Application for DC Grant Funds

Purpose

The purpose of Disciplinary Communication Grants (DCG) is to enhance writing proficiency and accomplishment within majors by promoting innovation and assessment of new approaches to DC education.

Example projects:

- ☐ Undertake a formal analysis of the existing DC offering to inform plans for the future
- ☐ Facilitate collaborations with the Writing Program
- ☐ Launch a writing tutoring program
- ☐ Create an online or technology-assisted course
- ☐ Develop a new course or DC pathway in the major
- ☐ Support graduate students assisting underprepared or ESL students

Proposals must be approved by the department or program chair and Dean.

Please submit via email to the Academic Senate Office, senate@ucsc.edu by Friday, December 22, 2017 or March 29, 2018.

If awarded, funding will be available on July 1, 2018 and reports will need to be submitted the following year on July 1, 2019.

1. Proposed title for Disciplinary Communication Grant:
2. Department/Program:
3. Amount requested:
4. Number of students affected:
5. Overview of the program's DC requirement:
6. What is proposed?
7. What problem will this proposal solve?
8. How does the DC fit within your program's learning outcome goals?
9. Detailed budget: (you may attach additional spreadsheet)
10. Assessment Plan: How will the effectiveness of this change be measured?
11. Sustainability: How will this innovation be continued without DCG funding?

Recommended by (or attach dated email approval)

_____ _____

Dept. Chair or Program Director Date

_____ _____

Dean Date

Approved by CEP month/day/year

Ecology and Evolutionary Biology Disciplinary Communication Grant Application

Robin Dunkin, EEB, Assistant Teaching Professor,
Laurel Fox, Professor, EEB, Undergraduate Curriculum Committee
Mark Carr, Professor, EEB, Chair, Undergraduate Curriculum Committee
Jody Greene, Center for Innovations in Teaching and Learning

1. Program Title:

Improving Undergraduate Scientific Writing Through Enhanced Training of Graduate Student and LSS Tutors in DC Courses in Ecology and Evolutionary Biology

2. Department/Program:

This project is a collaboration between the Ecology and Evolutionary Biology Department (Division of Physical and Biological Sciences), the Center for Innovations in Teaching and Learning, and Learning Support Services

3. Amount Requested

We are requesting a budget of $18,007 to cover the development of a scientific writing rubric to be used across DC courses (20 total in our department after the transition), curriculum development for graduate student and LSS training, funds for graduate students and LSS tutors to attend the training, and 6 additional LSS tutors to assist with the increased workload of the additional DC courses that we must cover while we transition from two large lecture courses (600+ students per year) to 20 smaller upper division lab courses (600+ student per year).

4. Number of Students Affected

Over the course of the academic year, we offer 20 courses that are designated as DC. Several of these courses are offered multiple times per year. During the transition period to our new DC courses (see below) we have two additional large lecture courses that will meet this DC requirement. These large lecture courses are both offered every quarter and enroll 125 students each. Thus, for the transition period, we have the majority of our total enrollments taking DC courses, many taking multiple DC courses in one academic year. We estimate that this will result in 600+ students being impacted by this proposal during the academic year covered by this proposal.

This proposal will also directly impact 30-40 graduate students and 12 undergraduate LSS tutors who will be supporting these DC courses as Teaching Assistants. Beyond the year of the grant, the curriculum we intend to develop will continue to be used in our graduate student professional development program and therefore will continue to impact both graduate students and undergraduate students in future years.

5. Overview of the Program's DC Requirement

The Ecology and Evolutionary Biology Department strives to impart in our undergraduate students the skills to both read and critically interpret scientific literature and to become skilled writers of scientific papers themselves. This goal is at the heart of our program's DC requirement. Prior to academic year 2017/2018, the DC requirement was met through completion of the two core courses required for all EEB majors, Ecology and Evolution (BIOE 107 and BIOE 109). Recently, in recognition that (i) there were a number of upper division courses in which students were already doing the amount of writing that satisfied the DC requirement but were not designated as DC, and (ii) students receive more direct, in-depth feedback in the smaller upper division courses, we shifted our DC courses from the large BIOE 107 and BIOE 109 courses to the 20 smaller upper division courses. This change has several key benefits for our undergraduates beyond increasing the flexibility in how they satisfy the DC requirement during their tenure in our program.

The expansion of the DC courses in our program was largely the result of inclusion of the upper division 5 unit laboratory intensive courses. Thus, a key benefit is that writing assignments will more authentically represent the way writing is most often done as part of the scientific process, mirroring the development of hypotheses, collection and analysis of data, using evidence to support a claim through scientific reasoning and use of literature. The second key benefit is that this writing will also be done in the smaller sections of laboratory courses supported by a graduate student teaching assistant rather than a large lecture style course with less TA support. Together these benefits mean that students will be practicing authentic scientific writing with more access to expert assistance through the process.

6. What is Proposed

Our three main goals for this proposal are to (i) develop a sustainable model in which we can provide more in-depth feedback and writing support for our undergraduate students, (ii) provide professional development for our graduate students teaching scientific writing, and to (iii) provide increased support for faculty, graduate students, and undergraduate tutors teaching new DC courses as we undergo the transition from large lecture to upper division labs. To meet these goals we propose the development of an EEB Writing Support Program with three main components:

(1) Development of a common rubric, based on previously developed writing guidelines and with additional faculty input, to assess writing skills, decoupled from content. This rubric can be used by faculty and graduate students in all DC courses as well as other EEB courses with significant writing components.

(2) Professional development for graduate students and undergraduate LSS tutors supporting DC courses through quarterly in-depth workshops and TA-LSS mentoring.

(3) The funding for 6 additional LSS tutors to assist in covering our department during the transition phase of our DC requirement.

The specific details of each of these components is outlined below.

Component 1: Development of a Department Scientific Writing Rubric
While our department has previously developed detailed writing guidelines for undergraduates and graduate students, we propose to build upon these guidelines to develop a comprehensive rubric for scientific writing within the disciplines of ecology and evolutionary biology. The development of a common rubric in which writing is decoupled from the course content and can thus be applied across courses, will facilitate more continuity in how students experience and develop their writing skills as they move through our program. Writing is a skill best developed over time, yet in a quarter long course, it is difficult for both instructors and students to move through the writing cycle of writing, feedback, and revision often enough to see improvement. By adopting a common rubric that students will see through multiple courses, we hope to make the development of the skill of scientific writing a common, continual thread throughout a student's time in our program.

A common rubric will also be key in training graduate student and LSS tutors about how to provide quality feedback on scientific writing even while working across multiple courses that they may be supporting at any given time.

The development of the rubric will be led by Robin Dunkin but will be a collaboration among the undergraduate curriculum committee (especially Laurel Fox and Mark Carr) and all faculty that teach the DC courses. This rubric will also be used as part of our PLO assessment (see below). We will consult with writing faculty colleagues as necessary to ensure that we are able to develop a rubric that is both robust and flexible enough to use across courses.

Component 2: Professional Development for TAs an LSS tutors in Scientific Writing
Beginning in early Fall of 2018, Robin Dunkin will offer the first of 4 half day workshops for graduate student teaching assistants and undergraduate LSS tutors that will be supporting the DC courses for Fall 2018 quarter. These workshops will focus on key aspects of good scientific writing as well as help TAs and LSS tutors understand how to effectively guide individual students through the process of writing. We will also address specific challenges and solutions for assisting English Language Learners in developing their scientific writing skills. The curriculum for these workshops will be developed in consultation with the Center for Innovative Teaching and Learning (CITL) and Learning Support Services (see letters of support) as well as EEB faculty and graduate students with experience in the writing intensive courses offered in our department.

In addition to the initial training workshop, a mid-quarter meeting of all TAs and LSS tutors for DC courses offered in that quarter will be facilitated by one of the faculty instructors of the DC courses. This 2 hour meeting will focus on looking at student work and the feedback provided

by TAs and LSS tutors to discuss strategies and challenges that they have encountered so far in the quarter. A secondary goal of this mid-quarter meeting is to encourage an informal learning community around teaching scientific writing for the graduate students and undergraduate tutors. Graduate students will be encouraged throughout the quarter to provide mentorship for the LSS tutors that they are working with by looking at student papers and coordinating the feedback and assistance that they are giving students. This aspect provides opportunities for graduate students to practice their mentorship skills, provides ongoing support for the LSS tutors, and importantly, ensures ongoing coordination between LSS tutors and TAs to better support individual students in their section.

Component 3: Additional LSS support during the transition year

During the year in which students still have catalogue rights to the two large lecture courses that previously counted as DC courses while also offering the 20 newly designated DC courses, we will have an immense demand for writing support for our students. We have already identified scientific writing as a key area where we want to improve our program. Indeed, this is what has led us to transition the DC courses to smaller classes. Currently, Learning Support Services can provide us with up to 6 tutors per academic year. This amounts roughly to 100 students per tutor, a ratio that is does not come close to meeting the demand for assistance.

We propose to fund 6 additional LSS tutors, all of whom would attend the training described above. These tutors would help us support our undergraduates and faculty during the transition year. We also believe that the additional support will provide us with critical information about whether significantly increased support along with improved training can make a meaningful difference in the writing quality that we see in our students over their tenure in our program. Should we see significant improvement, as we anticipate, we intend to use this information to garner additional resources either from within or outside the department to sustain a higher level of near peer writing support for our program.

Timeline

Winter & Spring 2018	Collection of writing samples from students in DC courses to assist in rubric development and for pre-assessment
Summer 2018	Development of rubric and curriculum for writing training for graduate students and LSS tutors
Fall 2018	First training for graduate students and LSS tutors; hiring of 2 additional LSS tutors along with 2 provided by LSS
Winter 2019	Second training for graduate students and LSS tutors; hiring of 2 additional LSS tutors along with 2 provided by LSS; first assessment of pre and post writing using a blind review process
Spring 2019	Third and Fourth (for summer) training for graduate students and LSS tutors; hiring of 2 additional LSS tutors along with 2 provided by LSS; second assessment of pre and post writing using a blind review process; program evaluation

7. What Problem will this proposal solve?

We aim to solve three problems with our EEB Writing Support Program. First, we have identified scientific writing as a key area where we need to provide more support for our undergraduate students. Scientific writing is a vital skill itself and is also important for reinforcing critical thinking and learning content. Writing of any kind requires students to undergo the writing cycle of writing, feedback, and revision. Providing the level of support to give every student the detailed feedback they need to move through this cycle is challenging at best. This proposal will assist us in providing a higher quality, cohesive curriculum around scientific writing across all of our courses while also providing training to graduate students and tutors that will most directly interact with our students through the writing cycle.

A second problem this proposal aims to solve is that the number of instructors that will now be responsible for DC courses has increased from eight per academic year to over twenty. The number of graduate students that are going to support DC courses as teaching assistants has also gone up three-fold. The increase in number of faculty and graduate students that are now teaching a DC course means there is greater opportunity for differences in how writing is taught and supported across these courses. This proposal seeks to set a standard through use of a common rubric and across the board enhancement of graduate student and LSS tutor training that will help undergraduate students experience the development of their writing skills as a continuum from one course to the next.

The third problem we aim to solve with this proposal is a lack of professional development around teaching in general and teaching writing skills more specifically, for graduate students in our department. We are currently working toward a more formal teaching professional development program for our graduate students and we view the teaching of writing skills as a central component of that professional development. If funded, this proposal would significantly improve our ability to dedicate time, thoughtful consideration of pedagogy, and a framework for assessing our gains in this area that would complement our current efforts.

8. How does the DC fit within your program's learning outcome goals?

Developing proficiency in critical evaluation of scientific literature and writing of scientific papers is a core PLO in our department. We also see the development of excellent scientific writing as broadly supportive of all of our PLOs because writing can be tool to elicit logical thinking and critical evaluation of data. Indeed, writing in a number of forms is a key assessment tool in the vast majority of our courses. The EEB Writing Support Program we propose here directly supports our PLOs and we have intentionally set up a plan for assessment (see below) that will integrate with the current development of our department PLO assessment plan. We believe this is an ideal time in this process to implement a more comprehensive strategy for supporting the development of writing skills in our students because we are already in the process of assessing the full set of EEB PLOs and can quantitatively determine using a pre and post intervention assessment, how well this program is working.

9. Detailed Budget

Budget Item	Time/quantity	Requested DC Grant Funds	Requested EEB Department	Total
Faculty Mentor, Teaching Professor Summer Salary**	0.86 months	$8,054.00		$8,054.00
TA stipends (37 grads/per year)	37 x $150 stipend for workshops		$5,550.00	$5,550
Additional LSS Tutors for Transitional Year (6)	6 x $1,133	$6,798		$6,798
LSS Tutor Training (12 total)	12 x 4hrs x 15.71/hr	$755.00		$754.08
Lunch for TA/LSS Trainings	4 workshops for total 52 people over 1 year (37 TAs, 12 LSS Tutors, 1 instructor)	$393.00		$400.00
~~Materials for Trainings~~		~~$150.00~~		~~$150.00~~
Total Budget		$16,000.00	$5,550	$21,550.00

**To offset the reduction in the faculty mentor's salary, we intend to leverage our anticipated graduate student pedagogy fellow that we will have through CITL next academic year to assist with the workshops and with the implementation of the rubric.

10. Assessment Plan

We will assess our EEB Writing Support Program in several ways. First, we will collect writing samples from students taking DC courses over Winter 2018 and Spring 2018 prior to the implementation of this proposal. These writing samples will be used to assist with development of our new rubric and will be scored independently by four faculty using the new rubric. After implementation of the program, this process will be repeated with the same courses and faculty to determine whether we are seeing gains in the quality of student writing.

The second aspect of our assessment plan is to develop a short survey for faculty, graduate students, undergraduate LSS tutors, and undergraduates in the DC courses to assess the experience of each of these groups specifically in the following areas. First, do they feel supported in teaching and/or learning scientific writing. Second, do they believe the EEB Writing Support Program is effective in improving their teaching/learning of scientific writing. Finally, we will specifically ask about the key elements of our proposal in assisting students with writing. For example, *how often did you meet with an LSS tutor*? *On a scale of 1-6 how important was the feedback you received from the LSS tutor in helping you improve your*

writing? These surveys will be written within our department, but we will seek guidance and feedback from colleagues in the Department of Psychology (Dr. Cam Leaper for example) or Dr. Anna Sher (Director for Assessment and Survey Research) who can ensure that the survey questions meet best practices. The survey may be integrated with assessment of PLOs as described above.

11. Sustainability Plan

We are in the process of evaluating our graduate student professional development of evidence-based teaching practices. We see our graduate students as the key element in helping make this EEB Writing Support Program a success as they have the most individual contact with undergraduate students and provide the feedback necessary to help students improve. Therefore, the main element of our sustainability plan is to use the training and rubric developed in this proposal as a key element of the professional development we ultimately integrate in our graduate curriculum. For example, we may integrate components of the workshops into our core graduate student course, 200A or into a summer teaching workshop. Whether this ultimately is integrated into a course or workshop series, the components we have proposed here will be easily transferable.

We also have a new Teaching Professor (Robin Dunkin) in our department to support undergraduate teaching. Facilitating this type of program long term is well within the scope of her position and will provide a stable and sustained position to oversee the EEB Writing Support in the long term.

While we are proposing funding to hire additional LSS tutors, we anticipate using this year to evaluate whether the increased near peer support is effective in helping us meet our goal of improving undergraduate writing in our department. Using the data from the pre and post writing survey along with the survey data about the LSS tutors, we plan to determine whether to devote additional departmental funds or seek other funding to permanently increase the level of near-peer writing tutors in our department.

APPENDICES

(I) Letter of support and collaboration from Dr. Jody Greene, Director for the Center for Innovations in Teaching and Learning

(II) Letter of support and collaboration from Charis Herzon, Director for Learning Support Services