

## **ABOUT TDI's COURSES**

### **Program Requirements**

The Master of Public Health (MPH) and Master of Science (MS) curricula are designed to provide every student with the fundamental skills, knowledge base, and philosophical foundation in health policy and clinical practice, with specific attention paid to public health, clinical/health services research, or health care leadership.

### **MPH PROGRAM**

To fulfill the requirements for the MPH degree, all students must satisfactorily complete at least fifty-six (56) credits total, including all required courses (ECS 100, 115, 117, 140, 151, 154, 156-159, 160, 161, 162). Electives may be taken to reach 56 credits. An example of a curriculum is below:

#### **SUMMER**

ECS 100: Inferential Methods and Systematic Review: Part 1 (4 cr)

ECS 111: Critical Issues in Health and Health Care (4 cr)

ECS 140: Epidemiology/Biostatistics 1 (6 cr)

ECS 156: MPH Seminar Series 1 (1 cr)

Total credits: 15

#### **FALL**

ECS 102: Inferential Methods and Systematic Review: Part 2 (4 cr)

ECS 117: Continual Improvement of Healthcare: An Overview (6 cr)

ECS 140: Epidemiology/Biostatistics I (continued from summer term)

ECS 154: Social and Behavioral Determinants of Health (4 cr)

ECS 157: MPH Seminar Series 2 (1 cr)

Total credits: 15

#### **WINTER**

ECS 115: Strategic and Financial Management of Health Care Institutions (4 cr)

ECS 151: Environmental and Occupational Health (4 cr)

ECS 158: MPH Seminar Series 3 (1 cr)

ECS 160: Internship in a Public Health Setting: Part 1 (4 cr)

ECS Elective course (4 cr or 6 cr depending on course selected)

Total credits: 17 (or 19 depending on elective course selected)

#### **SPRING**

ECS 159: MPH Seminar Series (1 cr)

ECS 161: Internship in a Public Health Setting: Part 2 (6 cr)

ECS 162: Public Health Culminating Project (4 cr)

ECS Elective (optional depending on need for credits)

Total credits: 11 (or more with elective)

***TOTAL CREDITS: 58 (56 are required for graduation)***

## **MS PROGRAM**

To fulfill the requirements for the MS degree in the ECS, all students must satisfactorily complete at least fifty-six (56) credits total, including all required courses (ECS 100, 102, 111, 117, 140, 154, 176-179). In addition, courses required for either the Clinical/Health Services Research concentration or the Health Care Leadership concentration for the MS degree must be satisfactorily completed.

### ***Concentrations for the MS degree:***

All MS degree students entering Summer 2007 or after must choose between two concentrations: Clinical/Health Services Research or Health Care Leadership. See concentration description and course curriculum for each concentration below.

#### MS Program: Clinical/Health Services Research

The Clinical/Health Services Research concentration provides students with a rigorous understanding of the following areas: fundamentals of epidemiology and biostatistics; quantitative techniques in the assessment of the outcomes of medical care; historical and contemporary theories in decision making; decision analyses and cost effectiveness analyses; and clinical guidelines, patient satisfaction, and survey methods. An example of the MS in Clinical/Health Services Research is below:

### **SUMMER**

ECS 100: Inferential Methods and Systematic Review: Part 1 (4 cr)

ECS 111: Critical Issues in Health and Health Care (4 cr)

ECS 140: Epidemiology/Biostatistics 1 (6 cr)

ECS 176: MS Tutorial Series 1 (1 cr)

Total credits: 15

### **FALL**

ECS 102: Inferential Methods and Systematic Review: Part 2 (4 cr)

ECS 117: Continual Improvement of Healthcare: An Overview (6 cr)

ECS 140: Epidemiology/Biostatistics I (continued from summer term)

ECS 154: Social and Behavioral Determinants of Health (4 cr)

ECS 177: MS Tutorial Series 2 (1 cr)

Total credits: 15

### **WINTER**

ECS 120: Studying Patients' Decisions (4 cr)

ECS 122: Survey Research Methods and Principles (4 cr)

ECS 141: Epidemiology/Biostatistics 2 (6 cr)

ECS 178: MS Tutorial Series 3 (1 cr)

ECS Elective course (optional; 4 cr or 6 cr depending on course selected)

Total credits: 15

### **SPRING (Practicum Course in either ECS 119 or ECS 147 is required)**

ECS 119/121: Decision and Cost-Effectiveness Analysis (ECS 119=Practicum course) (6 cr/4 cr)

ECS 147: Advanced Methods in Health Services Research (Practicum course) (6 cr)

or ECS 245: Advanced Statistics and Methods (4 cr)

ECS 179: MS Tutorial Series 4 (1 cr)

Total credits: 11

***TOTAL CREDITS: 56 (56 are required for graduation)***

MS Program: Health Care Leadership

The Health Care Leadership concentration provides students with a rigorous understanding of the following areas: macro issues in the U.S. health care system and the major disciplinary approaches to them, focusing on microeconomics, organization theory, systems analysis, operations research, and political theory; skills in leading change and improvement in health care systems; barriers to making the health of the population better; and approaches for taking costs out of the care while maintaining or improving quality and enhancing customer satisfaction. An example of the MS in Health Care Leadership curriculum is below:

**SUMMER**

ECS 100: Inferential Methods and Systematic Review: Part 1 (4 cr)

ECS 111: Critical Issues in Health and Health Care (4 cr)

ECS 140: Epidemiology/Biostatistics 1 (6 cr)

ECS 176: MS Tutorial Series 1 (1 cr)

Total credits: 15

**FALL**

ECS 102: Inferential Methods and Systematic Review: Part 2 (4 cr)

ECS 117: Continual Improvement of Healthcare: An Overview (6 cr)

ECS 140: Epidemiology/Biostatistics I (continued from summer term)

ECS 154: Social and Behavioral Determinants of Health (4 cr)

ECS 177: MS Tutorial Series 2 (1 cr)

Total credits: 15

**WINTER**

ECS 101: Health Policy: Organizational & Delivery System Issues (4 cr)

ECS 115: Strategic & Financial Management of Health Care Institutions (4 cr)

ECS 126: Statistical Measurement and Analysis for Quality Improvement (4 cr)

ECS 178: MS Tutorial Series 3 (1 cr)

ECS Elective course (4 cr or 6 cr depending on course selected)

Total credits: 17

**SPRING (Practicum in ECS 124 is required. One elective is required (ECS 105, ECS 107, or ECS 121))**

ECS 105: The Economics of Health Care Financing (4 cr) or

ECS 107: Pharmaceuticals, Health, and Health Economics (4 cr) or

ECS 119/121: Decision and Cost-Effectiveness Analysis (ECS 119=Practicum course) (6 cr/4 cr)

ECS 124: Design and Improvement of Clinical Micro-Systems (Practicum course) (6 cr)

ECS 179: MS Tutorial Series 4 (1 cr)

Total credits: 11

***TOTAL CREDITS: 58 (56 are required for graduation)***

## **Course Descriptions (by course number)**

*For Master of Science, Master of Public Health, and Doctoral Students*

### ECS 010: Introduction to Health and Human Disease

This not-for-credit course provides an overview of the basics of health and human disease so that students with little knowledge or experience of clinical or health care information.

*Summer term (July 11-12 and July 18-19 from 8am-4pm each day); 0 credits; No grade.*

### ECS 040: Introduction to Quantitative Methods

This not-for-credit course is designed to assist students who would like a mathematics review (including algebra, notation, exponents, logarithms and weighted average), cross tabulations, graphs (including line graphs, pie charts, histograms), introduction to Excel, and an introduction to the Biomedical libraries online resources and other web-based publicly available resources on clinical care and population health.

*Summer term (Mondays from 8am-5pm from July 9-July 23); 0 credits; No grade.*

### \*ECS 100: Inferential Methods and Systematic Review: Part 1

In this course students engage in thinking about common health care related questions and identifying basic approaches and challenges to studying them. Part 1 of this course focuses on recognizing the purpose, structure, strengths and weaknesses of various study designs, while developing skills to critically assess the relevance and validity of their conclusions. At the same time, each student begins to develop a research question of their own and, after conducting a preliminary literature search, submits a proposal for conducting a systematic review.

*Summer term; 4 credits; (HP, P, LP, NC)*

*\*Core Requirement for MPH and MS*

*Prerequisites: None*

### ECS 101: Health Policy: Organizational and Delivery System Issues and Problems

This course provides an understanding of current policy debates and a practical introduction to the tools of policy analysis in their application to current health policy problems. It provides an introduction to basic concepts and methods in health economics and outcome assessment, particularly from the perspective of system assessment and organizational performance. Students should gain an understanding of the different perspectives, theories and interpretations that economists, sociologists, and administrators place on the production of health care, managed care, and networks and alliances in the health care system.

*Winter term; 4 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 111 or permission of the instructor.*

### \*ECS 102: Inferential Methods and Systematic Review: Part 2

Part 2 of this course is dedicated to step-by-step instruction on conducting and communicating the findings of a systematic review. Students work in pairs or trios to hone a single research question, identify and critically appraise the peer-reviewed literature on the topic, use statistical analyses to interpret and summarize their findings, and present the work in both a poster session and a final manuscript. Each team submits multiple intermediate products (a revised proposal, data collection forms, draft methods, mock tables and figures, an abstract, and a draft paper) and is given numerous opportunities for peer and instructor feedback prior to presenting their poster and submitting their final manuscript.

*Fall term; 4 credits; (HP, P, LP, NC)*

*\*Core Requirement for MPH and MS*

*Prerequisites: ECS 100*

### ECS 105: The Economics of Health Care Financing

The purpose of this course is threefold: 1) to provide an overview of the concepts, principles, and practices in financing health care services in the U.S.; 2) to understand key principles of economics and how they relate to the U.S. health care industry including the relationship between public and private sector financing of health care and the role of government; and 3) to become sensitive to the complexities of U.S. health care financing and the continuous challenge of providing accessible, quality health care that is cost effective.

*Spring term; 4 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 111 or permission of the instructor.*

### ECS 107: Pharmaceuticals, Health, and Health Economics

This is a course concerning prescription benefits, access, and utilization in the US. The class will study current prescription access and barriers and their impact on health and health costs in the US. The course will consider the interplay between prescription drug spending and overall health costs with attention to market issues including moral hazard, adverse selection, direct to consumer advertising, public policy, and the influence of insurance and information on patient/consumer preferences. Focusing largely on Medicaid and the new Medicare Part D drug benefit, the course will examine the theory and effects of formularies, cost-sharing, prior approval requirements and optimal prescription access. The course will conclude with a brief introduction to the research opportunities and obstacles created by prescription claims data.

*Spring term; 4 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 111 or permission of the instructor.*

### \*ECS 111: Critical Issues in Health and Health Care

This course is designed to provide an opportunity for all newly-enrolled Master's students to develop a foundational understanding of critical issues in health and health care today, especially as they relate to key aspects of the research and practice of TDI. The course will use lectures and a series of case studies, discussed from both the public health and health care delivery perspectives, to provide grounding in issues that can be explored in depth during the rest of the academic year. Students will explore how to improve the health of a population, the boundaries and financing of the US health care system, and different methods used to analyze and present solutions to problems in health and health care.

*Summer term; 4 credits; (HP, P, LP, NC)*

*\*Core Requirement for MPH and MS*

*Prerequisites: None*

### ECS 112: Special Topics in Health Policy: Medical Care and the Corporation

This course is intended to 1) illustrate the applicability of management concepts and techniques to the health care and biotechnology industries; 2) enhance the ability of managers to serve as trustees of health care organizations; and 3) demonstrate how corporate managers can exercise judgment and control over expenditures for health care benefits while protecting the health of their employees. The characteristics and components of the health care system and their interactions and determinants will be analyzed. The history of corporate and governmental intervention in health care will be reviewed. The importance of understanding the medical market dynamics and the options for data-driven strategies for market reform will be stressed. Case examples will highlight the use of new analytic techniques for understanding and managing the medical markets.

*Fall term; 3 credits; (HP, P, LP, NC)*

*Prerequisites: None*

### ECS 115: Strategic & Financial Management of Health Care Institutions

Strategic and Financial Management of Health Care Institutions offers students the opportunity to learn about and practice strategic and financial management as those disciplines apply to health care institutions. By the end of the course, students will be able to understand financial accounting, cost accounting, financial analysis, financial strategy, organizational structure, strategic planning, environmental analysis, and marketing. Students will be able to apply financial techniques to strategic analysis of the health care environment, cost reduction in health care and to organizational decision making. The ability to apply that knowledge will be reinforced through projects, casework and homework problems. The course integrates textbooks, cases, and projects. The first half of the course focuses on financial analysis; the second half of the course focuses on strategy.

*Winter term; 4 credits; (HP, P, LP, NC)*

*Required for MPH*

*Prerequisites: ECS 100; no economics preparation assumed*

#### \*ECS 117: Continual Improvement of Healthcare: An Overview

This course offers participants the opportunity to discover and preview the knowledge, methods, and skills necessary to effect the continual improvement of the quality and value of health care. Participants will be offered an opportunity to connect that knowledge, and those methods and skills, to their personal life and work. This course includes a significant amount of weekly pre-class preparation. Small group work is encouraged during the afternoon lab period.

*Fall term; 6 credits; (HP, P, LP, NC)*

*\*Core Requirement for MPH and MS*

*Prerequisites: None*

#### ECS 119: Decision and Cost-Effectiveness Analysis: Practicum in Decision Making

This course, which covers the fundamental principles and mechanics of decision analysis and cost-effectiveness analysis, is offered in conjunction with ECS 121 (see its description below). Students in ECS 119 participate in the same weekly assignments and attend the same lectures as students in ECS 121, but students in ECS 119 complete an independent practicum project and paper instead of a small group project. Approval of a practicum project by the course instructors is required before a student can pre-register for ECS 119.

*Spring term; 6 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 100 and permission from instructor prior to pre-registration.*

#### ECS 120: Studying Patients' Decisions

This course introduces the basic strategies used for fundamental and applied investigations into patients' health care decision making. There are three major topical areas. The first involves the cognitive theories, study designs, and measurement methods most commonly used to elicit patients' preferences for health states, treatment processes, time periods, levels of risk, and participation in decision making. The second area begins with the clinical concept of decisional conflict, and then focuses on the challenges of designing, evaluating, and implementing patients' decision aids as one approach to providing effective decision support in various clinical contexts. The third area pervades the course; it involves helping students gain awareness of the broader scientific, philosophical, and socio-political issues inherent in studying patients' decision making. The course will be built around selected weekly reading and application exercises, as well as the research interests of the individual students. By the conclusion of the course, the student will have outlined a proposal that addresses a particular research problem in this field.

*Winter term; 4 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 100*

#### ECS 121: Decision and Cost-Effective Analysis: An Introduction

This course covers the fundamental principles and mechanics of decision analysis and cost-effectiveness analysis. Topics covered in the course include basics of probability (including Bayes' Theorem), structuring decision problems as decision trees and Markov models, components of preference (value preference, time preference, and risk preference), valuing multidimensional outcomes, evaluating decision trees, sensitivity analysis, value of information, and basic principles of cost-effectiveness analysis. The course has a weekly lab that involves use of decision analysis software to reinforce concepts presented in class. Labs are also used for development, progress review and discussion of small group decision analysis projects, which culminate in formal presentations the last week of class. Weekly problem sets are also used to reinforce the concepts presented in class.

*Spring term; 4 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 100*

#### ECS 122: Survey Research Methods and Principles

This course introduces the basic skills needed to conduct and present survey research. It will focus on two aspects of such research: designing and administering a survey (primary data collection); and accessing, analyzing and reporting on data from publicly available national survey data (secondary data analysis). Topics covered will include survey design, sampling, validity, reliability, data collection, analysis, interpretation and reporting of results. To reinforce practical skills, the course will include weekly computer labs, research in progress sessions to critique draft survey instruments, and a journal club to critically read articles reporting survey results.

*Winter term; 4 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 140*

#### ECS 124: Design & Improvement of Clinical Micro-Systems

This course creates an opportunity for students to study and apply the principles and concepts learned in ECS 117, The Continual Improvement of Health Care: An Overview, to the work of managing the health and value of health care for a defined population of patients. Participants will work in partnership with selected managed care settings throughout the United States. Specifically, this course will offer participants an opportunity to identify the processes involved in managing a panel of patients, learn the knowledge and skills providers need to manage panels and provide optimal patient care, identify approaches for taking costs out of the care while maintaining or improving quality and enhancing customer satisfaction, understand the difference between the efforts for improvement of care at the front line and in the front office and how they may be related, and identify some of the barriers to making the health of a population better.

*Spring term; 6 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 117*

#### ECS 126: Statistical Measurement and Analysis for Quality Improvement

This course explores the history and theory of statistical process control and its application to health care. Specific topics covered include: development of measures; data collection; graphical display of data; the theory and construction of control charts for means, proportions, counts and rare events; statistical testing with control charts; risk adjusted control charts. Benchmarking and an organizational approach to measurement and improvement are discussed. The course provides case studies and small group exercises in which applicable theories and principles may be applied. Lab exercises and a personal project are included.

*Winter term; 4 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 117, ECS 140 (preferred)*

#### \*ECS 140: Epidemiology/Biostatistics 1

The epidemiology component of this course introduces the basic principles of epidemiology, including formulation of the research question, choice of study subjects, measures of disease frequency, assessment of exposure and disease status, study design (cross-sectional studies, prospective and retrospective cohort studies, case-control studies, and clinical trials), measures of association between exposure and disease (risk ratio and risk difference measures), measurement precision and accuracy, causal inference, use of statistical testing, and interval estimation in epidemiological studies. Taught as lectures, seminars, and assigned exercises, this course stresses the practical applications of epidemiological techniques.

The biostatistical topics in this course include introduction to the use of computers for statistical analysis, exploring and organizing data, vital rates and ratios, life tables, probability concepts, discrete and continuous probability distributions, populations and samples, nonparametric analysis, sampling distributions and statistical inference, statistical estimations, hypothesis testing, sample size and power, two-sample comparisons, analysis of variance and multiple comparisons, association and correlation, simple linear regression, multiple regression, multiple analysis of variance, analysis of covariance, logistic regression, and log-linear models.

*Second 5 weeks of Summer term ongoing through Fall term; 6 credits; (HP, P, LP, NC)*

*\*Core Requirement for MPH and MS*

*Prerequisites: None*

#### ECS 141: Epidemiology/Biostatistics 2

The epidemiological portion examines methods used to evaluate the role of chance, bias, and confounding in epidemiological studies. Topics include sources and definitions of bias and confounding, analytic techniques, e.g., stratified analyses, Mantel-Hanszel techniques, uses of logistic regression analysis in cohort and case control studies, and introduction to life table analysis using both Kaplan-Meier and regression techniques. Other topics include planning data management and analysis in epidemiological studies and estimating sample size. Lectures are illustrated by reference to epidemiological data.

The biostatistical portion of the course continues the examination of topics raised in the fall term (See ECS 140).

*Winter term; 6 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 140*

#### ECS 147: Advanced Methods in Health Services Research

This course will develop student analytic competencies to the level necessary to conceptualize, plan, carry out, and effectively communicate small research projects in patient care, epidemiology, or health services. Lectures, demonstrations, and labs will be used to integrate and extend methods introduced in other ECS courses. The course will also cover additional new analytic methods in epidemiology and health services. The students will use research datasets from the Medical Care Epidemiology Unit at TDI in classroom lab exercises and course assignments. Course topics will include risk adjustment, sampled data, multilevel analyses, instrumental variables, and small area analysis. Practical skill areas will include programming in STATA, studying datasets for completeness and quality, designing tables, and figures, and an introduction to geographic information systems. The instructors will tutor students as they develop their own analytic projects. Students taking the course for two credits will complete a research project, including a manuscript draft.

*Spring term; 6 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 140, 141*

*Required for PhD*

#### ECS 151: Environmental and Occupational Health: Challenges, Controversies, and Critical Analysis

The course is open to all students who meet the course prerequisites (ECS 140 and ECS 100) and is a required course for the MPH degree and for residents in the Dartmouth-Hitchcock Leadership Preventive Medicine Residency. This course seeks to engage students in the exploration of major environmental/occupational health issues through application of epidemiologic methods and risk assessment. Through case studies and critical analysis of the literature, the relationship between environmental and occupational exposures and human disease will be examined with emphasis on risk communication, formation of public policy, and the role of regulatory agencies. Topics include air and water quality, hazardous waste, radiation, metals, environmental pathogens, and clinical occupational medicine. This course will be taught using lectures, guest experts, assigned readings/exercises and field/site visits.

*Winter term; 4 credits; (HP, P, LP, NC)*

*Required for MPH*

*Prerequisites: ECS 140*

#### \*ECS 154: Social and Behavioral Determinants of Health

This course describes the evolution of the predominant illness patterns that dominate contemporary populations. It delves into explanations for individual and population health that focus primarily social and behavioral determinants for health promotion and disease prevention. Finally, it examines local and global responses to burgeoning factors that will significantly impact population health in the coming decades.

*Fall term; 4 credits; (HP, P, LP, NC)*

*Required for MPH and MS*

*Prerequisites: None*

#### ECS 155: The Geography of Health

This course provides a broad introduction to medical geography, spatial epidemiology, and the principles and methods used in the disciplines. The course is divided into three parts. The first section introduces the importance of place in understanding disease and health and covers topics in spatial epidemiology and analysis of geographic data. The second section uses case studies to explore the geography of disease, including infectious diseases and diffusion models, small area studies, workforce issues, and chronic disease. The third section of the course covers several special topics including the challenges of using aggregate data, the built environment and neighborhood planning, and parcel-level analysis in relation to chronic disease and health promotion. Students will be introduced to geographic information systems software in two lab sessions. Learning takes place through readings of selected manuscripts, the geographic information systems lab, lecture and discussion, assignments, and completion of a term project.

*Spring term; 4 credits; (HP, P, LP, NC)*

*Prerequisites: ECS 140*

#### ECS 156-159: MPH Seminar Series: Parts 1-4

The overarching goal of this course, a series of four public health seminars taught during the academic year, is to provide a progressive roadmap for the student's professional development in public health. Specific goals are to assure acquisition, demonstration, and documentation of public health competencies, facilitate integration of TDI and PH content and skills, communicate the culture and values associated with the study and practice of public/population health, and guide and support the completion of academically robust, high quality internship experiences and culminating products.

*All terms; 1 credit each term; (C, NC)*

*Prerequisites: None*

#### ECS 160: Internship in a Public Health Setting: Part 1

Part 1 of the Internship in a Public Health Setting is designed to provide MPH students with initial exposure to the organizational framework of their respective internship agencies. Students are to examine the following areas relevant to their internship sites: 1) populations served (and not served) by the agency, 2) the principal public health problem being addressed by the agency, 3) how program outputs and outcomes are defined, measured, and tracked, 4) who are the stakeholders and what are their respective roles, 5) where does financial support come from and how are funds distributed, and 6) what federal and state laws, regulations, and policies are relevant to the work of the program. Based on the above information, the final proposal for Part 2 of the Public Health Internship (ECS 161) is submitted.

*Winter term; 4 credits (C, NC)*

*Required for MPH; Not available for MS, PhD, Post-doc or Special students*

*Prerequisites: ECS 100, 102, 111, 115, 117, 140, 151, 154, 156, 157, or consent of course director.*

#### ECS 161: Internship in a Public Health Setting: Part 2

The public health field internship provides students with an opportunity to apply principles and skills learned in the classroom - the measurement, organization, and improvement of public health care - to real situations in the field. A minimum of 320 hours is to be spent at the placement site during the winter and spring terms. Attendance at public health-related conferences, events, and meetings is highly recommended throughout the year and can be counted toward an additional 40 hours of required public health-related education. Typically, this internship occurs in the final term of the year, but other arrangements are possible with permission of the course director. Students who have completed their internships prepare and present posters at the conclusion of the spring term and complete an exit appraisal of their experience and achievements.

*Spring term; 6 credits (C, NC)*

*Required for MPH; Not available for MS, PhD, Post-doc or Special students*

*Prerequisites: ECS 100, 102, 111, 115, 117, 140, 151, 154, 156, 157, 158, 160 or consent of course director.*

#### ECS 162: Public Health Culminating Project

The public health culminating project provides students with an opportunity to apply principles and skills learned in the classroom and in the field – through the measurement, organization, and improvement of public health care. This culminating project is typically completed in conjunction with the internship project. Culminating projects require one of the following options for all students: a) data collection and analysis related to a public health question appropriate for a research paper, b) plan and implement a needs assessment with a community organization in conjunction with a grant proposal, c) intervention design for community implementation, or d) a systematic literature review of a public health issue.

*Spring term; 4 credits (HP, P, LP, NC)*

*Required for MPH; Not available for MS, PhD, Post-doc or Special students*

*Prerequisites: ECS 100, 102, 111, 115, 117, 140, 151, 154, 156, 157, 158 or consent of course director.*

#### ECS 163: Government Public Health Experience for Leadership Preventive Medicine Residents: Pt 1

Residents in the Dartmouth-Hitchcock Leadership Preventive Medicine Residency enroll in this course, the equivalent of ECS 160.

*All terms; 4 credits; (HP, P, LP, NC)*

*Required for Leadership Preventive Medicine Residents*

*Prerequisites: ECS 100, 102, 115, 140, 151, 154, 171-174 or permission of course director.*

#### ECS 164: Government Public Health Experience for Leadership Preventive Medicine Residents: Pt 2

Residents in the Dartmouth-Hitchcock Leadership Preventive Medicine Residency enroll in this course, the equivalent of ECS 161.

*All terms; 6 credits; (HP, P, LP, NC)*

*Required for Leadership Preventive Medicine Residents*

*Prerequisites: ECS 100, 102, 115, 140, 151, 154, 171-174 or permission of course director.*

#### ECS 165: Practicum Project for LPMRs

Residents in the Dartmouth-Hitchcock Leadership Preventive Medicine Residency enroll in this course, the equivalent of ECS 162.

*All terms; 4 credits; (HP, P, LP, NC)*

*Required for Leadership Preventive Medicine Residents*

*Prerequisites: ECS 100, 102, 115, 140, 151, 154, 171-174 or permission of course director.*

#### ECS 171-174: Critical Issues in Health and Health Care for Leadership Preventive Medicine Residents

Residents in the Dartmouth-Hitchcock Leadership Preventive Medicine Residency Program enroll in this year-long course, the equivalent of ECS 111. The focus of this course is for LPM residents to discuss the history of the US health care system, describe the basic health economics and insurance, discuss health care financing, and analyze comparative health systems.

*Each term; 1 credit per term; (CT, NC)*

*Required for Leadership Preventive Medicine Residents.*

*Prerequisites: None*

#### ECS 176-179: MS Tutorial Series: Parts 1-4

The overarching goal of this course, a series of four tutorial seminars taught during the academic year, is to provide a progressive roadmap for the student's professional development in the evaluative clinical sciences. Specific goals are to assure acquisition, demonstration, and documentation of specific competencies in the evaluative clinical sciences and guide and support the completion of an academically robust, high quality culminating research proposal or paper.

*All terms; 1 credit each term; (HP, P, LP, NC)*

*Prerequisites: None*

#### ECS 187, ECS 188, and ECS 189: Directed Readings

Students may participate in a Directed Readings course through arrangements with a faculty member. "Directed" coursework involves readings and special projects, and is subject to approval by an approved TDI faculty supervisor and the Academic Programs Administrator (for masters degree students) or the Chair or Director of their programs (for PhD students and non-degree Postdoctoral fellows). See the Blackboard webpage in the 'My Organizations' section called 'TDI Directed Research and Readings' for guidelines and other students' approved proposals as examples.

Directed Readings are typically literature reviews on a specific topic with a paper due at the end of the term that provides an overview of the topic(s) to be reviewed, the references read and the process used to identify readings and that summarizes the theory and evidence found in the literature review. In addition to meeting with faculty regularly and conducting literature searches throughout the term, an average of 12 hours each week devoted to the readings and preparation of the products during the 10 week term is worthy of a 4 credit Directed Reading (ECS 187). An average of 24 hours each week devoted to the readings and preparation of the products during the 10 week term is worthy of a 8 credit Directed Reading (ECS 188). An average of 36 hours devoted each week to the readings and preparation of the products during the 10 week term is worthy of a 12 credit Directed Reading (ECS 189).

*All terms: By arrangement. (HP/P/LP/NC).*

*ECS 187 is four credits; ECS 188 is eight credits; ECS 189 is twelve credits.*

*Prerequisites for Masters degree students: Core courses or permission of an approved faculty supervisor and an Approved Proposal. To obtain approval of proposal, prior to the beginning of the term please submit by email to Center for Education the Readings cover sheet and proposal with an electronic signature or email from the proposed TDI faculty supervisor.*

*Prerequisites for PhD students and NRSA Postdocs: Approved Proposal. To obtain approval of proposal, prior to the beginning of the term submit by email to the PhD Program the Readings cover sheet with an electronic signature or email from the proposed TDI faculty supervisor.*

#### ECS 197, ECS 198, and ECS 199: Directed Research

Students may participate in a Directed Research course through arrangements with a faculty member. MS students are required to enroll in ECS 197 during their final term. “Directed” coursework involves a specific research proposal and is subject to approval by an approved TDI faculty supervisor and the Academic Programs Administrator (for masters degree students) or the Chair or Director of their programs (for PhD students and non-degree Postdoctoral fellows). See the Blackboard webpage in the ‘My Organizations’ section called “TDI Directed Research & Readings, Supervised TA & RA” for guidelines and other students’ approved proposals as examples.

When the intended work to be accomplished is considered to be ‘deep background’ reading for the student’s general training or topic, choose directed readings courses (ECS 187-189); see separate guidelines. On the other hand, if the literature review to be accomplished is intended to be primarily directly related to preparing a dissertation or other research project, use the directed research courses. Also use directed research for preparing the PhD proposal and for carrying out all research activities for design, analysis, and writing up the findings. On the other hand, if the research to be conducted is primarily or exclusively to do grant work or research for a faculty member and for which the student is NOT a principal designer and would be inappropriate to claim first authorship on publications or reports of the results, then the student should sign up for Supervised Research Assistantship; students may be paid to carry out such grant work; see separate guidelines.

In addition to meeting with faculty regularly and conducting research activities throughout the term, an average of 12 hours each week devoted to the research and preparation of the products during the 10 week term is worthy of a 4 credit Directed Research (ECS 197). An average of 24 hours each week devoted to the research and preparation of the products during the 10 week term is worthy of a 8 credit Directed Research (ECS 198). An average of 36 hours devoted each week to the research and preparation of the products during the 10 week term is worthy of a 12 credit Directed Research (ECS 199).

PhD students carrying out research prior to defending their proposal should enroll in these courses. Post proposal defense (i.e., thesis work by PhD candidates) should use the 297-299 course number.

*All terms: By arrangement. (HP/P/LP/NC)*

*ECS 197 is four credits; ECS 198 is eight credits; ECS 199 is twelve credits.*

*Prerequisites for Masters degree students: Core courses or permission of student's program advisor and Approved Proposal. To obtain approval of proposal, submit to Center for Education the Masters Degree cover sheet and research proposal, signed by your program advisor and proposal advisor prior to the beginning of the term.*

*Prerequisites for PhD students and NRSA Postdoc: Approved Proposal. To obtain approval of proposal, submit to PhD Program the PhD/Postdoc cover sheet documenting approval of supervising faculty and Chair of PhD and research proposal prior to the beginning of the term.*

#### ECS 245: Advanced Statistics & Methods

This course provides an in-depth coverage of the regression methods introduced in ECS 140 and ECS 141, including linear models (multiple regression, ANOVA, and repeated measures ANOVA), proportional hazards regression, accelerated failure time models, logistic regression and Poisson

regression. For each model covered, we will first review assumptions and methods for estimation and statistical inference. This will be followed by an introduction to estimating equations based on least squares and maximum likelihood and the use of these methods to address complex data analysis problems. The course will introduce linear and non-linear regression methods for longitudinal data. Additional methods introduced include propensity scores, generalized estimating equations and bootstrapping. Methods will be illustrated using examples from health services and biomedical research. Assignments will consist of brief analysis reports, using sample data sets. Emphasis will be on selection of appropriate analysis methods and formulation of appropriate interpretations. Students will use the STATA statistical software package extensively.

*Spring term; 4 credits (HP, P, LP, and NC)*

*Prerequisites: PhD student or Postdoctoral Fellow status, familiarity with the subject matter, and ECS 140 and 141.*

*Required for PhD students*

### ECS 250-254: Supervised Teaching in the Evaluative Clinical Sciences

This experience for the student teacher assumes that the course has been developed and taught in prior terms. Course faculty and the student teaching assistant (TA) work closely to develop and evaluate discussion assignments and associated homework. TAs conduct discussion sessions in courses under the supervision of the course faculty. TAs may be encouraged to present lectures for which they receive detailed feedback on their teaching style. TAs receive instruction on effective teaching techniques, such as how to teach the material, how to run a discussion, how to evaluate student responses, and grading. TA performance will be monitored throughout the term and the supervising faculty will provide appropriate evaluation, coupled with detailed suggestions for improvement. See the Blackboard webpage in the “My Organizations” section called “TDI Directed Research & Readings, Supervised TA & RA” for guidelines and other students’ approved proposals as examples. A proposal is required when signing up for any of the TAship courses.

To select which of the ECS 250-254 courses is the appropriate course for enrollment, the selection should match the projected number of hours usually attributed to TAing a specific course. For example, a TA for ECS 254 at 4 credits should expect to spend an average of approximately 12.5 hours per week in and out of class for 13 weeks, performing the agreed-upon TA responsibilities in assisting the course faculty. ECS 254 is typically appropriate for a TA for one of the 6 credit courses with labs or 6 credit practicum courses. A TA for ECS 253 at 3 credits should expect to spend an average of approximately 9.6 hours per week in and outside of class for 13 weeks, performing the agreed-upon TA responsibilities in assisting the course faculty.

Teaching Assistants should plan on being available for 13 weeks of a 10-week course, for final course planning prior to the start of the term and student evaluation purposes after the end of the term. *All terms: By arrangement. (ECS 250=1/2 credit; ECS 251=1 credit; ECS 252=2 credits; ECS 253=3 credits; ECS 254=4 credits). (Credit/No Credit grade).*

*Prerequisites: PhD student or Postdoctoral Fellow status, familiarity with the subject matter, and prior approval from TDI’s Center for Education and the supervising faculty member; MS and MPH students must request an exception from OEP to participate.*

*A total of six credits of Supervised Teaching in TDI courses is required for PhD students. Any combination of ECS 250-254 will suffice (e.g., ECS 254 in one term, ECS 251 in one term, and ECS 251 in one term add up to 6 credits). If ECS 250 is a chosen TAship course, students must enroll in it for two terms, for a total of 1 credit, to partially meet the 6 credit TA requirement.*

### ECS 257-259: Advanced-Level Student Teaching in the Evaluative Clinical Sciences

This experience for the student teacher assumes that the student has had considerable experience in teaching this course content. This is an advanced teaching course in which student teachers are given the opportunity to refine their teaching techniques and expand their role, under the supervision of the course faculty, and to include more advanced levels of responsibility as an instructor compared

to those expected under ECS 256. Students enrolling in this course must have completed their programmatic teaching requirement and otherwise be experienced as a teacher and exceptionally proficient in the subject matter.

*All terms: By arrangement. 1-3 credits (ECS 257=1 credit; ECS 258=2 credits; ECS 259=3 credits). (Credit/No Credit grade)*

*Prerequisites: PhD student or Postdoctoral Fellow status; advanced proficiency with the subject matter, completed the programmatic teaching requirement; and prior approval from TDI's Center for Education) and the supervising faculty member; MS and MPH students must request an exception from the Center for Education to participate.*

#### ECS 276-279: Supervised Research Assistantship

Only PhD Students, PhD Candidates, or non-degree-seeking postdoctoral fellows with a thesis degree may sign up for Supervised Research Assistantship Courses. When the intended work to be accomplished is considered to be for training as a research assistant and work to be completed is for a grant or work of the faculty member and the student would not qualify for first authorship on reports or publications and is being paid hourly as a student employee, the student should sign up for Supervised Research Assistantship courses at the appropriate level. Otherwise, the student should sign up for directed research.

Supervised Research Assistantship is graded using the following graduate grading options: Credit and No Credit. Please note: it is **NOT** acceptable for you to receive an INC or ON grade; these are seldom, if ever, appropriate. Instead, work closely with your supervising faculty to agree upon a revised end-product for the term.

For this course, there is no formal proposal due to the Chair of the Program. The student is expected to work out products and expectations with the supervising faculty. This is a guideline for hours associated with credits:

In addition to meeting with faculty regularly throughout the term, an average of 8 hours (20% FTE) each week devoted to the proposed tasks and preparation of the products during the 13 week quarter is worthy of a 2 credit Supervised Research (ECS 277). An average of 16 hours (40%FTE) each week devoted to the proposed tasks and preparation of the products during the 13 week quarter is worthy of a 6 credit Supervised Research (ECS 278). An average of 20 hours (50%FTE) devoted each week to the proposed tasks and preparation of the products during the 13 week quarter is worthy of a 12 credit Supervised Research (ECS 279). With the agreement of both the student and faculty member, the FTE for pay can be negotiated; see the definition under 'choosing the right number for registering' to define appropriate courses. Please inform the Chair of the Program when the FTE is not exactly 20% or 40% or 50%. If the student enrolls in more than one Supervised RA course in a given term, the combined FTE for Supervised RA cannot exceed 50%.

*All terms: By arrangement. (Credit/No Credit)*

*Prerequisites: Doctoral student or candidate status or post-doctoral fellow*

#### ECS 290: Doctoral Seminar

All doctoral students are required to enroll for six terms of the doctoral seminar, over a two-year cycle, during their first and second year. "Advanced topics" years alternate with professional ethics and research skills sessions.

Format: The seminar may take various forms, e.g., a journal club. The chairperson of the doctoral program directs the course, but teaching faculty chooses the readings and facilitates discussion, with the assistance of a doctoral student. Students will be assigned sessions for which they will have a special responsibility, but everyone will be expected to read the articles and actively participate in all discussions.

*All terms: By arrangement. 2 credits per term; (Credit/No Credit)*

*Six terms of doctoral seminars required for PhD program.*

*Prerequisites: Doctoral student status at first or second year level*

ECS 297, ECS 298, and ECS 299: Doctoral Research

Thesis research under the guidance of a faculty member who is the student's designated Dissertation Research Advisor. See Tabs 3 and 7 in the PhD Student Handbook for more details and examples of acceptable proposals.

*All terms: By arrangement.*

*ECS 297 is four credits; ECS 298 is eight credits; ECS 299 is twelve credits.*

*Prerequisites: PhD candidacy status, including successfully defending the thesis proposal.*

**For the specific guidelines and forms for Directed Readings, Directed Research, Supervised Teaching Assistantships, and Supervised Research Assistantships, please go to Blackboard and review the information in the "TDI Directed Research, Readings, Supervised TA and RAs folder under 'My Organizations.'**