SIDDHARTHA ACADEMY OF HIGHER EDUCATION

(Deemed to be University)

Velagapudi Ramakrishna Siddhartha School of Engineering

Department of Computer Science and Engineering

Honor Degree Program in Cloud Engineering

In Collaboration with Google Cloud

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B.Tech (2025 Admitted Batch) Course Structure

The Google Cloud Engineering program aims to provide B.Tech students with industry-ready skills in cloud computing through globally recognized certifications such as Associate Cloud Engineer (ACE) and Cloud Digital Leader (CDL). With access to over 1,250 free cloud-based labs, courses, and hands-on projects in AI, ML, GenAI, security, and data analytics, students gain practical knowledge from the first year onward. The program includes bootcamps, webinars, hackathons, and exclusive placement drives for certified students, along with a 50% discount on certification fees. This initiative not only strengthens technical and problem-solving skills but also bridges the academia-industry gap, enhances employability, and boosts institutional reputation through official collaboration with Google.

Total Credits: 20

Year	Code	Course Name	L-T-P	Credits
I-B.Tech		**Semester-I**		
	24CSIH101	**Cloud Digital Leader** **Description:** This course introduces foundational concepts of cloud computing with a focus on Google's cloud ecosystem. It equips students with a clear understanding of digital transformation, cloud infrastructure, security, data analytics, and AI principles. Designed for beginners, it sets the stage for deeper exploration into cloud technologies while preparing students for the Cloud Digital Leader certification. **Objectives:** • Understand the key concepts of cloud computing and digital transformation. • Identify Google Cloud products and services. • Explain the benefits of cloud solutions in business and IT. • Recognize cloud security and compliance fundamentals. • Prepare for the Cloud Digital Leader certification exam	1-0-0	1
		Semester-II		
	24CSIH201	**Cloud Computing Foundation Certificate** **Description:** This course builds fundamental knowledge of cloud infrastructure and	3-0-2	4

		operations, emphasizing virtualization, storage, networking, and security within Google Cloud. It includes hands-on labs and real-world scenarios to develop core technical proficiency. The course also introduces cloud-native application development and continuous integration concepts. **Objectives:** • Explain the core infrastructure and services offered by Google Cloud. • Perform basic operations on virtual machines, networks, and storage. • Understand identity, access, and security models in cloud environments. • Implement simple cloud-based solutions using guided labs. • Gain foundational skills for further Google Cloud certifications.		
II-B.Tech		**Semester-III**		
	24CSIH301	**Cloud Engineering Certificate - 1** 1. *Preparing for Your Associate Cloud Engineer Journey* 2. *Google Cloud Fundamentals: Core Infrastructure* 3. *Essential Google Cloud Infrastructure: Foundation* **Description:** Focusing on the Associate Cloud Engineer certification path, this two-semester course teaches essential Google Cloud infrastructure concepts including virtual machines, networks, Kubernetes, and automation tools. Students learn to deploy, manage, and monitor cloud solutions through extensive hands-on practice and infrastructure-as-code techniques. **Objectives:** • Deploy and manage Google Cloud resources like Compute Engine and Cloud Storage. • Design scalable and fault-tolerant cloud infrastructure. • Implement CI/CD pipelines and automation using GCP tools. • Work with Kubernetes and container orchestration on GKE. • Prepare for the Associate Cloud Engineer certification.	**2-0-2**	**3**
		Semester-IV		
	24CSIH401	**Cloud Engineering Certificate - 2** 1. *Essential Google Cloud Infrastructure: Core Services* 2. *Essential Google Cloud Infrastructure: Scaling and Automation* 3. *Getting Started with Google Kubernetes Engine* **Description:** This course builds upon foundational Google Cloud knowledge to cover advanced infrastructure management topics, including core services, automation, and container orchestration. Students learn to configure and optimize cloud services such as IAM, load balancing,	**2-0-2**	**3**

		and autoscaling. With a strong focus on DevOps practices and Kubernetes, the course equips students to architect, automate, and scale cloud-native applications using Google Cloud tools. **Objectives:** • Configure and manage core services like IAM, VPC, and load balancers on Google Cloud. • Automate cloud infrastructure with infrastructure-as-code tools and templates. • Implement autoscaling and performance tuning strategies. • Deploy and manage containerized applications using Kubernetes and GKE. • Strengthen readiness for the Associate Cloud Engineer certification.		
		Semester-V		
III-B.Tech	**24CSIH501A**	**Cloud Data Analytics Certificate - 1** 1. *An Introduction to Data Analytics in Google Cloud* 2. *Data Management and Storage in the Cloud* 3. *Data Transformation in the Cloud* **Description:** This course trains students in data analysis, transformation, and visualization using Google Cloud tools such as BigQuery, Looker Studio, and Dataflow. It culminates in preparing students for data analyst roles with emphasis on storytelling with data and real-world datasets. **Objectives:** • Analyze large datasets using BigQuery and Cloud Storage. • Perform ETL processes and build data pipelines. • Visualize and communicate insights effectively. • Apply statistical methods to cloud-based data analytics. • Prepare for cloud data analyst roles and certifications.	**2-0-2**	**3**
	24CSIH501B	**(OR)** **Cloud Cybersecurity Certificate - 1** 1. *Introduction to Security Principles in Cloud Computing* 2. *Strategies for Cloud Security Risk Management* 3. *Cloud Security Risks: Identify and Protect Against Threats* **Description:** This course introduces students to cyber security in cloud environments, covering core principles, risk management, and threat mitigation. Students explore identity and access management, incident response, and compliance frameworks. Emphasis is placed on hands-on learning and security best practices within Google Cloud. **Objectives:**		

		• Understand the fundamentals of cloud security and IAM. • Identify and mitigate common cloud vulnerabilities and threats. • Implement secure infrastructure with encryption and logging. • Respond to and recover from cloud security incidents. • Prepare for roles such as Cloud Security Analyst.		
		Semester-VI		
	24CSIH601A	**Cloud Data Analytics Certificate - 2** 4. *The Power of Storytelling: How to Visualize Data in the Cloud* **5.** *Put It All Together: Prepare for a Cloud Data Analyst Job* **Description:** This advanced course enhances students' ability to derive insights from data and communicate them effectively using visualization tools in the Google Cloud ecosystem. Students learn storytelling techniques to present data clearly and persuasively through dashboards and reports. The course culminates in a capstone project simulating real-world analytics tasks, helping students develop a portfolio and career-ready skills for roles in cloud-based data analysis. **Objectives:** • Apply data storytelling techniques using Looker Studio and Google Cloud visualization tools. • Develop intuitive dashboards and reports to support data-driven decisions. • Translate analytical results into business insights for diverse stakeholders. • Complete real-world, project-based tasks simulating industry data analyst roles. • Prepare resumes, portfolios, and interview skills aligned with cloud data analytics careers. **(OR)**	**2-0-2**	**3**
	24CSIH601B	**Cloud Cybersecurity Certificate - 2** 4. *Detect, Respond, and Recover from Cloud Cybersecurity Attacks* 5. *Put It All Together: Prepare for a Cloud Security Analyst Job* **Description:** This course deepens students' expertise in cloud security by focusing on real-time threat detection, incident response, and recovery strategies within the Google Cloud environment. It emphasizes applied learning through simulations of cybersecurity scenarios. The capstone module guides students through career preparation for cloud security analyst roles, helping them integrate technical knowledge with job-ready skills and industry-aligned practices. **Objectives:**		

		• Detect and respond to cybersecurity threats in cloud-based systems. • Apply recovery strategies to restore secure and stable cloud operations. • Use Google Cloud tools to monitor, log, and investigate security events. • Demonstrate security incident handling in hands-on scenarios. • Prepare professionally for cloud security analyst roles through guided projects and assessments		
		Semester-VII		
IV-B.Tech	**24CSIH701**	1) **Introduction to Gen AI** 2) **Gemini for Google Cloud** 3) **Generative AI for Developers** **Description:** This advanced course explores the fundamentals and applications of Generative AI (GenAI) using Google Cloud's AI suite, including Gemini. Students learn to build, fine-tune, and deploy GenAI models in real-world applications such as text generation, image synthesis, and conversational AI. **Objectives:** • Understand the principles and models of Generative AI. • Explore Gemini and its capabilities within Google Cloud. • Develop and deploy GenAI solutions using Google tools. • Evaluate ethical considerations in GenAI applications. • Apply GenAI in domains such as NLP, vision, and automation.	**2-0-2**	**3**
Total Credits				**20**