NUS School of Computing
Master of Computing (General Track) - Essential Modules
Semester 2, AY2022/2023

Module Code & Title	Lecture Day/Period	Time	Venue	Remarks	Exam
IT5001 Software Development Fundamentals *Lecturer: Alan Cheng and Foo Yong Qi*	Wednesday [11 Jan 2023 - 22 Feb 2023]	4pm - 6pm	**LECTURE** (LT15)	All full-time students will attend both Wed 4pm-6pm and Fri 2pm-3pm lessons.	Saturday, 18 Mar 2023, 2pm - 4pm For exam details, please check with your lecturer and Canvas for announcements.
	Friday [13 Jan 2023 - 24 Feb 2023]	2pm - 3pm	**LECTURE** (COM1-0206)		
	Monday [16 Jan 2023 - 27 Feb 2023] *(Please note that 23 Jan 2023 is a public holiday so there will be no class on that day.)*	2pm - 4pm	**LAB** (COM1-0120)	Full-time students attending the Wed 4pm-6pm and Fri 2pm-3pm lessons will attend either lab session.	
		4pm - 6pm	**LAB** (COM1-0120)		
	Wednesday [11 Jan 2023 - 22 Feb 2023]	6.30pm - 8.30pm	**LECTURE** (COM1-0206)	All part-time students will attend both Wed 6.30pm-8.30pm and Sat 9am-10am lessons.	
	Saturday [14 Jan 2023 - 25 Feb 2023]	9am - 10am	**LECTURE** (COM1-0206)		
	Saturday [14 Jan 2023 - 25 Feb 2023]	10am - 12pm	**LAB** (COM1-B110/ COM1-0120/ AS6-0421)	Part-time students attending the Wed 6.30pm-8.30pm and Sat 9am-10am lessons will attend this lab session.	
IT5003 Data Structures and Algorithms *Lecturer: Steven Halim*	Wednesday [1 Mar 2023 - 19 Apr 2023]	6.30pm - 8.30pm	**LECTURE** (COM1-0206)	Students are to attend both Wed and Sat lectures.	Thursday, 4 May 2023, 5pm - 7pm For exam details, please check with your lecturer and Canvas for announcements.
	Saturday [4 Mar 2023 - 22 Apr 2023] *(Please note that 22 Apr 2023 is a public holiday so there will be no class on that day.)*	9am - 10am	**LECTURE** (COM1-0206)		
	Saturday [4 Mar 2023 - 22 Apr 2023] *(Please note that 22 Apr 2023 is a public holiday so there will be no class on that day.)*	10am - 12pm	**LAB** (SR_LT19)	Students may select one lab session to attend.	
	Monday [6 Mar 2023 - 24 Apr 2023]	2pm - 4pm	**LAB** (COM1-B112/ SR_LT19)		
		4pm - 6pm	**LAB** (COM1-B112/ SR_LT19)		
	Friday [3 Mar 2023 - 21 Apr 2023]	2pm - 4pm	**RECITATION** (COM1-0206)	Optional for students.	

	(Please note that 7 Apr 2023 is a public holiday so there will be no class on that day.)				
IT5004 Enterprise Systems Architecture Fundamentals *Lecturer: Lek Hsiang Hui*	Thursday [12 Jan 2023 - 13 Apr 2023]	6.30pm - 9.30pm	**LECTURE** (COM1-0206)	Students are to attend all lectures.	There will be no exam for IT5004.
IT5005 Artificial Intelligence *Lecturer: Colin Tan*	Tuesday [10 Jan 2023 - 11 Apr 2023]	2pm - 4pm	**LECTURE** (COM1-0206)	Students are to attend all lectures and labs.	Wednesday, 3 May 2023, 1pm - 3pm For exam details, please check with your lecturer and Canvas for announcements.
		4pm - 5pm	**LAB** (COM1-0206)		
IT5006 Fundamentals of Data Analytics *Lecturer: Ashish Deepak Dandekar*	Friday [13 Jan 2023 - 14 Apr 2023] *(Please note that 7 Apr 2023 is a public holiday so there will be no class on that day.)*	6.30pm - 9.30pm	**LECTURE** (COM1-0206)	Students are to attend all lectures.	Thursday, 27 Apr 2023, 5pm - 7pm For exam details, please check with your lecturer and Canvas for announcements.
IT5007 Software Engineering on Application Architecture *Lecturer: Prasanna Karthik Vairam*	Tuesday [10 Jan 2023 - 11 Apr 2023]	6.30pm - 9.30pm	**LECTURE** (COM1-0206)	Students are to attend all lectures.	There will be no exam for IT5007.

*** Modules offered, descriptions and schedules may be subject to change.**
*Please refer to this link for lecture/lab venues: https://www.comp.nus.edu.sg/maps/venues/

Essential Modules:

IT5001 Software Development Fundamentals
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).
Students must pass IT5001 in order to continue with the other CF I modules.

IT5002 Computer Systems and Applications
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).

IT5003 Data Structures and Algorithms
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.

IT5004 Enterprise Systems Architecture Fundamentals
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 them move on to acquire fundamental systems analysis and design techniques such as object-oriented requirements analysis and design using the Unified Modelling Language.

IT5005 Artificial Intelligence

The study of artificial intelligence, or AI, aims to make machines achieve human-level intelligence. This module provides a comprehensive introduction to the fundamental components of AI, including how problem-solving, knowledge representation and reasoning, planning and decision making, and learning. The module prepares students without any AI background to pursue advanced modules in AI.

IT5006 Fundamentals of Data Analytics

This module introduces students to the fundamental concepts in business analytics. They can learn how to apply basic business analytics tools (such as R), and how to effectively use and interpret analytic models and results for making informed business decisions. The module prepares students without any analytics background to pursue advanced modules in business and data analytics.

IT5007 Software Engineering on Application Architecture

Pre-requisite: IT5003 Data Structures and Algorithms

To meet changing business needs, this course focuses on flexible and agile software development on modern application architecture. Students learn to design and develop modern applications that support multiple clients across different platforms such as desktop, mobile devices and cloud. The course covers designing (1) website-based front-end software and (2) mobile app front-end that interacts with a common cloud-based backend. The final part involves engineering software for higher-level objectives such as security and performance. Tools and techniques for writing modern software, such as, HTML5, CSS3, React.js, Node.js, MySQL/MongoDB, and Git will be taught.