

**1. Course number and name**

CptS 481: Python Software Construction

**2. Credits and contact hours**

3 credits, 3 lecture hours

**3. Instructor's or course coordinator's name**

Robert R. Lewis

**4. Textbook, title, author, and year**

J. Goebel, A. Hassan, T. Tehrani, and R.R. Lewis. *The Book of Python*, No Starch Press. (In progress; draft copy provided)

*Other supplemental materials*

F. Lundh. *An Introduction to Tkinter*. (Unpublished)

New Mexico Tech. *Tkinter Reference: A GUI for Python*. (Unpublished)

**5. Specific course information**

a. *Catalog description*: Intensive introduction to the python language; user interface, building and using extension modules; C interfacing; construction of a major project.

b. *Prerequisites or corequisites*: CptS 121, CptS 122, CptS 223 and CptS 224

**6. Specific goals for the course**

By the end of the course, students will be able to

- Design, build, test, debug, and deploy medium-scale (single programmer) platform-independent modules, packages, and scripts in the Python language (2a, 2e, 2g)
- Explain the internal workings of Python data structures and its interpreter (1e)
- Build Python graphical user interfaces using the Tkinter package (1c, 2g)
- Invoke a Python module from within a C program (2g)
- Construct a module in C that can be invoked from a Python module (2g)
- Complete a substantial project in Python (possibly as part of a team) (2g)

**7. Brief list of topics to be covered**

- The Python Language
  - The Environment
  - Program Structure and Identifiers
  - Base Classes
  - Expressions
  - Statements
  - Functions
  - Modules and Packages
  - Input/Output
  - Objects
  - Exceptions

- Builtins
- Python Software Development
  - Documenting
  - Checking and Debugging
  - Testing
- Building Python User Interfaces
  - Tkinter
- Advanced Topics
  - Distributing
  - System Programming
  - Embedding and Extending
  - Arrays
  - Case Studies
- Selected Topics  
(Possible choices. Actual topics will be selected with student input.)
  - 3D Graphics
  - Compiling
  - Cookbook Selections
  - Databases
  - Games
  - Networking
  - Web CGI