HCS 6315
Scientific and Grant Writing

Spring 2023 Syllabus
Credits: 3 Credit Lecture

Scheduled Class Meeting Times and Class Location
Tues from 1:00 to 3:45 PM in ECSN 2.120

Instructor and Office Locations
Dr. Benedict J. Kolber BSB 10.566 x7225 benedict.kolber@utdallas.edu

Office Hours
Office hours are by appointment. Please email Kolber.

Course Description
This course is designed to provide graduate students with a complete understanding of the NIH grant writing and review process with a focus on developing scientific writing and editing skills with a final goal of preparing a finished NIH NRSA F31 pre-doctoral proposal. This will be accomplished via a number of different, integrated mechanisms. The bulk of the course will focus on students developing and writing their own F31 applications. The issues addressed here include the generation of a testable hypothesis, the design of experiments to test the hypothesis, and the interpretation of potential outcomes of the experiments proposed. Students will also discuss strategies for developing a fully integrated proposal that addresses the goals and guidelines of a particular funding mechanism. The focus of this course is on the concepts, ideas and strategies of successful grant writing, as well as the mechanics of the writing. Students will present and defend their Specific Aims and Research Strategy that will be written in the format required for the 7-page NIH fellowship application. Additional didactic lectures will cover most of the other required elements of the F31. The course will conclude with a study section-style review of your completed applications.
The grant topic written by the student for this course should ideally be approved by the PhD supervisor and final submission to the NIH will be at their discretion. Students may write projects completely unrelated to their PhD research or can create a project that is in line with their dissertation proposal. Please note that we take plagiarism very seriously and all of the writing must be original writing from you, the student PI, even if you are using source material from your lab and/or supervisor.

Note: NIH F31's are technically restricted to US Citizen's or permanent residents. But ~70% of the documents you will prepare for this course are actually still relevant to lots of other (future) NIH grants you might apply for including K99/F00, KO1, KO8, R21, R01 etc so don't feel like this is a waste if you don't actually submit the grant.

Mentor Involvement
As student will be writing research in topic areas that are varied, it is highly encouraged and recommended that each students PhD supervisor be an active participant. PhD supervisors may be invited to attend some sessions involving student presentations and are highly encouraged to help with editing and crafting of the overall grant*.

* Note: If you are using this grant as a qualifying exam for your PhD program, please make sure you and your PI stay within the bounds of your PhD program guidelines for mentor help on the grant. In other words, if your guidelines say "no mentor help" then that applies here too.

Required Textbooks and/or other Course Materials

Required:

- NIH Application Guide (https://grants.nih.gov/grants/how-to-apply-application-guide.html)
    - SF424 Fellowship Addition (see Bb)
- Example F31 Applications from previous students

Supplemental:

- NIH website (https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm)
- Grant Writers Seminars and Workshops – The Grant Application Writer's Workbook
- Miscellaneous readings provided by the instructor

Educational Technology Requirements

This course will use eLearning/Blackboard as its official course site. All course announcements will be posted to this site. Additionally, course materials designed to help learn the material will also be posted here. All written assignments will be submitted through Blackboard. It is each student's responsibility to check Blackboard on a regular basis.

Examinations, and other Methods of Evaluation

This course requires that students produce numerous written documents including reviews. Many of these assignments must be shared via email (in addition to submission through Bb) with the instructor and members of the class **prior** to specific course meetings. The deadlines are listed in the syllabus below. When indicated or announced, the assignments must be sent to Dr. Kolber prior to the deadline (he will disseminate the work products when appropriate).

All documents will be written using the approved grant format: ½" top, bottom, right, and left margins, single-spaced, 11pt Arial. NO EXCEPTIONS. Figures and tables should be included where appropriate.

20 Written Assignments (240 points): 20 points each (assignments #3, 17, 18, 19), 10 points all other written assignments
5 Critique Assignments (70 points): 10 points each assignment #1-3; assignment #4 and #5 worth 20 points each
2 Oral Presentations (40 points): 20 points each
1 Elevator Pitch (10 points)
Participation/Reading points (50 points)
410 points total

The instructor reserves the right to assign additional assignments as he deems fit.

Grading Policy

Grades will be assigned as follows: A, A-, B+, B, B-, C+, C and F based on the overall grade. (94-100 A, 90-93 A-, 87-89 B+, 84-86 B, 80-83 B-, 77-79 C+, 68-76 C, Below 68 F)

Course Domains, Competencies, Learning Outcomes

Learning Outcomes and Assessment Strategy

1. Students will be able to describe at least four common scientific writing mistakes.
2. Students will be able to analyze written material for mistakes and interpretability.
3. Students will learn about the process of submitting an NIH grant by writing and submitting an NIH F31 Pre-Doctoral Fellowship.
4. Students will enhance and refine their writing skills and grantsmanship through writing a grant and critiquing the grants of other students.
5. Students will gain a better understanding of the NIH grant review process through mock Study Sections.
6. Students will improve their scientific presentation skills by presenting their project to the other students and answering questions.

Assessment of the above learning outcomes will be done through the grant writing and critique process.

Course Objectives

1. Understand the NIH Grant submission process
2. Write an F31 Pre-Doctoral Fellowship Grant
3. Improve grantsmanship and experimental design
4. Enhance science communication
5. Learn how to develop a scientific project and proposal using NIH guidelines

Key Concepts

- NIH Grant Process
- Grantsmanship within scientific writing
- All of the extra parts of grant submission beyond just the proposal

Course Regulations and Expectations

- This course requires active participation of all students involved. Students must have read and completed critiques of other students grants prior to class, when applicable.
- Students will communicate with each other in a respectful manner and critiques should be formatted to be constructive in nature. Students will accept critiques as a learning opportunity and something beneficial to improving their grants and NOT an attack against their science or themselves.
- Students are highly encouraged to utilize the writing center and other campus resources for support in language, grammar, and writing style.

Attendance

You are required to attend this course in-person live (synchronously) each week on Tuesday (note: Tuesday February 14th will be Virtual). Other courses may be re-scheduled as Virtual as needed.

Policy for Missed or Late Assignments
Any Missed or late assignments will not be accepted except in extreme circumstances. Adherence to the deadlines is required as fellow students need time to review many of the documents. In addition, meeting deadlines is crucial to becoming a successful, independent researcher in the age of electronic submission where there are no appeals for late submissions.

Confidentiality
All scientific discussions in this workshop are to be considered confidential. We will be reviewing unpublished and preliminary proposals. It is important that neither the physical documents (electronic or hard copy) nor discussions about the science (other than your own of course) be carried beyond this workshop.

Plagiarism and Cheating
Plagiarism and cheating will not be tolerated. Any evidence of plagiarism and cheating will result in an automatic zero for the assignment and forwarding to the University honor code system and likely dismissal from your PhD program. It is your responsibility to understand what constitutes plagiarism and cheating. If you have questions, ask. Ignorance cannot be used as an excuse. Please university page for related information:
https://www.utdallas.edu/conduct/dishonesty/.

Administrative Policies Governing All Courses
The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus unless otherwise adjusted in this specific course policy described above.
Please see https://go.utdallas.edu/syllabus-policies for these policies.

PLEASE TAKE A MOMENT TO READ THIS

Outline of Course Topics and Lecture Schedule

Named Primary sections or Secondary sections in a NRSA F31-style grant

Date	Topic for Today and Future Assignment(s)	In Class Presentation or Activity	Assignments Due Today
Week 1 (1/17)	Introduction: 1) Grant writing for fun and profit (Powerpoint) 2) NIH study section video https://www.youtube.com/watch?v=lzBhKeR6VIE&t=633s 3) Introduction to F31 format (broad sections of grant); Master Instructions = SF424 4) NIH review criteria – F31 and other Grants 5) Hypothesis vs Prediction 6) Endpoints 7) Specific Aims 8) Biosketch 9) Scientific Writing **For 1/24: 1)** Read and Critique F31s 2) Sign Confidentiality Agreement **For 1/31: 1) Write** NIH Biosketch 2) Prepare Specific Aims Presentation	Lecture by Kolber Discussion and Exercise on "The Science of Scientific Writing" Presentations by PIs	**Prior to class:** Pre-Read "The Science of Scientific Writing" 5 Min Elevator Pitch (oral presentation)

Week 2 **(1/24)**	1) Mock Study Section: Evaluate both grant applications with the eyes of a "reviewer". You will be using the critique template used by reviewers of NIH pre-doctoral fellowship applications. There are five scored criteria, which serve as the basis for an overall impact score. The scored criteria include: -Applicant -Sponsors/Collaborators/Consultants -Research Training Plan -Training Potential -Institutional Environment and Commitment to Training Pay attention to the factors that should be weighed when evaluating the strengths and weaknesses of the proposal with respect to each of these criteria. These are detailed on the critique template. ADDITIONAL REVIEW CRITERIA SHOULD ALSO BE CONSIDERED IF APPLICABLE. These include: -Protection of human subjects. -Vertebrate animals -Biohazards -Resubmission ADDITIONAL REVIEW CONSIDERATIONS INCLUDE: -Training in responsible conduct of research -Applications from Foreign Organizations -Select agents -Resource sharing plans -Budget and Period of Support **For 1/31: 1) Write** NIH Biosketch 2) Prepare Specific Aims Presentation **For 2/7:** Draft Written Specific Aims (F.58) Read F.59 Research Strategy Section	mock Study Section – SRO Dr. Benedict Kolber	**Prior to class:** Confidentiality Agreement (Bb) Critique for F31s (Bb)
Week 3 **(1/31)**	1) **Draft Specific Aims Presented by Student PI** (10-15 min Powerpoint presentation plus discussion) Content should include: 1) Present central hypothesis 2) Endpoints (ie Aims and Exps) to test hypothesis 3) Before class – Go to NIH Reporter (http://projectreporter.nih.gov/reporter.cfm) And answer the following questions: How many other grants have been funded with in 1 standard deviation of what you propose? *1 Slide* 4) What is (are) the appropriate NIH Institutes that might fund your project? *1 Slide* 2) Open **Discussion** **For 2/7: 1) Write** Specific Aims (F.58) 2) Read F.59 Research Strategy Section **For 2/14:** 1) Read: Applicant's Background and Goals for Fellowship Training (F.56) and Respective Contribution (F.61)	Presentations by PI's Lecture by Kolber	**Prior to Class:** NIH Biosketch (Bb) **In class:** Specific Aims Presentation (oral presentation in class)
Week 4 **(2/7)**	1) **Discussion** of Research Strategy Outline/Formats (F.59) including Significance and Innovation (F.59) and Approach (F.59) along with Rigor and Reproducibility, **For 2/14:** 1) Read: Applicant's Background and Goals for Fellowship Training (F.56) and Respective Contribution (F.61) **For 2/21: 1)**Peer-edit specific aims 2) **Read:** Project Summary (F.35), Project Narrative (F.36), Facilities and Other Resources (F. 37), Major Equipment (F.38), **Future:** Begin serious work on Approach section	Lecture by Kolber	**Prior to Class:** Draft Specific Aims (F.58) (Bb) Read F.59 Research Strategy Section
Week 5 **(2/14) Virtual**	1) **Discussion** of Applicant's Background and Goals for Fellowship Training (F.56) including A: Research Experience, B. Training Goals and Objectives, and C. Activities Planned Under this Award total 6 pages. Human/Animal Studies, Select Agent, Resource Sharing, Respective Contribution (F.61) 2) **Working Session**	Lecture by Kolber	**Prior to Class:** Read: Applicant's Background and Goals for Fellowship Training (F.56) and Respective Contribution (F.61)

	For 2/21: 1) Peer-edited specific aims **Read:** Project Summary (F.35), Project Narrative (F.36), Facilities and Other Resources (F. 37), Major Equipment (F.38), **For 2/28:** 1) Submit sections Applicant's Background and Goals for Fellowship Training (F.56) including A: Research Experience, B. Training Goals and Objectives, and C. Activities Planned Under this Award (total number of pages for this section = 6) **2) Read** Selection of Sponsor and Institution (F-61), Environment and Institutional Commitment (F-65), Training in the Responsible Conduct of Research (p F-63), and Authentication of Key Biological and/or Chemical Resources (F-71) **For 3/7:** **Submit** 1) Human/Vertebrate Animal (F-68, F-71+) 2) Select Agent (F-69) 3) Resource Sharing (F-70) – Not required but suggested 4) Respective Contribution (F-61) **Future:** Continue serious work on Approach section		
Week 6 (2/21)	1) **Discussion** on figures and visual aids 2) **Working Session** **For 2/28:** 1) Submit section Applicant's Background and Goals for Fellowship Training (F.56) including A: Research Experience, B. Training Goals and Objectives, and C. Activities Planned Under this Award (total number of pages for this section = 6) **2) Read:** Selection of Sponsor and Institution (F-61), Environment and Institutional Commitment (F-65), Training in the Responsible Conduct of Research (p F-63), and Authentication of Key Biological and/or Chemical Resources (F-71) **For 3/7:** **Submit** 1) Human/Vertebrate Animal (F-68, F-71+) 2) Select Agent (F-69) 3) Resource Sharing (F-70) – Not required but suggested 4) Respective Contribution (F-61) **Future:** Continue serious work on Approach section	Lecture by Kolber	**Prior to class:** Peer-edited Specific Aims due (Bb) **Read:** Project Summary (F.35), Project Narrative (F.36), Facilities and Other Resources (F. 37), Major Equipment (F.38),
Week 7 (2/28)	1) **Discussion** of Project Summary (F.35), Project Narrative (F.36), Facilities and Other Resources (F. 37), and major Equipment (F.38); **Discussion** of Selection of Sponsor and Institution (F-61), Environment and Institutional Commitment (F-65), Training in the Responsible Conduct of Research (p F-63), and Authentication of Key Biological and/or Chemical Resources (F-71). 2) **Working session** **For 3/7:** **Submit** 1) Human/Vertebrate Animal (F-68, F-71+) 2) Select Agent (F-69) 3) Resource Sharing (F-70) – Not required but suggested 4) Respective Contribution (F-61) **Future:** Continue serious work on Approach section	Lecture by Kolber Class Discussion	**Prior to class (Bb):** Submit sections Applicant's Background and Goals for Fellowship Training (F.56) including: A: Research Experience B. Training Goals and Objectives C. Activities Planned Under this Award (total number of pages for this section = 6) Read in SF424: Selection of Sponsor and Institution (F-61), Environment and Institutional Commitment (F-65), Training in the Responsible Conduct of Research (p F-63), and Authentication of Key Biological and/or Chemical Resources (F-71)
3/1/23	*Note: 2nd year SCN Neuroscience Students – Your Dissertation Pre-proposal is Due Today*		
Week 8 (3/7)	1) **Discussion** about preliminary data – what is it and why it matters. 2) **Working Session** **For 3/21:**	Lecture by Kolber	**Prior to class (Bb):** 1) Human/Vertebrate Animal (F-68, F-71+) 2) Select Agent (F-69)

	1) Prepare Presentation on Approach section **2) Submit** 1) Selection of Sponsor and Institution (F-61) 2) Environment and Institutional Commitment (F-65) 3) Training in the Responsible Conduct of Research (p F-63) 4) Authentication of Key Biological and/or Chemical Resources (F-71) **For 3/28:** **Submit** 1) Project Summary (F.35) 2) Project Narrative (F.36) 3) Facilities and Other Resources (F. 37) 4) Major Equipment (F.38) **Future:** Continue serious work on Approach section		3) Resource Sharing (F-70) – Not required but suggested 4) Respective Contribution (F-61)
Week 9 (3/14)	Spring Break	No class – Work on your Documents	
Week 10 (3/21)	1) **Presentation of Approach by Student PI** (15 min Powerpoint presentation plus discussion) **For 3/28:** **Submit** 1) Project Summary (F.35) 2) Project Narrative (F.36) 3) Facilities and Other Resources (F. 37) 4) Major Equipment (F.38) **For 4/4:** **Submit Final Drafts** 1) Specific Aims (F.58) 2) Research Strategy (F.59) A) Significance B) Approach	PI Presentations (15 min per student)	**Prior to class (Bb):** 1) Selection of Sponsor and Institution (F-61) 2) Environment and Institutional Commitment (F-65) 3) Training in the Responsible Conduct of Research (p F-63) 4) Authentication of Key Biological and/or Chemical Resources (F-71) **In Class:** Approach Section (Oral Presentation)
Week 11 (3/28)	1) **Discussion** of other training grant opportunities from the NIH and other institutes 2) **Working Session** **For 4/4:** **Submit Final Drafts** 1) Specific Aims (F.58) 2) Research Strategy (F.59) A) Significance B) Approach **For 4/11:** Peer Critique of Aims, Significance, Research Strategy	Lecture by Kolber	**Prior to class (Bb):** 1) Project Summary (F.35) 2) Project Narrative (F.36) 3) Facilities and Other Resources (F. 37) 4) Major Equipment (F.38)
Week 12 (4/4)	1) **Discussion** of grant resubmissions including Introduction to Revised Application (F.56). 2) **Discussion** about reviewing best practices and opportunities. 3) **Working Session** **For 4/11:** Peer Critique of Aims, Significance, Research Strategy **For 4/18:** Prepare/write: Incorporate any new feedback and prepare a complete grant submission**. You will attach the following documents to four "Forms" (see instructions on Bb).** The documents that you will have already written and will be added to the forms are: Project Summary, Project Narrative, Bibliography, Facilities, Equipment, Biosketch (yours only), Applicant's Background and Goals, Specific Aims, Research Strategy, Respective Contributions, Selection of Sponsor and Institution, Training in RCR, List of letters of support (actual letters not needed), Description of Institutional Environment and Commitment to Training, Vertebrate Animals (if applicable), Human Studies (if applicable), Select Agent Research, Resource Sharing Plan, Authentication Section	Lecture by Kolber	**Prior to class (Bb):** **Submit Final Drafts** 1) Specific Aims (F.58) 2) Research Strategy (F.59) A) Significance B) Approach
4/8/23	*NIH F31 Official Deadline for People Submitting This Spring!*		

Week 13 (4/11)	1) **Discussion** of Peer Review Process cont and Budgets for all Grants. **Discussion** of ASSIST, eRA commons, etc. **For 4/18:** Incorporate any new feedback and prepare a complete grant submission for **next week. You will attach the documents to three "Forms" (see instructions on Bb).**	Lecture by Kolber	**Prior to class (Bb)** Peer Critique of Aims, Significance, Research Strategy
Week 14 (4/18)	1) **Discussion** of Sponsor/co-Sponsor and the Sponsor/co-Sponsor Statement (F-64) which is prepared by the sponsor. **Discussion** of RPPR (annual updates), loan re-payment etc. **Discussion** of Candidate's Contribution to Program Goals (F-67)* *Only for diversity F31 2) **Working Session** **For 4/25:** Peer reviews of complete F31 submissions	Lecture by Kolber	**Prior to Class (Bb)** Complete F31 Document PDFs
Week 15 (4/25)	Study Section of Final F31's **For 5/2:** Peer reviews of complete F31 submissions	Study Section of F31's led by SRO Kolber	**Prior to Class (Bb)** Critique for F31
Week 16 (5/2)	Study Section of Final F31`s cont	Study Section of F31's led by SRO Kolber Group Celebration and Food	**Prior to Class (Bb)** Critique for F31
Finals (5/8)	Write an Introduction to Resubmission based on Study Section		**By 5pm CST (Bb)**