




Example 1



The Human Impact of Racial Bias in Healthcare Based on Anatomical Assumptions




COURSE DESCRIPTION

Anatomy and Physiology I is a lecture and laboratory course focusing on the structure and function of body systems, including the nervous, endocrine, integumentary, muscular and skeletal systems. It is a requirement for the pre-professional phase of RIT's physician assistant program. Laboratory experiences include anatomical dissections, histological study and examination, and physiological experiments. The lecture instructor and advisor for this project is Professor 

BACKGROUND

The consequences of systemic racism in the United States are ubiquitous, seen particularly in the quality of healthcare available to people of color and the treatment of minorities in medical research. Historically, medical bias has been a source of discrimination and injustice, supported through questionable anatomical evidence. From pain tolerance to kidney function, racially disparate perceptions of anatomy lead to inequitable treatment offerings in modern healthcare, causing disproportionate loss of life in minority groups to this day.

OVERVIEW

In this Honors option, I plan to use the basic anatomical understandings earned in this course as a foundation for further literary review of research into racial bias in healthcare. With the help of Professor , I will critically examine and evaluate the past anatomical research that permits misunderstandings of anatomy based on race to persist and affect the healthcare offered to persons of color. Investigation into the ways in which minority trust of the healthcare system, healthcare professionals, and medical research is affected by their mistreatment in the system will also be relevant to include. This task will involve extensive reading of published research and

journal articles on the topics of race inclusion in medical research, as well as potential interviewing health professionals or students in health professions who have involvement in activism towards eliminating racial bias in research and healthcare. The development of such a research project will extend my understanding of anatomy beyond the purely scientific or biological domain. This complex study of anatomy is enriched by a historical and cultural context that will enhance critical awareness of my own biases, helping me to recognize and address prejudice in order to serve all communities equitably as a better educated and socially-aware physician assistant.

DELIVERABLES

Professor [REDACTED] will advise my literature review, and I will compile the information I find into a report on racial bias in research and medicine that will be made available to interested readers in the College of Health Sciences and Technology to raise awareness on the topic. In addition to a written report, an oral presentation will be delivered to laboratory classmates and other interested parties.

Professor [REDACTED] will determine that I have met the requirements for this Honors option in a satisfactory display of quality research and analysis, ensuring exceptional representation of Honors-level coursework.

Example 2

► Project Title: Introduction to Electrical Impedance Tomography

► Course Description:

Linear Algebra is a general education, mathematics course that introduces concepts associated with linear functions acting on high-dimensional spaces, and the way that those concepts are encoded as an algebra of matrices. Although applications will make cameo appearances throughout the course, they will occur mostly as one-shot exercises that highlight one particular concept or skill; none is covered in depth.

► Proposal Overview:

Cancer researchers have found that tumors tend to conduct electricity much better than healthy tissue, and it is hoped that this fact can be exploited to devise a new means of detection: locate tumors by locating regions of high conductivity (low resistivity). As a practical matter, since our intention is to avoid dissecting the patient, this requires us to reconstruct the conductivity of a body's interior based solely upon knowledge at its boundary, and that is the goal of electrical impedance tomography (EIT).

In this honors option, I will extend the standard course in linear algebra by investigating its application to electrical impedance tomography. Under the direction of Prof. [REDACTED], I will familiarize myself with the physical laws that govern voltage and current in biological tissue, and the systems of linear equations that result from them in inhomogeneous (location-dependent), anisotropic (direction-dependent) situations. This will involve directed reading, and the completion of exercises in which I see how the ideas and techniques of linear algebra help us to accomplish the goal of EIT. In the end, I hope to have a thorough understanding of the problem and the associated linear algebra.

► Deliverables:

Prof. [REDACTED] will help me learn the basics of LaTeX (a mark-up language used for mathematical writing), and I will use what I learn to write a report that summarizes the application of linear algebraic ideas to the problem of EIT. I will also deliver an oral presentation of my findings at the Honors Creativity and Research Symposium.

Prof. [REDACTED] will coach me toward a high-quality outcome, and will assess whether I have met the terms of this option at a level that demonstrates the substance and quality expected of honors-level work.