

NUS SOC Summer Workshop 2026
Structure and Interpretation of Computer Programs
X-Cluster
Course Information

Pre-requisites:

 Which year of study is appropriate for your topic?

This course is appropriate for all undergraduate-level university students from any field. No programming experience is needed. Students who already have programmed are likely to get a new perspective on the structure and interpretation of computer programs.

 What background and programming languages are required for your topic?

No background in programming languages is required, but students are expected to have a solid foundation in and appreciation for high-school mathematics, including calculus and basic linear algebra.

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

The National University of Singapore has pioneered the SICP JS approach to teaching computational thinking in its computer science programme, using the flagship course CS1101S. This course follows the pedagogy of CS1101S and makes the material accessible to university students of all fields who are interested in the structure and interpretation of computer programs.

Learning content and Teaching

 What will be covered during the introductory lectures?

The trial lecture covers functional abstraction and explores 2D/3D graphics and sound processing from its basic mathematical principles, without requiring any prior knowledge in computing. The audience will get a taste for programming using examples that stimulate the eyes and ears.

 What will be covered during the advanced seminars?

The advanced seminars focus on programming languages and their implementation. The Source Academy will serve as a platform to discover the principles of programming languages using the essential components of popular programming languages such as Python, JavaScript, Python, and C.

 What will students be doing for the project work? How do you intend to split students into project groups?

Students will work in pairs to develop their own programming language or their own graphics audio or video modules that stretch their imagination.

 Do you have any recommendations for references (books) where students can study to prepare for this topic beforehand?

Students can explore the book SICP JS before the course to get a head-start.

 Apart from a laptop/computer, is there any other equipment/software required for this topic?

No requirements needed. A laptop with a web browser is enough.