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## **Tools: Software Carpentry** *- Wade Sheldon (GCE)*

Software Carpentry (<http://www.swc.scipy.org/>) is an online course designed to teach scientists and engineers how to design, build, maintain and share computer programs efficiently. The authors' premise is that many scientists and engineers spend much of their lives programming, but few have ever been taught how to do this well; consequently, they spend most of their time wrestling with software instead of doing research and solving problems, and they have no idea how reliable or efficient the programs they write are. Lectures are included on using version control systems (e.g. SVN), automating building and testing software, basic scripting, debugging, quality assurance, and a host of other topics.

The authors make a case for using high-level, interpreted languages for most scientific programming (e.g. Python, MATLAB and others), arguing that programming efficiency and code readability (i.e. human time) have a greater impact on scientist productivity than raw software performance (i.e. machine time), particularly on modern computing hardware. Most examples are therefore written in Python, and additional material is being developed for MATLAB. Not surprisingly, both the Python Software Foundation and The MathWorks (publisher of MATLAB) have signed on as sponsors of this course. However, many of the lectures are general enough to be applicable to any software development technology.

I've learned a lot from these lectures, and they are now required reading for students in our ecological modeling group in Marine Sciences at UGA. All of the material is provided under an open source license, and can be freely copied for use in classes.