

NUS School of Computing - Graduate Certificate in Computing Foundations

Module Code, Title & Description	Module Offered	Lecture Day/Period	Exam
<u>Graduate Certificate in Computing Foundations (CF)</u>			
<p><i>IT5001 Software Development Fundamentals</i> This module aims to introduce non-computing students to the principles and concepts of software development at an accelerated pace. Students will be introduced to the basics of programming (control flow, code and data abstraction, recursion, types, OO), development methodology (ensuring correctness, testing, debugging), simple data structures and algorithms (lists, maps, sorting), and software engineering principles. Through hands on assignments and projects, students will learn good software development practices (documentation, style) and experience a typical software engineering cycle (waterfall and agile workflow).</p>	Semester 2 (Jan 2019)	<p>Saturdays 9.00am to 5.00pm From 19 Jan to 23 Feb 2019 Venue: Seminar Room 3 (SR3), COM1 02-12 (9.00am to 1.00pm) Programming Lab 2 (PL2), COM1 B-09 (1.00pm to 5.00pm)</p>	<p>Date: Saturday, 9 Mar 2019 Time: 2pm Venue: Seminar Room 3 (SR3), COM1 02-12</p>
<p><i>IT5002 Computer Systems and Applications</i> This module aims to introduce non-computing students to (a) the common principles and concepts in computer systems: abstraction, layering, indirection, caching, hierarchical naming, prefetching, pipelining, locking, concurrency; (b) the inner workings of a computing device, including hardware (CPU, memory, disks), operating systems (kernels, processes and threads, virtual memory, files), and applications (Web, databases).</p>	Semester 1 (Aug 2019)	To Be Confirmed	To Be Confirmed
<p><i>IT5003 Data Structures and Algorithms</i> This module introduces non-computing students to efficient computational problem solving in an accelerated pace. Students will learn to formulate a computational problem, identify the data required and come up with appropriate data structures to represent them, and apply known strategies to design an algorithm to solve the problem. Students will also learn to quantify the space and time complexity of an algorithm, prove the correctness of an algorithm, and the limits of computation. Topics include common data structures and their algorithms (lists, hash tables, heap, trees, graphs), algorithmic problem solving paradigms (greedy, divide and conquer, dynamic programming), and NP-completeness.</p>	Semester 1 (Aug 2019)	To Be Confirmed	To Be Confirmed
<p><i>IT5004 Enterprise Systems Architecture Fundamentals</i> This module aims to equip non-computing students with fundamental knowledge in architecting and designing modern Enterprise Systems in organisations that can be reasonably complex, scalable, distributed, component-based and mission-critical. Students will develop an understanding of high-level concepts such as enterprise architecture and software architecture. They will then move on to acquire fundamental systems analysis and design techniques such as object-oriented requirements analysis and design using the Unified Modelling Language.</p>	Semester 2 (Jan 2019)	<p>Saturdays 9.00am to 5.00pm From 16 Mar to 20 Apr 2019 Venue: Seminar Room 3 (SR3), COM1 02-12</p>	<p>Date: Saturday, 27 April 2019 Time: 1pm Venue: Seminar Room 3 (SR3), COM1 02-12</p>

** Modules offered, descriptions and schedules may be subject to change.*