# Course Bulletin

| 144240 | Introduction to Health Informatics and Analytics | | | |
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| Subject: | Catalog Nbr: | | | |
| HIA | 0201 | | | |
| 2021 FALL | Primary | Anna Orlova | | Anna.Orlova@tufts.edu |

This required 14-week course provides an overview of the fields/disciplines of informatics and analytics in the context of problem-solution lifecycle (problem identified, characterized, managed with a solution, problem-solution outcomes evaluated) and its correspondent data lifecycle (data design, data collection, data management, data analysis, and data use and re-use). The course explains how these two fields of informatics and analytics emerged overtime following the evolution of information science and technology, and specifically, health information technology (HIT) including electronic health records (EHR), telehealth and digital health. Commonalities of these two disciplines (terminologies, approaches, standards, domains of use, the roles of users) and their complementary roles in the data/information/knowledge generation process are emphasized. Students will learn how these disciplines are used in healthcare, public health and research via specific business cases and use cases.

| 144302 | Health Data Usage | | | |
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| Subject: | Catalog Nbr: | | | |
| HIA | 0202 | | | |
| 2021 SUMR | Primary | Olaf Dammann | | Olaf.Dammann@tufts.edu |

This course provides a broad overview of how health data are used today. We discuss the health data ecosystem and technologies, and data in healthcare, clinical research, and public health. Special topics are social determinants of health and environmental data. The asynchronous material is provided by faculty with expertise in these fields. Assessments will be weekly, both individually and in groups, and with a final paper critique group assignment, as well as a final paper about a health data topic relevant to students' interest.

| 144303 | Digital Health | | | |
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| Subject: | Catalog Nbr: | | | |
| HIA | 0203 | | | |
| 2021 FALL | Primary | Lisa Gualtieri | | Lisa.Gualtieri@tufts.edu |

We all generate data through smartphones, sensors, trackers, and other devices, and our physicians generate data about us. In this course, we look at how clinicians, technology professionals, public health professionals, patients, and caregivers use digital health technologies and data to bring value to patients' lives. This course focuses on the wealth of digital health technologies and how they are used, as well as the many other ways people generate data, and how data can be used ethically to assist in behavior change, diagnosis, and treatment for individuals and populations.

| 144339 | Health Information Systems, Standards, Decision Support | | | |
|---|---|---|---|---|
| Subject: | Catalog Nbr: | | | |
| HIA | 0204 | | | |
| 2020 SUMR | Primary | William Harvey | | William.Harvey@tufts.edu |
| 2021 FALL | Primary | Michael Davis | | Michael.Davis@tufts.edu |

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| | 2021 SUMR | Primary | Daniel Chandler | daniel.chandler@tufts.edu |

This 14-week course is focused on the use of health information technology (HIT) in healthcare organizations. The course consists of three modules: (1) introduction to health information systems in care delivery settings, including electronic health record systems, financial systems, laboratory information systems, imaging information systems, personal health record, telehealth, mobile health, public health, and population health systems; (2) HIT standards and systems interoperability; and (3) clinical decision support. Using various use case examples, students will learn how informatics and analytics projects enable successful HIT adoption and use by health professionals.

The course includes asynchronous lectures and subject matter expert panels, live online class discussions, individual assessments, and a group final assignment on evaluating/critiquing a health informatics and analytics project from the publications in the Journal of the American Medical Informatics Association (JAMIA).

**144340** **Design and Evaluation of Health Technologies**

| Subject: | Catalog Nbr: | | | |
|---|---|---|---|---|
| HIA | 0205 | | | |
| | 2021 SPRG | Primary | Lisa Gualtieri | Lisa.Gualtieri@tufts.edu |
| | 2021 SPRG | Primary | Ramya Palacholla | Ramya.Palacholla@tufts.edu |

Digital technologies are transforming healthcare in a variety of beneficial ways, from streamlining workflow processes to making more precise patient diagnoses. In this course, you will learn how to design digital health technologies by applying the principles of user-centered design and cognitive psychology. You will learn to apply a rigorous, objective and standardized process of evaluating various health technologies such as web portals, smartphone apps, clinical decision support and population health management tools in order to increase usability, appeal, and adoption. Through the course, you will also investigate the barriers and opportunities for deploying digital technologies in healthcare settings to transform patient care, with a focus on universal design. Finally, you will explore the roles, teams and skills required to enable technology implementation in healthcare settings in addition to exploring the regulatory and ethical aspects.

**144341** **Capstone Planning Immersion**

| Subject: | Catalog Nbr: | | | |
|---|---|---|---|---|
| HIA | 0301 | | | |
| | 2021 FALL | Primary | Olaf Dammann | Olaf.Dammann@tufts.edu |
| | 2021 FALL | Primary | Ramya Palacholla | Ramya.Palacholla@tufts.edu |
| | 2021 SPRG | Primary | Christopher Vaughan | No Email on file. |

The Capstone Planning Immersion is a cumulative practice-based experience to begin the student's capstone project for the Health Informatics and Analytics Program. The purpose of the immersion weekend is to prepare the HIA student to apply the skills and knowledge that they have acquired during their time in the HIA Program to complete a Health Informatics or Health Analytics project with an organization with the assistance of their advisor, career services and/or other faculty member. Students initiate and design capstone projects in consultation with faculty, career services and Capstone organizations. Faculty members provide guidance

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and mentoring. Requires prior completion of at least three semesters of graduate study in health informatics. During the immersion students will participate in seminars, lectures, and group discussions with HIA faculty, subject matter experts, and classmates to conceptualize how they will initiate, plan and execute a project in their chosen track of either Health Informatics or Analytics.

| **144342** | **Capstone Practicum** |
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| Subject: | Catalog Nbr: | | | |
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| HIA | 0302 | | | |
| | 2021 FALL | Primary | Ramya Palacholla | Ramya.Palacholla@tufts.edu |
| | 2021 SPRG | Primary | Christopher Vaughan | No Email on file. |

As a culminating experience, students will put into practice the knowledge and skills they learned during their coursework through the Capstone Practicum. The Capstone Practicum will provide the student a launching pad to pursue opportunities for professional growth and development in the field of health informatics and health analytics. Students will have the opportunity to develop and implement a health informatics or health analytics project within a host organization, or within their workplace. Students will identify a health care need/ problem and use the methodologies learned in the HIA program to address the problem including creating new data management resources, optimizing current data systems, conducting data analytics, building machine learning algorithms, deploying clinical decision support systems, designing and evaluating new technology solutions. Students will engage with problems in a variety of settings: clinical, research, and industry (health technology companies, pharmaceutical companies). During the Capstone Practicum, students will have the opportunity to continue developing these skills, while they earn recognition for their professional competence, technical skills and leadership acumen. The program will also aid students in identifying viable Capstone projects and establishing a preceptor for oversight and mentorship.

| **144343** | **Data Wrangling and Exploratory Analysis** |
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| Subject: | Catalog Nbr: | | | |
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| HIA | 0216 | | | |
| | 2021 SUMR | Primary | Kenneth Chui | Kenneth.Chui@tufts.edu |
| | 2021 SUMR | Primary | Misha Eliasziw | Misha.Eliasziw@tufts.edu |

This 14-week course provides the foundation for students who wish to engage in data analytics. The first 7 weeks introduce the basics of using software R and various downloaded expansion packages to compile and manage data sets for analyses. It also introduces the use of Structured Query Language (SQL) in data set preparation. The second 7 weeks introduce the basics of statistics, analyzing data using R, interpretation of results, and reporting of findings.

Upon successful completion of the first 7 weeks of the course, students will be able to carry out simple to moderate data abstraction tasks, so that they can be ready to build a stronger understanding of the data and their inter-relationship prior to in-depth analysis. From the second 7 weeks of the course, students will be able to summarize data using descriptive statistics and graphical displays and perform hypothesis testing.

All fourteen weeks include asynchronous lectures and synchronous online Live Sessions, and individual assessments.

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| No prerequisites are needed for this course. Students are not expected to have prior knowledge in statistics or any statistical software. |

| 144344 | Multivariable Data Analysis and Visualization | | | |
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| Subject: | Catalog Nbr: | | | |
| HIA | 0217 | | | |
| 2021 SUMR | | Primary | Kenneth Chui | Kenneth.Chui@tufts.edu |
| 2021 SUMR | | Primary | Misha Eliasziw | Misha.Eliasziw@tufts.edu |

In the first 7-week section, students will learn the principles and practice of regression modelling, including simple linear regression, multivariable linear, logistic, Poisson, and Cox proportional hazards regression, as well as being able to interpret regression coefficients, assess model fit, and create prediction equations. In the second 7-week section, student will learn basic graphical design principles and best practices, and apply them to produce static data visualizations (e.g. stand-alone charts, panel charts,) location-based data visualizations (e.g. thematic map,) and interactive data visualizations (e.g. data dash boards) using software such as R and Tableau. At the end of the course, students will be able to perform regression modelling, conduct integrating data analyses and visualizations.

| 144345 | Introduction to the Application of Artificial Intelligence and Big Data in Health Care | | | |
|---|---|---|---|---|
| Subject: | Catalog Nbr: | | | |
| HIA | 0218 | | | |
| 2021 FALL | | Primary | Imtiyaz Hossain | Imtiyaz.Hossain@tufts.edu |
| 2021 FALL | | Primary | Vahab Vahdatzad | Vahab.Vahdatzad@tufts.edu |
| 2021 SPRG | | Primary | Ramya Palacholla | Ramya.Palacholla@tufts.edu |

Students will learn to understand and apply concepts in Big Data (BD) analytics and Artificial Intelligence (AI)- the two key catalyzers for technological revolution within the context of the healthcare industry and analyze case studies from healthcare, public health and research. The students will be introduced to the concepts of BD, AI and Machine Learning (ML) and their application in health care. Students will explore the application of supervised, unsupervised ML algorithms and Natural Language Programming (NLP) through various use cases in health care including medical diagnosis, disease management, screening, and clinical decision support. Advantages, disadvantages and ethics of leveraging AI and BD in the health care domain will be discussed. As a hands-on lab, students will work with R/ R Studio to apply the concepts taught in class. The course will prepare students for a career in health informatics and analytics space through a real-world understanding of the role of BD and AI within the health care context.

| 144346 | GIS/Spatial Epidemiology | | | |
|---|---|---|---|---|
| Subject: | Catalog Nbr: | | | |
| HIA | 0219 | | | |
| 2021 FALL | | Primary | Thomas Stopka | Thomas.Stopka@tufts.edu |
| 2021 FALL | | Primary | Shikhar Shrestha | Shikhar.Shrestha@tufts.edu |

In public health, place matters. Place is a close reflection of the social and economic deprivation and environmental exposures that can result in significant health disparities that are manifest in health outcomes, including morbidity and mortality. While uses of geographic information systems (GIS) and spatial

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epidemiology have increased steeply and steadily within the public health sciences during the past two decades, they are still in their infancy. In health disparities, nutrition, disease prevention, and health services research, this is particularly evident. More than an estimated 80% of health issues have a spatial component; however, only a small fraction of
research studies include a focus on the geography of health and spatial associations of putative exposures, access to care, and health outcomes. This course will provide students with the basic skills needed to obtain, analyze, and decipher spatial data in GIS, using a variety of examples from public health, nutrition, urban development, and the US Census Bureau.

| **144347** | **Business of Healthcare** |
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| Subject: | Catalog Nbr: | | | |
|---|---|---|---|---|
| HIA | 0220 | | | |
| 2020 SUMR | | Primary | Mark Haas | Mark.Haas@tufts.edu |
| 2021 FALL | | Primary | Imtiyaz Hossain | Imtiyaz.Hossain@tufts.edu |

The Business of Healthcare is a 14-week, 3 credit elective that will provide students a foundation for understanding financial and operational management of healthcare organizations. Health Informatics and Analytics students aspiring to be a manager in the industry will gain the essential financial and management tools for a managerial role in an organization. The course will begin with a global overview of how the US healthcare system is financed and show how that translates locally into a healthcare organization's budget. Students will learn how to properly create and monitor a budget while also learning to benchmark financial as well as non-financial performance in the industry. Particular attention will be given to how healthcare financial data is collected and analyzed for internal decision making as well as more global decisions around healthcare reimbursement. After the financial management foundation is set, the course will then explore general management topics and assist with developing useful skills in human resources management, project management, strategic planning, conflict resolution and negotiations. This course will provide students with techniques and tools that healthcare organizations use everyday to make the most effective financial and operational decisions. Application of these techniques and tools will be described in the context of real-life healthcare examples and applicable business cases, while also discussing them in the context of the latest regulatory and financing changes being considered in the industry. A combination of quizzes, written case analyses, lecture questions, and live session exercises will be used to gauge the students' comprehension of the material.The course includes asynchronous lectures, synchronous online live sessions, software demonstrations, individual work, and a group exercise on negotiations.

| **144348** | **Data Trust: Information Governance in Health** |
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| Subject: | Catalog Nbr: | | | |
|---|---|---|---|---|
| HIA | 0221 | | | |
| 2021 FALL | | Primary | Chad Brouillard | Chad.Brouillard@tufts.edu |
| 2021 FALL | | Primary | Kimberly Reich | Kimberly.Reich@tufts.edu |

This elective 14-week course provides an overview of the topic of data trust and a practice of Information Governance (IG) to enable this trust. IG is an enterprise-wide framework which identifies why and defines how a healthcare entity's information is controlled, protected, retained, accessed, used and destroyed as well as the internal and external mechanisms that enforce the framework. Information Governance is the foundation of data trust within and across healthcare technologies and their supporting industries. This

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course will focus on the creation, preservation, and use of healthcare data for legal purposes, including regulatory compliance, clinical and business value, and for litigation purposes to comply with threshold requirements of authenticity.

| 144349 | Fundamentals of Privacy and Security in Health IT |
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Subject: HIA | Catalog Nbr: 0222

2021 FALL | Primary | John Lowry | John.Lowry@tufts.edu

This 14-week course provides an overview of the fields/disciplines of privacy and security law and policy, operational, technical, physical and administrative security, as well as the application of privacy and security best practices to diverse healthcare organizations. Students will develop an understanding of health information technology (HIT) security and privacy issues, requirements, and best practices to ensure the confidentiality, integrity, availability and privacy of health data.

| 144350 | Organizational Behavior, Leadership and Change Management |
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Subject: HIA | Catalog Nbr: 0223

2021 SUMR | Primary | Gina Abudi | Gina.Abudi@tufts.edu

The ability to understand organizational behavior and apply leadership and change management is essential in today's workforce and a required competency regardless of the person's role in the organization. To build this competency, students will develop an understanding of the principles of organizational behavior, leadership, and change management, all with an emphasis on sustaining positive outcomes from informatics and analytics projects. Students will develop strategies for building organizational capacities ensuring engagement of stakeholders and employees. Students will also learn a range of interpersonal skills for teamwork and collaboration, conflict resolution and negotiation, and management and leadership.

| 144351 | Project Management |
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Subject: HIA | Catalog Nbr: 0224

2021 FALL | Primary | Gina Abudi | Gina.Abudi@tufts.edu

This elective 7-week course provides students with a foundation in project management. Project management competency is essential in healthcare, where projects launched are more complex than previously. The ability to shepherd a health informatics and analytics (HIA) project through, from making the business case through to capturing lessons learned for continuous improvement, is essential for ensuring projects meet the defined objectives and are completed within the limited time often allocated for completion. The course includes asynchronous lectures and guest lectures, synchronous online Live Sessions, discussions, individual assessments, and a team project and presentation.

| 144352 | Introduction to Python for Health Informatics and Analytics |
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Subject: | Catalog Nbr:

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| HIA | 0225 | | | |
| 2021 FALL | | Primary | Olaf Dammann | Olaf.Dammann@tufts.edu |

Python is one of the most widely used programming languages in health informatics and analytics. This 7-week course provides a high-level introduction to the Python language and familiarize you with how it is used in some healthcare settings. You will have an introductory session on the language and user interfaces available, do some coding, and review existing, real-life code examples from healthcare and public health applications. This course is intended for students with no prior coding experience.

| **144353** | **Informatics Fundamentals** | | | |
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| Subject: | Catalog Nbr: | | | |
| HIA | 0211 | | | |
| 2021 FALL | | Primary | Harold Lehmann | Harold.Lehmann@tufts.edu |

In this 7-week course students will develop an understanding of health informatics, broadly considered. Students will gain a system view of information problems and participate in learning activities examining broad context, organizational issues, roles, business processes, information system, data, information, knowledge, algorithms, and underlying technologies. The course includes lectures, reading, tutorials, “live talks,” quizzes and a final project.¿

| **144354** | **Informatics for Health Professionals** | | | |
|---|---|---|---|---|
| Subject: | Catalog Nbr: | | | |
| HIA | 0212 | | | |
| 2021 FALL | | Primary | Ajibade Ashaye | Ajibade.Ashaye@tufts.edu |

This course is designed for healthcare professionals. The course learning objectives include applying a system view of informatic problems and gaining practical skills in guiding the development of information technology solutions in healthcare delivery and population health. The course is built around relevant business cases/use cases and functional requirements analysis related to direct patient care in ambulatory or hospital settings, including clinical documentation, care coordination, and medication management. The course includes asynchronous lectures, live online class discussions, individual assessments, and group exercises on business case/use case development.

| **144355** | **Informatics for Public Health Professionals** | | | |
|---|---|---|---|---|
| Subject: | Catalog Nbr: | | | |
| HIA | 0213 | | | |
| 2020 Fall | | Primary | Anna Orlova | Anna.Orlova@tufts.edu |

This is a required course under the Health Informatics track of the Health Informatics and Analytics (HIA) program. The 7-week course is designed for public health professionals. The course is built around relevant business cases/use cases and functional requirements analysis related to the use of health information technology (HIT) for public health practices. Specifically, the course is focused on electronic data reporting from Electronic Health Record (EHR) systems to public health agencies, emergency preparedness and other public health information systems.

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| | The course includes asynchronous lectures and subject matter expert panels, live online class discussions, individual assessments, and group exercises on business case/use case development. |

| **144356** | **Informatics for Clinical Research** |
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| Subject: | Catalog Nbr: |
| HIA | 0214 |
| This 7-week course provides an overview of the fields/disciplines of informatics in the support of biomedical research, focusing on clinical research. Using the research life cycle as its framework, the course demonstrates how informatics realates to each phase (hypothesis generation, team assembly and training, protocol development, permission seeking, execution, data collection, data analysis, results reporting and archiving). In each case, the core information problems will be articulated, current solutions discussed (As-Is), and gaps between need and tools articulated (To-Be). | |

| **144357** | **Quality and Outcomes** | | | |
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| Subject: | Catalog Nbr: | | | |
| HIA | 0215 | | | |
| 2021 FALL | | Primary | Judith Cullinane | Judith.Cullinane@tufts.edu |
| The course reviews the fundamental steps, measures and data analysis requirements for systems and quality improvement necessary in healthcare. The content will address systems and quality improvement theories, root cause analysis, and change management steps. Commonly used measurements, statistical tools, quality structure, process and outcomes will be addressed to evaluate outcomes of quality and safety initiatives in health care settings. In addition, the course will address the importance of interprofessional collaboration in the context of change improvement using evidenced based practice, reviewing the implications of variation in practice, and understanding the difference between research and clinical quality improvement.¿Course information will emphasize approaches applied to solving actual problems using clinical case scenario. | | | | |

| **144810** | **Principles of Epidemiology** | | | |
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| Subject: | Catalog Nbr: | | | |
| PH | 0201 | | | |
| 2020 Fall | | Primary | Kimberly Nguyen | Kimberly.Nguyen@tufts.edu |
| 2021 FALL | | Primary | Dominique Michaud | Dominique.Michaud@tufts.edu |
| 2021 FALL | | Primary | Silas Pearman | Silas.Pearman@tufts.edu |
| 2021 FALL | | Primary | Christina Parrinello | Christina.Parrinello@tufts.edu |
| 2021 SPRG | | Primary | Shayesteh Jahanfar | Shayesteh.Jahanfar@tufts.edu |
| 2021 SUMR | | Primary | Mei Chung | Mei_Chun.chung@tufts.edu |
| 2021 SUMR | | Primary | Richard Niska | Richard.Niska@tufts.edu |
| This course provides an introduction to the epidemiological perspective on health and disease. The course emphasizes the principles and methods used to describe and evaluate the patterns of illness in communities and in population subgroups. Methods and research designs used in the investigation of the etiology of infectious and noninfectious disease are presented. Lectures and laboratory examples illustrate a wide range of contemporary health problems. | | | | |

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| 144811 | Public Health Assessment: Data, Determinants, and Systems |
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| Subject: | Catalog Nbr: | | | |
|---|---|---|---|---|
| PH | 0202 | | | |
| 2021 FALL | | Primary | Linda Hudson | Linda.Hudson@tufts.edu |
| 2021 FALL | | Primary | Fernando Ona | Fernando.Ona@tufts.edu |
| 2021 FALL | | Primary | Signe Flieger | Signe.Flieger@tufts.edu |
| 2021 SPRG | | Primary | Ji Young Lim | jean.lim@tufts.edu |
| 2021 SPRG | | Primary | Karen Errichetti | Karen.Errichetti@tufts.edu |
| 2021 SUMR | | Primary | Jasmine Bihm | Jasmine.Bihm@tufts.edu |
| 2021 SUMR | | Primary | Nina Ashford | Nina.Ashford@tufts.edu |

This foundational course in the Tufts MPH program provides an overview of essential frameworks, perspectives, and domains in public health. The course will introduce students to the social ecological model, social determinants of health, public health and health care systems, global health, and health equity. Critical public health challenges will be examined within historical, social, and political contexts across an array of public health domains, such as individual health behaviors, environmental health, occupational health, and health care services and systems. Students will be exposed to practice-based tools for conducting assessments and characterizing public health problems using a systems approach, examining multiple levels of the social ecological model, including individual, organizational, community, systems, and policy.

| 144812 | Public Health Action: Programs, Policy, and Advocacy |
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| Subject: | Catalog Nbr: | | | |
|---|---|---|---|---|
| PH | 0203 | | | |
| 2021 FALL | | Primary | Silas Pearman | Silas.Pearman@tufts.edu |
| 2021 FALL | | Primary | Darleesa Doss | Darleesa.Doss@tufts.edu |
| 2021 FALL | | Primary | Karen Collins | Karen.Collins@tufts.edu |
| 2021 SUMR | | Primary | Anthony Schlaff | anthony.schlaff@tufts.edu |
| 2021 SUMR | | Primary | Kimberly Nguyen | Kimberly.Nguyen@tufts.edu |
| 2021 SUMR | | Primary | Karen Errichetti | Karen.Errichetti@tufts.edu |

This course will introduce concepts, frameworks, and skills for how public health professionals intervene at multiple levels to address critical public health problems of our time, and to improve population health and health equity. This course will build on the foundational health equity content, public health frameworks, systems thinking, and evidence synthesis and assessment skills developed in PH 202: Public Health Assessment. Students will leverage their knowledge of individual behavior, social determinants of health, health care systems, occupational health, and environmental health and apply this content to new situations and contexts. Specifically, students will engage in a variety of active learning scenarios, including case discussions, role plays, simulations, and project development and implementation.

| 144813 | Principles of Biostatistics |
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| Subject: | Catalog Nbr: | | | |
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| PH | 0205 | | | |
| 2021 FALL | | Primary | David Tybor | david.tybor@tufts.edu |

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|---|---|---|---|
| 2021 FALL | Primary | Adela Hruby | Adela.Hruby@tufts.edu |
| 2021 SPRG | Primary | Rachel Silver | Rachel.Silver@tufts.edu |
| 2021 SUMR | Primary | Mark Woodin | mark.woodin@tufts.edu |
| 2021 SUMR | Primary | Katherine Rancano | Katherine.Rancano@tufts.edu |

This course provides an introduction to the basic principles and applications of statistics as they are applied to problems in clinical and public health settings. Topics include the description and presentation of data, random variables and distributions, descriptive statistics, introduction to probability, estimation, elements of hypothesis testing, and one- and two-sample tests, ANOVA (including repeated-measures), non-parametric tests, and an introduction to linear and logistic regression. Lectures, problem sets, and computer output are used to develop these and additional concepts. Graduate standing.

**144814** **Health Care Organization: Budgeting and Management**

Subject: PH Catalog Nbr: 0216

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|---|---|---|---|
| 2021 FALL | Primary | Niobis Queiro | Niobis.Queiro@tufts.edu |
| 2021 FALL | Primary | Faisal Aboul-Enein | Faisal.Aboul_Enein@tufts.edu |
| 2021 SUMR | Primary | Mark Haas | Mark.Haas@tufts.edu |

This course focuses on cost accounting and budgeting in health services, nonprofit financial statement preparation, and the formulation of strategic business plans within the context of economic health policy. Students learn managerial theory and practice pertaining to organizational behavior, information systems, personnel, resource allocation, consensus building and prioritization of goals, conflict resolution, and negotiation strategies.

**144815** **Evaluation Of Health Programs**

Subject: PH Catalog Nbr: 0285

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|---|---|---|---|
| 2021 FALL | Primary | Fernando Ona | Fernando.Ona@tufts.edu |
| 2021 FALL | Primary | Karen Errichetti | Karen.Errichetti@tufts.edu |

This is an introductory course in Public Health Program Evaluation. Students will become familiar with how small-scale evaluations are designed and carried out in the context of public health practice. We will review the tools and data collection methods evaluators use to plan evaluations and collect appropriate data. Both qualitative and quantitative approaches will be addressed. Students will practice data collection skills and apply content and conceptual knowledge learned in the course to the development of an evaluation plan for an existing program.

**144816** **Intermediate Biostatistics**

Subject: PH Catalog Nbr: 0206

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|---|---|---|---|
| 2021 FALL | Primary | Mei Chung | Mei_Chun.chung@tufts.edu |
| 2021 FALL | Primary | James Parrott | James.Parrott@tufts.edu |
| 2021 SUMR | Primary | Shayesteh Jahanfar | Shayesteh.Jahanfar@tufts.edu |

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A variety of topics related to modeling continuous, binary, and survival time outcomes in terms of multiple risk factors are explored. Topics covered include the analysis of variance and covariance, linear regression, multiple linear regression, nonlinear regression, logistic regression, non parametric regression, and regression for survival times, including proportional hazard models. Emphasis is on the practical aspects of model construction, model checking, and model prediction. Applications and computer methods are stressed. Graduate standing.

| 144817 | Survey Research Methods |
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| Subject: | Catalog Nbr: | | | |
|---|---|---|---|---|
| PH | 0222 | | | |
| 2021 FALL | | Primary | Kimberly Dong Breen | kimberly.dong@tufts.edu |
| 2021 FALL | | Primary | Susan Koch-Weser | Susan.Koch_Weser@tufts.edu |
| 2021 SUMR | | Primary | Linda Neff | Linda.Neff@tufts.edu |

This course uses real world examples to introduce students to basic survey methodology and data management. Students have the opportunity to practice the fundamentals of good survey design and how to enter, code and clean the data one collects. Topics include formulating research questions, sampling, sample size determination, linking instruments to conceptual frameworks, principles of item construction and scale development, modes of survey administration, and qualitative methods. During the laboratory component of the course, students learn how to develop and maintain a documentation system, create data entry screens, verify the accuracy of data entry, clean data, merge and subset data files, derive new variables, conduct descriptive analyses and summarize results.

| 144818 | Intermediate Epidemiology |
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| Subject: | Catalog Nbr: |
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| PH | 0251 |

This course in intermediate epidemiologic methods reinforces the concepts and methods taught in PH 201, with in-depth instruction in issues of study design, assessing threats to study validity including confounding and selection bias, and analyzing data with standard regression models. The course emphasizes hands-on learning and includes a combination of discussions of methodologic papers, and a required laboratory component where students will learn to apply the concepts learned in class to real-world problems.

| 144819 | Analytical Workflow Management |
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| Subject: | Catalog Nbr: | | | |
|---|---|---|---|---|
| PH | 0272 | | | |
| 2021 FALL | | Primary | Kenneth Chui | Kenneth.Chui@tufts.edu |
| 2021 FALL | | Primary | Ji Young Lim | jean.lim@tufts.edu |

This course will cover knowledges and techniques of the peri-analysis components of the data life cycle. To name a few: how to retrieve data, how to shape and wrangle data into a form that is most suitable for analysis, how to clean data, how to prepare professional documentations for other users to understand our data, and how to connect output production with our analysis software so that reports can be generated whenever data are revised. Most importantly, students will learn how to accountably document all these activities so that the work is repeatable.

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| 144820 | ALE: Planning Seminar | | | |
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| Subject: | Catalog Nbr: | | | |
| PH | 0301 | | | |
| 2021 FALL | Primary | Virginia Chomitz | Virginia.Chomitz@tufts.edu | |
| 2021 FALL | Primary | Silas Pearman | Silas.Pearman@tufts.edu | |
| In the planning semester students develop a proposed project in collaboration with an organization engaged in public health practice. Faculty assist students in identifying, negotiating, and crafting a suitable project. Students develop a formal plan for project implementation. | | | | |

| 144821 | ALE: Implementation Seminar |
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| Subject: | Catalog Nbr: |
| PH | 0302 |
| After obtaining formal approval for their project plan (including Institutional Review Board review if necessary), student spend a minimum of 160 hours in the field, implementing their project, written as if for publication, and give a formal presentation to the faculty and their peers. | |

| 144822 | Infectious Disease Epidemiology |
|---|---|
| Subject: | Catalog Nbr: |
| PH | 0224 |
| This course focuses on the epidemiological aspects of infectious diseases, concentrating on the epidemiology of bacterial and viral infections. Emphasis is placed on concepts of transmission and prevention. In addition, epidemiological problems are presented to explore how epidemiology is used to understand "new" diseases such as Legionella, AIDS, and Lyme disease. | |

| 144985 | Public Health Practice Epidemiology | | | |
|---|---|---|---|---|
| Subject: | Catalog Nbr: | | | |
| PH | 0252 | | | |
| 2021 FALL | Primary | Janet Forrester | janet.forrester@tufts.edu | |
| 2021 SPRG | Primary | Kimberly Nguyen | Kimberly.Nguyen@tufts.edu | |
| The focus of this course will be on mastering the concepts used in epidemiology by application of the concepts to the practice of public health. | | | | |

| 145120 | Directed Study | | | |
|---|---|---|---|---|
| Subject: | Catalog Nbr: | | | |
| HIA | 0401 | | | |
| 2020 Fall | Primary | Olaf Dammann | Olaf.Dammann@tufts.edu | |
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| 145428 | Analysis of Multilevel and Longitudinal Data |
|---|---|

Subject: PH | Catalog Nbr: 0291

2021 FALL | Primary | Misha Eliasziw | Misha.Eliasziw@tufts.edu

Multilevel and longitudinal study designs have become commonplace in public health, biomedical sciences, and medicine. Ignoring the correlative structure of the responses in the analysis leads to invalid tests and erroneous conclusions. This course presents corrective statistical methods that include, linear and generalized linear mixed models, repeated measures analysis of variance, generalized estimating equations, and hazards regression models. Each method is discussed in a practical in-depth manner by emphasizing parallels with more familiar regression models and is illustrated by analyzing data using statistical software. The course not only provides guidelines for selecting an appropriate analytical approach but also provides a sound interpretation of the results.

| 145429 | Qualitative Methods and Data Analysis |
|---|---|

Subject: PH | Catalog Nbr: 0290

2021 FALL | Primary | Fernando Ona | Fernando.Ona@tufts.edu

The course is an introductory course, to begin, but not develop full mastery in, various relevant qualitative methods relevant for public health. The course emphasizes practical skills of qualitative research design, data collection (i.e., interviewing, focus group facilitation, participant observations, photovella/photovoice, etc.) and analysis. The course introduces students to: 1) paradigms of qualitative research and inquiry; 2) selected data collection, management, and analysis methods for qualitative research in public health; and, 3) standards for reporting qualitative findings.

The course will follow a remote studio format in which students will receive guidance on how to set up and implement qualitative methods, conduct qualitative data analysis as well as peer-feedback on their own qualitative data analysis efforts. Class meetings will involve short interactive lectures, qualitative methods and data analysis exercises, and collaborative remote studio work toward an ePortfolio. Students will learn about methods for analyzing qualitative data manually but will be exposed to the nVivo software platform.

| 145430 | Data Wrangling |
|---|---|

Subject: HIA | Catalog Nbr: 0226

2021 FALL | Primary | Shikhar Shrestha | Shikhar.Shrestha@tufts.edu

This 7-week course provides the foundation for students who wish to engage in data analytics. The course introduces the basics of using software R and various downloaded expansion packages to compile and manage data sets for analyses. It also introduces the use of Structured Query Language (SQL) in data set preparation.

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Upon successful completion of the seven-week course, students will be able to carry out simple to moderate data abstraction tasks, so that they can be ready to build a stronger understanding of the data and their inter-relationship prior to in-depth analysis.

All 7 weeks include asynchronous lectures and synchronous online Live Sessions, and individual assessments.

| 145431 | Applied Univariable and Bivariable Statistics |
|---|---|
| Subject: HIA | Catalog Nbr: 0227 |

This seven-week course introduces the fundamental concepts of summarizing data and statistical inference, including descriptive statistics, graphical displays, hypothesis testing of means and proportions, p-values, confidence intervals, and statistical power. Students will analyze data using R and learn how to interpret results and report findings.

All seven weeks include asynchronous learning and live online synchronous sessions, and individual assessments.

| 145432 | Applied Multivariable Statistics |
|---|---|
| Subject: HIA | Catalog Nbr: 0228 |

2021 FALL Primary Misha Eliasziw Misha.Eliasziw@tufts.edu

This seven-week course introduces the principles of regression modelling, including simple linear regression, multiple linear regression, two-factor analysis of variance, and logistic regression. Students will analyze data using R and learn how to interpret results, assess model fit, create prediction equations, and report findings.

All seven weeks include asynchronous learning and live online synchronous sessions, and individual assessments.

| 145433 | Data Visualization |
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| Subject: HIA | Catalog Nbr: 0229 |

During the 7-week course, students will learn how to graphically express their quantitative results. Important concepts and practices in data visualization will be discussed, as well as exploring how to create clear and

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well-planned graphs using the ggplot2 package of R and commercial software Tableau. As a culminating experience, students will present their individual data analysis and visualization project in the last week.

All 7 weeks include asynchronous lectures, synchronous online live sessions, and individual assignments.

| 145435 | Health Data Analysis and Usage |
|---|---|
| Subject: | Catalog Nbr: |
| HIA | 0230 |
| 2021 FALL | Primary Olaf Dammann Olaf.Dammann@tufts.edu |

This seven-week survey course provides a broad overview of how health data are used today. We discuss the health data ecosystem and technologies, and data in healthcare, clinical research, and public health. Special topics are social determinants of health and environmental data. The asynchronous material is provided by faculty with expertise in these fields. Assessments will be weekly, both individually and in groups, and with a final paper critique group assignment, as well as a final paper about a health data topic relevant to students' interest. ¿

The course includes asynchronous lectures and expert panels, synchronous online live meetings, individual assessments, and group exercises on reviewing/critiquing published projects from informatics and analytics perspectives. No prerequisites are needed for this course.

| 145516 | Implementation Science: Bridging the Gap Between Knowledge and Practice |
|---|---|
| Subject: | Catalog Nbr: |
| PH | 0276 |

| 145527 | U.S.Health Care |
|---|---|
| Subject: | Catalog Nbr: |
| PH | 0277 |

This course serves as an overview of the context, stakeholders, and function of healthcare systems. It covers a large amount of information about how healthcare in the U.S. functions so that, by the end of the course, students can apply what they know to evaluate options and contribute to conversations about policy solutions. Since policy information is constantly changing, students will also learn how to continue updating their knowledge on these topics throughout their careers. Students interested in careers in the health care system, government, or consulting will find this course invaluable.

Each week has one block of asynchronous instruction (90 min online video and presentation) and one block of synchronous instruction (90min online classroom via Zoom). All preparatory asynchronous material is

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reviewing a certain area of health care and each synchronous meeting will be a discussion about students' experiences, areas of interest, and current policy challenges and debates related to the weekly topic.