATION INTERNET OF THINGS 3D PRINTING CURRICULUM

Target Audience:

- University students/ Freshers enrolled in streams such as Engineering, Computer Science, Statistics, Sciences or Mathematics
- Employed professionals who wish to explore their career options and interests with regards to IoT
- Enthusiasts curious about understanding the hype behind IoT

• **Pre Requisites** – Basics of Materials for manufacturing, Photoshop, Basics for CAD

• **Indicative Duration-** 45 hours (39 hours theory + 6 hours practical)

Learning Outcomes:

- Develop CAD models for 3D printing.
- Import and Export CAD data and generate .stl file.
- Select a specific material for the given application.
- Select a 3D printing process for an application.
- Produce a product using 3D Printing or Additive Manufacturing (AM).

- Introduction, Process, Classification, Advantages, Additive V/s Conventional Manufacturing processes, Applications.
- CAD Data formats, Data translation, Data loss, STL format.
- Additive Manufacturing Techniques
- Additive Manufacturing Equipment Applications
- Post Processing: Requirement and Techniques
- Product Quality Testing

H. FOUNDATION – ROBOTICS PROCESS AUTOMATION

ROBOTICS PROCESS AUTOMATION (RPA) MODEL CURRICULUM

Target Audience:

- University students/ Freshers enrolled in streams such as Engineering, Computer Science, Statistics, Sciences or Mathematics
- Employed professionals who wish to explore their career options and interests with regards to Robotics Process Automation
- Enthusiasts curious about understanding the hype behind Robotics Process Automation

- **Pre Requisites** – Understanding the fundamentals of Control System Engineering, basics of Kinematics. Familiarity with writing code using at least one programming language, or a basic understanding of sensors and microcontrollers.
- **Indicative Duration-** 40 hours (28 hours theory + 12 hours practical)

Learning Outcomes:

- Explain the basic components of a robot, closed-loop and open- loop control systems.
- Discuss Robot Kinematics including Kinematic Modelling with Translation and Rotation Representation, Coordinate transformation, DH parameters, Jacobian, Singularity, and Statics.
- Discuss dynamic Modelling with Equations of motion.
- Explain Sensors and Vision System including Contact and Proximity, Position, Velocity, Force, Tactile etc
- Understand the Camera calibration, Geometry of Image formation, Euclidean/Similarity/Affine/Projective transformations
- Explain Basics of Robot Control including Transfer functions, Control laws for P, PD, PID
- Discuss Non-linear and advanced controls
- Explain Robot Actuators (Electric, Hydraulic and Pneumatic) & Transmission with Gears, Timing Belts and Bearings
- Explain Control Hardware and Interfacing for Robotic Process Automation
- Discuss the Programming for Robot Applications

- Module 1 -Introduction to Robotics
- Module 2- Robot Kinematics & Dynamics
- Module 3- Basics of Sensors and Vision System
- Module 4- Basics of Robot Control Mechanism
- Module 5 – Robot Actuation System
- Module 6 – Robot Control Hardware and Interfacing

I. FOUNDATION – VIRTUAL REALITY

VIRTUAL REALITY MODEL CURRICULUM

Target Audience:

- University students/ Freshers enrolled in streams such as Engineering, Computer Science, Statistics, Sciences or Mathematics
- Employed professionals who wish to explore their career options and interests with regards to Virtual Reality
- Enthusiasts curious about understanding the hype behind Virtual Reality

- **Pre Requisites** – Understanding the fundamentals of 2D and 3D mathematics. Familiarity with writing code using at least one programming language, or a basic understanding of sensors and microcontrollers.

- **Indicative Duration-** 40 hours (28 hours theory + 12 hours practical)

Learning Outcomes:

- Explain Virtual Reality and Virtual Environment including 3D Computer Graphics.
- Understand the Animation of Virtual Environment, Physical Simulation with Elastic collisions, projectiles, simple pendulum, springs and Flight dynamics of an aircraft.
- Introduction to Geometric Modelling from 2D to 3D, 3D space curves and 3D boundary representation
- Discuss the introduction to Human factors, Virtual Reality Hardware including sensor hardware, Head-coupled displays, Acoustic hardware
- Discuss VR Software along with Modelling of virtual world, Physical simulation, VR toolkits and Introduction to VRML
- Discuss key application areas of Virtual Reality in Engineering, Entertainment, Science and Training.

- Module 1 -Introduction to Virtual Reality
- Module 2- 3D Computer Graphics
- Module 3- Basics of Virtual Environment
- Module 4- VR hardware and Software
- Module 5 – VR Applications