

## **Charter for Foundations for Research Computing**

Finalized September 24, 2018

As a result of discussions at the annual review by the Research Computing Executive Committee (RCEC) of the Shared Research Computing Policy Advisory Committee (SRCPAC) in May 2017, the RCEC asked SRCPAC to investigate whether there existed a significant unmet need to augment the computational skill sets of graduate students. SRCPAC formed a Training Subcommittee to evaluate the issue and make recommendations.

The Training Subcommittee presented its findings and recommendations<sup>1</sup> to the RCEC one year later at its annual meeting on May 24, 2018. The RCEC determined to support the creation of a program – *Foundations for Research Computing* – to address the perceived need to provide non-credit opportunities to develop computational skill sets.

To initiate the *Foundations* program in time to organize boot camps for graduate students prior to the Fall 2018 semester, a “*Memorandum of Understanding to Establish Phase I of Foundations for Research Computing*” (Appendix A) was agreed to and signed by G. Michael Purdy as EVP for Research, Ann Thornton as Vice Provost and University Librarian, Mary C. Boyce as Dean of the Fu Foundation School of Engineering and Applied Science, David Madigan as EVP and Dean of the Faculty of Arts and Sciences, and Gaspare LoDuca as Vice President and CIO of CU Information Technology. This Charter further elucidates the purpose and structure for *Foundations*.

### **Foundations for Research Computing: Purpose and Mission**

Computation has become deeply ingrained in nearly every aspect of research, and traditional curricula do not evolve fast enough to optimally prepare students to exploit current and emerging practices in computation. Surveys of both departments and graduate students demonstrate a need to support graduate students across the University interested in developing fundamental skills for harnessing computation, such as core languages and libraries, software development tools, best practices, and computational problem-solving. *Foundations* organizes and supports not-for-credit activities to augment graduate student training and engagement. The episodic boot camps, workshops, and help sessions contemplated for *Foundations* are explicitly not a substitute for the courses of study and for-credit classes offered by Columbia’s schools and institutes.

### **Governance and Reporting Lines**

As discussed at the May 24, 2018 meeting of the Research Computing Executive Committee, and articulated in the MOU, this initiative will involve substantial coordination with existing education and training programs in SEAS, DSI, and A&S, as well as the involvement and guidance from Columbia Libraries, CU Information Technology, and the Office of the Executive Vice President for Research. Two Committees will support the development of this program:

An Advisory Committee will review the development of the proposed program and report to the RCEC no less often than annually. Voting members of the Committee will include the Chair of SRCPAC, the Chair of the Training Subcommittee (who shall now serve as Chair of the Advisory Committee), and representatives from the major financial supporters, initially Arts and Sciences, Engineering and Applied Science,

---

<sup>1</sup>The Presentation can be found on the SRCPAC website. <https://research.columbia.edu/system/files/ORI/RCEC%20Presentation%20Slides%20-%20Spring%202018.pdf>

 COLUMBIA UNIVERSITY  
Foundations for Research Computing

Office of the Executive Vice President for Research, CU Information Technology, and Columbia University Libraries. Members will serve for a three-year term commencing July 1<sup>st</sup>; and,

To support the Research Computing Program Coordinator (RCPC), a Coordination Committee reporting to the Advisory Committee will include administrative representatives from Columbia Libraries, CU Information Technology, and the Office of the Executive Vice President for Research, who will serve terms as decided by their individual supervisors. It is anticipated that this committee shall meet monthly during at least the first year.

Any changes over \$1,000 from the approved budget shall be reviewed and approved by the Coordination Committee. Any changes over \$10,000 shall be reviewed and approved by the Advisory Committee.

### **Keystone Activities**

The inaugural *Foundations* program encompasses five primary activities:

- Pre-semester [Boot Camps](#) for computational tools and methods such as Unix shell, Git, R, and Python
- Monthly [Distinguished Lectures in Computational Innovation](#) speaker series
- Weekly, Morningside-based [Research Computing Office Hours](#) wherein students receive hands-on support with their computational challenges
- Monthly [workshops](#)
- An annual [symposium](#) for student researchers who apply computational methods to their disciplines

### **Membership/Audience**

In order to develop a robust and high-quality program, *Foundations* shall initially focus primarily on graduate students, although certain activities such as the Distinguished Lectures shall be open to all Columbia University faculty, students, postdocs, and staff. The Advisory Committee may recommend and the RCEC may consider expanding *Foundations* offerings such as boot camps and workshops to broader audiences as the need and ability to fulfill the demand is demonstrated.

### **Staff**

A full-time Research Computing Program Coordinator (RCPC) will be housed within Columbia University Libraries, reporting through the Digital Scholarship division to the Associate University Librarian for Research and Learning. The RCPC shall be responsible for the initiation and smooth administration of the aforementioned keystone activities, preparation of and monitoring of the budget, and evaluation of the programs. The RCPC will staff both the Coordination Committee and the Advisory Committee. The RCPC will draft the annual report that the Advisory Committee makes to SRCPAC and the RCEC.

### **Financial Model**

The MOU establishes funding for the inaugural year of *Foundations*, with the understanding that this first exploratory year will provide information on both demand across the University, and actual expenses incurred, to help refine the financial model going forward. The MOU signatories committed to revisiting the model in Spring 2019 to identify a funding model to continue the program.

For FY2018, specific commitments included:


**COLUMBIA UNIVERSITY**  
 Foundations for Research Computing

Unit	Annual Amount	3-Year Amount	Purpose
Columbia Libraries	~\$100,000	~\$300,000*	Full-time Coordinator salary and fringe
Arts and Sciences	\$25,000	TBD	Participation of A&S students
Engineering and Applied Science	\$25,000	TBD	Participation of SEAS students
Office of the EVP for Research	\$50,000	TBD	Support of interdisciplinary need

Columbia University Libraries will support a full-time Research Computing Program Coordinator (job description as Appendix B), whose time is dedicated to the *Foundations for Research Computing* program, housed within their Digital Scholarship division for the 2018-2019 fiscal year. Columbia University Libraries will continue to support this salary line for three years, contingent upon the receipt of an annual operating budgets from other entities.

Columbia Libraries and CU Information Technology will also annually identify altogether six full-time staff to be formally trained as Instructors via *The Carpentries*<sup>2</sup>, with the intention of building a robust staff of Instructors across the University. Each Instructor will commit to teach Boot Camps for one week in August or September, and one week in January or February. They will also attend Instructor business and discussion meetings, and provide guidance for additional workshops, research computing office hours, eventual curriculum development, and evaluation measures. Other commitments are outlined in the MOU.

---

<sup>2</sup>The *Software Carpentry Foundation* and its sibling lesson project, *Data Carpentry*, is a non-profit organization that provides training and open-source lessons to teach researchers practical computing skills. Columbia joins many university institutional partners, which can be found on its site: <https://software-carpentry.org/about/>

Appendix A: *Foundations for Research Computing* Memorandum of Understanding

At the annual Research Computing Executive Committee meeting on May 24, 2018, the Training Subcommittee of the Shared Research Computing Policy Advisory Committee delivered their report of their year-long examination of the needs expressed both by Morningside departments and students for training, and recommended a multi-phased approach to addressing the perceived gaps.

To support the Year One Start-Up phase of *Foundations for Research Computing* to address the perceived need to provide non-credit opportunities to develop computational skill sets, the undersigned agree to the following commitments, governance model, and preliminary approach to determining the funding model. This MOU will be continuously revisited at or prior to the annual meetings of the Research Computing Executive Committee.

**COMMITMENTS**

Unit	Annual Amount	3-Year Amount	Purpose
Columbia Libraries	~\$100,000	~\$300,000*	Full-time Coordinator salary and fringe
Arts and Sciences	\$25,000	TBD	Participation of A&S students
Engineering and Applied Science	\$25,000	TBD	Participation of SEAS students
Office of the EVP for Research	\$50,000	TBD	Support of interdisciplinary need

\*Columbia Libraries will support a full-time Coordinator whose time is dedicated to the *Foundations for Research Computing* program, housed within their Digital Scholarship group. They will support this salary line for the 2018-2019 fiscal year. Supporting this salary line past June 2019 is contingent upon their receiving future annual operating budgets from the other undersigned entities.

Furthermore, the following units agree to the following terms:

- Columbia Libraries and CU Information Technology will together *annually* identify six full-time staff to be formally trained as Instructors via *The Carpentries*. The intention is to build a robust staff of trainers. Each trainer will commit to teach Boot Camps for one week in August or September, and one week in January or February. They will also attend trainer business and discussion meetings, and provide guidance for additional workshops, help desk events, eventual curriculum development, and evaluation measures.
- Columbia Libraries will commit the use of a room – precise location to be determined – on one afternoon per week for running the Help Desk.
- CU Information Technology will work with Software Carpentry on the contract negotiations, working closely with Columbia Libraries.
- All Boot Camps, Workshops, Distinguished Lectures, Symposiums, and other affiliated programming will be announced to all graduate students. Attendees will register on a first-come/first-served basis.

**GOVERNANCE**

As discussed at the May 24, 2018 meeting of the Research Computing Executive Committee, this initiative will involve substantial integration with existing education and training programs in Arts and Sciences, the Data Science Institute, and Engineering and Applied Science, as well as the involvement and guidance from Columbia Libraries, CU Information Technology, and the Office of the Executive Vice President for Research. Two Committees will support the development of this program:

An Oversight Committee<sup>3</sup> will review the development of the proposed program and report to the RCEC no less often than annually. The Committee will include the Chair of SRCPAC, the Chair of the Training Subcommittee, and faculty representatives from Arts and Sciences and Engineering and Applied Science, and a representative of the Office of the Executive Vice President for Research, CU Information Technology and Columbia Libraries; and,

A Coordination Committee, reporting to the Oversight Committee, will include administrative representatives from Columbia Libraries, CU Information Technology, and the Office of the Executive Vice President for Research. This Committee shall meet monthly during at least the first year.

## FINANCIAL MODEL

The members of the RCEC will underwrite Year One of *Foundations of Research Computing* as indicated above, with the understanding that this exploratory year will provide information on both demand across the University, and actual expenses incurred, which will help to refine the financial model going forward.

ALL PARTICIPATING UNITS – COLUMBIA LIBRARIES, CU INFORMATION TECHNOLOGY, ARTS AND SCIENCES, ENGINEERING AND APPLIED SCIENCE, AND THE OFFICE OF THE EXECUTIVE VICE PRESIDENT FOR RESEARCH COMMIT TO REVISIT THIS MEMORANDUM IN SPRING 2019 TO IDENTIFY A FUNDING MODEL FOR CONTINUING THIS FOUNDATIONS PROGRAM PAST ITS INITIAL FIRST YEAR, IN PARTICULAR FOR THE THREE-YEAR PHASE I PROPOSED BY THE SRCPAC TRAINING SUBCOMMITTEE.



---

G. Michael Purdy  
Executive Vice President for Research



---

Ann Thornton  
Vice Provost and University Librarian, Columbia Libraries



---

Mary Boyce  
Dean, The Fu Foundation School of Engineering and Applied Science

---

<sup>3</sup> Renamed the Advisory Committee on the *Foundations* website



---

David Madigan  
Executive Vice President and Dean, Faculty of Arts and Sciences



---

Gaspare LoDuca  
Vice President and Chief Information Officer, CU Information Technology

CC: Shih-Fu Chang, The Fu Foundation School of Engineering and Applied Science  
Peter deMenocal, Faculty of Arts and Sciences  
Kim Bregenzer, The Fu Foundation School of Engineering and Applied Science  
Scott Norum, Faculty of Arts and Sciences  
Ellen Binder, Faculty of Arts and Sciences  
Victoria Hamilton, Office of the Executive Vice President for Research  
Kathy Zeigerson, CU Information Technology  
Jeannette Wing, Data Science Institute  
Gaspare LoDuca, CU Information Technology  
Barbara Rockenbach, CU Libraries  
Rob Cartolano, CU Libraries  
Kris Kavanaugh, CU Libraries  
Justin Pearlman, Office of the Provost  
Halayn Hescoek, CU Information Technology  
Marc Spiegelman, Shared Research Computing Policy Advisory Committee  
Chris Marianetti, Shared Research Computing Policy Advisory Committee

## Appendix B: Job Description of Research Computing Program Coordinator

The Research Computing Program Coordinator will lead the activities of the Foundations for Research Computing Program, training Columbia graduate students in the data sciences and overall computational literacy. The Program Coordinator will advance programming and special events for graduate students in close cooperation with Columbia University Libraries, Columbia University Information Technology, and the Office of the Executive Vice President for Research. The Program Coordinator will identify training needs, promote related resources for graduate students, and develop a comprehensive program to support those needs. The Program Coordinator will work with volunteer instructors for training and scheduling to plan and facilitate workshops, boot camps, as well as events such as lectures and symposia. The Program Coordinator will also oversee related consultative “office hour” services and web and marketing communications. The Program Coordinator will additionally maintain continuous relationships and communications channels with University-wide academic departments in order to survey leadership, faculty, and students about their ever-evolving needs for computational literacy, and methods for meeting these expressed needs. The Program Coordinator will supervise undergraduate and graduate student workers, and serve as Columbia’s representative on *The Carpentries*’ membership council.

Reporting to the Director of Digital Scholarship within Columbia University Libraries, the Research Computing Program Coordinator will work closely with advisory groups comprising faculty and administrator stakeholders and will provide regular reports to the faculty-led Shared Research Computing Policy Advisory Committee. Please note this is a three-year position, with the possibility of extension.

### General Responsibilities

- Plan and execute pre-semester boot camps in partnership with The Carpentries and other external training organizations; organize registration, departmental participation, and assessment. Represent Columbia University on The Carpentries’ members council.
- Organize a monthly Distinguished Lecture Series in Computational Innovation, including recruiting guest lecturers and collaborating with campus partners to coordinate events.
- Organize monthly workshops in applied topics related to data science, high-performance computing, and computation.
- In close coordination with the Office of the Executive Vice President for Research, plan an annual research symposium with faculty, student, staff, and leadership participation.
- Coordinate an advisory committee of faculty and senior administrators governing the program activities and identifying resources for success.
- Develop and moderate web content pertaining to training graduate students in the data sciences.
- Develop an “Office Hours” service, staffed by graduate and undergraduate student interns, for students to utilize when solving problems with the applications of data science techniques to their research.
- Coordinates internal and external communications, administrative contacts, and databases.
- Present at regular meetings of the Shared Research Computing Policy Advisory Committee.
- Supervise graduate and undergraduate interns
- Other responsibilities as assigned.

### Required Qualifications

- At least three years related work experience.
- Bachelor’s degree required.
- Experience planning events, training sessions, or other community engagements.
- Prior experience in computation and/or a highly-quantitative discipline.

- Full proficiency in the Microsoft Office suite, specifically Word, Excel, and PowerPoint.

Preferred Qualifications

- Graduate degree strongly preferred.
- Familiarity with high-performance computing systems and the research tools commonly deployed.
- Knowledge of programming languages such as R, Matlab, and/or Python used in introductory computational literacy instructions.
- Understanding of current issues, trends, and approaches to supporting computational literacy in higher education.
- Excellent organizational, verbal/written communications and interpersonal skills; must be customer service-oriented, a team player, and self-starter.
- Strong project management skills with demonstrated ability to work independently, to track and manage multiple projects simultaneously and to meet deadlines.