

**UNIVERSITY OF COLORADO DENVER
CLINICAL SCIENCE PROGRAM
COURSE LISTINGS
2009**

NOTICE: ALL COURSE LISTINGS IN THIS DOCUMENT ARE SUBJECT TO CHANGE. PLEASE CONTACT HOME DEPARTMENT OF THE COURSE TO VERIFY ACCURACY.

CLINICAL SCIENCE COURSES

CLSC 6060 Systems Analysis and Design 3.0 cr.

Dr. J. Karimi - Cross listed: CU Denver ISMG 6060. Prereq: Computer programming experience preferred. This course emphasizes information requirements analysis, logical system specification, and detailed system design. Topics include structured system development methodologies, prototyping, file design, systems architecture, systems testing and software design strategies.

CLSC 6080 Database Management Systems 3.0 cr.

Dr. M. Mannino - Cross listed: CU Denver ISMG 6080. Prereq: Computer programming experience preferred. This course focuses on the development and management of database systems to support business operations. Important topics include semantic data modeling, normalization, SQL, fourth generation languages, and client-server database applications.

CLSC 6120 Data Communications 3.0 cr.

Dr. S. Walczak - Cross listed: CU Denver ISMG 6120. Prereq: Computer programming experience preferred. These courses introduces the basic concepts of data transmission, principles governing the design and administration of both wide and local area networks and technical issues pertaining to client server computing and open system interconnection.

CLSC 6251 Assistive Technology: Advanced Practices in AT Assessment 3.0 cr.

Dr. C. Bodine, M. Melonis, M.N.S. - 303-315-1280. Students will learn to use family-centered, trans-disciplinary methods of assistive technology assessment for individuals with low-incidence disabilities. Observations, videotaped learning activities, and supervised assessment sessions will facilitate understanding of best practice in this field.

CLSC 6261 Assistive Technology: Implement for Low Incidence Disabilities 3.0 cr.

Dr. C. Bodine, M. Melonis, M.N.S. - 303-315-1280. This course provides an overview of low incidence populations (including intellectual, hearing, and vision impairments), relevant research, and implementation strategies in early childhood and classroom settings. Emphasis is on implementation techniques, and working with trans-disciplinary teams, supporting agencies, and families.

CLSC 6271 Assistive Technology: Advanced Fieldwork Experience in AT 2.0 cr.

Dr. C. Bodine, Dr. P. Heyn, M. Melonis, M.N.S. - 303-315-1280. Students will participate in fieldwork that offers tailored opportunities to engage in AT assessments and implementation in various settings. A peer-reviewed submission must be coordinated before a grade is assigned for this course.

CLSC 6281 Assistive Technology: Engineering and Biotechnology: Principles & Emerging Technologies 3.0 cr.

Dr. C. Bodine, G. McGrew - 303-315-1280. The student will develop an understanding of engineering principles and the technical design process relevant to assistive technology. The course will provide hands-on experience in several technologies to give the students a real-life appreciation of specific technologies and processes.

CLSC 6300 Scientific Grant Review Process – Masters 1.0 cr.

Dr. T. Campbell, Dr. P. Zeitler. 303-724-4929. Prereq: BIOS 6601 and BIOS 6602. Students will understand and participate in the process of scientific review of human subject research protocols submitted to the University of Colorado Denver Clinical Translational Research Centers at University Hospital and The Children's Hospital.

CLSC 6550 Applications of Biostatistics Clinical Research Questions 1.0 cr.

Dr. M. O'Brien
An introduction to allow clinician-scientists to be critical consumers of the medical literature by improving their ability to discuss statistical issues about their own research and the research of others. A familiarity will be gained with commonly used statistical methods and terms.

CLSC 6650 Guided Research Tutorial – Masters 1.0-3.0 cr.

Faculty. Prereq: Consent of program, approved course plan, closed registration.

This is an independent study course developed by the student and appropriate faculty member based on the area of study. Students meet regularly with the selected course instructor. The student and course instructor will develop a course plan prior to registration of the course.

CLSC 6653 Key Concepts in Neuro-developmental Disabilities 1 2.0 cr.

Dr. C. Robinson - 303-724-7680, Program contact: Dina Johnson, 303-724-7673

This interdisciplinary graduate course focuses on systems, issues, and service provision related to children, youth, and young adults with autism or with neurodevelopmental and related developmental disabilities and their families. Key Concepts I is an interdisciplinary examination of research in neurodevelopmental and related disabilities, emphasizing development of critical thinking skills necessary for evaluating scientific findings and integrating research into practice.

CLSC 6654 Key Concepts in Neuro-developmental Disabilities 2 2.0 cr.

Dr. C. Robinson - 303-724-7680, Program contact: Dina Johnson, 303-724-7673

This interdisciplinary graduate course focuses on systems, issues, and service provision related to children, youth, and young adults with autism or with neurodevelopmental and related developmental disabilities and their families. Key Concepts II is an interdisciplinary examination of research in neurodevelopmental and related disabilities, emphasizing development of critical thinking skills necessary for evaluating scientific findings and integrating research into practice.

CLSC 6658 An Interdisciplinary Approach to Promoting Early Parent Child Relationships Part I/ Theory 2.0 cr.

Dr. C. Robinson, Dr. B. Deloian, Dr. K. Fehringer - 303-864-5267.

This is Part 1 of a two-part course series which examines the theory and research relevant to the assessment of early parent-child relationships as well as the clinical application for interventions across disciplines intended to promote and improve child health outcomes.

CLSC 6659 An Interdisciplinary Approach to Promoting Early Parent Child Relationships Part 2/ Measurement 3.0 cr.

Dr. C. Robinson, Dr. B. Deloian, Dr. K. Fehringer - 303- 864-5267.

This is Part 2 of a two-part course which examines the research relevant to the assessment of early parent-child relationships, identifies intervention strategies by analyzing observational findings, and evaluates the effectiveness of interventions across disciplines that promote and improve child health outcomes.

CLSC 6661 Leadership Dialogues 1 1.0 cr.

Dr. K. Kennedy - 303-871-3483. Program contact: Dina Johnson, 303-724-7673. Prereq: CLSC 6661.

This two-semester interdisciplinary course cultivates the leadership competencies required by MCH and child health professionals, as articulated in the *Maternal and Child Health Leadership Competencies Version 2.0*. The curriculum is public health oriented, directly providing content on the field of public health and emerging public health issues, and will integrate public health principles and practices throughout. Students will meet individually with the instructor for an hour long individual consultation about personal leadership goals and challenges. They will be coached on reflection and on planning their life-long leadership development.

CLSC 6662 Leadership Dialogues 2 1.0 cr.

Dr. K. Kennedy - 303-871-3483. Program contact: Dina Johnson, 303-724-7673. Prereq: CLSC 6661.

This two-semester interdisciplinary course cultivates the leadership competencies required by MCH and child health professionals, as articulated in the *Maternal and Child Health Leadership Competencies Version 2.0*. The curriculum is public health oriented, directly providing content on the field of public health and emerging public health issues, and will integrate public health principles and practices throughout. Students will meet individually with the instructor for an hour long individual consultation about personal leadership goals and challenges. They will be coached on reflection and on planning their life-long leadership development.

CLSC 6663 - Interventions for Children and Youth with Autism and Neurodevelopmental Disabilities 3.0 cr.

Dr. S Hepburn - 303-724-7672. Program contact: Dina Johnson, 303-724-7673

This is interdisciplinary course reviews evidence-based practices in intervention for children with autism and other neurodevelopmental disorders, presented through lectures, critical readings of the literature, case discussions, and small group presentations. Curriculum content will derive from best practice reviews, such as the National Standards Project, the Academy of Sciences Educating Children with Autism report, and the best practice recommendations of professional organizations. Multidisciplinary teams of 3-4 trainees will present structured reviews of specific intervention approaches, such as: structured teaching, pivotal response training, peer-mediated social skills intervention, relationship-based interventions, discrete trial training, milieu language instruction.

CLSC 6664 Leadership Dialogues 3 1.0 cr.

Dr. K. Kennedy - 303-871-3483. Program contact: Dina Johnson, 303-724-7673. Prereq: CLSC 6661.

This two-semester interdisciplinary course cultivates the leadership competencies required by MCH and child health professionals, as articulated in the *Maternal and Child Health Leadership Competencies Version 2.0*. The curriculum is public health oriented, directly providing content on the field of public health and emerging public health issues, and will integrate public health principles and practices throughout. Students will meet individually with the instructor for an hour long individual consultation about personal leadership goals and challenges. They will be coached on reflection and on planning their life-long leadership development.

CLSC 6665 Leadership Dialogues 4 1.0 cr.

Dr. K. Kennedy - 303-871-3483. Program contact: Dina Johnson, 303-724-7673. Prereq: CLSC 6661.

This two-semester interdisciplinary course cultivates the leadership competencies required by MCH and child health professionals, as articulated in the *Maternal and Child Health Leadership Competencies Version 2.0*. The curriculum is public health oriented, directly providing content on the field of public health and emerging public health issues, and will integrate public health principles and practices throughout. Students will meet individually with the instructor for an hour long individual consultation about personal leadership goals and challenges. They will be coached on reflection and on planning their life-long leadership development.

CLSC 6666 Trans-disciplinary Model Early Intervention Service Delivery 3.0 cr.

Dr. C. Robinson, R. Charlifue-Smith, M.A. - 303-864-5267.

This course provides instruction about the ENRICH model of community-based, family-driven, trans-disciplinary service delivery. The course will target service coordination and collaboration throughout Part C supports and services. Practicum is CLSC 6830.

CLSC 6668 Screening and Assessment for Children and Youth with Autism and Neurodevelopmental Disabilities 3.0 cr.

Dr. S Hepburn - 303-724-7672. Program contact: Dina Johnson, 303-724-7673

This interdisciplinary a course presents a review of evidence-based practices in screening and assessment for autism, focusing on: (a) identification of signs and symptoms of autism at different ages and developmental levels; (b) differentiation of autism from other disorders of development; (c) recognition of core symptoms (e.g., social, communication), associated features (e.g., attention, anxiety), and moderating features (e.g., cognitive ability, language functioning) which impact upon the child's overall presentation; (d) examination of the impact of culture on clinical presentation; and, (e) and approaches to share observations with family members in a sensitive, culturally-competent, family-centered manner.

CLSC 6699 Masters Research Project – Publishable Paper 1.0-6.0 cr.

Faculty. Prereq: Consent of program, BIOS 6601, BIOS 6602, BIOS 6648 or EPID 6626, CLSC 7101, CLSC 7150, EPID 6630.

During this course students plan, execute, and write the Final Research Project in the form of a publishable paper. In addition, students will prepare for the Final Research Project Examination. This is a capstone course.

CLSC 6800 Introduction to Health Information Technology 3.0 cr.

Dr. S. Ross - 303-724-2267. Cross listed: CU Denver HLTH 6071

This course is intended as an overview to the dynamic environment of healthcare informatics and to prepare healthcare professionals to better utilize and manage emerging communication technologies. A brief introduction to e-health, telehealth, electronic medical records, telecommunications, and bio-informatics is provided.

CLSC 6820 Fundamentals of Health Information Technology Management 3.0 cr.

Dr. H. Haugen, D. Jacobs – 303-483-4308. Cross listed: CU Denver HLTH 6072.

This course will provide an introduction to the management of information technology in healthcare. A description of information processing, the origin, content and evolution of healthcare information systems and the methodologies deployed to acquire and manage information requirements will be discussed.

CLSC 6830 Practicum in Developmental Disabilities 1.0 - 4.0 cr.

Dr. C. Robinson - 303-724-7680, Program contact: Dina Johnson, 303-724-7673

Practicum in developmental disabilities individually designed to give graduate students and post-graduates observational experiences in clinical, teaching, or research service settings and systems for persons with developmental disabilities of all ages. Practicum contact hours are as follows: 1 credit = 65 hours; 2 credits = 130 hours; 3 credits = 195 hours; 4 credits = 260 hours.

CLSC 6831 Practicum in Developmental Disabilities 2 3.0 cr.

Dr. C. Robinson - 303-724-7680, Program contact: Dina Johnson, 303-724-7673. Prereq: CLSC 6830.

Practicum in developmental disabilities individually designed to give graduate students and post-graduates observational experiences in clinical, teaching, or research service settings and systems for persons with developmental disabilities of all ages. Practicum contact hours are as follows: 1 credit = 65 hours; 2 credits = 130 hours; 3 credits = 195 hours; 4 credits = 260 hours.

CLSC 6890 Introduction to Telehealth/Telemedicine 2.0 cr.

Dr. H. Haugen - 303-483-4308.

This course will examine different Telemedicine/Telehealth options currently available. A primary goal will be for students to evaluate how clinical outcomes and health care education (e.g., patient education and health care provider education) can be improved using new technologies.

CLSC 6950 Masters Research Project – Thesis 1.0-6.0 cr.

Faculty. Prereq: Consent of program, BIOS 6601, BIOS 6602, BIOS 6648 or EPID 6626, CLSC 7101, CLSC 7150, EPID 6630.

During this course students plan, execute, and write the Final Research Project in the form of a master's thesis. In addition, students will prepare for the Final Research Project Examination. This is a capstone course.

CLSC 7101 Grant Writing 1 **1.0 cr.**

Faculty. Prereq: BIOS 6601 and BIOS 6602 or BIOS 6611 and BIOS 6612, BIOS 6648 or EPID 6626, CLSC 7150
This course prepares students to write research grant submissions. Topics covered include writing the various sections of grants: background, specific aims, hypotheses, methods, analysis, potential problem, and the summary. A grant submission will normally occur before a grade is assigned.

CLSC 7102 Grant Writing 2 **1.0 cr.**

Variable. Prereq: Consent of program and CLSC 7101.
This course builds on CLSC 7101 and further prepares students for subsequent grant submissions. Strategies for preparation (including hypothesis generation, experimental design, statistical considerations, and potential problems) will be discussed. At the end of the course, a KO8, R23, or equivalent national grant application will be completed for submission. A grant submission will normally occur before a grade is assigned.

CLSC 7150 Ethics and Regulation in Human Subjects Review **1.0 cr.**

Dr. A. Prochazka, Dr. H. Milgrom - 303-399-8020 x 2144.
This course will provide an overview of the field of ethics in clinical research and is designed for students who will be conducting research involving human subjects.

CLSC 7151 Lectures in Ethics and Regulation in Human Subjects Review **1.0 cr.**

Dr. A. Prochazka, Dr. H. Milgrom - 303-399-8020 x 2144. Cross listed: PHSC 7339.
This course provides an overview of the field of ethics in clinical research and is designed for non-clinical science degree students and investigators who will be conducting research involving human subjects. Topics include historical background, current regulations, and IRB requirements.

CLSC 7200 Clinical Outcomes Assessment **2.0 cr.**

Dr. C. Battaglia – 303-370-7565.
This course provides an overview of the field of clinical outcomes assessment and prepares students to identify patient risk factors and to select appropriate outcomes based on current literature.

CLSC 7300 Scientific Grant Review Process – Doctoral **1.0 cr.**

Dr. T. Campbell, Dr. P. Zeidler. 303-724.4929. Prereq: BIOS 6601 and BIOS 6602 or BIOS 6611 and BIOS 6612.
Students will understand and participate in the process of scientific review of human subject research protocols submitted to the University of Colorado Denver Clinical Translational Research Centers at University Hospital and The Children's Hospital.

CLSC 7400 Theory and Application of Techniques for the Study of Human Metabolism In Vivo **2.0 cr.**

Dr. P. MacLean - 303-724-3030. Prereqs: BIOS 6648 or EPID 6626, CLSC 7500 preferred.
This advanced clinical investigation course will critically review lab-based techniques and experimental approaches used to study nutrient metabolism in vivo. Students will learn the theory, appropriate application and limitations of these technique/approaches.

CLSC 7450 Biopharmaceutics and Applied Pharmacokinetics **2.0 cr.**

Dr. T. Henthorn - 303-724-1751. Prereq: BIOS 6601 and BIOS 6602 or BIOS 6611 and 6612, CLSC 7500 preferred.
This advanced pharmacokinetics course will provide working knowledge of drug administration, distribution, metabolism and excretion as well as provide practical clinical working examples of pharmacokinetics (drug clearance and distribution).

CLSC 7500 Practical Application of Molecular and Cell Biology Techniques for the Clinical Investigator **3.0 cr.**

Dr. J. Tentler - 303-724-3887.
Designed to teach clinical investigators "hands-on" approaches to basic molecular and cellular biology techniques. Weekly special topics lectures will cover cutting edge technologies and their clinical application of techniques. This course runs as a month long intensive during the summer. An additional lab fee is associated with this course.

CLSC 7650 Guided Research Tutorial – Doctoral **1.0-3.0 cr.**

Faculty. Prereq: Consent of program, approved course plan, closed registration.
This is an independent study course developed by the student and appropriate faculty member based on the area of study. Students meet regularly with the selected course instructor. The student and course instructor will develop a course plan prior to registration of the course.

CLSC 8990 Doctoral Thesis **1.0-10.0 cr.**

Faculty. Consent of program, BIOS 6601 and BIOS 6602 or BIOS 6611 and 6612, BIOS 6648 or EPID 6626, CLSC 7101, CLSC 7150, EPID 6630
Doctoral thesis work in clinical science.

REQUIRED CORE COURSES

BIOS 6601 Applied Biostatistics I **3.0 cr.**

Dr. J. Kittelson – 303-315-5279.

An introduction to statistical methods in the health sciences emphasizing the use of statistics to answer research questions. Content includes descriptive and statistical inference; statistical methods include t-tests, chi-square tests, one-way ANOVA, and linear regression. Statistical software is used.

BIOS 6602 Applied Biostatistics II **3.0 cr.**

Dr. L. Ogden – 303-315-0508. Prereq: BIOS 6601.

An introduction to statistical methods in the health sciences emphasizing the use of statistics to answer research questions. Content includes descriptive and statistical inference; statistical methods include t-tests, chi-square tests, one-way ANOVA, and linear regression. Statistical software is used.

BIOS 6611 Biostatistical Methods I **3.0 cr.**

Dr. A. Barón – 303-315-7502. Prereq: Differential calculus.

This is a first course in applied statistics that covers elementary probability, descriptive, parametric and nonparametric methods for one and two sample estimation and testing, and some common simple cases of the univariate general linear model. The statistical package SAS is used extensively.

BIOS 6612 Biostatistical Methods II **3.0 cr.**

Dr. L. Ogden - 303-315-0508. Prereq: BIOS 6611.

This is a continuation of BIOS 6611 covering univariate linear modeling and emphasizing multiple regression and analysis of variance. Logistic regression and methods for correlated data are also covered. Matrix algebra and the statistical package SAS will be used.

BIOS 6648 Design of Clinical Trials and Experiments **2.0 cr.**

Dr. J. Kittelson – 303-315-5279. Prereq: BIOS 6611 or BIOS 6601 or BIOS 6611.

An introduction to the design and conduct of human intervention trials. Specific topics include: specifying the research question, study endpoints, study populations, study treatments, sample size evaluation, and choice of control groups. Common trial designs and issues in trial monitoring are described.

EPID 6626 Research Methods in Community Health **3.0 cr.**

Dr. D. Lezotte – 303-315-6873

Research methods topics include: cohort and case control studies, clinical trials, medical care evaluation, and survey research. Lectures and discussions cover problem statement and hypothesis formulation, study design, data collection and analysis. Students will gain practical experience through analysis of large data sets available from state agencies.

EPID 6630 Epidemiology **3.0 cr.**

Dr. R. Hamman – 303-315-6863

Offers an introduction to the 1) approaches and methods used in describing the natural history of disease in the community and for locating clues to the causes of disease, and 2) analytical epidemiology (study design, bias, confounding and measures of excess risk) used in the study of disease etiology and the critical review of the medical literature. Lectures/discussions are supplemented with problem-solving exercises.

REQUIRED TRACK COURSES

EPID 6631 Analytical Epidemiology **2.0 cr.**

Dr. J. Hokanson – 303-315-8359 Prereq: EPID 6630, BIOS 6601.

This course emphasizes the analytical foundations of epidemiology and its application to etiologic studies and public health practice. Topics include determining rates of disease occurrence, assessing exposure disease relationships, stratified analysis, measurement error and sampling. Final project requires analysis and interpretation of epidemiologic data.

HSMP 6603 Health Care Systems **3.0 cr.**

Dr. R. Wolfson – 303-315-8359

This is the first of a two-semester sequence designed to introduce students to the U.S. health care system from an organizational, service delivery, social, and political perspective. Students are introduced to the basic components of the current health care system (personnel, organizations, facilities) and basic economic principles as they are applied to selected aspects of the health care system (financing, insurance, Medicare, Medicaid).

HSMP 6604 Health Care Economics **3.0 cr.**

Dr. D. Milne – 303-315-8359 Prereq: HSMP 6603.

This course is a sequel to PRMD 6603 and focuses on health care financing and economic issues. A microeconomics framework, including issues of supply, demand, market structure, market failure, price and output are discussed as they apply to the health sector. Specialized markets, the role of the government in regulating and/or fostering competition, and the significance of health insurance in financing the US health care system are addressed.

HSMP 6617 Introduction to Health Services Research **2.0 cr.**

Faculty. HSMP 6603 and HSMP 6604.

This course defines the field of inquiry, addresses the types of research questions and data sources appropriate to this research, and surveys the types of measures and methodologies used. Students will prepare a letter of intent for an HSR topic that will be critiqued by another student, will create a personal research agenda, and will have readings and quick internet searches to prepare for each class session.

HSMP 6625 Advanced Health Services Research **3.0 cr.**

Faculty. Available Spring 2010. Prereq: HSMP 6617

This course provides an overview of research methods in health services. This class is designed for individuals who have taken or are taking EPID 6631.

NURS 6289 Information Systems Life Cycle **4.0 cr.**

Dr. L. Meyer, Dr. D. Skiba – 303-724-8527 (Fall and Spring) Prereq: Minimum of one informatics course.

Course focuses on a structured approach to the selection and implementation of an information system. The five phases of the life cycle (planning, analysis, design, implementation and evaluation) provide the framework for students to work in teams on structured exercises. The role of the information specialist is also highlighted.

NURS 6293 Database Management Systems **3.0 cr.**

Dr. M. Kahn – 720-777-6407 (Spring)

Prereq: Current knowledge equivalency of upper level division research methods course.

This interdisciplinary course focuses on historical, theoretical, and application issues in the design and administration of database management systems. Theories and concepts of file and database structure are explored.

ELECTIVE COURSES

BIOL 5054 Developmental Biology 3.0 cr.

Dr. B. Stith. 303-556-3371 (Spring) UCDenver Downtown Campus.

Covers gametogenesis, fertilization, cleavage and development of the embryo with an emphasis on the biochemical and biophysical aspects. Prereq: Graduate standing or permission of instructor. Cross-listed with BIOL 4054.

BIOS 6606 Statistics for the Basic Sciences 3.0 cr.

Dr. D. Everett (Fall) Restrictions: Enrollment in UCDenver graduate program or permission of the instructor.

This course provides an overview of fundamental concepts in statistics such as hypothesis testing and estimation, and it provides an overview of statistical methods (for example, regression and analysis of variance) that apply to many areas of science.

BIOS 6607 Statistics for Pharmacology 2.0 cr.

Dr. D. Everett (Spring) Course restrictions: Enrollment in UCDenver graduate program or permission of the instructor.

This course provides an overview of fundamental concepts in statistics such as hypothesis testing and estimation, and it provides an overview of statistical methods (for example, 1- and 2- sample tests and microarray techniques) that apply to pharmacology.

BIOS 6621 Statistical Consulting 1.0 cr.

Dr. G. Grunwald - (Fall, Spring, Summer) Coreq: BIOS 6611 and consent of instructor/program director.

Students will gain experience with statistical consulting and common statistical problems and techniques encountered in consulting through a combination of real examples and consultations with investigators. Under faculty supervision, advanced students will work on consulting projects with investigators.

BIOS 6631 Statistical Theory I 3.0 cr.

Dr. D. Glueck (Fall) Prereq: Differential and integral calculus.

This course presents an introductory coverage of the theory of discrete and continuous random variables and applications to statistical problems. Topics include probability theory, transformations and expectations, common families of distributions, multiple random variables, and properties of a random sample.

BIOS 6632 Statistical Theory II 3.0 cr.

Dr. S. MaWhinney (Spring) Prereq: Differential and integral calculus.

This course covers theoretical and applied fundamentals of statistical inference. The course is a continuation of BIOS 6631. The primary topics include point estimation, hypothesis testing, interval estimation and asymptotic methods.

BIOS 6646 Survival Analysis 2.0 cr.

Dr. A. Barón (Spring) Prereq: BIOS 6611 and BIOS 6631. Coreq: BIOS 6612 and BIOS 6632.

This course covers the analysis of time-to-event data with applications to biology, medicine, and public health. Nonparametric methods for group comparisons and semi-parametric regression models will be emphasized. Parametric methods and distribution theory for survival analysis will also be included.

BIOS 6648 Design of Clinical Trials 2.0 cr.

Dr. J. Kittelson (next offered Spring 2010) Prereq: BIOS 6611 or BIOS 6601.

The design and conduct of human intervention trials. Specific topics include: specifying the research question, study endpoints, study populations, study treatments, sample size evaluation, and choice of control groups. Common trial designs and issues in trial monitoring are described.

BIOS 6649 Statistical Methods for Clinical Trials 1.0 cr.

Dr. J. Kittelson (next offered Spring 2010) Prereq: BIOS 6611. Coreq: BIOS 6612 and 6648.

This course is a companion to BIOS 6648 that focuses on statistical issues in the design and analysis of clinical trials including sample size calculations, trials with repeated measurements, and the statistical aspects of trial monitoring (group sequential designs).

BIOS 6655 Statistical Methods in Genetic Association Studies 3.0 cr.

Dr. T. Fingerlin (next offered Fall 2009) Prereq: BIOS 6612 or consent of instructor.

This course is designed to give an introduction to statistical methods in genetic association studies. Topics include an introduction to population genetics topics relevant to genetic association studies, design strategies, and analysis methods for case-control and family data.

BIOS 6659 Statistical Methods in Genomics 2.0 cr.

Dr. K. Kechris (Fall) Cross listed: BIOD 7659 Prereq: BIOS 6611 or equivalent graduate level statistics course with consent of instructor.

This course will give an introduction to statistical methods for analyzing molecular sequences and genomic data. Topics include hidden Markov models for sequence alignment, molecular evolution and gene expression data analysis.

- BIOS 6680 SAS Data Mgmt & Database Design** 3.0 cr.
 Dr. J. Bondy – 303-724-4353. (Fall)
 This course provides the necessary introduction and experience to design and manage large public health information systems using SAS and to prepare data for statistical analyses. Specifically, this course will include: inputting, manipulating, recording, reformatting, and organizing information into system/software/study specific formats using SAS DATA step functions, SAS procedures, SAS Macros, and the SAS SQL procedure.
- BIOS 7711 Longitudinal Data Analysis** 3.0 cr.
 Dr. G. Zerbe – 303-315-9030. (Fall) Prereq: BIOS 6612.
 The theory and application of univariate and multivariate techniques appropriate for longitudinal data are discussed with emphasis on recently developed growth curve and longitudinal models. Students will be exposed to theoretical developments and will analyze real data.
- BIOS 7712 Statistical Methods for Correlated Data** 1.0 cr.
 Dr. G. Grunwald – 303-315-9030. (Spring) Prereq: BIOS 7711.
 This course will cover special topics in applied statistics. Details of content will be announced by the instructor.
- BIOS 7713 Statistical Methods for Missing Data** 2.0 cr.
 Dr. D. Fairclough – 303-315-9030. (Spring) Prereq: BIOS 7711 and BIOS 7712.
 This course covers methodological research being carried out for longitudinal studies with missing data. Topics include missing data mechanisms, non-ignorable missing data, multiple imputation, mixture models and sample size determination. Students will complete a project applying methods to real datasets.
- CBHS 6610 Social and Community Factors in Health** 3.0 cr.
 Dr. L. Crane – (Spring)
 Course considers the social/community factors affecting health status, seeking and providing health care. Cross-cultural concepts of health and disease are reviewed. The measurement of selected social/psychological factors, including demographic, socioeconomic and life style indicators and use in epidemiological studies emphasized.
- CBHS 6611 Foundations of Health Behavior** 3.0 cr.
 Drs. J. Leiferman, Sheana Bull – (Fall)
 Course will cover basic theories, concepts, models from a range of social/behavioral disciplines used in public health research and practice. Applications of theoretical frameworks in specifying multiple targets and levels of intervention to public health research will be addressed.
- CBHS 6612 Methods in Research & Evaluation** 3.0 cr.
 Dr. L. Crane – (Fall)
 Provides students with understanding of role of systematic evaluation in assessing effectiveness of public health programs/policies. Includes theoretical concepts and methodology. Topics to be examined include: needs assessment, process and outcome evaluation, qualitative/quantitative research designs, and data collection methodologies.
- CBHS 6620 Questionnaire Design** 2.0 cr.
 Dr. L. Crane – (Fall)
 Course examines survey research methodology, including the use of face-to-face, telephone and self-administered questionnaires. Topics include: methods of data collection; developing and ordering questions; formatting; determining reliability and validity; methods of sampling; implementation; maximizing response rate; data issues; and reporting.
- CBHS 6624 Community Health Assessment** 3.0 cr.
 J. Baxter – (Spring) Prereq: EPID 6630.
 Community diagnosis provides the means of assessing the social, economic, physical, and environmental status of a community, as these factors affect the health of its population. Students will learn to use national and local demographic and health data resources.
- EHOH 6614 Environmental & Occupational Health** 3.0 cr.
 Dr. J. Litt - (Spring) Prereq: EPID 6630
 Presents an overview of information needed to assess the relationship between the environment, workplace and health. Topics include facets of industrial hygiene, air and water pollution, radiation monitoring, toxicology studies, clinical occupational medicine, and biologic monitoring. The emphasis throughout is on the epidemiologic link between exposure and health with a discussion of study methods and interpretation specific to the areas.
- EHOH 6615 Topics in Occupational/Environmental Medicine** 2.0-3.0 cr.
 Dr. B. Gottshall – (Fall, Spring, Summer) Prereq: EPID 6630
 Students presented with series of problems that focus on industries/environmental problems in Denver metropolitan area. The solutions to the problems involve visiting industries, consulting with experts, and learning the principles and practice of toxicology, industrial hygiene, and occupational epidemiology.

EHOH 6616 Environmental & Occupational Toxicology 3.0 cr.

Dr. L. Newman – (Spring) Undergraduate Biology & Chemistry, EPID 6630

This course examines basic and applied concepts of toxicology in environmental and occupational settings. Mechanisms of injury to various body systems following exposure to toxicants are examined at the systemic, organ, cellular, molecular and genetic level, with particular reference to human disease and public health.

EHOH 6617 Environmental & Occupational Exposure Assessment 2.0 cr.

Dr. J. Martyny – (Spring) Prereq: EHOH 6614; Coreq: EPID 6630.

This course will provide the methodologies by which environmental hazards can be anticipated, recognized, evaluated and controlled. Methodologies to determine the degree of hazard and personal protection will be covered. Practical experience will be provided by field trips and labs.

EHOH 6618 Environmental Health Policy & Practice 2.0 cr.

Dr. J. Litt – (Spring)

This course provides a more in-depth examination of environmental health regulations, policies and practices by government agencies and other health-related entities at the local, state, national and international level, capturing the continuum of environmental public health core functions including water and sanitation, air quality, food safety, housing, community design, and more broadly, sustainability and health.

EHOH 6619 Health Effects from Exposures 2.0 cr.

Drs. C. Rose, A. Mayer (Fall) Coreq: EPID 6630.

This course will provide an understanding of the spectrum of health effects caused by occupational and environmental hazards. We will explore the settings which pose the greatest risk, and emphasize the importance of early recognition, prevention, and hazard control. Field trips will provide practical experience.

EHOH 6643 The Nuclear West 2.0 cr.

Faculty – (Fall) Cross listed: UCB - ENVS 5100/JOUR 5871 Course Restrictions: Permission of Instructor.

This interdisciplinary seminar examines historical nuclear issues in the West from perspectives of natural science, epidemiology and the news media.

EPID 6622 Cancer Prevention and Control 2.0 cr.

Dr. T. Byers – (Summer)

Course provides overview of preventable cancers, epidemiology and contributing factors. Phases of cancer control research and appropriate methodologies are discussed. Basic principles of intervention development are reviewed. Psychosocial issues related to cancer are discussed. Students research topics related to course.

EPID 6629 Clinical Epidemiology 1.0 cr.

Dr. T. Byers – (Summer)

This course provides an overview of the design, conduct, and appraisal of clinical research. Topics include choice of study design, issues in randomized trials (bias, measurement, validity), assessment of diagnostic tests, functional status measurement, meta-analysis, and use of questionnaires.

EPID 6632 Advanced Epidemiology 2.0 cr.

Dr. J. Marshall - (Spring) Prereq: EPID 6630, EPID 6631, BIOS 6601.

This is a course on epidemiologic methods designed to improve the student's ability to conduct and interpret epidemiologic studies including intervention studies, cohort studies and case control studies.

EPID 6635 Epidemiology of Communicable Disease 3.0 cr.

Dr. C. Nyquist - (Spring) Prereq: EPID 6630.

This course considers the epidemiology of selected communicable diseases. Methods for their prevention and control, and assessment of these methods will be treated primarily through case studies.

EPID 6636 Chronic Disease Epidemiology 3.0 cr.

Dr. D. Dabelea - (Spring) Prereq: EPID 6630.

The major chronic diseases of Western countries will be reviewed including heart disease, cancer, stroke, diabetes, neurological diseases, and selected other conditions. Factual information about epidemiology of these diseases will be provided with the discussion of methodological issues which arise.

EPID 6637 Injury Epidemiology and Control 2.0 cr.

Dr. C. DiGuseppi - (Fall)

Major causes of injuries in U.S. will be reviewed. This includes motor vehicle traffic injuries, other unintentional injuries (including occupational injuries) and intentional injuries. The major components of injury control will be discussed – acute care, biomechanics, epidemiology and surveillance, prevention/rehabilitation.

EPID 6638 Cardiovascular Epidemiology 1.0 cr.

Dr. J. Hokanson - (Fall) Prereq: EPID 6630.

Course provides practical introduction to current concepts, research methods, unanswered questions in epidemiology of coronary artery disease, stroke/peripheral artery disease. It prepares students for independent work in academic/nonacademic settings in the area of cardiovascular disease surveillance, etiology and outcome research.

EPID 6639 Genetic and Molecular Epidemiology **2.0 cr.**
Dr. J. Norris – (Spring) Prereq: EPID 6630, BIOS 6601.

This course reviews basic genetic principles and teaches epidemiologic methods employed in the investigation of the genetic susceptibility to chronic disease. This course also covers the methods, uses, and limitations of modern molecular technologies applied to epidemiological problems.

EPID 6646 Methods for Systematic Reviews **1.0 cr.**

Dr. C. DiGiuseppi - (Spring) Prereq: EPID 6630, or permission of instructor.

Introduces the rationale and methods of conducting systematic reviews to evaluate health and community interventions. Topics will include designing systematic reviews, study identification and selection, publication bias, assessing study quality, meta-analysis, exploring heterogeneity, and reporting results through the Cochrane Library.

EPID 7911 Epidemiologic Field Methods **1.0-4.0 crs.**

Dr. D. Dabelea - (Fall, Spring, Summer). Prereq: EPID 6626, EPID 6630, EPID 6631, EPID 6632, BIOS 6611, BIOS 6612. Course Restrictions: Permission of instructor is required.

Ph.D. students have the opportunity to work with faculty on current epidemiologic projects to develop skills in field research, proposal writing, budget development, staff hiring and training, protocol and instrument development and implementation, and specific methods topics.

EPID 7915 Analytic Methods in Epidemiology **1.0-4.0 crs.**

Dr. D. Dabelea – (Fall, Spring, Summer) Prereq: EPID 6626, EPID 6630, EPID 6631, EPID 6632, BIOS 6611, BIOS 6612. Course Restrictions: Permission of instructor is required.

Advanced treatment of techniques in the analysis of epidemiological studies, including longitudinal, time-dependent, survival data, causality, missing data, etc. Students will analyze data sets currently on file using contemporary epidemiological methods.

HSMP 6605 Health Policy **2.0 cr.**

D. Dauer – (Spring) Prereq: HSMP 6603.

The focus of this course will be the analysis of important U.S. health policy issues, such as access, cost and quality. Analytic concepts, approaches and frameworks will be used to explore specific significant health policy issues.

HSMP 6606 Public Health Administration **3.0 cr.**

Faculty – (Fall)

Course designed to present technical, policy and administrative issues within context of operational activities of community and public health agencies. Introduction to basic management skills is included

HSMP 6607 Current Legal Issues in Health Care **2.0 cr.**

D. Matthew – (Spring)

This elective will explore American health care policy. Particular emphasis will be placed on the provider's role in addressing issues of justice in health care delivery and the legal tools available to policy makers.

HSMP 6608 Ethical and Legal Issues in Public Health **2.0 cr.**

Dr. J. Glover – (Spring)

Course explores ethical/legal dimensions of various topics of concern in areas of public health, health policy, epidemiology. Topics: health care reform, medical indigence, screening/genetic screening, epidemiological research, QUALYS and health outcomes research, public health/individual rights, public health in developing countries.

HSMP 6609 Cost Benefit and Effectiveness in Health **3.0 cr.**

Dr. S. Eisert – (Summer)

This is an intermediate level course on the theory, methods and application of economic evaluation in the health context. Students are required to conduct an economic evaluation by collecting data and information related to a health program of interest.

NURS XXXX Foundations of Health Care Informatics **3.0 cr.**

Faculty – (Fall and Spring) Contact Dr. Diane Skiba for more information. 303-724-8527.

This introductory course focuses on core concepts, skills, tools that define the informatics field, including the examination of health information technologies to promote safety, improve quality, foster consumer centered care and efficiency.

NURS 6304 Decision Support **3.0 cr.**

Faculty – (Fall)

This course focuses on the identification, acquisition, analysis, interpretation and application of data. Application of decision-making strategies for advanced practice nurses will be emphasized in the areas of quality management and clinical decision support. Information management tools will be explored.

NURS 6274 Semantic Representation **3.0 cr.**

Faculty – (Spring)

Introduces the concept of classifying nursing phenomena to facilitate data management and retrieval. Topics include: minimum data sets, nursing language, classification systems and vocabularies, and relates each topic to nursing practice, administration, and research.

- NURS 6279 Knowledge Management** **3.0 cr.**
Faculty – (Summer)
The need for knowledge discovery, distribution, and management in clinical settings is examined. Knowledge Management techniques (probabilistic/statistical models, machine learning, data mining, queuing theory, computer simulation) are examined. The specification of a knowledge management comprehensive system for healthcare is developed.
- NURS 6284 E-Health** **3.0 cr.**
Faculty – (Summer)
The focus is on the design and application of e-health principles to the delivery of health care. Evidence-based support for e-health are examined within a context of the legal, ethical, social and public policy challenges of health care delivery system.
- NURS 6285 Human Computer Interaction Design Principles** **3.0 cr.**
Faculty – (Fall)
This course examines the relationship of interface design to effective human interaction with computers. This course examines principles, theory and models to design and evaluate optimal interfaces to promote human computer interaction in health care informatics applications.
- PHSC 7310 Fundamentals of Pharmaceutical Science** **3.0 cr.**
Dr. D. Bain – 303-724-6118 – (Fall)
This course examines biophysical approaches, pharmaceuticals/formulation 10, topics in cell biology, pharmacokinetics , pharmacogenomics, and basic immunology.
- PHSC 7610 Cost Effectiveness Theory** **3.0 cr.**
Dr. P. Sullivan – 303-724-2886.
The theoretical and methodological foundational course of a two-course sequence in cost-effectiveness analysis, this course will provide an overview of cost-effectiveness theory and methodology in health and medicine. It will also introduce patient-reported outcomes and health-related quality of life measurement. This course examines the historical and conceptual bases of public health, the key issues and problems faced by the public health system, and the tools available for the protection and enhancement of the public's health.
- PUBH 6600 Foundations in Public Health** **2.0 cr.**
Dr. K. Kennedy – (Summer)
This course examines the historical and conceptual bases of public health, the key issues and problems faced by the public health system, and the tools available for the protection and enhancement of the public's health.
- PUBH 6602 Healthy People 2010** **1.0 cr.**
Dr. C. DiGiuseppi – (Summer)
The student will understand the development of Healthy People 2010, its organization and content, compare ways that different states use Healthy People 2010 and critically analyze a focus area or objective.
- PUBH 6619 Perspectives in International Health** **2.0 cr.**
Faculty – (Fall)
Review of health care issues and the ways in which various national health care systems are organized or have evolved to deal with these issues. The role of governmental, multi-governmental, philanthropic, voluntary, industrial organizations in international health area are examined.
- PUBH 6621 Maternal and Child Health** **1.0 cr.**
Dr. J. Leiferman - (Fall)
This course introduces students to several current issues in maternal and child health such as electronic fetal monitoring, well child care, accidents, adolescent pregnancy, child abuse, chronic illness and child advocacy.
- PUBH 6641 Public Health and Aging** **2.0 cr.**
Dr. L. Bryant – (Spring)
This course will introduce students to 1) factors across the social-ecological spectrum that will affect population patterns of health, disease, and risk factors in older adults; and 2) appropriate responses by public health, aging services and the research community.
- PUBH 6910 MPH Field Practicum** **1.0-3.0 cr.**
Faculty – (Fall, Spring, Summer) Prereq: EPID 6630, BIOS 6601, HSMP 6603, CBHS 6610.
Students may work in state and local health departments or industry. Students can participate in ongoing studies in chronic and infectious disease epidemiology, environmental health and community health planning, or develop their own project in conjunction with a preceptor.
- PUBH 6670 Topics in Public Health** **1.0-3.0 cr.**
Faculty – (Spring, Summer)
Special interest areas of current preventive medicine research and controversy are analyzed in depth. The course format is lecture and discussion or seminar.
- RPSC 7801 Molecular Mechanisms of Reproductive Endocrinology and Metabolism** **3.0 cr.**

Dr. J. McManaman (Spring) Prereq: IDPT 7800, 7801, 7802

Endocrine systems will be covered from the molecule to the systems level. Pituitary secretions and their actions and regulation, regulation of water, ion, calcium balance, and regulation of metabolism including insulin secretion and action will be discussed the context of normal physiology and the mechanisms of endocrine dysfunction. Special emphasis will be placed on Reproductive Endocrinology.

RESOURCES FOR ADDITIONAL COURSE INFORMATION

University of Colorado Denver Clinical Science Program

<http://www.uchsc.edu/clinicalscience/information/course/courselist.htm>

Colorado School of Public Health

<http://www.cudenver.edu/Academics/Colleges/PublicHealth/Academics/coursesandregistration/Pages/index.aspx>

University of Colorado Denver School of Pharmacy

http://www.uchsc.edu/sop/currentstudents/2.Professional_Curriculum/2.Listing_of_Courses.html

University of Colorado Denver College of Nursing - Health Informatics

<http://hshealth.uchsc.edu/son/grad/healthinformatics.htm>

University Colorado Denver Business School – Health Administration

<http://business.cudenver.edu/Disciplines/HealthAdmin/HealthAdminRequirements.htm>

University Colorado Denver Office of the Registrar

<http://www.uchsc.edu/registrar>