BIOMEDICAL INFORMATICS (BIOINF) COURSES
(as of October 27, 2010)

BIOINF 2011
Introduction to Health Informatics (ISSP 2015) (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. and Henk Harkema, 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)
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: TBA
Days/Times: Tuesdays and Thursdays, 9:00 a.m. to 10:25 a.m.
Location: M-184 VALE, 200 Meyran Avenue
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:** Gregory F. Cooper, M.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 is will emphasize conceptual understanding and applications rather than formal proofs. Each mathematical subject will be illustrated with problems from within biomedical informatics.

**Instructor:** Madhavi Ganapathiraju, Ph.D.

**Days/Times:** Monday, Tuesday and Thursdays, 1:00 p.m. to 2:30 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:** TBA  
**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 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-185 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 Bayes 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) (3 credits)
This course is now being offered as a graduate-student seminar. It covers more advanced computational approaches for probabilistic modeling and inference than the previous version of the course. A particular focus is placed on Bayesian networks, although other probabilistic models are studied. Healthcare applications are emphasized, however, the principles are general and no medical knowledge is needed to take the seminar.
Instructor: Gregory F. Cooper, M.D., Ph.D.
Term: Fall term 2010
Days/Times: Tuesdays and Thursdays, 2:30 to 4:00 p.m.
Location: M-184 VALE, 200 Meyran Avenue
Prerequisites: Students should have either taken Introduction to Health Informatics (BIOINF 2110) or have a basic understanding of probability theory and Bayesian networks.
Recitations: None
Expected class size: 10
This course is usually offered in the fall 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)
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 2116  
**Computational Thinking for Biomedical Scientists** (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](http://serverus.dbmi.pitt.edu)).

**Recitations:** none

**Expected class size:** 15-20

This course will be offered in the spring term.

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**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., 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.

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**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:** Roger Day, Sc.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.

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**BIOINF 2119**

**Artificial Intelligence Foundations of Biomedical Informatics 1 (3 credits)**

This course is designed for students who do not necessarily have a background in computer science and want to learn and apply methods in artificial intelligence to problems in biomedicine. The course will introduce and provide the foundations artificial intelligence methods in search, probabilistic knowledge representation and reasoning, and machine learning with applications to biomedical informatics. Prerequisites for this course include introductory mathematics and programming.

**Instructor:** Shyam Visweswaran, MD, PhD plus guest lecturers

**Days/Times:** Monday/Wednesday from 1:00-2:30
BIOINF 2120
Artificial Intelligence Foundations of Biomedical Informatics 2 (3 credits)
This course is designed for students who do not necessarily have a background in computer science and want to learn and apply methods in artificial intelligence to problems in biomedicine. The course will introduce and provide the foundations of artificial intelligence methods in logical knowledge representation and reasoning, biomedical ontologies and terminologies and information retrieval. Prerequisites for this course include introductory mathematics and programming.
Instructor: Rebecca Crowley, MD, plus guest lecturers
Days/Times: TBA
Location: M-184 VALE, 200 Meyran Avenue
Prerequisites: BIOINF 2119
Recitations: none
Expected class size: 15-20
This course will be offered in the fall term. To be developed for Fall term 2010.

BIOINF 2121
Human Computer Interaction and Evaluation (NURSP 2083) (3 credits)
This course is designed to provide informatics students with the knowledge necessary to take an applied role in the design, implementation and evaluation of healthcare information systems. In this course, students will apply principles of usability and evaluation theory to informatics projects. Topics include: critical success factors, test plan development and user interface design.
Instructor: Christa Bartos, PhD and Harry Hochheiser, PhD
Days/Times: Wednesday from 4:30-7:30 p.m.
Location: M-184 VALE, 200 Meyran Avenue
Prerequisites: There are no prerequisites.
Recitations: none
Expected class size: 15-20
This course will be offered in the summer term.

BIOINF 2122
Critical Reflections on Biomedical Informatics (3 credits)
This course will showcase presentation from DBMI researchers and invited speakers from across the campus and beyond. Sessions will be videotaped and presented as weekly one-hour recording. The on-site question and answer session afterwards will be substituted by a facilitated asynchronous online discussion in Blackboard.

To be developed for Fall term 2011 for the on-line certificate program.

BIOINF 2123
Terminology and Coding (3 credits)
To be developed for Fall term 2011 for the on-line certificate program.
BIOINF 2124  
Principles of Global Health Informatics (3 credits)  

This course explores challenges and opportunities in developing and supporting health information systems in developing-world settings by examining differences, and ways to both integrate and sustain systems in an appropriate way in low-resource settings. The course will review the current "state-of-the-art" in this field by looking at examples of systems currently deployed in the developing world, and explore opportunities for advancing this work through a series of case studies and hands-on exercises based on real-world scenarios.

Instructor: Gerald Douglas, PhD  
Days/Times: TBA  
Location: M-184 VALE, 200 Meyran Avenue  
Prerequisites: BIOINF 2011 or permission from instructor  
Recitations: none  
Expected class size: 15-20  
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 Department of Biomedical Informatics.  
Instructor: Department of 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: Department of 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 -- check 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: Department of 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 – check with Toni Porterfield (tls18@pitt.edu).

**BIOINF 2134**
**Publication & Presentation in Biomedical Informatics (3 credits)**
This course provides a practical overview of how to write a research manuscript and how to give a scientific talk. It is usually taken after completing the Project Course (BIOINF 2014). Students taking this course must have a completed research project that can be used to complete the course exercises. Each week, we will target a specific section of the manuscript or scientific talk. Didactic sessions describing common problems and approaches will alternate with student presentation and peer critique. The course also covers the details of the publication process. At the end of the course, a special presentation workshop gives students the opportunity to improve their talks using videotaping and debriefing methods. By the end of the course, students will have completed a research paper and a finalized colloquium presentation.

**Instructor:** Rebecca Crowley, MD, MS  
**Days/Times:** Mondays from 12:00 noon – 2:55 p.m.  
**Location:** Cancer Pavilion, Room 308 (Shadyside)  
**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)**
This course is intended to provide trainees with a rich practical experience in conceptualizing, formulating, conducting and publishing short-term (3-6 months) research projects in dental informatics. Practical experience with research projects is a crucial component of the dental informatics training program. In this course, students will begin by identifying ideas for short term research projects in cooperation with the course faculty. The group will then jointly formulate the research question(s) to be addressed and conduct a thorough review of the literature. It will then develop the research methodology using state-of-the-art methodological approaches. Students will also prepare the submission of the research protocol to the Institutional Review Board if required. As appropriate, students will participate in the actual conduct of the research project itself, as well as in the analysis and publication of the results. Through 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., Heiko Spallek, Ph.D. and Thankam Thyvalikakath, M.D.S, M.S.  
**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)**
Graduates of dental informatics programs often are asked to develop, establish or direct organizational units to support information technology and/or informatics. Most dental schools do not have informatics departments and/or faculty. Thus, dental informaticians are faced with numerous challenges in establishing an organizational presence. Often, they are asked to set up and/or direct support for the computing infrastructure, teach dental informatics courses, and engage in research. As IT implementations grow in scale (e.g. the number of users they support) and scope (e.g. the number of
different applications used), managing the infrastructure presents a significant challenge. This course is
designed to equip students with the basic skills necessary to meet those challenges. The course also
covers several other topics necessary for survival in a new academic discipline.

**Instructor:** Titus K.L. Schleyer, D.M.D., Ph.D., Heiko Spallek, Ph.D. and Thankam Thyvalikakath,
M.D.S, M.S.

**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).

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**BIOINF 2202**

**Dental Informatics Seminar (3 credits)**

This course has two primary objectives. The first one is to expose participants to current research
questions and issues in dental informatics. To that end, the course will review several different dental
informatics research projects in-depth, and also provide an opportunity to explore research questions that
should be addressed in the future. The second objective is to prepare participants for teaching in
informatics and information technology, both at the predoctoral and continuing education level. The
course focuses on providing the concepts and methods for teaching these subjects, rather than developing
participants into full-fledged content experts. Participants will begin with conceiving an informatics
course, continue to the development of a full course proposal, and explore implementation and evaluation
issues.

**Instructor:** Titus K.L. Schleyer, D.M.D., Ph.D., Heiko Spallek, Ph.D. and Thankam Thyvalikakath,
M.D.S, M.S.

**Days/Times:** TBA

**Location:** Salk Hall

**Prerequisites:** None

**Recitations:** None

**Expected class size:** 2-4

This course is offered in fall or spring term.

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**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.

**BIOINF 2480 (1-6 credits)**

Masters Thesis/Project Research

**BIOINF 2990 (1-14 credits)**

Masters Independent Study

**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)**