### COURSE DESCRIPTIONS

**Clinical Research Methods**

This course provides an overview and in-depth introduction to principles of clinical research, utilizing reading, protocol development, problem sets, and seminars. Brief mini-lectures to review concepts are followed by in-depth discussions built on assigned reading and exercises. Each learner develops a research protocol following an iterative process in which practical feedback is received in individual and small group protocol review sessions. By the end of the course, students write and present a research protocol that describes in detail the aims, background, and study plan for an investigation to address the question formulated by the student.

**Ethical Conduct of Research**

This course is required by the NYU School of Medicine and provides important insights into general scientific ethics, regulatory responsibilities, ethical consideration of human subjects, and research reporting and intellectual property.

**Introduction to Biostatistics**

This practical and interactive course introduces students to probability and statistical methods utilized in the analysis and interpretation of experimental and epidemiological data.

**Drug Development in a New Era**

The goal of this course is to provide an overview of new drug development to entry-level professionals in the medical sciences. Seminars include a combination of lectures and discussions. Invited speakers from the academic and private sectors offer an array of different viewpoints. Completion of this course will enable each participant to:
1. learn the vocabulary and principles of new drug development
2. assess the non-clinical background of a drug
3. learn practical skills for interacting with regulatory agencies during the course of new drug development, and
4. discuss the financial and marketing issues behind new drugs

**Advanced Epidemiology**

This course is designed to introduce students in all fields to the background, basic principles and methods of public health epidemiology. Topics covered include: measures of disease frequency and risk; epidemiologic study designs, both experimental and non-experimental; understanding bias; and measures of effect and association. In addition, students will develop skills to read, interpret and evaluate health information from published epidemiological studies and mass media sources.

**Integrative Seminar**

The *Integrative Seminar* in translational research provides a forum for students to come together in small groups, share their work in progress, and receive feedback and guidance on their ongoing research from their peers and their faculty seminar leaders. Scheduled activities include weekly research and journal club presentations interspersed with career development activities. Emphasis is on group discussion, collaborative and team-based approaches to problem solving, and a focus on methodological and scientific study design and execution.

**Biomolecular Medicine**

This course familiarizes students with current technologies that may be useful in answering their scientific questions. Students will also be introduced to faculty members who may be able to assist them in advancing their projects. For students who do not require use of such technologies themselves, the course strives to improve their ability to understand the background science and literature pertinent to their scientific interest, and to help them collaborate with basic scientists in the future.

**Clinical Trials Design**

This course will provide students an overview of clinical trial design using multiple examples to showcase a range of different approaches. Students will learn to frame a focused clinical trial question; specify patient eligibility and distinguish between inclusion and exclusion criteria; describe the administrative structure of a clinical trial; perform sample size determinations; explain a statistical analysis plan; distinguish between different forms of clinical benefit; and interpret clinical trial data from published articles.

**Biotechnology Industry, Structure & Strategy**

Biotechnology started as a science, referring to the use of living cells as factories to produce protein through manipulation of genes. Yet today, biotechnology refers to an industry, with the top companies in the sector exceeding some of the major pharmaceutical companies in market capitalization. No longer are biotechnology companies constrained to using recombinant DNA technology alone, as the moniker is assigned today to any small company engaged in any life sciences-related research directed toward developing a commercial product, using any scientific means. Belonging to the sector usually also implies a culture – small, nimble, visionary but practical, cash constrained but willing to risk it all. While some of the above characteristics are more idealized than real, it is certainly the case that, while the key factors for success in a development stage company include the very same scientific, analytic, and/or managerial talents that reside in “big pharma”, the context is different, requiring the organization to incorporate some additional skills to ensure survival, and non-traditional systems to support success.
Molecular Signaling and Drug Development

Many promising drugs published in Nature and Science never make it to market, but some do. There is evolving thought about the molecular signaling pathways targeted and the effect on the disease process and/or the disease itself. In this course, we will learn about these molecular signaling pathways from the point of view of drug targeting: gene and protein targets and methods of drug design. We will discuss several case studies of drugs with murky histories that turned out to be successful therapies such as penicillin, octreotide and thalidomide. By contrast, we will discuss several stories of drugs that failed or were pulled off the market with retrospectively obvious science predicting the failure such as Rofecoxib (Vioxx, Merck) and Vytorin.

Medical Informatics

This course introduces trainees to medical informatics, the interdisciplinary science of information management in medicine. Focusing on areas relevant to clinical research, students will learn innovative methods to capture, store, and retrieve clinical and population level data, as well as ways in which information systems can support research intervention.

Grant Writing

This course provides instruction and skill building opportunities on the development of federal and other grant applications. The course reviews research design issues and provides instruction on how to develop and present a research abstract, specific aims, background, preliminary studies, methods, human subjects protection issues, budgets and budget justification. NIH grant forms and regulations are also reviewed. In addition to interactive didactic sessions, students are given the opportunity to complete applications using a standard NIH format. Subsequent didactic sessions address peer review, and students act as peer reviewers for submitted applications.

Health Services Research Methods

This research methods course reviews core methodologic approaches and general principles of population health research. Lectures will be combined with practical discussions applying course principles to the students’ research projects.

Advanced Biostatistics

Learners in this course gain expertise in doing and interpreting multiple regression analysis and applying methods learned to their own research data. The course will focus on analytic methods, assumptions, diagnostics, modeling options, tests of significance, and interpretation for multiple linear and logistic regression.

Trending Topics

This course will vary from semester to semester depending on student body and faculty interest. However, it is anticipated that the course will focus on important issues in the area of Health Innovations and Therapeutics. Topics may include: new drugs, new health devices, revolutionary discoveries, journal reviews, and changes in intellectual property law.