

**COURSE OUTLINE** – subject to changes :

Mon 12 Jun	L-1	welcome to mcs 260 – computer literacy and Python programming
	L-2	computer architecture – first steps with Python
Wed 14 Jun	L-3	the von Neumann machine – calculating in the Python shell
	L-4	numbers, variables, and assignments – developing Python programs
Fri 16 Jun	L-5	operating systems – the os module – turtle graphics
	L-6	syntax and semantics of languages – strings, lists, and tuples
Mon 19 Jun		<b>Juneteenth holiday. No classes.</b>
Wed 21 Jun	L-7	mass storage, files and databases – dictionaries in Python – anydbm
	L-8	boolean algebra – flowcharts – conditional constructs in Python
Fri 23 Jun	L-9	transistors and logic gates – intrinsic operations on numbers and strings
	L-10	flip-flops and registers – intrinsic operations on lists: queues and stacks

**Project One due on Friday 23 June at 10am**

Mon 26 Jun	L-11	adder circuits – loop constructs: the while and for – estimating $\pi$
	L-12	simulation using random numbers – binary expansion with repeat until: break
Wed 28 Jun	L-13	top down design of programs – functions in Python
	L-14	local and global variables – arguments of functions – functions using functions
Fri 30 Jun	L-15	functional programming – lambda forms – list comprehensions
	L-16	organization of data on files – manipulating files with Python
Mon 3 Jul	L-17	data compression – format conversions – using buffers to process files
	L-18	networking and the internet – markup languages – using the urllib module

**Project Two due on Wednesday 5 July at 10am**

Wed 5 Jul	L-19	review of the first 18 lectures
	L-20	more review for the midterm exam
Fri 7 Jul	L-21	<b>midterm exam on the first 18 lectures</b>
	L-22	second part of the midterm exam
Mon 10 Jul	L-23	software engineering – bottom up design of programs – modules in Python
	L-24	the software development cycle and quality – modular design with Python
Wed 12 Jul	L-25	software licensing and open source – modules and packages
	L-26	object-oriented programming – unified modeling language – classes in Python
Fri 14 Jul	L-27	data and functional attributes of classes – operator overloading
	L-28	encapsulation, inheritance, polymorphism – wrapping and delegation
Mon 17 Jul	L-29	software testing, verification techniques – pre- and postconditions with assert
	L-30	exception handling – defining, raising, and handling exceptions in Python

**Project Three due on Wednesday 19 July at 10am**

Wed 19 Jul	L-31	complexity and cost – complexity classes – timing Python programs
	L-32	graphical user interfaces – using Tkinter, a GUI toolkit for Python
Fri 21 Jul	L-33	expression evaluation – graphing functions – using the Canvas widget
	L-34	entering data with a scale – the development of animations
Mon 24 Jul	L-35	class hierarchies – visualization with inheritance
	L-36	cellular automata – the game of life – a Tkinter application
Wed 26 Jul	L-37	processes and threads – lifecycle of a thread – multithreaded programming
	L-38	an object-oriented implementation of a predator-prey simulation
Fri 28 Jul	L-39	network programming with sockets – the multiprocessing module
	L-40	high level parallel programming – the multiprocessing module

**Project Four due on Monday 31 July at 10am**

Mon 31 Jul	L-41	recursive algorithms – tracing the execution of recursive functions
	L-42	machine learning – neural networks
Wed 2 Aug	L-43	review of the first half of the course
	L-44	review of the second half of the course
Fri 4 Aug	L-45	<b>final exam</b>
	L-46	second part of the final exam