AMC Biostatistics                 Credits: 2

Course Directors: Dr. Paul Feustel and Dr. Peter Vincent

This course is designed to teach the student basic statistics so that they can perform appropriate statistical analysis of their research and so they can determine if appropriate analysis was performed when reading the literature in their field of study. The first part of the course is lecture/exercise based sessions run by the faculty that exposes students to basic principles and tests commonly used in biostatistics, including sessions on what inferential statistics is and determining the statistical analysis as part of your experimental design. In the second part of the course students bring in experiments and/or data from their laboratory and describe the experimental design and the statistical test that was used (or will be used) to analyze the data and how this allowed (or will allow) them to formulate a conclusion from the data.

AMC Design and Analysis of Clinical Studies                Credits: 3

Course Director: Dr. Sarah McCallum

This course provides the fundamental information to understand, evaluate and design clinical research studies. Students will learn multiple aspects of clinical study design, including participant selection, sample size estimation, cohort, case-control and cross-sectional designs, and experimental design of clinical trials. Students will also become proficient with common statistical analyses used in clinical studies. Regulatory components of clinical trials, such as quality control and database management will be discussed. Finally, using Qualtrics, students will develop a questionnaire or other assessment tool. Practice problems, graded problem sets, self-assessments, exams, and quizzes will be used to aid and assess learning.

AMBI Foundations of Research Ethics                     Credits:3

Course Director: Dr. John Kaplan

The purpose of this course is three-fold: 1) to engage students in reading, considering, and discussing the responsible conduct of scientific research; 2) to familiarize students with the basic ethical principles guiding modern biomedical research; and 3) to acquaint students with the basic ethical underpinnings and legal requirements for conducting research with human subjects and
with animals in the U.S. Although this course will focus primarily on issues involving the use of human subjects in biomedical research, it is designed to give students to basic fundamental skills necessary to understand ethical principles as they apply to all aspects of laboratory and clinical research. The following topics will be covered: basic ethical theory and principles as they apply to the culture of science; scientific and academic integrity, including such topics as peer review and conflict of interest; regulation of human subjects research; informed consent in research; the just selection of research participants; risk and benefit in research; appropriate use of placebos; protection of vulnerable subjects; and the use of animals in research.

AMC Fundamentals of Clinical Research

Credits: 3

Course Director: Dr. Julie G. Pilitsis

The goal of this course is to provide a practical context for learners to gain skills and processes for conducting clinical trials. The course encompasses group activities using interactive case studies with realistic scenarios illustrating how clinical trial regulations and guidelines impact each situation. It provides an overview and in-depth introduction to principles of clinical research, utilizing reading, protocol development, and seminars. Brief mini-lectures to review concepts are followed by in-class discussions built on assigned reading and exercises. Each learner will develop a research protocol that describes in detail the aims, background, and study plan for an investigation to address a research question formulated by the student. This protocol will be developed following an iterative process, and learners will receive feedback in individual and small group protocol review sessions.

AMC Introduction to Grant Writing

Credits: 1

Course Directors: Dr. Michael DiPersio and Dr. Peter Vincent

This course is designed to provide the student with an introduction to writing research grants and to the grant review process. The course will focus on what should be included in the different sections of a NIH research proposal (Research Plan Section). To emphasize the purpose of this information in supporting the grant proposal, students will be provided with sections of well written proposals, as well as proposals that did not do well in study sections. Discussions of these examples will highlight how proposals can be improved. As part of each module, students will write (1) a Specific Aims page, (2) a Significance and Innovation section, and (3) an Approach section that is focused on one of the specific aims. Students will then read and critique one another’s written assignments and discuss their reviews using a study section format. Students will then revise each section in response to the reviewers’ critiques. The course will
culminate in a mock study section performed by AMC faculty with experience serving on NIH
grant review panels, in order to demonstrate how the grant peer review process works at the NIH.

AMC Journal Club: 
Course Directors: Dr. Mark Fleck and Dr. Sarah McCallum

During each journal club, a student or faculty will present topics in related subject matter to the
group’s interest. The student will be given a list of existing journal clubs (basic science and
clinical) to attend. A minimum of 10 journal clubs must be attended. DNET journal clubs include
options for basic science (DNET journal club) as well as clinical articles (DNET with
psychiatry). The student will need to present a minimum of one peer-reviewed journal article
during journal club (with a PowerPoint slide presentation). The student will receive feedback
from the course directors for their presentation using an assessment form

AMC Research A: 
Course Directors: Dr. Julie Pilitsis & Dr. Sarah McCallum; Research Mentor

The goal of this course is to provide supervised experience in designing, conducting, and/or
presenting research projects. For research, students will choose a clinical research mentor
consistent with their interests. Didactic/technique sessions will be presented to familiarize
students with common laboratory techniques and regulatory procedures involved in clinical
research. Students will attend seven technique sessions and perform 39 hours of lab work in the
fall semester.

AMC Research B: 
Course Directors: Dr. Julie Pilitsis & Dr. Sarah McCallum; Research Mentor

For research, students will continue their research with their respective mentors. The goal of this
course is to provide supervised experience in designing, conducting, and/or writing up results of
a clinical research project. Students will engage in approximately 60 hours of clinical research
during this term.
AMC Research Project:  

Course Directors: Dr. Julie Pilitsis & Dr. Sarah McCallum; Research Mentor

By end of this course, students will have finished their research project. Students will prepare a manuscript that is suitable for submission to a peer-reviewed journal, and give a poster presentation of their research on the “Graduate Studies Program Annual Poster Day”.