



BIOMEDICAL INFORMATICS (BIOINF) COURSES

(as of August 1, 2009)

BIOINF 2011

Introduction to Biomedical Informatics (ISSP 2015 / HRS 2429) (3 Credits)

A survey of fundamental concepts and activities on information technology applied to health care. Topics include computer-based medical records, knowledge-based systems, telehealth, decision theory and decision support, human-computer interfaces, systems integration, the digital library, bioinformatics, and educational applications. Department-specific applications such as pathology, radiology, psychiatry and intensive care are also discussed.

Instructor: Shyam Visweswaran, M.D., Ph.D.

Days/Times: Mondays and Wednesdays, 10:00 a.m. to 11:25 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: None

Recitations: None

Expected class size: 20-25

This course is usually offered in the fall term.

BIOINF 2012

Problem-Oriented Programming in Medical Informatics (ISSP 2062) (3 credits)

<http://jhh.opi.upmc.edu/main/pop/>

This course is designed to extend students' programming abilities through review of current program design and coding techniques, including fourth-generation languages, the Unified Modeling Language (UML), Object-oriented Programming and Extreme Programming. The course includes a strong practical programming component based on the Python language that includes in-class laboratories, weekly practical programming problems, and midterm and final programming projects. Programming assignments are drawn from areas relevant to medical informatics such as structured text and image processing, network communications, database management, natural language processing, expert systems, etc. Through the course, students learn to understand the programming process at a practical level and gain the ability to independently create useful software tools.

Instructor: Brian E. Chapman, Ph.D.

Days/Times: Thursdays, 9:00 a.m. to 12:00 noon.

Location: TBA

Prerequisites: One course in introductory Programming, or equivalent experience.

Recitations: None

Expected class size: 8-16

This course is usually offered in the fall term.

BIOINF 2013

Introduction to Patient Care and Clinical Environments (3 credits; optional for U.S. trained clinicians)

This three credit course is designed for students who have no significant clinical experience with the U.S. healthcare system. The course is divided into two main sections. In the first section, we will cover medical and health care concepts and terms, and discuss observational techniques derived from the

Toyota Production System. In the second section of the course, students will shadow physicians in a variety of clinical settings and report back to the class on their observations using the skills learned in the first half of the course. No previous clinical experience is assumed. Students will be expected to attend lectures and will spend a significant portion of their time observing and reporting on different clinical settings throughout the semester.

Instructor: Natalia Morone, M.D., M.Sc. and Steven Handler, M.D.

Days/Times: Thursdays from 1:00 p.m. to 4:00 p.m.

Location: M-185 VALE, 200 Meyran Avenue and various clinical areas

Prerequisites: None

Recitations: None

Expected class size: 10-12

This course is offered in the fall term.

BIOINF 2014

Biomedical Informatics Project Course (3 Credits)

This course provides an opportunity for students to apply concepts that they learned in BIOINF 2011 to carry out a one-term research project. They will be asked to identify, plan, develop, carry out, and report on such a project. This hands-on course will encourage students to think more deeply and concretely about the concepts and methods presented in BIOINF 2011 and in doing so to develop a better understanding of that material. This course will also serve as an early, mentored introduction to performing biomedical informatics research.

Instructor: T.B.D.

Days/Times: Tuesdays and Thursdays from 1:00 p.m. to 2:30 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: BIOINF 2011 – Introduction to Biomedical Informatics.

Recitations: None

This course is offered during the spring term.

BIOINF 2015

Mathematical Foundations of Biomedical Informatics (3 credits)

The purpose of this class is to review mathematical techniques that underly biomedical informatics. Knowledge of these mathematical subjects will be assumed in many subsequent biomedical informatics courses (e.g. statistics and machine learning). The course will emphasize conceptual understanding and applications rather than formal proofs. Each mathematical subject will be illustrated with problems from within biomedical informatics.

Instructor: Brian E. Chapman, Ph.D.

Days/Times: Monday, Tuesday, and Wednesdays, 2:05 p.m. to 3:00 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: None

Recitations: None

Expected class size: 10-16

This course is usually offered in the fall term.

Biomedical Informatics Colloquium (Lecture Series) (This is not a formal course.)

This course meets once each week for one hour. The current research of Biomedical Informatics faculty and senior fellows will be presented.

Instructor: Various speakers

Days/Times: Fridays, 11:00 a.m. to 12:00 noon

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: None

Recitations: None

Expected class size: 35

This course is offered in both fall and spring terms.

BIOINF 2032

Biomedical Informatics Journal Club (ISSP 2083) (1 Credit)

Biomedical informatics is a broad field encompassing many different research domains. What all of the domains have in common is the need to review and publish scientific papers and to give talks that present research to different audiences. The aim of this journal club is to expose students to recent research in various topics of biomedical informatics and to teach students how to critique a research article, present research from a research study; and critique a verbal presentation of research.

Instructor: Brian Chapman, PhD

Days/Times: Fridays, 10:00 a.m. to 11:00 a.m.

Location: M-185 VALE, 200 Meyran Avenue

Prerequisites: None

Recitations: None

Expected class size: 35

This course is offered in the spring term.

BIOINF 2033

Introduction to Research in Biomedical Informatics (1 Credit)

Students will explore the fundamentals of basic and applied research in biomedical informatics, with instructor-lead readings and discussions on a wide range of topics, including important aspects of experimental design, modes of scientific inference, science as a way of knowing, ethical issues of scientific research, special issues in the information age, the value of awareness of the impact of culturalism in multidisciplinary research, the purpose and value of the peer-review process, and the role of informatics in medical scientific research.

Instructor: Brian Chapman, Ph.D.

Days/Times: Tuesdays, 1:00 p.m. to 2:00 p.m.

Location: M-185 VALE, 200 Meyran Avenue

Prerequisites: This course is open only to students in the Biomedical Informatics Training Program of the Department of Biomedical Informatics.

Recitations: None

Expected class size: 25

This course is offered in the fall term.

BIOINF 2051

Introduction to Bioinformatics (ISSP 2081) (3 Credits)

Provides an introduction to selected topics of bioinformatics also known as computational biology. In this course, the difficult computational problems involving different types of biological information are identified using case studies from current literature. **Emphasis is on genomic aspects of computational biology with some overview of proteomics and structural aspects.** The course is structured as a seminar course intending to draw students into participating in discussions related to both problems and existing solutions.

Instructor: Vanathi Gopalakrishnan, Ph.D.

Days/Times: Mondays and Wednesdays 12:30 p.m. to 2:00 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: An introductory biology course and an undergraduate mathematics course.

Recitations: none

Expected class size: 10

This course is offered in the fall term.

BIOINF 2052

Introduction to Computational Structural Biology (CMPBIO 2030 / MSBIO 2030) (3 Credits)

This course is a general introduction to current theories and methods used in computational structural biology. Fundamental concepts of probability, statistics, statistical thermodynamics and polymer physics

will be considered as well as a general description of our current knowledge of biomolecular structure and dynamics for modeling and simulations of biological interactions and function. The Protein Data Bank and software commonly used in computational structural biology will be used for modeling and simulations of structure and dynamics.

Instructor: Ivet Bahar, Ph.D.

Days/Times: Tuesdays and Thursdays, 9:30 a.m. to 10:45 a.m.

Location: BST-3, Room 3073

Prerequisites: An introductory biology course and an undergraduate mathematics course.

Recitations: none

Expected class size: 15

This course is offered in the spring term, every odd year.

BIOINF 2053

Sequence Analysis Laboratory (3 Credits)

This course will give students hands-on experience with sequence analysis software by involvement in an intensive workshop offered by the Pittsburgh Supercomputing Center. In addition, students will work on a study project directed by the instructor that will enable them to apply bioinformatics techniques to a challenging biomedical problem.

Instructor: Vanathi Gopalakrishnan, Ph.D.

Days/Times: TBA

Location: M-184 VALE, 200 Meyran Avenue & The Pittsburgh Supercomputing Center

Prerequisites: BIOINF 2051 Introduction to Biomedical Informatics.

Recitations: none

Expected class size: 3

This course is offered in the summer term.

BIOINF 2054

Statistical Foundations for Bioinformatics Data Mining (BIOST 2018) (3 Credits)

This course introduces data analysis methods which are widely used or rapidly gaining use in bioinformatics. Methods deal with prediction, classification, optimization, and clustering. Methods covered include classification trees, flexible varieties of discriminant analysis including support vector machines, EM algorithm and Monte Carlo Markov chain, the bootstrap and bagging, boosting, and self-organizing maps. The methods are placed into the context of principles and models of statistical science, with emphasis on Bayesian methods. Examples are drawn from microarrays, analysis of genetic networks, proteomics, computational pharmacology, and research text mining.

Instructor: Roger S. Day, Sc.D.

Days/Times: Wednesdays and Fridays, 3:00 to 4:30 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: An introductory statistics/biostatistics course.

Recitations: none

Expected class size: 6-10

This course is offered in the spring term, every odd year. Special permission from instructor is required for this course.

BIOINF 2055

Practical Analysis of High-Throughput Genomic and Proteomic Data Sources (3 Credits)

This course provides an in-depth, comparative study of methods for the analysis and interpretation of high-throughput genomic and proteomic data sources. Using a broad survey of the literature, the student will become familiar with approaches to normalization/transformation, finding predictive biomarkers, methods for classification, cross-validation, functional interpretation. Ways to integrate diverse data sources, including clinical outcomes, will be explored. Classroom activities will include lectures exercises in the use of publically-available software, and intensive experience in the analysis and

interpretation of published data sets. By the end of the semester, students will be able to think critically about the diverse strategies for analyzing high-throughput genomic and proteomic data sources.

Instructor: James Lyons-Weiler, Ph.D.

Days/Times: Tuesdays and Thursdays, 3:00 to 4:30 p.m.

Location: UPMC Cancer Pavilion (Shadyside UPMC), Room 304, 3rd Floor.

Prerequisites: This course is open to seniors and graduate students from any school. At least two semesters of statistics, any level, are required.

Recitations: none

Expected class size: 10-12

This course is offered in the spring term, every even year.

BIOINF 2057

Elements of Statistical Learning (BIOST 2015) (3 Credits)

The purpose of the course is to present the theory and practice of statistical learning algorithms, placing “statistical learning” or “data mining” techniques in the proper context with regard to their origins in simple classical methods like linear regression, to clarify the strengths and weaknesses from theoretical and practical sides. “Supervised learning” techniques studied include using regularization and Bayesian methods, kernel methods, basis function methods, neural networks, support vector machines, additive trees, boosting, bootstrap-based methods. Unsupervised learning techniques studied include cluster analysis, self-organizing maps, independent component analysis and projection pursuit.

Instructor: Roger S. Day, Sc.D.

Days/Times: Wednesdays and Fridays, 3:00 p.m. to 4:25 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: BIOST 2041, 2042, 2043, 2044 or permission of the instructor

Recitations: none

Expected class size: 6-10

This course is offered in the spring term, every even year.

BIOINF 2058

Bayesian & Empirical Bayes Computational Methods (BIOST 2064) (3 Credits)

This course provides the students with an understanding of both the theory and practice with regard to the EM algorithm, Markov-chain, sampling techniques, importance sampling, and the solution of decision trees. Students gain hands-on experience programming with S-Plus.

Instructor: Roger S. Day, Sc.D.

Days/Times: Tuesdays and Thursdays, 11:30 a.m. to 12:55 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: BIOST 2063

Recitations: none

Expected class size: 6-10

This course is offered in the fall term, every even year.

BIOINF 2059

Bayesian & Empirical Bayesian Statistical Methods (BIOST 2063) (3 Credits)

The theoretical foundations of Bayesian and empirical Bayes statistical methods will be presented. The use of these methods in data analysis will be illustrated with specific examples and with discussions of common data analysis issues contrasts and similarities between Bayesian, empirical Bayesian, and classical methods will be evaluated.

Instructor: Roger S. Day, Sc.D.

Days/Times: Tuesdays and Thursdays, 11:30 a.m. – 12:55 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: BIOST 2042, BIOST 2044

Recitations: none

Expected class size: 6-10

This course is offered in the fall term, every odd year.

BIOINF 2060

Computational Genomics (MSCBIO 2070) (3 credits)

In this course, we will discuss classical approaches and latest methodological advances in the context of the following biological problems: 1) Computational genomics, focusing on gene finding, motif detection and sequence evolution. 2) Analysis of high throughput biological data, such as gene expression data, focusing on issues ranging from data acquisition to pattern recognition and classification. 3) Molecular and regulatory evolution, focusing on phylogenetic inference and regulatory network evolution, and 4) Systems biology, concerning how to combine sequence, expression and other biological data sources to infer the structure and function of different systems in the cell. From the computational side this course focuses on modern machine learning methodologies for computational problems in molecular biology and genetics, including probabilistic modeling, inference and learning algorithms, pattern recognition, data integration, time series analysis, active learning, etc.

Instructor: Ziv Bar-Joseph and Takis Benos

Days/Times: TBA

Location: TBA

Prerequisites: Students are expected to have successfully completed Machine Learning, or an equivalent class

Recitations: None

Expected class size: 35

This course is offered in the spring term.

BIOINF 2082

Bioinformatics Journal Club (1 Credit)

This course meets once each week for one hour. The research being presented will be taken from recent journal papers, specific to the field of bioinformatics and related areas.

Instructor: Various speakers

Days/Times: Fridays, 10:00 a.m. to 11:00 a.m.

Location: M-185 VALE, 200 Meyran Avenue

Prerequisites: None

Recitations: None

Expected class size: 35

This course is offered in the spring term.

BIOINF 2101

Probabilistic Methods for Computer-Based Decision Support (ISSP 2070 / INFSCI 2905) (3 Credits)

This seminar provides an introduction to computational approaches for probabilistic modeling and inference. A particular focus is placed on Bayesian networks, although other probabilistic models also will be studied. Medical applications are emphasized, however, the principles are general and no medical knowledge is needed to take the course. The course does not require knowledge of a computer programming language.

Instructor: Gregory F. Cooper, M.D., Ph.D.

Days/Times: Tuesdays and Thursdays, 1:30 to 3:00 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: An understanding of basic probability theory would be helpful, but is not required.

Recitations: None

Expected class size: 15

This course is usually offered in the fall term, every even year.

BIOINF 2109

The Internet and Health Informatics (NURSP 2087) (3 Credits)

This course is designed to survey applications and technologies for health informatics. Web-based and multimedia approaches will be emphasized. The focus will be on the design, development and evaluation of applications that support training, education and access to health information. The course is taught in a web-enhanced format.

Instructor: Gilan Saadawi, M.D., M.S.

Days/Times: Mondays, 1:00 to 4:00 p.m.

Location: School of Nursing, Rm. 114 Victoria Hall

Prerequisites: None

Recitations: none

Expected class size: 10-12

This course is offered in the spring term, every even year.

BIOINF 2110

Concepts of Software Project Engineering in Health Care (HRS 2428) (3 credits)

This course examines how health care organization implement both clinical and financial information systems. The course will study the implementation process and how to integrate systems to create the computerized patient record (CPR). Students will also have the opportunity to learn about the industry-wide implementation data standards and how to manage them.

Instructor: Melissa Saul, M.S.

Days/Times: Mondays and Wednesdays, 5:00-7:55 p.m.

Location: 6048 Forbes Tower.

Prerequisites: No prerequisites.

Recitations: none

Expected class size: 30

This course is offered in the summer term. Special permission from instructor is required for this course. (e-mail mis18@pitt.edu, obtain permission, then obtain signed permission slip from Toni, M-190 VALE)

BIOINF 2111

Cognitive Studies for Health Informatics (3 credits)

This course is intended to serve as an intensive introduction to Human Information Processing and a survey of its applications to Health Care Informatics. The first four weeks present an overview of the basic architecture of the human information processing system. For each of the last twelve weeks of the course, we alternate classes concentrating on underlying basic cognitive science issues and principles, with classes focusing on how these principles and issues apply in medical informatics domains, such as medical decision support, design of information systems, and computer-based education for health professionals. Students will learn and apply methods for studying cognitive tasks, such as verbal protocol analysis and cognitive modeling.

Instructor: Rebecca S. Crowley, M.D., M.S.

Days/Times: Tuesdays, 9:00-12:00 noon

Location: 304 UPMC Cancer Pavilion.

Prerequisites: No prerequisites.

Recitations: none

Expected class size: 10-12

This course is offered in the spring term, every even year.

BIOINF 2113

Realtime Outbreak and Disease Surveillance (3 Credits)

Many countries are constructing real-time public health surveillance systems. This work--which is proceeding in an accelerated manner due to the threats of emerging diseases, bioterrorism, and common infectious diseases--can benefit greatly from the expertise of the medical informatics community.

This course on the theory and practice of outbreak detection will present up-to-the minute information about the theory and practice of real-time public health surveillance. This course will cover key topics ranging from the network level to the application level to the organizational level. Specific topics will

include functional requirements (e.g., for data, for analysis, for performance), terminology standards, data models, and messaging standards. We will cover algorithms for the automatic detection of epidemics including natural language processing techniques with an emphasis on methods for validation. The experience gained from field deployments of real-time detection systems in Utah, Ohio, Taiwan, New Jersey, Georgia, the Commonwealth of Pennsylvania and other locations will be presented. There will be demonstrations of a surveillance system in operation.

Instructor: Michael M. Wagner, M.D., Ph.D.

Days/Times: Tuesdays and Thursdays, 3:30 to 5:00 p.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: Introductory statistics course. The course can be followed by anyone with medical, medical informatics, or public health background. Ideally, the student will already understand the basic concepts of ROC curve analysis, sensitivity, specificity, positive predictive value, statistical significance testing.

Recitations: none

Expected class size: 12-25

This course is offered in the spring term, every even year.

BIOINF 2114

Introduction to Medical Language Processing (3 Credits)

Biomedical informatics applications may be used for decision support, quality assurance, assistance in research studies, and resource allocation. However, much of the information that drives these applications in free-text format and cannot be manipulated by a computer. Natural language processing (NLP) attempts to automatically retrieve, classify, summarize, or extract information from text.

This class will introduce students to NLP in the medical domain with an emphasis on techniques, applications, and evaluation strategies used in medical language processing (MLP). The class will overlap slightly with the NLP class taught by Diane Litman in Computer Science in that we will spend some time learning about the building blocks of NLP, including syntax, semantics, and pragmatics. However, a large portion of the class will focus on NLP topics peculiar to the medical domain and to evaluation techniques.

Instructor: Wendy W. Chapman, Ph.D.

Days/Times: Tuesdays, 9:00 to 11:00 a.m. and Thursdays, 9:00 to 10:00 a.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: BIOINF 2011 Introduction to Biomedical Informatics.

Recitations: none

Expected class size: 15-20

This course is offered in the spring term, every odd year.

BIOINF 2116

Algorithms for Computational & Predictive Biomedicine (1 or 3 credits)

This course teaches computational approaches from disparate fields, specifically, machine learning, signal and graph theory. Fundamental algorithms for pattern recognition, classification, modeling and inference will be presented from each of these fields to provide the students with the ability to identify the best computational approach to solve a biomedical problem at hand. Each algorithm will be discussed in application to one or more area(s) of computational biomedicine and predictive medicine. Computational examples would demonstrate modeling and prediction of macromolecular (protein and gene) structures, functions and interactions. Predictive medicine is an emerging area that studies patterns in genome sequence, and gene and protein expression phenotypes that serve as biomarkers for early detection of disease such as cancer. Examples will be drawn from this area to demonstrate inference of the genotypic and phenotypic biomarkers through application of relevant algorithms.

Instructor: Madhavi Ganapathiraju, Ph.D.

Days/Times: Monday and Wednesdays, 10:00 a.m. to 11:30 a.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: Working knowledge of probability theory, differential calculus and linear algebra. Students who do not have the prerequisites are also encouraged to attend this course by registering for only 1 credit. See website for further details (<http://serverus.dbmi.pitt.edu>).

Recitations: none

Expected class size: 15-20

This course will be offered in the spring term.

BIOINF 2117

Applied Medical Informatics (2 Credits)

This course is designed to provide an overview of the field of Applied Medical Informatics. Students will learn about the myriad issues that arise when deploying information technology into clinical environments. Various clinical, social, organizational, legal, and technical challenges make deployment a challenge. Learning how others have addressed these challenges will equip the student for applied informatics roles.

Instructor: Richard Ambrosino, M.D., Ph.D., William Hogan, M.D., and Steve Hasley, M.D.

Days/Times: Wednesdays, 9:00 a.m. to 11:00 a.m.

Location: M-185 VALE, 200 Meyran Avenue

Prerequisites: There are no prerequisites.

Recitations: none

Expected class size: 10-15

This course will be offered in the spring term.

BIOINF 2118

Probability and Statistics for Biomedical Informatics (3 Credits)

This is an introductory probability and statistics course intended primarily for biomedical informatics students. The first part of the course covers probability, including basic probability, random variables, univariate and multivariate distributions, transformations, expectation, numerical integration, and approximations. The second part of the course covers statistics, including study design, classical parametric inference, hypothesis testing, Bayesian inference, non-parametric methods, classification, ANOVA, and regression. We will use R for statistical computing and applications. Examples and applications will focus on biomedical informatics and related discipline.

Instructor: Garrick Wallstrom, Ph.D.

Days/Times: Tuesdays/Thursdays, 9:00 a.m. to 10:30 a.m.

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: There are no prerequisites.

Recitations: none

Expected class size: 10-15

This course will be offered in the spring term.

BIOINF 2131

Practicum in Advanced Biomedical Information Technology (ISSP 2090) (1-6 Credits)

This course is designed for people who want a practical experience in working with advanced information technology in the Center for Biomedical Informatics.

Instructor: Center for Biomedical Informatics Faculty and Staff

Days/Times: TBA

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: Discuss with Instructor

Recitations: None

Expected class size: 20

This course could be offered in any given term -- check with Toni Porterfield (tls18@pitt.edu).

BIOINF 2132

Special Topic Seminar in Medical Informatics (3 Credits)

This course is designed for faculty to offer small groups of students a study course on a topic of mutual interest and concern in the faculty member's area of expertise.

Instructor: Center for Biomedical Informatics Faculty (will vary)

Days/Times: TBA

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: Discuss with Instructor

Recitations: None

Expected class size: 20

This course could be offered in any given term -- with Toni Porterfield (tls18@pitt.edu).

BIOINF 2133

Practicum in Advanced Infectious Disease and Public Health Surveillance (Biosurveillance)

Technology (1-6 Credits)

This course is designed for people who want a practical experience in working with advanced biosurveillance technology in the realtime outbreak and disease surveillance (RODS) laboratory.

Instructor: Center for Biomedical Informatics Faculty (will vary)

Days/Times: TBA

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: Discuss with Instructor

Recitations: None

Expected class size: 20

This course could be offered in any given term -- with Toni Porterfield (tls18@pitt.edu).

BIOINF 2134

Research Writing Practicum (3 credits)

This course will provide a practical overview of how to write a research manuscript. Students will be required to successfully submit a manuscript for publication in order to complete the course.

Instructor: Rebecca Crowley, MD, MS and Wendy Chapman, Ph.D.

Days/Times: Mondays and Fridays, 1:30 p.m. to 3:00 p.m.

Location: Mondays at UPMC Shadyside Cancer Pavilion and Fridays at M-184 VALE, 200 Meyran Avenue

Prerequisite: Completed data collection for study in research project with approval of both research advisor and course instructor.

Recitations: None

Expected Class Size: 5

This course will be offered during the fall term.

BIOINF 2200

Introduction to Dental Informatics Research (3 Credits)

<http://intranet.dental.pitt.edu/di.coures/2200/dim.htm>

This course is intended to expose trainees to the breadth and depth of dental and craniofacial research problems. The course will center on the six research areas of the National Institute of Dental and Craniofacial Research: Craniofacial Anomalies & Injuries; Infectious Diseases & Immunity; Neoplastic Diseases; Chronic Diseases; Biomaterials, Biomimetics, & Tissue Engineering; and Clinical, Behavior, & Health Promotion Research. By learning about specific research problems in dentistry, trainees will be able to identify which informatics-related solutions would be most helpful to solve them. In this course, we expect trainees to develop several ideas for their Master's Thesis or other research projects.

Instructor: Titus K.L. Schleyer, D.M.D., Ph.D. and Heiko Spallek, Ph.D.

Days/Times: TBA

Location: Salk Hall

Prerequisites: None

Recitations: None

Expected class size: 2-4

This course is offered in fall or spring term (as per instructor decision).

BIOINF 2201

Dental Information Systems Infrastructures (3 Credits)

<http://intranet.dental.pitt.edu/di.coures/2201/dim.htm>

This series of seminars and assignments is centered on the management of large-scale information technology infrastructures, with practical experience provided in management of large user bases, help desk management, systems management, end user training, disaster prevention and recovery, and computer security. The course will emphasize practical exercises within the information systems infrastructure at the School of Dental Medicine. The course also includes several special topics related to dental informatics in academia and industry.

Instructor: Titus K.L. Schleyer, D.M.D., Ph.D. and Heiko Spallek, Ph.D.

Days/Times: TBA

Location: Salk Hall

Prerequisites: None

Recitations: None

Expected class size: 2-4

This course is offered in fall or spring term (as per instructor decision).

BIOINF 2202

Dental Informatics Seminar (3 Credits)

In this course, students will review current research projects of the Center of Dental Informatics and seminal research in dental/medical informatics. Participants will critically evaluate studies, methodologies, and results. During the course, students will prepare and conduct a joint research project of limited scale and scope resulting in a publishable paper or report. The course also includes other topics of interest for dental informaticians in academic careers.

Instructor: Titus K.L. Schleyer, D.M.D., Ph.D. and Heiko Spallek, Ph.D.

Days/Times: TBA

Location: Salk Hall

Prerequisites: None

Recitations: None

Expected class size: 2-4

This course is offered in fall or spring term.

BIOINF 2203

Dental Informatics Masters Thesis Research (3 Credits)

Dental informatics trainees will be expected to register for this mentored research experience with dental informatics faculty while they are working on their research project/thesis. This course emphasizes interdisciplinary projects that integrate several domains. Research topics may include information needs and retrieval, decision support, intelligent agents, computer-based patient records and educational applications. Special emphasis is placed on applying informatics research methods to ongoing research projects at the School of Dental Medicine.

(Note: For Health Services Research (HSR) concentration, see specific curriculum at <http://www.dbmi.pitt.edu/trainingprogram/hsr-ms.html> and <http://www.pitt.edu/~crtp/>)

BIOINF 2480 (1-6 credits)

Masters Thesis/Project Research

BIOINF 2990 (1-14 credits)

Masters Independent Study

BIOINF 2992

Information in Radiological Imaging (3 credits)

This course provides an introduction to the nature of information in radiological images. Standard clinical techniques will be examined as well as current radiology research topics. Three basic units will be covered: image formation, image postprocessing, and image quality assessment.

Instructor: Brian E. Chapman, Ph.D.

Days/Times: TBA

Location: M-184 VALE, 200 Meyran Avenue

Prerequisites: None

Recitations: None

Expected class size: 20-25

This course is usually offered in the spring term, every odd year.

BIOINF 2993 (1-9 credits)

Masters Directed Study

BIOINF 3990 (1-14 credits)

Doctoral Independent Study

BIOINF 3995 (1-9 credits)

Doctoral Directed Study

BIOINF 3998 (3 credits)

Doctoral Teaching Practicum

BIOINF 3999 (1-9 credits)

Doctoral Dissertation Research

NOTE: Students registering for Full-time Dissertation Study must register under the School of Medicine's Course Number: **FTDS 0000 (0 credits)**