Course summary:

The purpose of the integrated methods course is to build on the skills learned in the intensive summer session and provide a hands-on research experience. Trainees will learn the phases of the research process from conception to design and, ultimately, to implementation of the research. Through a combination of group sessions and independent work, trainees will use a research topic of their choice to develop their own research proposal in the form of an NIH grant application. The application will include sections on specific aims, background and significance, previous work, and methods. In addition, trainees will review and critique the work of their peers.

Prerequisites:

CLRES 2005, CLRES 2010, CLRES 2020 and CLRES 2040. Mentor must be identified prior to class. CLRES 2050 is taken simultaneously.

Course Credits and Contact Hours:

3 credits; 32 contact hours; 1 session/week for 16 weeks (~2 hours per session)

Teaching Methodology:

Throughout this course there will be a combination of didactic instruction and small group work. The small group work is designed to give extensive feedback during the grant writing process.

Course Competencies Addressed:

I. Foundational Skills
   1. Research Design
      A. Problem Formation
      B. Methodology
      C. Sampling
      D. Measurement

II. Functional Skills
   1. Professional Skills
      A. Oral Communication
      B. Written Communication
   2. Teamwork and Leadership
      A. Multidisciplinary Teamwork

Course Objectives:

1. Students will propose significant and novel empirical research questions.
2. Students will identify agencies that are potential funding sources for research projects.
3. Students will conduct comprehensive literature reviews from appropriate sources across disciplines.
4. Students will design appropriate research study protocols based on specific research questions.
5. Students will identify relevant regulations from Federal agencies tasked with protecting the rights and well-being of human subjects into research studies.
6. Students will identify appropriate study populations, control groups and comparison groups for research problems.
7. Students will determine appropriate sample sizes for given research designs.
8. Students will identify and assess possible sources of bias with regard to sampling issues (recruitment, randomization, comparability, etc.).
9. Students will choose appropriate measurement instruments that can be applied to clinical and translational research problems.
10. Students will identify pertinent issues applicable to the construction of effective data management plans for varying research designs.
11. Students will identify pertinent issues applicable to the construction of effective data and safety monitoring plans for varying research designs.
12. Students will describe appropriate data analysis plans for addressing specific research questions.
13. Students will determine the appropriate statistical technique for answering given research problems.
14. Students will prepare and deliver oral presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
15. Students will generate appropriate responses to constructive criticism of and questions about oral presentations.
16. Students will prepare critiques of oral presentations.
17. Students will prepare written presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
18. Students will generate appropriate responses to constructive criticism of and questions about written presentations.
19. Students will prepare critiques of written presentations.
20. Students will demonstrate behaviors which allow them to be an effective member of a multidisciplinary team.
21. Students will engage in self-assessment of their research skills.

Session Dates and Times

| Session 1: | August 31, 2010 | 1:00-3:00 |
| Session 2: | September 7, 2010 | 1:00-3:00 |
| Session 3: | September 14, 2010 | 1:00-3:00 |
| Session 4: | September 21, 2010 | 1:00-3:00 |
| Session 5: | September 28, 2010 | 1:00-3:00 |
| Session 6: | October 5, 2010 | 1:00-3:00 |
| Session 7: | October 12, 2010 | 1:00-3:00 |
| Session 8: | October 19, 2010 | 1:00-3:00 |
| Session 9: | October 26, 2010 | 1:00-3:00 |
Textbook:

None

Grading and Expectations: Letter grade is based on:

- Research Proposal %
- Assignments %
- Small Group Participation %
- Peer Review %

Attendance policy:

**75% attendance is required to pass this course.** Attendance will be taken both electronically and on paper (back-up). Electronic attendance is taken via desktop computers in the 300 suite of Parkvale and a laptop computer in the 200 suite of Parkvale. If you do not see your name in the attendance system, you can add yourself by clicking the link below your names! The electronic attendance system is turned on 30 minutes before class starts (12:30pm) and times out 60 minutes after class starts (2pm), at which time you will no longer be able to sign into the computers. If you miss the electronic attendance system, please send an email immediately to Lauren Talotta (talottals@upmc.edu) so she can record your attendance credit. A notebook will also be provided for you to sign-in on paper. Please check your name off the roster on a weekly basis. This is being provided as a back-up to the electronic system.

Small Group policy:
The small groups will consist of 7-10 students each. Each student will present their proposal and progress in about half of the small group sessions. Students are expected to email or post on CourseWeb a copy of their proposal **48 hours before** they present in small group. Students will receive verbal and written feedback on their proposal from instructors and peers. Students are expected to read assignments posted and be prepared to give feedback.

Course Web site:


Course Policies: This adheres to all University policies including:

Academic Integrity:
Students in this course will be expected to comply with the University of Pittsburgh’s Policy on Academic Integrity. 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 office no later than the second seek 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 412-648-7890 (Voice or TTD) to schedule an appointment. The office is located in 216 William Pitt Union.

Copyright Notice:
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CourseWeb Accessibility:

CourseWeb is ADA Compliant and has fully implemented the final accessibility standards for electronic and information technology covered by Section 508 of the Rehabilitation Act Amendments of 1998. Please note that, due to the flexibility provided in the product, it is possible for some material to inadvertently fall outside of these guidelines.
Session 1 (August 31)

Competency:

Topic:

Session 1 will be an introduction to the course and an overview of expectations for the course.

Learning Objectives:

Teaching Method:

Lecture

Session 2 (September 7)

Competency:

II. Functional Skills
   1. Professional Skills
      B. Written Communication

Topic:

Session 2 introduces the structure of the NIH and the types of grants available for junior investigators. Also, this session will focus on the NIH review process, as well as the components of a grant proposal. Finally, the session will give important steps on how to prepare for a grant before writing a proposal.

Learning Objectives:

1. Students will apply the appropriate guidelines (e.g. NIH) for preparing constructive critiques of written presentations.
2. Students will identify the types of grants available for junior investigators.
3. Students will identify the components of an NIH grant proposal.
4. Students will identify strategies for preparing a grant proposal before writing.

Teaching Method:

Lecture

Assignment:

Read “Rollman CABG grant first submission 2001” proposal, critique it using the RPG template, and be prepared to discuss in class. Due Sept. 14, 2010

Session 3 (September 14th)

Competency:
II. Functional Skills
   1. Professional Skills
      A. Oral Communication
      B. Written Communication

**Topic:**

Session 3 will be a group discussion of the Rollman CABG grant proposal.

**Learning Objectives**

1. Students will apply the appropriate guidelines (e.g. NIH) for preparing constructive critiques of written presentations.
2. Students will generate multiple points of view for given problems.
3. Students will contribute to the group decision-making process

**Teaching Method:**

Large group discussion

**Due:**

Critique of the Rollman CABG grant proposal using the RPG template and participation in the associated class discussion.

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**Session 4 (September 21st)**

**Competency:**

I. Foundational Skills
   1. Research Design
      A. Problem Formulation

**Topic:**

The focus of session 4 will be the formulation of an innovative and significant problem, how to write specific aims, and the differences between aims and hypotheses.

**Learning Objectives:**

1. Students will evaluate the importance of biomedical, clinical or public health research problems.
2. Students will identify the differences between specific aims and hypotheses.

**Teaching Method:**

Lecture

**Assignment:**

Students will review their assigned grant using the appropriate critique template. One student will be assigned to be the “primary reviewer” for each grant. This student will be expected to lead the small group discussion for that grant. **Due September 28, 2010.**
Students should begin formulating specific aims for their grant proposal. **Due October 12, 2010**

**Session 5 (September 28th)**

**Competency:**

II. Functional Skills  
   1. Professional Skills  
      A. Oral Communication  
      B. Written Communication  
   2. Teamwork and Leadership  
      A. Multidisciplinary Teamwork

**Topic:**

This session is a small group critique of the assigned grants.

**Learning Objectives:**

1. Students will apply the appropriate guidelines (e.g. NIH) for preparing constructive critiques of written presentations.  
2. Students will generate multiple points of view for given problems.  
3. Students will contribute to the group decision-making process.

**Teaching Method:**

Small group

**Assignment:**

Students will review their assigned grant using the appropriate critique template. One student will be assigned to be the “primary reviewer” for each grant. This student will be expected to lead the small group discussion for that grant. **Due October 5, 2010**

Students should continue formulating specific aims for their grant proposal. **Due October 12, 2010**

**Due:**

Critique of the assigned grant using the appropriate template and participation in the associated small group discussion.

**Session 6 (October 5th)**

**Competency:**

II. Functional Skills  
   1. Professional Skills  
      A. Oral Communication  
      B. Written Communication  
   2. Teamwork and Leadership  
      A. Multidisciplinary Teamwork
**Topic:**

This session is a small group critique of the assigned grants.

**Learning Objectives:**

1. Students will apply the appropriate guidelines (e.g. NIH) for preparing constructive critiques of written presentations.
2. Students will generate multiple points of view for given problems.
3. Students will contribute to the group decision-making process

**Teaching Method:**

Small group

**Assignment:**

Students should continue formulating specific aims for their grant proposal. **Posted no later than October 10, 2010.**

Students are expected to read their colleagues’ postings and be prepared to give appropriate feedback during the small group presentations **October 12, 2010.**

**Due:**

Critique of the assigned grant using the appropriate template and participation in the associated small group discussion.

**Session 7 (October 12th)**

**Competency:**

I. Foundational Skills
   1. Research Design
      A. Problem Formulation

II. Functional Skills
    1. Professional Skills
       A. Oral Communication
       B. Written Communication

**Topic:**

During this session, students will present their specific aims to their small group.

**Learning Objectives:**

1. Students will prepare and deliver oral presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
2. Students will generate appropriate responses to constructive criticism of and questions about oral presentations.
3. Students will prepare written presentations of research in a variety of stages to a variety of audiences, technical and non-technical
4. Students will generate multiple points of view for given problems.

Teaching Method:

Small group,

Due:

Specific aims for your grant proposal and presentation. Students are also expected to participate in the small group discussion and give appropriate feedback.

Session 8 (October 19th)

Competency:

I. Foundational Skills
   1. Research Design
      A. Problem Formulation

II. Functional Skills
   1. Professional Skills
      A. Oral Communication
      B. Written Communication

Topic:

During this session, students will present their specific aims to their small group.

Learning Objectives:

1. Students will prepare and deliver oral presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
2. Students will generate appropriate responses to constructive criticism of and questions about oral presentations.
3. Students will prepare written presentations of research in a variety of stages to a variety of audiences, technical and non-technical
4. Students will generate multiple points of view for given problems.

Teaching Method:

Small group

Due:

Specific aims for your grant proposal and presentation. Students are also expected to participate in the small group discussion and give appropriate feedback.

Session 9 (October 26th)

Competency:

I. Foundational Skills
   1. Research Design
B. Methodology

Topic:

In session 9, the focus will be on identifying non-NIH funding sources and suggestions for submission of grant proposals to these additional sources of funding.

Learning Objectives:

1. Students will identify agencies that are potential funding sources for research projects.

Teaching Method:

Lecture

Assignment:

Students should start revising their specific aims based on feedback given. **Due November 9, 2010.**

Session 10 (November 2nd)

Competency:

II. Functional Skills
   1. Professional Skills
      B. Written Communication

Topic:

This session will introduce the non-science parts of a NIH grant proposal, the electronic application procedure and aspects of the post-submission grant proposal cycle.

Learning Objectives:

1. Students will identify the non-science parts of an NIH grant proposal.
2. Students will identify the steps in the electronic submission process.
3. Students will identify issues related to the post-submission wait period.

Teaching Method:

Lecture

Assignment:

Students should continue revising their specific aims based on feedback given. Revised specific aims should be posted no later than **November 7, 2010.**

Students are expected to read their colleagues’ postings and be prepared to give appropriate feedback during the small group presentations **November 9, 2010.**

Session 11 (November 9th)
Competency:

II. Functional Skills
   1. Professional Skills
      A. Oral Communication
      B. Written Communication

Topic:
During this session, students will present their revised specific aims to their small group.

Learning Objectives:

1. Students will prepare and deliver oral presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
2. Students will generate appropriate responses to constructive criticism of and questions about oral presentations.
3. Students will prepare written presentations of research in a variety of stages to a variety of audiences, technical and non-technical
4. Students will generate multiple points of view for given problems.

Teaching Method:

Small group

Due:
Revised specific aims and presentation. Students are also expected to participate in the small group discussion and give appropriate feedback.

Session 12 (November 16th)

Competency:

II. Functional Skills
   1. Professional Skills
      A. Oral Communication
      B. Written Communication

Topic:
During this session, students will present their revised specific aims to their small group.

Learning Objectives:

1. Students will prepare and deliver oral presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
2. Students will generate appropriate responses to constructive criticism of and questions about oral presentations.
3. Students will prepare written presentations of research in a variety of stages to a variety of audiences, technical and non-technical
4. Students will generate multiple points of view for given problems.

Teaching Method:
Due:

Revised specific aims and presentation. Students are also expected to participate in the small group discussion and give appropriate feedback.

Session 13 (November 23rd)

Competency:

I. Functional Skills
   1. Professional Skills
      B. Written Communication

Topic:

In session 13, the focus will be on best practices for writing a methods section, including the necessary components of the methods section, how to link specific aims to the method section, how to create an organized methods section, and some pitfalls that should be avoided.

Learning Objectives:

1. Students will explain the importance of the methods section in writing a grant proposal.
2. Students will identify best practices for writing a methods section.
3. Students will demonstrate the ability to clearly and concisely link specific aims to the method section.

Teaching Method:

Lecture

Assignment:

Students should begin preparing the methods section of their grant proposal. Due December 7, 2010.

Session 14 (November 30th)

Competency:

Topic:

Roundtable of past K awards

Learning Objectives:

Teaching Method:

Assignment:

Students should continue preparing the methods section of their grant proposal. Posted no later than December 5, 2010.
Students are expected to read their colleagues’ postings and be prepared to give appropriate feedback during the small group presentations December 7, 2010.

**Session 15 (December 7th)**

**Competency:**

II. Functional Skills
   1. Professional Skills
      A. Oral Communication
      B. Written Communication

**Topic:**

During this session, students will present their methods section to their small group.

**Learning Objectives:**

1. Students will prepare and deliver oral presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
2. Students will generate appropriate responses to constructive criticism of and questions about oral presentations.
3. Students will prepare written presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
4. Students will generate multiple points of view for given problems.

**Teaching Method:**

Small group

**Due:**

Methods section of your grant proposal and presentation. Students are also expected to participate in the small group discussion and give appropriate feedback.

**Session 16 (December 14th)**

**Competency:**

II. Functional Skills
   1. Professional Skills
      A. Oral Communication
      B. Written Communication

**Topic:**

During this session, students will present their revised specific aims to their small group.

**Learning Objectives:**

1. Students will prepare and deliver oral presentations of research in a variety of stages to a variety of audiences, technical and non-technical.
2. Students will generate appropriate responses to constructive criticism of and questions about
oral presentations.
3. Students will prepare written presentations of research in a variety of stages to a variety of 
audiences, technical and non-technical
4. Students will generate multiple points of view for given problems.

Teaching Method:

Small group

Assignment:

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Due:

Methods section of your grant proposal and presentation. Students are also expected to participate in the small group discussion and give appropriate feedback.