Overview and Objectives
Obtaining peer-reviewed grant support is one of the most critical determinants to academic and career success, yet the process is highly challenging. Through select readings and podcasts, the writing of a draft grant application to request funds from one of the many seed programs available to Pitt students and faculty, and class discussions led by a long-time NIH-funded clinical investigator, Introduction to Grant Writing CLRES 2076 will provide CEED trainees, clinical fellows, post-doctoral students, and junior faculty without any prior grant writing experience with useful knowledge, insights, and skills in the grant writing process to improve their chances of later funding and subsequent career success.

Course Requirements
1. Completion of required reading and podcasts and other web video prior to each session.
2. Submission of a draft grant application requesting funds from a University-approved pilot program (http://www.ctsi.pitt.edu/planpilot.shtml) (40% of grade)
3. Class attendance and participation (60% of grade).

Textbook

Key Web Resources
All About Grants Podcasts - http://grants.nih.gov/podcasts/All_About_Grants/
The Office of Extramural Research (OER) presents conversations with NIH staff members designed to provide investigators at all career stages with easy-to-understand insights on a wide variety of grant topics.

Tips and Advice for NIH Grant Proposal Submissions - http://nihgrants.blogspot.com/
Information, tips, tricks, and useful links to help you navigate the NIH grant proposal process. Written and updated by an experienced proposal writer.

4Researchers.org - http://www.4researchers.org/
A searchable online collection of practical advice from clinical investigators on the many challenges of conducting research.
Academic Integrity
Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity (http://www.provost.pitt.edu/info/ai1.html). Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

Disabilities
If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructor and the Disability Resources and Services (http://www.drs.pitt.edu/policies.html) no later than the 2nd week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call 648-7890 (Voice or TTD) to schedule an appointment. The Office is located in 216 William Pitt Union.

Course Grading Scale
This course will be graded on a pass/fail scale. To pass the class, students will need to attend ≥75% of classes and submit a satisfactory 4-7 page draft grant proposal for review within 10 days of the date of the final class.

Incomplete grades
Students who are unable to complete the course for any reason must contact the course instructor as soon as possible to discuss grades and remediation (course reasons (“I” incomplete), extenuating personal reasons (“G” incomplete), withdrawal (“W”). Students will have one calendar year from the start of the course to complete the course requirements, otherwise an "I" or "G" grade will remain on the transcript.
Session 1: *Introduction to Grant Writing*

At the conclusion of this session, students will be able to:
1. Understand the importance of obtaining peer-reviewed grant support to one’s career.
2. Explain the “10,000 Rule”.
3. Understand the types of career-development and beginning NIH grant awards.
4. Begin to understand the NIH review process.
5. Critically evaluate a request for applications (RFA).

Topics:
1. Course overview.
2. What are grants and why they are important.
3. Where do you apply for grants.
4. What types of grants are available.

Required reading before the session:
Eisenberg textbook; Chapter 11, Grants

Required listening/viewing before the session:
“10,000 Hour Rule” *YouTube* - [http://www.youtube.com/watch?v=Kq2n1Jlx5P0](http://www.youtube.com/watch?v=Kq2n1Jlx5P0)
5,000 Hours of Effort *4researchers.org* - [http://www.4researchers.org/articles/2397](http://www.4researchers.org/articles/2397)
NIH Office of Extramural Research “Frequently Asked Questions”:
[http://grants.nih.gov/training/q&a.htm](http://grants.nih.gov/training/q&a.htm)
“NIH Early Career Funding” *4researchers.org* - [http://www.4researchers.org/articles/6862](http://www.4researchers.org/articles/6862)
“Grant Writing for New Investigators” - *All About Grants* podcast

In-class exercise:
Review the Pilot Programs listed on the CTSI web page ([http://www.ctsi.pitt.edu/planpilot.shtml](http://www.ctsi.pitt.edu/planpilot.shtml)) and print-out applications for 1 or 2 pilot programs that you may be interested in submitting a grant application to. Be prepared in class to discuss details of the application(s) you selected.
Session 2: Choosing a Research Question

At the conclusion of this session, students will be able to:

1. Consider the strategic issues when deciding on a research question to investigate.
2. Use the Internet and other resources to conduct “due diligence” on the originality of ones ideas.
3. Be familiar with the key issues when deciding on a potential funding agency.
4. Describe what is a Specific Aims section.

Topics:

1. How to identify appropriately ambitious, feasible, and “fundable” ideas.
2. What is grant “due diligence”
3. How to conduct “due diligence” on one’s own ideas

Required reading before the session:
   Eisenberg textbook;  Chapter 8, Research
   Chapter 12, Grantsmanship

Required listening/viewing before the session:
   NIH Tips for Applicants: http://public.csr.nih.gov/ApplicantResources/Pages/default.aspx
   Research Online Reporting Tools (NIH RePorter): http://projectreporter.nih.gov/reporter.cfm
   Clinicaltrials.gov: http://clinicaltrials.gov/
   Ovid at Pitt Health Science Library: http://www.hsls.pitt.edu/
   “NIH Early Career Funding” 4researchers.org - http://www.4researchers.org/articles/6862

Required written assignment to complete before the session:
E-mail the instructor one or two ideas for projects that you might pursue pilot funding for (http://www.ctsi.pitt.edu/planpilot.shtml). Each idea should be 2-3 paragraphs long that begins with 1-2 sentences describing the background of the problem, includes a testable research hypothesis, and can be completed in under 18-months.

In-class exercise:
With the class, the instructor will review the ideas submitted in writing by students, and demonstrate on-line methods that they can use to conduct “due diligence” on their own ideas.
Session 3: Specific Aims

At the conclusion of this session, students will be able to:
1. Understand the structure and elements of a well-crafted Specific Aims document.
2. Identify the common flaws in a Specific Aims page.

Topics:
1. What is the purpose of the Specific Aims section.
2. Why is the Specific Aims section so critical to funding success.
3. What are the components of a compelling Specific Aims section.

Required reading before the session:
Eisenberg textbook; Chapter 9, Writing
What should I write first? - Tips and Advice for NIH Grant Proposal Submissions

Required listening/viewing before the session:
“Telling your Story” - All About Grants podcast
“Make it Crystal Clear” - 4researchers.org - http://www.4researchers.org/articles/4580
“Send us a Concept Paper First” 4researchers.org - http://www.4researchers.org/articles/3687

In-class exercise:
We will distribute in class the Specific Aims sections from several NIH grant applications and highlight the critical elements and structure of a well-crafted draft.

Required written assignment for submission in Session 4:
Draft a 1-page specific aims section for your pilot project. The draft should describe the background of the problem, two or three specific aims, and include a “testable” primary hypothesis and at least one secondary hypothesis.
Session 4: *Significance, Innovation, and Approach*

**At the conclusion of this session, students will be able to:**
1. Describe the Significance, Innovation, and Approach sections of a grant application.
2. Understand how to organize the Significance and Innovation sections to create a compelling story for readers.
3. Describe the key elements of an exciting “fundable” Approach section.

**Topics:**
1. What are the purposes and elements of the Significance, Innovation, and Approach sections of a grant application.
2. The importance of storytelling in a grant application.
3. Approach do’s and don’ts.

**Required reading before the session:**
Students will read the Significance, Innovation, and Approach sections from several proposals that will be distributed earlier prior to class.

**Required listening/viewing before the session:**
“Including All in Clinical Research” - *All About Grants* podcast
“What are the criteria used to score grant applications”
[http://nihgrants.blogspot.com/2010/08/what-are-criteria-used-to-score-grant.html](http://nihgrants.blogspot.com/2010/08/what-are-criteria-used-to-score-grant.html)

**In-class exercise:**
We will review the Significance, Innovation, and Approach sections from the proposals distributed prior to class.

**Required written assignment:**
Turn-in your 1-page draft specific aims section for your pilot project by the end of class
Session 5: Timelines, Biosketches, and Letters of Support

At the conclusion of this session, students will be able to:
1. Discuss timelines for various grant types (K, R21, R01).
2. Understand the difference between a CV and a biosketch.
3. Understand the elements of a biosketch and what to include in a biosketch personal statement.
4. Appreciate what reviewers look for in letters of support.

Topics:
1. What is a grant timeline and what does it look like.
2. What is a NIH biosketch and how does it differ from a CV.
3. What do reviewers look for in a biosketch personal statement.
4. Who should I ask to provide letters of support.
5. What do reviewers look for in a letter of support.
6. Review students’ draft specific aims.

Required reading before the session:
New Biosketch Instructions – Tips and Advice for NIH Grant Proposal Submissions

The Worst Personal Statement Ever - Tips and Advice for NIH Grant Proposal Submissions
http://nihgrants.blogspot.com/2012/06/worst-personal-statement-ever.html

Required listening/viewing before the session:
“Assembling the Right Team” - All About Grants podcast:

In-class exercise:
Together, we will review and critique the draft Specific Aims sections students submitted at the end of our last class.

Required written assignment for submission in Session 6:
Use the fillable individual PHS 398 forms on the NIH website to create your Biosketch and personal statement (http://grants.nih.gov/grants/funding/phs398/phs398.html).
Session 6: Budgets

At the conclusion of this session, students will be able to:
1. Understand the basics of how NIH funds projects.
2. Understand the basics of grant budgets.
3. Create a basic grant budget justification.

Topics:
1. What is a budget and where does the money go.
2. What spending is allowed by NIH.
4. How to write a strong budget justification section.

Required reading before the session:
Eisenberg textbook; Chapter 14, Managing your Team, Time, and Money.
Researchers get hungry too - Tips and Advice for NIH Grant Proposal Submissions http://nihgrants.blogspot.com/2012/01/researchers-get-hungry-too.html

Required listening/viewing before the session:
“Why are Budgets Cut” - All About Grants podcast:
“Design First, Budget Later” 4researchers.org - http://www.4researchers.org/articles/3677

In-class exercise:
We will review and discuss the budget justification sections from several recent NIH grants.

Required written assignment:
Turn-in your biosketch by the end of class.
Session 7: The NIH Grant Review Process

At the conclusion of this session, students will be able to:
1. Understand the basics of the NIH peer-review process.
2. Appreciate what NIH reviewers look for when reviewing grant applications.
3. Understand the components of the summary statement.

Topics:
1. What goes on in study section.
2. What is a summary statement.
3. How to begin to interpret a summary statement.
4. Percentiles and scores, which is most important.
5. Reading the tea leaves, or what are the reviewers trying to tell me.

Required reading before the session:
Eisenberg textbook; Chapter 13, Peer Review of Grant Applications.
NIH Scoring System and Procedure -

Required listening/viewing before the session:
“The Ins and Outs of a Study Section Meeting”, “Scoring Your Application”, and “Summary Statement Basics” All About Grants podcasts

In-class exercise:
We will review the summary statements from several NIH grants that will be distributed in class.

Required written assignment to complete:
E-mail the instructor a revised 1-page draft specific aims section for your pilot project that includes the background of the problem, two or three specific aims, a “testable” primary hypothesis and at least one secondary hypothesis.

The instructor will then review and “assign” a primary and secondary student reviewer to each proposal. Each student should be prepared to provide a 3-5 minute oral critique on their assigned grants during our Session 8 class.
Session 8: Reviews and Wrap-Ups

At the conclusion of this session, students will be able to:
1. Provide feedback on a specific aims document.
2. Appreciate the rewards and challenges of a physician-scientist career.

Topics:
1. Mini-grant reviews.
2. Class summary.

Required reading before the session:
Eisenberg textbook; Chapter 18, Balancing Research Clinical Activities, and Family Life.
Read your assigned Specific Aims documents.

Required listening/viewing before the session:
“Bad Reviews” 4researchers.org - [http://www.4researchers.org/articles/2175/919](http://www.4researchers.org/articles/2175/919)
“Responding to Summary Statements” 4researchers.org - [http://www.4researchers.org/articles/3903](http://www.4researchers.org/articles/3903)

In-class exercise:
We will review and critique the Specific Aims sections submitted earlier. Be prepared to provide a 3-5 minute oral critique on your assigned grants.

Required written assignment to complete before the session:
To pass the class, you will need to send the instructor a satisfactory 4-7 page draft grant application for one of the pilot programs listed on the CTSI web page ([http://www.ctsi.pitt.edu/planpilot.shtml](http://www.ctsi.pitt.edu/planpilot.shtml)) for review 10 days following this final class.