Graduate Interdisciplinary Specialization in
Biomedical Clinical and Translational Science Curriculum

Curriculum Requirements

- All students enrolled in the GISBCTS must take PUBHEPI 6413 Conducting and Communicating Research in Clinical and Translational Science (2 units). This is a 2 credit hour course offered each semester by the College of Public Health. It is recommended, but not required, that this course be taken first.
- Most of the participating colleges have internal procedures that are required to enroll in their courses, such as contacting the instructor. For most of these courses you will need to talk to the instructor before enrolling.
- Students must take at least one course from each of the Core Competency Clusters. The Competency Clusters are based on the National Center for Research Resources (NCRR) Core Competencies for Clinical and Translational Research. There are a total of 14 competencies that have been grouped together to form four clusters.

Specialization Guidelines

- The GISBCTS require a minimum of 10 and no more than 20 semester credit hours of graduate level coursework taken from at least 5 different courses.
- At least 9 semester credit hours of coursework must come from outside the student's home college/program.
- Credit hours can include work already required as part of the student's degree program.

Core Competencies

Research Methods

- Identify major clinical/public health problems and relevant translational research questions
- Access and critique health science knowledge through literature searches using advanced search techniques
- Identify, interpret, and critique literature and assess the state of knowledge regarding a problem
- Know how to design a study protocol for clinical and translational research
- Understand study methods, design and implementation
- Use appropriate laboratory, clinical, and population research methods
- Understand the principles of the conduct of responsible research

Analysis, Statistics, and Informatics

- Be able to use appropriate statistical methods and conduct relevant analysis
- Describe and make use of best practices for managing, protecting, and analyzing biomedical and health information

Community & Communications

- Understand the principles of community engagement in clinical and translational research
- Navigate competently among diverse populations and cultures
- Be able to communicate scientific findings to your peers and to disseminate scientific knowledge to those outside your field, including other scientists, university administrators, policy makers, and the public

Leadership & Training

- Participate in cross-disciplinary training and mentoring
- Demonstrate leadership and professionalism
- Engage in translational teamwork
All students take the core course:

**PUBHEPI 6412 - Basic Principles in Clinical and Translational Science**

Then students take at least one course from each of the four Core Competencies

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Course Descriptions

Core Course:

College of Public Health – Epidemiology

PUBHEPI 6412 - Identification of clinical and translational research issues, assessment of the literature, ethically responsible research, cross-disciplinary training and mentoring. 2 units.

Other Courses to Select From:

Fisher College of Business

Note: FCOB degree students will have priority in these classes. Work with GIS program coordinator for entrance.

BUSMHR 7264 - Leadership, Talent Management, and Organizational Behavior in Health Sciences
Provides an overview of factors that influence individual and team performance and techniques to improve it with an emphasis on the businesses in the life sciences and healthcare for managerial decision making. Offered in Summer Term only. 2 units.

BUSMHR 7230 - Developing High Performance Teams
Groups and teams are becoming a way of life in organizations. This course will teach the theory and processes of group and team behavior so that you can successfully manage groups and work effectively in a variety of group settings. It is intended for students who seek greater understanding of teams and wish to increase their competence in managing and working effectively in these contexts. 1.5 units

MBA 6201 - Organizational Behavior
An overview of factors that influence individual and team performance and techniques to improve it; analytical frameworks for determining effectiveness of given techniques in specific circumstances. 1.5 units

College of Medicine

School of Health and Rehabilitation Sciences

HTHRHSC 7350 - Issues and Policy in Health Sciences
Students develop leadership skills and learn to explain and discuss the laws and policies that influence allied health professions. 3 units

HTHRHSC 7888 - Health and Rehabilitation Science Grand Rounds Intro
Students develop skills in analyzing, discussing and synthesizing health and rehabilitation research. Students present their own research and critically appraise faculty research. Discussion and demonstration of leadership will occur. 1 units.

Integrated Biomedical Science Graduate Program

IBGP 7070 - Fundamentals of Grant Writing I
Introduce students to the basics principles of grant writing. 2 units.
IBGP 7080 - Fundamentals of Grant Writing II
Introduce students to principles of grant writing. Students will also write their own grants in the style of NIH submissions. Students will also learn about the grant review process. 2 units

IBGP 8050 - Research Techniques and Resources
Survey of research techniques used to solve problems in modern cell and molecular biology, immunology, biochemistry, microbiology, microscopy, laboratory safety, and related available resources. 4 units.

College of Nursing: Nursing Practice

NRSRPT 8400 - Leadership Throughout Organizations & Systems
Socialization to leadership and excellence in multiple dimensions of the Doctor of Nursing Practice role. 3 units

NRSRPT 8401 - Strategic Macrosystem Management for the Doctor of Nursing Practice
Integration of theoretical, leadership and communication principles into strategic management strategies for evidence based, innovative macro system health care optimization for selected populations. 3 units

NRSRPT 8780 - Clinical Effectiveness and Translation in Clinical Science
Theoretical underpinnings of nursing knowledge and critical appraisal of clinical relevant research related to clinical effectiveness and translational science concepts. 3 units.

College of Nursing

NURSING 6110 – Health Literacy
Examination and analysis of issues of low health literacy, including populations at risk, research, measurement tools, writing in plain language; health communication techniques; and organizational approaches. 2 units.

NURSING 8780 - Research Methods I
Survey of quantitative, qualitative and mixed methods approaches relevant to Nursing and health. Emphasis is placed on common research designs in Nursing and health research. 3 units.

NURSING 8781 - Research Methods II
Survey of quantitative, qualitative and mixed methods approaches relevant to nursing and health. Emphasis is placed on common measurement and sampling in nursing and health research. 3 units.

NURSING 8782 - Research Methods III
Integration and application of theoretical and measurement approaches applied at micro-, meso- and macro-levels in nursing and health research. Emphasis is on selected measures of individual and population health. 4 units.

College of Pharmacy

PHR 5610 - Success & Leadership in Pharmacy
Explore the meaning of success and leadership, attributes of successful leaders and what can be done to be a successful leader. 0.5 – 1.5 units
PHR 8520 – Research Ethics
Basic concepts of integrity in the process of research. The course fulfills NIH requirement for research ethics. 1 unit.

College of Public Health – Biostatistics

PUBHBIO 6210 - Design and Analysis of Studies in the Health Sciences I
Theory and application of basic statistical concepts for design of studies in health sciences, integrated with statistical software applications. 3 units.

PUBHBIO 6211 - Design and Analysis of Studies in the Health Sciences II
A second course in applied biostatistical methods and data analysis. Categorical data methods, nonparametric statistical testing, analysis of variance designs, and regression methods. Integrated with use of computer statistical packages. 3 units.

PUBHBIO 6280 - Practical Biostatistics for Biomedical Laboratory Researchers
Introduction to statistical principles and methods appropriate for experimental laboratory data with applications in biomedical sciences. 3 units

PUBHBIO 7245 - Biostatistical Collaboration
Basic biomedical research methodologies; collaborate with biomedical researchers to design experiments and plan analyses; protocol preparation; professional skills development; statistical report preparation. 2 units.

College of Public Health – Epidemiology

PUBHEPI 6413 - Conducting and Communicating Research in Clinical and Translational Science
Design and writing of protocol, study methods and implementation, community engagement, informatics, translational teamwork. Scientific communication skills and dissemination of clinical and translational science. 2 units.

PUBHEPI 7412 - Principles and Procedures for Human Clinical Trials
Principles and procedures for clinical professionals in the design, conduct and analysis of human clinical trials. 3 units.

College of Public Health – Health Behavior and Health Promotion

PUBHHBP 7520 - Community Health Assessment
Models of community health assessment; skills in identifying, analyzing and integrating information concerning community resources and needs. 3 units.

PUBHHBP 7522 - Program Planning and Implementation
Planning and implementation of programs to address public health issues in defined populations; development of a health promotion program for a specific community partner. 3 units

PUBHHBP 7532 - Program Evaluation in Public Health
Examination of evaluation models for public health programs; exploration of philosophical and scientific issues in evaluation; and skill building in both qualitative and quantitative evaluation methods. 3 units.
PUBHHBP 7534 - Research Methods in Health Behavior and Health Promotion
Social science research methods emphasizing methods used to assess the dimensions of health-relevant behaviors and community-based prevention research. 3 units.

PUBHHBP 7544 - Fundamental Determinants of Population Health and Implications for Public Health
Presents the ideas that population health is determined by factors outside of health care and individual behavior occurs within a social context. 3 units.

PUBHHBP 7558 - Social-Ecological Strategies in Prevention
Community health promotion strategies using policy, systems, and environmental change perspectives. 2 units.

College of Public Health – Health Services Management and Policy

PUBHHMP 7617 - Leadership in Health Care.
Overview of leadership in health care with an emphasis on theory, leadership development, and leadership styles. 3 units

PUBHHMP 7678 - Approaches to Health Services Research
Overview of the field of health services research and the role of health services research in improving health care delivery. 3 units.

PUBHHMP 8671 - Health Care Outcomes Measurement
Evaluation of specific techniques for measuring outcomes in clinical and health services research studies. 2 units.

Psychology

PSYCH 6810 - Statistical Methods in Psychology I
Basic concepts of descriptive and inferential statistics; includes estimation, hypothesis testing, non-parametric techniques, and analysis of variance. 4 units.

PSYCH 6811 - Statistical Methods in Psychology II
Simple linear regression and correlation, multiple linear regression, interactions; introduction to other related methods such as nonlinear regression and random effects models. 4 units.

Statistics

STAT 5301 - Intermediate Data Analysis I
The first course in a two-semester non-calculus sequence in data analysis covering descriptive statistics, design of experiments, probability, statistical inference, one-sample t, goodness of fit, two sample problem, and one-way ANOVA. 4 units.

STAT 5302 - Intermediate Data Analysis II
The second course in a two-semester sequence in data analysis covering simple linear regression (inference, model diagnostics), multiple regression models, variable selection, model selection, two-way ANOVA, mixed effects model. 3 units.
**College of Veterinary Medicine**

**VETCLIN 8781 - Research Methods and Grantsmanship**
Introduction to grantsmanship, including the development of a research question, use of appropriate statistical methods, and the preparation of a research proposal that will be reviewed by the class. 1 unit.

**VETCLIN 8783 - Experimental Design & Data Analysis in Veterinary & Comparative Medicine I**
Principles and practice of study designs and data analyses commonly used in veterinary and comparative medical research. 1 unit.

**VETCLIN 8784 - Experimental Design & Data Analysis in Veterinary & Comparative Medicine II**
Introduction to the principles and practice of study designs and data analyses commonly used in veterinary and comparative medical research. 1 unit.

**Vision Science**

**VISSCI 7960 - Ethics in Biomedical Research**
Provides a general understanding of the issues surrounding the ethical conduct of science including issues related to research involving human subjects, scientific misconduct, and authorship of scientific papers. Real-life case studies will be used. 2 units.

**VISSCI 7970 - Grantsmanship**
The structure of the National Institutes of Health, the principles of good grantsmanship, and description of the grant review process. Emphasis focused on Mentored Clinical Scientist Development Award (K23) and Research Project Grant (R01). 2 units.

**VISSCI 7940 - Oral Presentation of Scientific Research**
Student gives a talk based on his/her research or scholarship and improves his/her speaking skills. 1-3 units.