

Program Details (VRITIKA)

Name of the Event- "Cloud Computing"

Project Summary:

In the past, computing tasks such as word processing were not possible without the installation of application software on a user's computer. A user bought a license for each application from a software vendor and obtained the right to install the application on one computer system. Cloud computing differs from the classic client- server model by providing applications from a server that are executed and managed by a client's web browser, with no installed client version of an application required. Centralization gives cloud service providers complete control over the versions of the browser-based applications provided to clients, which removes the need for version upgrades or license management on individual client computing devices.

Cloud Computing is a latest buzzword, it provides means by which one can access the applications as utilities, over the internet. It allows creating, configuring, and customizing the business applications online. Basically, term Cloud refers to a Network or Internet. In other words, we can say that Cloud is something, which is present at remote location. Cloud can provide services over network, i.e., on public networks or on private networks, i.e., WAN, LAN or VPN. Applications such as e-mail, web conferencing, customer relationship management (CRM), all run in cloud. The potential of ubiquitous computing is enormous, and it will have an impact on a wide range of fields.

A standard internet connection or a virtual network provides us access to cloud-based applications and services like Google Docs, Skype, and Netflix. Most companies are shifting their businesses into the cloud as they require significant storage, which cloud platforms provide. A cloud computing architecture provides higher bandwidth to its users due to which data over the cloud can be used from anywhere across the world at any time. Due to its architecture, it not only shares resources among client source consumers but also with open source communities like Microsoft and Red hat.



Compared to traditional on-premises IT, and depending on the cloud services you select, cloud computing helps do the following:

- **Lower IT costs:** Cloud lets you offload some or most of the costs and effort of purchasing, installing, configuring, and managing your own on-premises infrastructure.

- **Improve agility and time-to-value:** With cloud, your organization can start using enterprise applications in minutes, instead of waiting weeks or months for IT to respond to a request, purchase and configure supporting hardware, and install software. Cloud also lets you empower certain users— specifically developers and data scientists—to help themselves to software and support infrastructure.
- **Scale more easily and cost-effectively:** Cloud provides elasticity—instead of purchasing excess capacity that sits unused during slow periods, you can scale capacity up and down in response to spikes and dips in traffic. You can also take advantage of your cloud provider’s global network to spread your applications closer to users around the world.
- **Shared responsibility for security:** Generally, the cloud provider is responsible for securing cloud infrastructure and the customer is responsible for protecting its data within the cloud—but it's also important to clearly define data ownership between private and public third parties.
- **Data encryption:** Data should be encrypted while at rest, in transit, and in use. Customers need to maintain full control over security keys and hardware security module.
- **User identity and access management:** Customer and IT teams need full understanding of and visibility into network, device, application, and data access.
- **Collaborative management:** Proper communication and clear, understandable processes between IT, operations, and security teams will ensure seamless cloud integrations that are secure and sustainable.
- **Security and compliance monitoring:** This begins with understanding all regulatory compliance standards applicable to your industry and setting up active monitoring of all connected systems and cloud-based services to maintain visibility of all data exchanges between public, private, and hybrid cloud environments.

Through this four-week internships, the organizer would like to train the participants as follows.

Week-I:

What makes a cloud? - Storage Virtualization, Application virtualization, Server virtualization, Network virtualization

Hands-on demonstration of cloud computing - Creating an account on the cloud, Starting a server instance, Allocating storage and other resources, Deploying an application

Week-II:

Cloud Computing Service Models - Infrastructure as a Service (IAAS), Platform as a Service (PAAS), Software as a Service (SAAS)

Cloud Computing deployment models - Public Cloud, Private Cloud, Community Cloud, Hybrid Cloud

Advantages of cloud computing - Cost model change (Capex to Opex only), Reduction in cost of ownership (TCO), On-demand scalability, Reliability, Shorter Time to Market, Ease of Use, Reduction in operation overheads

Week-III:

Amazon Web Services - Services offered by Amazon, Hands-on Amazon, EC2 - Configuring a server, Launching an instance, S3- Allocating storage buckets, Creating groups, objects and bucket policies

Introduction to Force.com from Sales force - Infrastructure as a service, Database as a service, Integration as a service, Logic as a service, UI as a service, Development as a service

Week-IV:

Server Provisioning

Capacity planning - How to provision servers in cloud, What type of server do I need?, Best practices

Providing Security - VPC (Virtual Private Cloud), How to ensure security within cloud, Firewall and security groups

Backup/Recovery of data – Backups, Backup strategy, Where to save backup, Restore operations

High Availability – HA - How to ensure availability, Provisioning across zones (Physical data-centers for availability), Elastic IPs for high availability

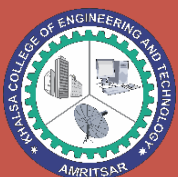
Server monitoring and Performance monitoring - Monitoring needed in the cloud, Monitoring tools availability, Performance monitoring, Tweaks to improve performance and availability

Objective (75 words)

1. The objective of this work is aimed at providing an opportunity for participants to enrich their knowledge and skills in the developing various solutions for solving engineering problems in the society.
2. To enhance the skills in domain of Cloud Computing as well interact AWS Cloud services and tools.
3. Define Cloud Computing and memorize the different Cloud service and deployment models.
4. Describe importance of AWS Cloud Analytics Services, Tools.
5. Use and Examine different AWS cloud developer tools.
6. Analyze the components of AWS cloud database tools and management tools.
7. Describe the key components of AWS Network services.
8. Design & develop backup strategies for cloud data based on AWS Cloud storage services

Expected output and outcome of the event:

1. To provide exposure and hands-on research skill development experience Cloud Computing.
2. The event will enhance the throughput of the ongoing "Cyber Swachhta Kendra".
3. To train the manpower that will push the development of smart innovation and providing knowledge awareness session for communities.
4. The event will help to increase the knowledge Cloud Computing security and stop the attacks and cybercrimes towards the cities/states/country.
5. To strengthen the ICT infrastructure in cyber areas and supports various IoT-enabled smart services and computing.



SERB Sponsored **One Month Training and Skill Internship**

(VRITIKA)

On

“Cloud Computing”

(11th July 2023 to 9th August 2023)



Organized

by

**Department of Computer Science &
Engineering**

Khalsa College of Engineering & Technology

(Governed by Khalsa College Charitable Society)

C Block , Ranjit Avenue, Amritsar,

Punjab , 143001

About Khalsa College of Engineering & Technology

Khalsa College of Engineering and Technology, Amritsar was established in 2009 with the avowed aim of providing world-class technical education to benefit all the sections of the society. In the current context of rapidly changing socio-economic scenario, where in India is poised to make significant advancement in Manufacturing and Service Sectors and in line with Make in India, Skill India, Digital India Start-up India initiatives at the national level, we constantly keep creating new avenues and opportunities for our engineering enthusiasts beyond what the university curriculum could otherwise provide. We are constantly making efforts to ensure that our students showcase their academic talent with high moral values.

About the Department

The Department of Computer Science and Engineering is renowned for cutting edge research and for imparting professional education endowed with human values. The Department has highly qualified and experienced faculty, good infrastructure facilities, equipped with full-fledged laboratories, audio visual facilities and is attracting top rankers.

About the SERB

SERB has a vision to position science and technology as the fulcrum for social and economic change by supporting competitive, relevant and quality scientific research and development. As the premier national research funding agency, the mission is to raise the quality and footprint of Indian Science and engineering to the highest global levels in an accelerated mode, through calibrated, competitive support of research and development.

About the Accelerate Vigyan

“Accelerate Vigyan” (AV) strives to provide a big push to high-end scientific research and prepare scientific manpower which can venture into research careers and knowledge-based economy. Recognizing that all research has at its base as development of quality, well trained researchers; AV will initiate and strengthen mechanisms of identifying research potential, mentoring, training and hands-on workshops, on a broad-based national scale. The aim is to expand the research base in the country, with three broad goals – consolidation / aggregation of all scientific training programs etc.

About VRITIKA

The VRITIKA is the call for initiation and practice in science through Training and Skill Internship. This program aims to provide opportunities to promising PG students from universities and colleges to get exposure and hands-on research skill development experience. These internships are primarily facilitated by organizations/institutions/laboratories of national importance.

Program Coordinator

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Sponsored by:

SERB,

Department of Science & Technology,
Government of India



Khalsa College of Engineering & Technology, Amritsar.

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Through this one month internship, the applicants would be able to learn the various aspects of Cloud Computing communication, simulation modelling, and realization of networks for free space and cyber society.

Course Content

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Registration Link

- **There is no Registration Fees.**
- The interested students can register on the following link <https://forms.gle/W9wFBAefH1ZAXH7BA>

Eligibility / Target Audience

- VRITIKA is aimed to provide Training and Skill development, hands-on experience to the students primarily from universities, colleges, private academic institutions, and newly established institutes in handling/troubleshooting of high-end scientific instruments and such skill development on themes required from research work.
- The program is meant to support 05 (Five) motivated PG level students, who are having a strong willingness to get excellence in their scientific and engineering research pursuits. However, the support will not be directly provided to the beneficiaries, but through the Event Organizers applying for and coordinating these events on behalf of SERB.

Venue

- Amritsar is well connected by road, rail and air services.
- Khalsa College of Engineering & Technology, Amritsar is about 15 kms from Main-railway station/Central Bus Stand and 16 km away from the Airport.

Nature of Support (if approved)

- Daily necessary expenses such as travel, stationary, consumables, accommodation, food, etc. for the participating students will be borne by the host institute through SERB funding support.
- The participating students will also be eligible for TA reimbursement for their journey to the host institute from their hometown/home institute, both ways, as per GoI norms.
- The applicants have to produce a letter of authentication from their Supervisor / Head of the Department / Head of the Institute indicating their association with the Institute and “No Objection Certificate (NOC)” for allowing their student to undergo internship, if selected.