Electronics & ICT Academy
IIT Guwahati, Assam
An Initiative of Ministry of Electronics & Information Technology (MeitY),
Ministry of Communications and IT,
Government of India

A Faculty Development Programme on

Cloud Computing with AWS

Organized in association with
Department of Computer Science
KKR & KSR Institute of Technology & Sciences
and
support from Kovid Academy.

Applications are invited from Faculty Members/ Research Scholars/PG & UG Students/Lab Technicians/Project Staffs from Universities/Colleges & Industry Personnel to attend a FDP on
"Cloud Computing with AWS"

Course Date: 07-13 Aug, 2017
Last Date of Registration : 01 Aug, 2017
(Online Registration Link will be open from 01 July, 2017)
Venue: Department of Computer Science
KKR & KSR Institute of Technology & Sciences, Guntur
(Andhra Pradesh)

Objective of the Course

➢ After successful completion of the course the participants would be able to build highly scalable, secure and fault tolerant applications in the AWS Cloud.

➢ The session would be a mix of theoretical concepts and practical exercises, with more focus on the regular practical assignments.

➢ The participants would be evaluated at the end using a MCQ (Multiple Choice Questionnaire) on the last day of the training towards the end. The evaluation would be very much like the AWS Developer Certification and would be conducted online.

Course Programme

Training Programme is split into two parts: Lectures and Labs/Hands-on sessions daily. Course contents are as follows:
1. Introduction to Cloud Computing
2. Cloud Computing Models
3. Scalability of Applications
4. Higher Availability Architecture
5. Scalable Resource
6. IP Addressing Schemes
7. Elastic Load Balancer (ELB)
8. Amazon Machine Image (AMI)
9. Relational Database Service (RDS) and S3

How to Apply

Online – The participants may log on to the E&ICT Academy, IIT Guwahati website:
http://eictacad.iitg.ernet.in and fill up the application form google doc link:
https://docs.google.com/forms/d/e/1FAIpQLSesiHAOzPQ3FcUoecqZrJ1Xtt7Be4rvJBPLSb1GGgYZufnnaA/view form

For Online Transfer
Bank Name: State Bank of India
Account Name: IIT Guwahati R and D E&ICT Academy
Account No.: 36071160089
IFSC Code: SBIN0014262
Bank Name: State Bank of India
Bank Address: IIT Guwahati, GHY- 39.

Registration Form

Name of the Applicant (first, last):
……………………………………………………..
Gender: …………………………………...
Category(Gen/ST/SC)……………………..
Designation: ……………………………….
Highest Qualification: ……………………………….
Name and Address of the Organization/Institute:
…………………………………………………….
City/town:…………………………………………
Email:……………………………………………...
Phone Number:…………………………………...
Mobile Number:…………………………………...
Do you need hostel accommodation? (Yes/No):……………………….........................
Transaction ID (Applicable for Online Transfer):…………
Signature of the Applicant:………………………………...
Signature and Seal of the Forwarding Authority
Name ....
Designation ....

Affix passport size photograph

Note: i)The Faculty/Staff are requested to submit the NOC from respective department before attending the session.
ii) The Faculty member belonging to SC/ST Category need to carry caste Certificate(both in original & photocopy).
iii) The participant need to carry the Institute/Organization valid Identity Card(Both in Original & Photocopy).
iv)The hostel accommodation will be free for out stationed participants . (For accommodation related queries contact KKR & KSR college. Contact no: 9493925553, 8978692777/repudiramesh@gmail.com)

Registration Fee

Registration Fee (Including Course Material, Snacks and Lunch)
➢ **Rs. 2,500/-** for Faculty, Lab Technicians and Project Staff..
➢ **Rs. 1,250/-** for Faculty members belonging to ST/SC category.
➢ **Rs. 5,000/-** for Industry Personnel (Subjected to Availability of Seat).
➢ **Rs. 1,500** for Student & Research scholar(Subjected to Availability of Seat) .

Course Outcome

After successful completion of the course the participants would be able to build highly scalable, secure and fault tolerant applications in the Cloud.

Pre- Requisites for the Course

The participants of the course are expected to have a prior knowledge of the following concepts:
- Basics of Linux
- Basics of networking concepts

Hands-on Session

The Hands- on session will include the following:
- Setting up a AWS.
- Creating ELB,EBS.
- Creating VPC.
- Creating & connecting to RDS.
- Creating Zones.
- Creating , monitoring & configuring Cloud Watch.
- Setting up an auto-scaled load balanced Amazon EC2 Application.
- S3 static webhosting.
- Creating & configuring CloudFront Distribution.
- Creating Dynamo DB Tables.

Project & AWS Case Study

All the different services have been explored individually till now. In the project, we would be combining the different AWS services to build a two-tier web application.

Practical:
- Architecting two-tier applications on AWS

**Contact Hours for the Course
64 Hrs (Theory, Hands-on & Tutorial)**

**For details of the programme and course contents etc., please log on to Electronics and ICT Academy website:
http://eict.iitg.ernet.in/**

Course Coordinators from Academy

- *Prof. Ratnajit Bhattacharjee*
  Principal Investigator
  E&ICT Academy, IIT Guwahati

- *Prof. Rohit Sinha*
  Co-Principal Investigator
  E&ICT Academy, IIT Guwahati

- *Dr. Gaurav Trivedi*
  Co-Principal Investigator
  E&ICT Academy, IIT Guwahati

- *Prof. R Ramesh*
  Course Co-ordinator,
  KKR & KSR Institute of Technology & Science

Expert from Academia

The Faculty Members from renowned Institutes will deliver lectures. They will also discuss about the scope of research in the areas and enlightened the participants with the latest development.

Expert from Industry

- *Mr. Praveen Sripati*
  Principal Architect,
  Kovid Academy, Hyderabad.

About Kovid Academy

Kovid Academy is a Data Science-driven Digital Transformation firm, established by serial entrepreneurs with over 100 years of combined experience in growing companies from the ground up. Our faculty consists of widely-recognized experts with an average 20+ years of experience. We offer courses oriented towards creating industry-ready engineers in emerging growth areas, such as Big Data Analytics, IoT, Information Security & Robotics

Contact Details

**For more details or any queries please contact
Program Manager, E&ICT Academy
IIT Guwahati
Email: eictacad@iitg.ernet.in,
eictacad@gmail.com
Phone No: +91-7086502139**

About E&ICT Academy

Electronics and ICT Academy is an initiative of Department of Electronics & Information Technology (DeitY) Ministry of Communications and IT, Govt. of India for Faculty/ Research Scholar Development Programme.

Academy has planned short term training programmes on fundamental and advanced topics in IT, Electronics & Communication, Product Design, Manufacturing with hands on training and project work using latest software tools and systems.

In addition, the Academy will conduct specialized/customized training programmes and research promotion workshops for corporate sector & educational institutions.

About KITS

KKR & KSR Institute of Technology and Sciences (KITS) was established in the year 2008, by GSR & KKR EDUCATIONAL SOCIETY in Vinjanampadu village, Vatticherukuru Mandal of Guntur district. The Institute is accredited with "A" Grade by NAAC.

About Department of CSE

The Department of Computer Science and Engineering (CSE) at KKR & KSR Institute of Technology & Sciences was started in the year 2008 and provides an outstanding academic & research environment complemented by excellence in teaching. The Department offers B.Tech and M.Tech degrees. The department has state-of-the-art infrastructure and computing equipment supported by high speed Ethernet and Wireless networks. Various student organizations & associations like INFOMAC, CSI Chapter, are active throughout the year.
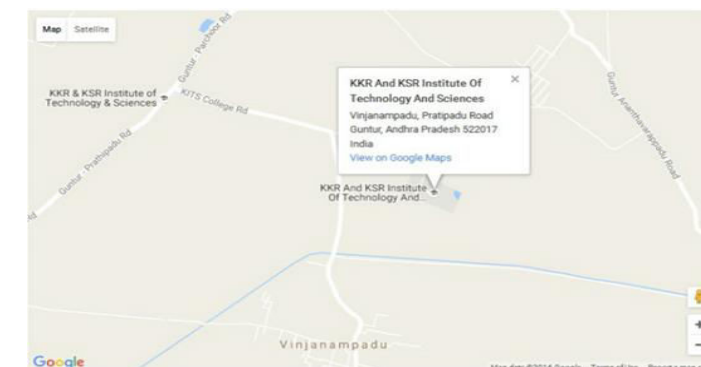
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Designation: ....

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City / Town: ....

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Ph. No: .... Mob: ....

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KITS

www.kitsguntur.ac.in

KKR & KSR INSTITUTE OF TECHNOLOGY & SCIENCES

Approved by AICTE, New Delhi | Affiliated to Jntuk, Kakinada
Accredited with 'A' Grade by NAAC

College: Vinjanampadu, Vatticherukuru Mandal, Guntur - 17
City Office: D# 3-28-21/1, Main Road, Brindavan Garden, Guntur - 6
Ph: 99517 13366, 99089 78444, 94419 15837

KITS Electronics & ICT Academy

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A Faculty Development Programme on

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56 Hrs (Theory, Hands-on & Tutorial)**

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Course Coordinators from Academy

Prof. Ratnajit Bhattacharjee
Principal Investigator
E & ICT Academy, IIT Guwahati

Prof. Rohit Sinha
Co-Principal Investigator,
E & ICT Academy, IIT Guwahati

Dr. Gaurav Trivedi
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For more details or any queries please contact:
Program Manager,
E & ICT Academy,
IIT Guwahati,
Email: eictacad@iitg.ernet.in,
eictacad@gmail.com
Ph: +91-70865 02139

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KKR & KSR Institute of Technology and Sciences (KITS) was established in the year 2008, by GSR & KKR EDUCATIONAL SOCIETY in Vinjanampadu village, Vatticherukuru Mandal of Guntur district. KITS is located away from the hustle and bustle of the city life in a scenic and serene environment spread over an expansive 10.9425 acres with lush lawns, a beautiful landscape, aesthetic architecture and avant-garden infrastructure amidst the lush greenery of mirchi and cotton fields of Vinjanampadu Village just 5 kms away from Guntur, the major city of the capital region of Andhra Pradesh.

The Institute is accredited with "A" Grade by NAAC. All undergraduate programmes in Departments of Computer Science and Engineering (CSE), Electrical and Electronics Engineering (EEE), Electronics and Communications Engineering (ECE) and later programmes in MBA, M.Tech (CSE), M.Tech (VLSI), M.Tech (PE&D), M.Tech (DECs), Departments of Civil Engineering and Mechanical Engineering were inducted. Dr. P. Babu is the Principal of KKR & KSR Institute of Technology & Sciences. The college epitomizes an exemplary setting for higher learning with dedicated efforts KITS has emerged as a Centre of Excellence in Engineering Education. Building purposive partnership with Industry, strengthening its wherewithal continually and evolving innovative programmes, consistent with changing times, KITS strives to maintain its pre - eminent position.

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The Department of Computer Science and Engineering (CSE) at KKR & KSR Institute of Technology & Sciences was started in the year 2008 and provides an outstanding academic & research environment complemented by excellence in teaching. The Department offers B.Tech and M.Tech degrees. The comprehensive curriculum includes topics related to all aspects of Computer Hardware and Software with an emphasis on practical training which really help the students according to the current scenarios of the society. The department maintains a good association with industries and equips the students with latest developments in Computer Science and Engineering. The department has state-of-the-art infrastructure and computing equipment supported by high speed Ethernet and Wireless networks. Various student organizations & associations like INFOMAC, CSI Chapter, are active throughout the year.

सत्यमेव जयते

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IIT Guwahati, Assam

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"Cloud Computing with AWS"

STEERING COMMITTEE

Chief Patrons
Shri. Koye Subba Rao
Chairman

Shri. Koye Sekhar
Secretary

Patron
Dr. P. Babu
Principal

CO-ORDINATORS

Prof. Ratnajit Bhattacharjee
Principal Investigator,
E & ICT Academy, IIT Guwahati

Prof. Rohit Sinha
Co-Principal Investigator,
E & ICT Academy, IIT Guwahati

Dr. Gaurav Trivedi
Co-Principal Investigator,
E & ICT Academy, IIT Guwahati

Prof. Repudi Ramesh
Head, Department of CSE
KKR & KSR Institute of
Technology & Sciences
Vinjanampadu, Guntur, A.P,
India-522017

Dear Sir / Madam,

Dept of CSE, **KKR & KSR Institute of Technology & Sciences (KITS),** Vinjanampadu, Guntur, A.P. India and E & ICT Academy, Indian Institute of Technology (IIT), Guwahati are pleased to invite you to attend our joint Faculty Development Programme (FDP) on **"Cloud Computing with AWS"** to be held from 07th to 13th August 2017, in KITS Campus. This FDP offers a forum of the professional exchange of knowledge and skills related to Cloud Computing with AWS areas. Applications are invited from Faculty Members / Research Scholars / PG & UG Students / Lab Technicians / Project Staff from Universities / Colleges & Industry Personnel to attend the FDP. They will have the opportunity to learn from the speakers of IIT's and Industrial experts through presentations and hands on experience.

The contributions from these speakers would enrich the programme and enhance the diversity of perspectives and contents. This associated academia value the opportunity to learn from and with our eminent personalities.

Brochure of this programme is attached. For more information you can visit: http://eict.iitg.ernet.in/faculty_development.html

For Registration
https://docs.google.com/forms/d/e/1FAIpQLSesiHAOzPQ3FcUoecqZrJ1Xtt7Be4rvJBPLS b1GGgYZufnnaA/viewform

If you have any questions or concern, please contact program co-ordinators.

Prof. R. Ramesh
Co-ordinator

DETAILED POINT-WISE COURSE SYLLABUS

DAY 1

1. Introduction to Cloud Computing

In this session, we would be exploring what Cloud Computing is all about, characteristics of the Cloud and the pros/cons of the same.

Theory:

▪ What is Cloud Computing?

▪ Essential Characteristics of Cloud Computing

▪ Why Cloud Computing?

▪ Advantages of Cloud Computing

2. Cloud Computing Models

There are different types/dimensions of Cloud, the same would be explored here along with the use cases. Given a particular requirement, we should be able to choose what type of Cloud to use.

Theory:

▪ Service Models (SAAS, PAAS, IAAS)

▪ Differences between the Service Models

▪ Deployment Models (Public, Private, Hybrid and Community Cloud)

▪ Overview of Community Cloud

3. Cloud Computing Risks and Concerns

As with any new technology there is a friction moving towards the Cloud. Here we would be exploring what the hindrances are moving towards the Cloud and how they can be addressed.

Theory:

▪ Cloud Security and Privacy

▪ Service Quality (SLA)

▪ Cloud Computing Portability and Interoperability

▪ Transition to the cloud

▪ Legal and compliance

4. Introduction to AWS

Amazon AWS, Google GCP and Microsoft Azure are the prominent vendors in the Cloud space. We would be looking at the basics of AWS and the free tier which it offers.

Theory:

▪ AWS Global Infrastructure (Regions, Availability Zones, and Edge Locations)

▪ AWS Free Tier

Practical:

▪ Signing up for AWS

5. Amazon Elastic Compute Cloud (EC2)

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.

Theory:

▪ Introduction to EC2

Practical:

▪ Creating Key Pairs

▪ Launching your first AWS instance

▪ Setting up security groups

▪ Provisioning Linux Instance with required security

6. Amazon EC2 Pricing

Depending on the usage and payment there are different pricing models in AWS. Understanding the pricing models helps to lower the overall bill while using the AWS Cloud.

Theory:

▪ On-demand Instance pricing

▪ Reserved Instance pricing

▪ Spot Instance pricing

DAY 2

1. Elastic Load Balancer (ELB)

Elastic Load Balancing automatically distributes incoming application traffic across multiple Amazon EC2 instances. It enables you to achieve fault tolerance in your applications, seamlessly providing the required amount of load balancing capacity needed to route application traffic.

Theory:

▪ Introduction to Load Balancing

Practical:

▪ Creating an Elastic Load Balancer

▪ Create an ELB with web servers across Availability Zones

2. EBS (Elastic Block Storage)

Amazon Elastic Block Store (Amazon EBS) provides persistent block storage volumes for use with Amazon EC2 instances in the AWS Cloud. Each Amazon EBS volume is automatically replicated within its Availability Zone to protect you from component failure, offering high availability and durability. Amazon EBS volumes offer the consistent and low-latency performance needed to run your workloads.

Theory:

▪ Introduction to Elastic Block Storage

▪ EBS Volume Types

▪ Introduction to Snapshots

Practical:

▪ Provisioning and Terminating EBS volumes

▪ Creating and deleting snapshots

▪ Creating volumes from snapshots

▪ Attach and Detach EBS volume to Linux Instances

3. IP Addressing Scheme

An addressing scheme is clearly a requirement for communications in a computer network. With an addressing scheme, packets are forwarded from one location to another. In this section, we will explore the IP Addressing Scheme just enough to get started with the AWS.

Theory:

▪ IPv4 and IPv6 Addressing

▪ IP Address Classification

▪ Public and Private IP Addresses

▪ Elastic IPs

▪ Network and Host Portions

▪ Introduction to NAT

DAY 3

1. Amazon Virtual Private Cloud (VPC)

Amazon Virtual Private Cloud (Amazon VPC) lets you provision a logically isolated section of the Amazon Web Services (AWS) cloud where you can launch AWS resources in a virtual network that you define. You have complete control over your virtual networking environment, including selection of your own IP address range, creation of subnets, and configuration of route tables and network gateways.

Theory:

▪ Introduction to VPC

▪ VPC Components

▪ VPC security and Inbound and outbound ACL's

Practical:

▪ Creating using VPC wizard

2. Relational Database Service (RDS)

Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while managing time-consuming database administration tasks, freeing you up to focus on your applications and business.

Theory:

▪ Introduction to RDS

▪ RDS Database types

Practical:

▪ Creating databases

▪ Configuring backups

▪ Connecting to the database

3. Route53

Amazon Route 53 is a highly available and scalable cloud Domain Name System (DNS) web service. It is designed to give developers and businesses an extremely reliable and cost-effective way to routeend users to Internet applications by translating names like www.example.com into the numeric IP addresses like 192.0.2.1 that computers use to connect to each other.

Theory:

▪ Introduction to Route53

▪ Various Route53 Record types

Practical:

▪ Creating zones

▪ Creating Health Checks

DAY 4

1. CloudWatch

Amazon CloudWatch is a monitoring service for AWS cloud resources and the applications you run on AWS. You can use Amazon CloudWatch to collect and track metrics, collect and monitor log files, set alarms, and automatically react to changes in your AWS resources.

Theory:

▪ Introduction to CloudWatch

Practical:

▪ Creating a CloudWatch dashboard

▪ Creating a CloudWatch alarms

▪ Monitoring other AWS services

▪ Configuring notifications

▪ Integrating CloudWatch with Auto-scaling

2. Auto scaling

Auto Scaling helps you maintain application availability and allows you to scale your Amazon EC2 capacity up or down automatically according to conditions you define. You can use Auto Scaling to help ensure that you are running your desired number of Amazon EC2 instances. Auto Scaling can also automatically increase the number

of Amazon EC2 instances during demand spikes to maintain performance and decrease capacity during lulls to reduce costs.

Theory:

▪ Introduction to Bootstrapping

▪ What is launch configuration?

▪ What is Auto-Scaling group?

Practical:

▪ Setting up an auto-scaled, load-balanced Amazon EC2 application

3. S3 (Simple Storage Service)

Amazon Simple Storage Service (Amazon S3) is object storage with a simple web service interface to store and retrieve any amount of data from anywhere on the web. It is designed to deliver 99.999999999% durability, and scale past trillions of objects worldwide. Customers use S3 as primary storage for cloud-native applications; as a bulk repository, or "data lake," for analytics; as a target for backup & recovery and disaster recovery; and with server less computing.

Theory:

▪ **Introduction to S3**

▪ **S3 durability and redundancy**

▪ **Buckets and Objects**

▪ **RRS (Reduced Redundancy storage)**

▪ **S3 Object Versioning and Lifecycle Policies**

Practical:

▪ **S3 static website hosting**

▪ **S3 Permissions and Bucket Policies**

▪ **Host a sample website on S3 Bucket**

DAY 5

1. CloudFront

Amazon CloudFront is a global content delivery network (CDN) service that accelerates delivery of your websites, APIs, video content or other web assets through CDN caching. It integrates with other Amazon Web Services products to give developers and businesses an easy way to accelerate content to end users with no minimum usage commitments.

Theory:

▪ **Introduction to CDN Network and CloudFront**

Practical:

▪ **Creating a CloudFront distribution**

▪ **Hosting a website of CloudFront distribution**

▪ **Implementing restrictions**

▪ **Configuring origins and behaviors**

2. Dynamo DB

Amazon DynamoDB is a fast and flexible NoSQL database service for all applications that need consistent, single-digit millisecond latency at any scale. It is a fully managed cloud database and supports both document and key-value store models. Its flexible data model and reliable performance make it a great fit for mobile, web, gaming, ad tech, IoT, and many other applications.

Theory:

▪ **Introduction to NoSQL Databases**

Practical:

▪ **Creating Dynamo DB tables**

▪ **Adding data manually**

▪ **Configuring alarms**

▪ **RCU and WCU**

DAY 6

1. Project and AWS Case study

All the different services have been explored individually till now. In the project, we would be combining the different AWS services to build a two-tier web application.

Practical:

▪ **Architecting two-tier applications on AWS**

2. AWS certification

Certification from AWS will increase the probability of getting a job in the IT. In this section, we will explore the trips and tricks around the AWS certification.

Theory:

▪ Overview of AWS certifications

▪ How to book a slot for AWS certification?

▪ Certification examination question patterns

Practical

▪ MCQ Exam

Venue: Dept of Computer Science & Engg,
KKR & KSR Institute of Technology & Science, Guntur (Andhra Pradesh)

Date: 07-14 Aug,2017

Date	Time	Topic
07-08-2017	10.00am-11.00am	Registration & Reporting
	11.00am-11.30am	Inauguration
	11.30am-11.45am	Tea Break
	11.45am-01.15pm	Expert Talk
	01.15pm-02.15pm	Lunch
	02.15pm-03.15pm	Discussion with Expert
	03.15pm-04.15pm	Expert Talk
	04.15pm-04.30pm	Tea Break
	04.30pm-05.30pm	Expert Talk
08-08-2017	09.00am-10.00am	Introduction to Cloud Computing
	10.00am-11.00am	Cloud Computing Models
	11.00am-11.15am	Tea Break
	11.15am-12.15pm	Cloud Computing Risks and Concerns
	12.15pm-01.15pm	Introduction to AWS
	01.15pm-01.45pm	Lunch
	01.45pm-04.00pm	Amazon Elastic Compute Cloud (EC2)
	04.00pm-04.15pm	Tea Break
	04.15pm-05.00pm	Amazon Elastic Compute Cloud (EC2)
	05.00pm-06.00pm	Amazon EC2 Pricing
	06:00pm-06:15pm	Evaluation
09-08-2017	09.00am-11.00am	Elastic Load Balancer
	11.00am-11.15am	Tea Break
	11.15am-12.15pm	Elastic Load Balancer
	12.15pm-01.15pm	EBS (Elastic Block Storage)
	01.15pm-01.45pm	Lunch
	01.45pm-03.45pm	EBS (Elastic Block Storage)
	03.45pm-04.00pm	Tea Break
	04.00pm-06.00pm	IP Addressing Scheme
	06:00pm-06:15pm	Evaluation
10-08-2017	09.00am-11.00am	Amazon Virtual Private Cloud
	11.00am-11.15am	Tea Break
	11.15am-12.15am	Amazon Virtual Private Cloud
	12.15am-01.15pm	Relational Database Service
	01.15pm-01.45pm	Lunch
	01.45pm-03.45pm	Relational Database Service
	03.45pm-04.00pm	Tea Break
	04.00pm-06.00pm	Route 53
	06:00pm-06:15pm	Evaluation

11-08-2017	09.00am-11.00am	CloudWatch
	11.00am-11.15am	Tea Break
	11.15am-01.15am	Auto scaling
	01.15pm-01.45pm	Lunch
	01.45pm-02.45pm	Auto scaling
	01.45pm-03.45pm	S3 (Simple Storage Service)
	03.45pm-04.00pm	Tea Break
	04.00pm-06.00pm	S3 (Simple Storage Service)
	06:00pm-06:15pm	Evaluation
12-08-2017	09.00am-11.00am	CloudFront
	11.00am-11.15am	Tea Break
	11.15am-12.15am	CloudFront
	12.15am-01.15pm	Dynamo DB
	01.15pm-01.45pm	Lunch
	01.45pm-03.45pm	Dynamo DB
	03.45pm-04.00pm	Tea Break
	04.00pm-06.00pm	Dynamo DB
	06:00pm-06:15pm	Evaluation
13-08-2017	09.00am-11.00am	Project and AWS Case study
	11.00am-11.15am	Tea Break
	11.15am-01.15pm	Project and AWS Case study
	01.45pm-01.45pm	Lunch
	01.45pm-04.00pm	Project and AWS Case study
	04.00pm-04.15pm	Tea Break
	04.15pm-05.15pm	AWS certification
	05.15pm-06.00pm	Closing Ceremony
	06:00pm-06:15pm	Evaluation