COURSE OUTLINE – subject to changes:

L-1 Mon 9 Jan welcome to mcs 275 – scripting in Python – from OOP to LAMP
L-2 Wed 11 Jan extending Python – wrapping code for use in Python
L-3 Fri 13 Jan arrays and matrices – finding saddle points

Mon 16 Jan Martin Luther King, Jr., Day – no classes

L-4 Wed 18 Jan object oriented programming – defining classes – wrapping and overloading
L-5 Fri 20 Jan graphical user interfaces – using Tkinter in Python – animations
L-6 Mon 23 Jan getting data from the web – file manipulation – cluster analysis
L-7 Wed 25 Jan word counts – frequency tables – pattern matching
L-8 Fri 27 Jan recursive problem solving – writing recursive functions
L-9 Mon 30 Jan recursive drawings – the Koch curve and flake – L-systems

L-10 Wed 1 Feb iterative versus recursive algorithms – exponential cost in relation to complexity

Project One due by 1PM, Friday 3 February

L-11 Fri 3 Feb enumerative searches and backtracking – the knapsack problem
L-12 Mon 6 Feb finding a path in a maze, applying backtracking
L-13 Wed 8 Feb recursive data structures: binary and classification trees
L-14 Fri 10 Feb binary trees as objects – preorder, inorder, and postorder traversals
L-15 Mon 13 Feb problem solving via divide-and-conquer methods, binary and bisection search
L-16 Wed 15 Feb divide and conquer applied to sorting: merge and quick sort
L-17 Fri 17 Feb evaluating expressions: postfix to infix – stacks of function calls
L-18 Mon 20 Feb from recursion to iteration using a stack for the parameters of the calls
L-19 Wed 22 Feb review of the first 18 lectures

L-20 Fri 24 Feb first midterm exam on the first 18 lectures

Project Two due by 1PM, Monday 27 February

L-21 Mon 27 Feb CGI programming – HTML forms – processing web input by Python scripts
L-22 Wed 1 Mar client-side and server-side scripting – passing text and commands via the web
L-23 Fri 3 Mar dynamic web pages – web interfaces to Python code
L-24 Mon 6 Mar database programming – an open source database MySQL – MySQLdb
L-25 Wed 8 Mar working with MySQL – Python scripts using MySQLdb
L-26 Fri 10 Mar accessing a database from a Python script – building a GUI for a database

Project Three due by 1PM, Monday 13 March

L-27 Mon 13 Mar computer networks – client/server interactions – the socket module in Python
L-28 Wed 15 Mar sockets for communication between programs – pleasingly parallel computations
L-29 Fri 17 Mar web interfaces for database servers – combining CGI scripts, MySQLdb, and sockets
L-30 Mon 27 Mar introduction to multithreading – using the thread module – the Thread class
L-31 Wed 29 Mar managing data between threads – locks and synchronization – building simulations
L-32 Fri 31 Mar multithreaded servers – sockets and threads – handler threads to serve requests
L-33 Mon 3 Apr advanced web programming – the SocketServer module – a basic HTTP server
L-34 Wed 5 Apr web clients and crawlers – using the urllib and urlparse modules
L-35 Fri 7 Apr cookies and email authentication

Project Four due by 1PM, Monday 10 April

L-36 Mon 10 Apr an application: web server to a database
L-37 Wed 12 Apr review for the second midterm exam
L-38 Fri 14 Apr second midterm exam on lectures 21 to 36
L-39 Mon 17 Apr processing data from the web: gtfs
L-40 Wed 19 Apr making connections
L-41 Fri 21 Apr running cython and vectorization
L-42 Mon 24 Apr review with focus on first midterm
L-43 Wed 26 Apr review with focus on second midterm

Project Five due by 1PM, Friday 28 April

L-44 Fri 28 Apr comprehensive review

Monday 1 May, 1:00PM - 3:00PM : Final exam, room to be announced.