

SOFTWARE CARPENTRY FOUNDATION 2015 ANNUAL REPORT



Software Carpentry Foundation
December, 2015
<https://software-carpentry.org/>

Contents

Message from the Executive Director	3
2015 In Numbers	4
Message from the Steering Committee	5
Software Carpentry Foundation Strategic Planning.....	5
SCF Committee Reports.....	6
Instructor Training Committee	6
Finance Committee	7
Assessment Committee	7
Mentoring Committee	8
Lesson Organization and Development Committee.....	9
Communications Committee	9

Message from the Executive Director

Dear Software Carpentry Community Members,

This has been an exciting year for Software Carpentry: we've taught over 250 workshops to over 7,100 learners while adding more than 200 new instructors and training 6 new instructor trainers. We hope to at least double each of the above statistics in 2016! This is truly a community project, with an ever-expanding community, serving the expressed needs of scientists around the world.



Work in our committees has been brisk, as you will see in the committee reports below. In the Assessment subcommittee we've revisited our pre- and post-workshop assessment surveys and begun to roll out a new survey tool. The Mentoring subcommittee developed bi-weekly instructor debriefings and has run them throughout the year. The same committee is helping to develop new methods for online instructor training, and is creating a mentorship plan to onboard new instructors and ensures that they are supported as they teach their first workshop. Lesson development and maintenance has been brisk, with major cleanups and updates to many of our lessons.

Our logistics and administrative management tool AMY has become incredibly useful in meeting the day-to-day needs of our workshop-organizing admins in Canada, the UK, the USA and mainland Europe. This tool is available to all of our partners that wish to administer their own workshops; if you're interested in using it, please contact us. If you know (or would like to get better at) Python, Django and other web tools, please have a look at the [AMY repository](#) and look for issues you can help with.

Financially, we are in great shape, thanks largely to our amazing partner organizations. We're working with them to expand their capacity to deliver workshops and meet local demands, while ensuring that their instructors are welcome and engaged members of our community.

We've hired a new Executive Director, myself, and Program Coordinator, Maneesha Sane. Our founding Steering Committee has worked tirelessly to advance the organization and place it on a strong footing. We're holding our second-ever Steering Committee Election in February, and if you've taught at least twice in the last two years we welcome you to stand for election.

Our plans for 2016 involve putting more structure in place so that we can effectively grow to meet the ever-expanding demand for high quality instruction, workshops and lessons in more communities around the world.

You are a valuable part of who we are, and we have many ways for you to contribute. I'm always available to help with any grants, programs, initiatives or activities that you'd like to have our community involved with, so please reach out if you'd like to talk through any ideas.

Sincerely,
Jonah M. Duckles
Executive Director
The Software Carpentry Foundation
execdir@software-carpentry.org

2015 in Numbers

Total number of instructors in Software Carpentry workshops

660

Number of unique instructors in Software Carpentry workshops

381

Total number of instructors in Data Carpentry workshops

53

Number of unique instructors in Data Carpentry workshops

43

Total number of learners in Software Carpentry workshops

6553

Total number of learners in Data Carpentry workshops

514

Number of Software Carpentry workshops

241

Number of Data Carpentry workshops

23

Number of Instructor Training workshops

21

Number of WiSE (Women in Science and Engineering) workshops

6

Number of self-organized workshops

63

Message from the Steering Committee

This year's steering committee formed strategic subcommittees to address SCF needs and growth. We are very grateful for our SCF community and look forward to working together more in the future. There are numerous opportunities to become involved in SCF, and we encourage you to contact us about how you can contribute.

This, our inaugural annual report, summarizes what we have done this year to further our goals of promoting reproducibility and reliability in all branches of science, and helping researchers be more productive.

The Steering Committee

Software Carpentry Foundation Strategic Planning

The Software Carpentry Foundation Steering Committee held a strategic planning meeting in August. In that two-day, intensive meeting, we focused on developing a long term strategic plan for the Software Carpentry Foundation. The process emphasized identification of our stakeholders and mission. It also used the results of [our community survey](#) to identify our strengths and weaknesses as well as the opportunities and threats that face the organization. The resulting Strategic Plan was developed over the course of the in-person meeting and summarized into a document. With vital feedback from the Advisory Council, whose role is to offer advice and guidance to SCF on strategic matters, we arrived at the document that now resides [on our public repository](#).

One highlight is our brief Mission Statement:

We aim to teach skills that promote reproducibility and reliability in research. To accomplish this, we focus on educating and supporting instructors, developing curricula, and running workshops.

Based on Strengths, Weaknesses, Opportunities, and Threats identified by the community, as well as a lengthy assessment of our stakeholders and mission, the Steering Committee arrived at the following major strategic issues that will be our primary focus for the near term. Some of the nearest-term goals have already moved forward since the development of the plan (such as the new website design, which contributes to reporting and transparency).

- Reporting and Transparency
- Documentation of Procedures
- Instructor Pipeline Management
- Coordination with Data Carpentry

More information about the detailed meaning of these issues can be found [in the document itself](#).

Rather than be a top-down declaration of our goals as a foundation, we intended this document to capture what we understood to be the ideas and missions of *you*, our community. As you look over this document, we hope you won't hesitate to provide feedback that will help SCF clarify its mission, nurture its strengths, and reach its aspirations.

SCF Committee Reports

The following committee reports describe the efforts and achievements of SCF staff and committee volunteers, and our plans for the coming year. We hope you enjoy them!

Instructor Training Committee

This has been another busy year for our instructor training program. We have tried several new approaches and learned many valuable lessons.

Between February and April, we ran the largest online multi-week version of the Software Carpentry instructor training ever. Hundreds of exercises and comments were submitted, and the course completion rate was good, but the consensus among participants was that GitHub isn't suitable as a course coordination platform.

We also ran several two-day versions of the instructor training course, both in person and over the web. We were pleasantly surprised by how well the latter worked: so long as participants were co-located (either all at one site or grouped in two or three sites), they seemed to get almost as much out of virtual instruction as they would have out of in-person instruction. Here, the two big lessons for us were to accommodate people's time zones (i.e., not require either the learners or the instructor to wake up too early or stay up impossibly late), and the importance of having at least a few people at each site who had been through workshops themselves, and so had hands-on experience of how sticky notes, Etherpads, and live coding work.

Based on feedback from participants in these classes, and on discussions with partners, we decided to pilot two new approaches to instructor training starting in October. The twin goals were to engage trainees with the existing instructor community more effectively, and to start scaling the program by training more

instructor trainers. The first pilot used the multi-week format, but had four peo-



ple assisting in delivering the course (all of whom are going to be teaching it themselves in the months to come). The second pilot, in December, used the compressed two-day format, but had an open ballot process through which groups could self-assemble and sign up to take part.

The biggest change, though, was that instead of having learners finish by submitting a small change to a lesson and doing a five-minute online teaching demonstration, these pilots required them to take part in mentoring sessions, during which they are paired with seasoned instructors to walk through the existing lessons. At the end of that, they are required to teach a one-hour mini-lesson while being observed by their mentor.

We are also (finally) writing up the instructor training course as a reusable lesson, which will be available for comment in January.

When Software Carpentry delivered its first class, back in 1998, we used slides and hour-long lectures because that was the only teaching method we knew. Today, seventeen years later, our classes are significantly more effective (and more enjoyable) because they use better methods. In the long run, introducing hundreds of researchers all over the world to those methods may have just as big an impact as teaching people how to program.

Finance Committee

Financial report, as of mid-November 2015 (all amounts in USD):

Category	Amount
2015 Income	
Memberships	\$125,470.00
Workshops	\$108,670.00
Misc	\$53,117.00
Total Income	\$287,257.00
Cash Received	\$234,644.00
Outstanding Invoices	\$50,612.00
2015 Expenses	
NumFOCUS	(\$19,766.16)
Bank Fees	(\$125.00)
Executive Director	(\$75,252.81)
PayPal	(\$545.66)
Project Expenses	(\$33,954.31)
Total Expenses	(\$129,643.94)
Balance	\$107,001.00
(only about \$57,000 available because of outstanding invoices)	

Assessment Committee

Most educators accept it, and we've known for a long time, that assessment is a non-negotiable component of teaching — it's ostensibly easy to teach, but only assessment can let us know if we are teaching well. The challenge of assessment for Software Carpentry (one that we are always looking for feedback on how to address) lies in the fact that we are not a standard classroom. Some distinguishing characteristics of our instruction include:

- We have a brief instructional period (2 days vs. one semester).
- Our educators have deep domain knowledge, but run the gamut of instructional experience (from on-

ly having been trained by us, to teaching Software Carpentry with years of formal instructional experience).

- We don't have access to the full range of traditional assessment tools (quizzes, midterms, finals).

There aren't widely accepted and standardized ways to evaluate workshops like ours. We apply evidence-based teaching techniques designed for the classroom, but in some ways, we better resemble science museums or libraries that try to teach within very short exposures, or where learning is prompted by

an exposure but takes place after interaction with students.

In 2015 we took a significant stab at re-organizing how we assess our learners. We have high hopes of addressing many of these issues in 2016, but this year we focused on developing tractable assessments that could help us answer some pressing questions:

- Do we create a learning environment that is welcoming and inclusive?
- Can we generate feedback for our instructors that will help them improve?
- What do learners think they know before and after our workshops?
- Are we lowering anxieties and barriers to learning the topics we teach; are we motivating learners?
- What positive outcomes do learners attribute to their Software Carpentry experience?
- Who are our learners, and are we setting and meeting goals for diversity?

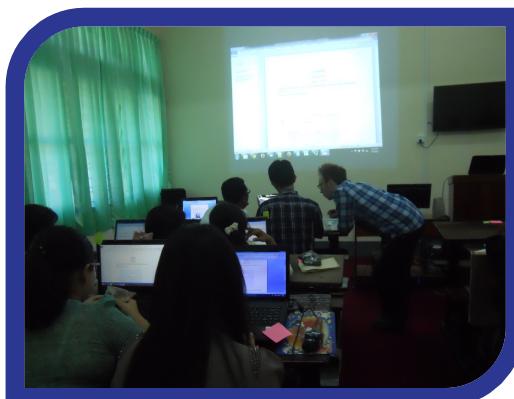
We think these are reasonable questions given our context and constraints. We know that two-day workshops are not going to change learners into experts, but we do think we can set a lot of learners down the path to competency within the best practices of software use in their respective sciences.

The assessment committee put many hours into making decisions about which technology to use to capture this information, and into designing the questions. The result of this work was three surveys — pre-workshop, post-workshop, and long-term follow up — which we deployed in the last weeks of 2015, and which you can preview at the links below:

[Pre-workshop Survey](#): Collects basic information about learner capabilities and attitudes.

[Post-workshop Survey](#): Collects feed-

back on the perceived effectiveness of



the workshop, learner motivation, and confidence.

[Long-term Survey](#): Determines impacts and outcomes for learners after attending a workshop.

Our goal is to have a few thousand responses by mid-2016 that will help us address the questions we identified above.

We welcome community feedback on these survey questions, and also hope to publish semi-annual summaries through our blog.

The assessment committee's next task is to turn the collected data into insights on improving our instruction, workshop experience, and future assessment. We are also working on ideas for better collecting formative assessments during the workshops, to give instructors and learners real-time feedback.

Special recognition goes to the assessment committee who made this work possible, including Daniel Chen and Jeramia Ory who helped lead the committee along with Jason Williams. Rayna Harris and Blake Joyce also provided consultation and many comments on the final drafts of the surveys.

Mentoring Committee

The Mentoring committee creates opportunities for members of the community to interact with each other, and share

experiences, ideas, suggestions and fears. The committee also helps instructors deliver workshops.

Our first initiative, which we continue to run, is the bi-weekly debriefing sessions at which instructors who have taught recently talk about their workshops. To date, we have hosted 21 debriefing sessions. After the first few debriefings, we began inviting instructors of upcoming workshops, so they could try to avoid issues that happened at the past workshops. The debriefings had an average attendance of six instructors, and members of the Mentoring committee that hosted the debriefings are happy with the opportunity to meet and talk with their peers.

Bill Mills and Tiffany Timbers, both members of the committee, lead the organization of the first ever Software Carpentry and Data Carpentry Help and Instructor Retreat, in the middle of November, with 17 local meetups in North America, Europe and Australia, 14 sessions broadcast globally via Google Hangouts on Air, and many people participating remotely by watching and asking questions at the global broadcast sessions.

The Mentoring committee was also involved with the rebooting of Instructor Training, which will help new instructors get familiar with the Software Carpentry and Data Carpentry lesson decks and deliver their first lessons, starting in 2016.

The Mentoring committee plan for 2016 includes: hosting the bi-weekly debriefing sessions and possibly offering more days and times; hosting help sessions



for instructors who will teach workshops in the future; and organizing another retreat (because the first was amazing).

Thanks to each member of the Mentoring committee for their amazing work this year. Also thanks to all Software Carpentry and Data Carpentry instructors, because we couldn't do anything without them.

Lesson Organization and Development Committee

The Lesson Organization and Development committee oversees and directs development, organization, and maintenance of the Software Carpentry curriculum materials. Our primary task for 2015 was to develop a plan for writing new novice and intermediate Python lessons. The programming lessons are often the main draw for students attending SWC workshops and we're excited to take part in developing new lessons that are designed to teach Python and best practices.

Members of the committee met in two very productive video sessions to sketch out our goals and create guidelines for the eventual lesson authors. The results are summarized in this blog post: <http://software-carpentry.org/blog/2015/11/python-lesson-rewrite.html>

Communications Committee

The objective of the Communications committee is to improve communication about SCF activities to our membership and partners. We are excited to present this year's annual report, and will produce future reports for SCF, as well as increasing communication in various other ways. In collaboration with our Program Coordinator, Maneesha Sane, we will also publish a monthly summary of recent and future SCF activities.