COURSE OUTLINE – subject to changes :

L-1	Mon 22 Aug	welcome to mcs 507 – a tour of Python and Sage
L-2	Wed 24 Aug	numbers and formulas – symbolic and numeric computing
L-3	Fri 26 Aug	interactive computing – mathematical modeling
L-4	Mon 29 Aug	loops and lists – while, for and repeat loops
L-5	Wed 31 Aug	Monte Carlo methods – list comprehensions
L-6	Fri 2 Sep	tuples and nested lists – list manipulations
	Mon 5 Sep	**Labor Day holiday. No classes**
L-7	Wed 7 Sep	defining functions – lambda functions
L-8	Fri 9 Sep	if and else – recursion and enumeration
L-9	Mon 12 Sep	numerical integration
L-10	Wed 14 Sep	parsing strings – eval and exec
Project One due on Friday 16 September by 10AM		
L-11	Fri 16 Sep	command line arguments – exceptions
L-12	Mon 19 Sep	making modules – Cython – graphical user interfaces
L-13	Wed 21 Sep	root finding methods
L-14	Fri 23 Sep	numpy – arrays and vectorization
L-15	Mon 26 Sep	curve plotting – animations
L-16	Wed 28 Sep	matrices and higher dimensional arrays
L-17	Fri 30 Sep	modeling a heat wave
L-18	Mon 3 Oct	files, strings and dictionaries
L-19	Wed 5 Oct	review of materials covered in lectures 1 to 18
L-20	Fri 7 Oct	**midterm exam – either in class or take home**
L-21	Mon 10 Oct	manipulating directories and files
L-22	Wed 12 Oct	reading data from web pages – a web crawler
Project Two due on Friday 14 October by 10AM		
L-23	Fri 14 Oct	using a database to manage and process data
L-24	Mon 17 Oct	introduction to classes – functions with parameters
L-25	Wed 19 Oct	numerical and automagic differentiation
L-26	Fri 21 Oct	a class for polynomials – overloading operators
L-27	Mon 24 Oct	interval arithmetic
L-28	Wed 26 Oct	random numbers and simple games
L-29	Fri 28 Oct	discrete and continuous random number generators
L-30	Mon 31 Oct	computing probabilities – Monte Carlo integration
L-31	Wed 2 Nov	random walks
L-30	Fri 4 Nov	class hierarchy for numerical differentiation
L-31	Mon 7 Nov	class hierarchy for numerical integration
L-32	Wed 9 Nov	class hierarchy for geometric shapes
L-33	Fri 11 Nov	object oriented design of graphical user interfaces
L-36	Mon 14 Nov	Maxima, a computer algebra system
L-37	Wed 16 Nov	GAP, a system for computational discrete algebra
Project Three due on Friday 18 November by 10AM		
L-38	Fri 18 Nov	PARI/GP, software for computer-aided number theory
L-39	Mon 21 Nov	R, free software for statistical computing
L-40	Wed 23 Nov	singular, a computer algebra system for polynomial computations
	Fri 25 Nov	**Thanksgiving holiday. No classes.**
L-41	Mon 28 Nov	presentation of projects or review for final exam
L-42	Wed 30 Nov	presentation of projects or review for final exam
L-43	Fri 2 Dec	presentation of projects or review for final exam

Friday 9 December, 10:30AM - 12:30PM : Final Examination – room to be announced.