

NUS SOC Summer Workshop 2026

Cloud, IoT, Security & AI

Cloud Computing

Course Information

Pre-requisites

 Which year of study is appropriate for your topic?

Year 2 and above.

 What background and programming languages are required for your topic?

Knowledge of programming is compulsory; web programming experience will be useful.

 What do you think is attractive/unique about your topic to students?

Hands-on experience opportunity to develop next-generation cloud-enabled software services with advanced capabilities including artificial intelligence, machine learning, data analytics, IoT among others.

Learning content and Teaching

 What will be covered during “trial” lectures?

Covers the foundation of cloud computing and is divided into: cloud concepts & models (key cloud characteristics, cloud service (delivery) models, cloud deployment models, cloud reference architecture); cloud applications and paradigms (common features and challenges, architecture styles for cloud applications, application development models – SaaS, PaaS and IaaS).

 What will be covered during the “advanced” seminars?

Divided into five 2-hr sessions:

1. Developing Applications using Different Cloud Service Models;
2. Hands-on experience with Amazon Web Services (AWS) and Google Cloud Platform (GCP);
3. Application Development using AWS and GCP;
4. Big Data Architectures and Patterns;
5. Technologies behind Cloud Computing

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 What will be the nature of the project work? How do you intend to split students into project groups, each consisting of 3 or 4 students?

Students are encouraged to come up with a novel idea for a problem and the solution includes integrating a number of cloud services such as machine learning and data analytics among others. Each group of at most four students is formed to promote creativity, collaboration, and innovative thinking. To monitor the progress, a project is broken down into four smaller milestones: pitch and buy-in, design walkthrough, prototype/implementation walkthrough, and presentation and demo.

 Do you have any recommendations for references (books) students can study to prepare for your topic before coming to NUS?

Students can read selective chapters (1, 2, 4 and 5) in the book – *Essentials of Cloud Computing*, CRC Press, 2015 (pdf version is available on Internet).

 Besides their own personal laptops, what other equipment or software would students need for your topic?

We will be using free credits from AWS (AWS Academy Learner Lab) and Google Cloud Platform.

Assessment

 What forms of assessment will there be?

Assessment is divided into individual lab exercises (30%) and group project (70% of which 10% is peer evaluation). Group project assessment is further broken down along four project milestones where every student have the opportunity to present their contribution to the whole project.