COURSE OUTLINE – subject to changes :

Mon 10 Jun	L-1	welcome to MCS 320 — SageMath and CoCalc — computer algebra
	L-2	the Jupyter notebook — structuring and documenting your work
Wed 12 Jun	L-3	use as a calculator — getting started and getting help
	L-4	exact and floating-point numbers — continued fractions
Fri 14 Jun	L-5	complex and algebraic numbers — making finite fields
	L-6	symbols, variables, and references — preventing evaluation
Mon 17 Jun	L-7	number types — functions to store data
	L-8	evaluation and execution — finite fields — binary expression trees
Wed 19 Jun		**Juneteenth holiday. No classes.**
Fri 21 Jun	L-9	input/output formats — saving and loading data from files
	L-10	timing Python functions — vectorization — Cython
Mon 24 Jun	L-11	univariate and multivariate polynomials — coefficient types — monomial orders
	L-12	quotients of polynomials, expression swell, Horner form, partial fractions
Wed 26 Jun	L-13	operators and operands — expression trees for symbolic and numeric evaluation
	L-14	manipulating expressions by substitution, expansion, and factorization

Project One is due on Friday 28 June, at 2pm.

Fri 28 Jun	L-15	normalizing expressions — canonical forms
	L-16	review of the first 15 lectures
Mon 1 Jul	L-17	**first midterm exam on the first 15 lectures**
	L-18	second part of the first midterm exam
Wed 3 Jul	L-19	defining mathematical functions — preventing premature evaluation
	L-20	recursive functions and memoization for efficient execution
Thu 4 Jul		**Independence Day holiday. No classes.**
Fri 5 Jul	L-21	computing with functions
	L-22	symbolic, numeric, and implicit differentiation
Mon 8 Jul	L-23	integration and summation
	L-24	series, approximations, and limits
Wed 10 Jul	L-25	symbolic-numeric computation
	L-26	two dimensional plots
Fri 12 Jul	L-27	plotting in three dimensions and beyond
	L-28	making animations
Mon 15 Jul	L-29	solving equations
	L-30	linear algebra — matrix factorizations as normal forms

Project Two is due on Wednesday 17 July, at 2pm.

Wed 17 Jul	L-31	differential equations — Laplace transforms
	L-32	linear programming and polyhedra
Fri 19 Jul	L-33	building interactive web pages
	L-34	an application of interact
Mon 22 Jul	L-35	review of lectures 19 to 34
	L-36	more review for the second midterm
Wed 24 Jul	L-37	**the second midterm on lectures 19 to 34**
	L-38	second part of the second midterm exam
Fri 26 Jul	L-39	symbolic computing with sympy
	L-40	numeric computing with numpy and scipy
Mon 29 Jul	L-41	introduction to Julia
	L-42	parallel computing with Julia

Project Three is due on Wednesday 31 July, at 2pm.

Wed 31 Jul	L-43	review of the first half of the course
	L-44	review of the second half of the course
Fri 2 Aug	L-45	**final examination**
	L-46	second part of the final exam